The Hidden Structure of Thai Noun Phrases

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Abstract

This dissertation investigates the structure and interpretation of noun phrases in Thai and
other classifier languages, focusing particular attention on whether Thai contains the same articu-
lated functional architecture as languages with articles. I argue that while bare nouns in Thai do
not project DP, noun phrases which include classifiers do, and that this DP functions as a phase for
cyclic spell-out. It is argued that Thai DPs involve the obligatory movement of the NP, accounting
for their noun-initial word order.

A uniform analysis of clausal modification within the noun phrase is provided, driven by an
analysis of the particle *thîi* as a complementizer that derives properties from clauses, with the use of
thîi in relative clauses being one instance of this use. The analysis of Thai bare nouns as NPs and *thîi*
as a relative complementizer are reconciled with a head-movement analysis of Thai relative clauses,
motivated by empirical considerations. Under this analysis, noun-complement clauses are analyzed
as modifiers, on par with relative clauses. The property-operator analysis of *thîi* is suggested to
extend to its occurrence in clefts and infinitival clauses as well.

A further construction is investigated in which modifiers do not combine directly with nouns,
but instead follow classifiers, resulting in a definite interpretation. This construction provides ev-
idence for a null determiner in Thai, which is argued to take modifiers as complements, either as
CPs or as small clauses. The general prohibition against bare classifiers in Thai, alleviated by the
presence of modifiers following classifiers, is argued to follow from a structural economy constraint
which prefers definite bare nouns to definite bare classifiers. It is argued that this constraint can also

provide a principled account for which classifier languages do and do not allow bare classifiers to occur with nouns.

The ability of quantifiers and their accompanying classifiers to appear discontinuously from their associated noun, or quantifier float, is the final major topic of this dissertation. Scope facts lend themselves to an analysis of quantifier float as a byproduct of Quantifier Raising, the normal movement of quantificational noun phrases to their scope position. Thus, quantifier float is analyzed as movement of the entire DP, with the quantifier and noun occurring in different positions due to the conflicting semantic transparency requirements. A generalization about the availability of quantifier float in classifier languages is presented: only languages in which quantifiers follow nouns allow rightward quantifier float. In light of the proposed analysis, this generalization provides evidence that DP is a phase even in languages that lack articles.

Contents

Acknowledgments

I was sitting on a plane, flying back to a freezing San Francisco summer after defending my dissertation in Cambridge. I was jotting down notes, trying hard to synthesize the feedback I received from my advisors during my thesis defense, when the thought of a very different westward trip crept into my head. Seven years ago I trekked from Hanover, New Hampshire to San Diego, California in an old Honda Accord. I had just finished my undergraduate honors thesis on quantifier float in Thai and was ready to begin a Ph.D. program at UC San Diego. I was young, arrogant, and woefully ignorant of how much I didn't know.

So many people have brought me from that first trip to this one I am on now, academically and personally. I am happy to have to opportunity to thank them all here.

I feel extremely fortunate to have been Masha Polinsky's student for the last seven years. To the extent that I have been successful I attribute much of it to her guidance. Masha taught my first syntax class at UCSD, read my undergraduate thesis in full, employed me as a research assistant, and had enough faith in me to take me with her to Harvard. She has always been very generous with her time, which is in great demand. Her knowledge of languages and linguistic theory are tremendous, but she never pushed her ideas on me, was always honest in her assessment of my work, and showed extraordinary patience as I waded through alternative analyses. Masha has kept me focused on language, which has kept me headed in the right direction for the last seven years.

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Jim Huang was on sabbatical for much of my dissertation year, but his influence on the work

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Outside of linguistics, more people have been a source of encouragement than I can list, so here I must restrain myself. My parents decided to move around the world to Thailand two years before I was born, which also made this thesis possible. The first time I thought about Thai

grammar was when my mother corrected me for using the Thai modal *càʔ* in sixth grade in a non-future context. I still maintain that my use was correct (see section 2.5.1). I am grateful to my sisters Erica and Melissa, who both made sure that my degree didn't get to my head and were great writing parners. I am particularly grateful that Melissa agreed to proof-read the *entire* dissertation, which she did marvelously in *two weeks*. My in-laws, Rik and Aria, have been supportive throughout this process as well, serving as my surrogate parents in the Bay Area while I was writing.

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Dedicated to my parents.

Chapter 1

Introduction

The noun phrase structure of languages that lack definite and indefinite articles, such as Thai, has received considerable attention in the formal literature in the past ten or so years. Two parallel trends in gave rise to this interest. The first is the universalist thrust of generative grammar, which has pushed researchers to search for creative ways to account for linguistic variation within a restricted theory of linguistic structure.

The second trend is the rise of functional categories. Abney (1987) provided what is often seen as the first detailed argument for functional structure in the nominal domain. Abney's proposal focused on the existence of a single projection above nouns, the DP, and the inflectional nature of articles and possessive constructions in many language, the denizens of DP. Stowell (1991), Szabolcsi (1994), and others provided further arguments for the existence of such a category and how it might be interpreted.

The prevalence of languages that lack article systems has led to a lively debate about the universality of the DP projection. In the universalist camp are those who maintain that all functional categories occur in every language, and thus that argumental noun phrases universally include a DP, often headed by a phonologically null article (Borer 2005; Longobardi 1994, 2005). Linguists on

the other side, who might be labeled variationists, point to a number of systematic differences that exist between languages with and without articles, arguing that these differences can be made to follow from the absence of a DP projection (Boškovìc 2008; Chierchia 1998; Dayal 2004; Fukui and Takano 2000).

This dissertation maintains an obvious middle ground, following the analyses of Thai noun phrases in Piriyawiboon (2010) and Mandarin Chinese in Yang (2000). The idea is that bare NPs are available as nominal arguments, as claimed by the variationist camp. However, when nouns do project higher structure, they project all the way to DP, as would be expected by the universalist camp. Building on the insights of Krifka (1995) and Chierchia (1998) about kind-reference in classifier languages, I adopt a semantic analysis of nouns in Thai as kinds. This analysis accounts straightforwardly for the ability of nouns in Thai to occur as nominal arguments in a type-driven semantics, as well as for their scopelessness. However, this view does not preclude the claim that NPs sometimes do project higher functional structure, which I limit to classifier phrases and DPs. This structure is sometimes necessary because of the semantic deficiencies of kinds. I focus on the semantic requirements of counting, deixis, and quantification to make this point. I also argue in chapter 5 that Thai does possess a null D, the protagonist of the universalist approach. However, I argue that this null D, interpreted as a choice function, cannot occur with bare nouns, and its distribution is restricted because it is in competition with bare nouns. This analysis thus differs from the analysis of Cheng and Sybesma (1999), who argue that the functional structure itself varies, and that in classifier languages the classifier functions as a kind of article.

While the interplay between NP and DP is the unifying theme of this dissertation, the topics covered within are more varied. Thai clause structure is not ignored, as it is the focus of chapter 2 and plays a central role in chapter 6 as well. The purpose of discussing Thai clause structure is both to provide a reference for those interested in Thai grammar as well as providing a reference point for the rest of the dissertation. A major theme of the dissertation is relative clauses, which I

argue can be derived by head-raising in Thai, a la Kayne (1994), both for bare NPs (chapter 4) and and DPs (chapter 5). I also present a detailed investigation of noun-complement clauses in chapter 4, while classifiers themselves are a major focus of chapter 3 and chapter 5. Chapter 6 is notably different from the rest of the dissertation, as it focuses on quantifier float, and does not address the internal structure of noun phrases. However, I present a generalization in that chapter which I take to be evidence DPs in classifier languages are phases. The structure of this work is largely modular; each chapter can be read as an independent entity.

While the major focus of this dissertation is Thai, data from other languages are presented at several points, and a number of generalizations or observations about crosslinguistic variation are presented. Chapters 4 and 5 both discuss Mandarin Chinese in some detail, in both cases regarding the structure of relative clauses, though I also postulate in section 5.4.3 that Mandarin may have a null D in some cases as well. I also sketch an account of the crosslinguistic availability of bare classifiers and bare nouns in chapter 5 based on notions of structural economy. In addition, chapter 6 presents a generalization about the availability of quantifier float in classifier languages and relates it to the proposed analysis for Thai.

1.1   Thai Basics

Thai is an *subject-verb-object* (SVO) language characterized by analytic morphology, rigid word order, and a rich set of functional words which mark the grammatical properties of phrases and clauses. Thai is a right-branching or head-initial language based on the more reliable typological diagnostics: auxiliary verbs generally precede verbs, adpositions precede nouns, nouns precede relative clauses, and complementizers precede clauses. All of these properties are illustrated in the following example:

(1) [NP dèk   [CP thîi chalàat]] khuan cà   phûut [CP wâa [NP ŋəən khɔ̌ɔŋ chǎn]
       children REL smart   should PROSP say COMP   money POSS 1SG
     jùu [PP bon tóʔ]]
     LOC   on table
     'Children that are smart should say that the money was on the table.'

Some additional aspects of Thai word order seem to indicate mixed headedness; some markers of aspect and modality follow the verb, for example, and numerals, classifiers, and demonstratives follow the head noun. Following Visonyanggoon (2000), chapters 2 and 3 argue that some of these are stranded in the phrase-final position by VP- and NP-movement, respectively, and some are modifiers, which always follow the elements they modify in Thai. This approach allows a uniform head-initial analysis of Thai to be maintained.

Thai also contains a number of sentence-final particles, including question markers and honorifics:

(2) a. nɔ́ɔj nɔɔn naan   **máj**
         Noi sleep long-time YNQ
         'Did Noi sleep for a long time?'

     b. nɔ́ɔj nɔɔn naan   **khráp**
         Noi sleep long-time HON:MSP
         'Noi sleeps for a long time.' (formal, male speaker)

     c. nɔ́ɔj nɔɔn naan   **náa**
         Noi sleep long-time FP
         'Noi sleeps for a long time, alright?'   (Pittayaporn 2011, ex. 1)

For a detailed overview of these particles, see Cooke (1989). These particles may be sentence-final either because they trigger phrasal movement to their specifier, or for their role in realizing Thai boundary tones, as discussed by Pittayaporn (2011).

Thai lacks the obligatory marking of tense, agreement, case, number, definiteness, or any other morphosyntactic category generally expressed by inflection. To some extent, this is an areal tendency of East and Southeast Asian languages with analytic morphology. However, the absence

of these categories is not in principle derivable from the analytic morphology of Thai; it is easy to imagine that such inflectional morphemes could be present as independent words. Given the absence of such inflectional markers in Thai, however, syntactic notions such as subject and object must be based on purely syntactic criteria, with subjects always immediately preceding the verbal complex and objects immediately following the verb itself (see chapter 2).

Outside of these inflectional categories, Thai does have extensive derivational morphology, including category-changing derivational prefixes, compounding, and reduplication (Iwasaki and Ingkaphirom 2005, ch. 2). Compounding is common, and can occur with N-N and V-V sequences, a property shared by many analytic languages, including Chinese (Li 1990). Reduplication in Thai is often used to mark emphasis, though it also marks plurality with a limited number of human nouns (section 3.3).

Topics are reliably marked by syntactic means in Thai. Given information is often located in an initial topic position (Ekniyom 1982). When a topic has been established, it can be omitted in subsequent sentences, including arguments in their argument position (Hoonchamlong 1991). Thus, Thai is a radical pro-drop or topic-drop language, in the sense of Huang (1984). Focus is marked either by fronting, in which case fronting must be accompanied by a focus particle (Ekniyom 1982), or, in the case of adjuncts, by manipulating their order after the verb (section 2.6.1).

Thai is a *wh*-in-situ language, meaning that *wh*-questions involve the in-situ use of an indefinite pronoun. These indefinite pronouns can be interpreted either as wh-elements, NPIs, or indefinites depending on the other operators in the clause:

(3) a. Nít hěn **khraj**
         Nit see INDF:HUM
         'Who did Nit see?'

     b. Nít mâj hěn **khraj**
         Nit NEG see INDF:HUM
         'Nit didn't see anybody.'

    c.   Nít hěn **khraj**   máj
        Nit see INDF:HUM YNQ
        'Did Nit see somebody?' (Ruangjaroon 2005, pp. 1-2)

A more detailed study of these expressions in Thai can be found in Ruangjaroon (2005).

Thai segmental phonology is characterized by a rich inventory of vowels and stops. The transcription system I adopt for these consonants is mostly based on the IPA but incorporates some aspects of the Royal Thai General System of Transcription adopted by the Thai government. Note in particular that voiceless aspirated stops are indicated simply by adding lowercase 'h' after the stop: ⟨ph, th, ch, kh⟩, rather than by making use of superscripts. The charts below are based on Hass (1964, p. xi) and Iwasaki and Ingkaphirom (2005, p. 4):

(4)   *Consonant inventory of Thai*

	LABIAL	ALVEOLAR	PALATAL	VELAR	GLOTTAL
STOPS					
+voice	b	d			
−voice, *−asp*	p	t	c	k	ʔ
−voice, *+asp*	ph	th	ch	kh	
FRICATIVES					
−voice	f	s			h
NASALS	m	n		ŋ	
LIQUIDS		l, r			
GLIDES	w		j		

All of these sounds occur as onsets, and complex onsets do occur, with /l/ or /w/ attaching to a subset of the voiceless oral stop series. Only glides and stops, including nasals, can occur in coda position. The three-way voicing contrast in oral stops is completely neutralized in coda position, where they are always transcribed as voiceless stops.

Thai has nine vowels, each of which contrast for length. I indicate long vowels throughout the dissertation simply by doubling the vowel. Thai has three diphthongs consisting of a high vowel with /a/:

(5)   *Vowel inventory of Thai*

	FRONT	CENTRAL	BACK
HIGH	i, ii	ɨ, ɨɨ	u, uu
MID	e, ee	ə, əə	o, oo
LOW	ɛ, ɛɛ	a, aa	ɔ, ɔɔ
DIPHTHONGS	ia	ɨa	ua

I write the unrounded high central vowel ɨ as ʉ throughout the dissertation for readability.

Last, Thai is a tonal language, with five contrastive lexical tones. I do not mark words that are lexically mid-toned with any diacritic:

(6)   *Tone inventory of Thai*

MID	a
LOW	à
HIGH	á
FALLING	â
RISING	ǎ

Thai words minimally consist of two moras; short vowels must be followed by a coda, which can include the glottal stop. When polysyllabic, Thai words exhibit iambic stress (Bennett 1995); non-final syllables can be monomoraic and toneless. The full inventory of tones only occur on bimoraic words with open syllables or sonorant codas. Short vowels in closed syllables can only receive high or low tone; long vowels and diphthongs in closed syllables are restricted to low and falling tone (Morén and Zsiga 2006).

Throughout this dissertation, I use the term 'Thai' to refer to the standard dialect of modern Thai, based on the dialect spoken in Bangkok and the surrounding area in central Thailand. Central Thai is a Southwest Tai language, a family that includes other non-standard dialects of Thai as well as Lao. Tai languages form one branch of the larger Kradai family (Edmondson and Solnit 1997; Pittayaporn 2009). Most non-Tai members of Kradai are spoken by minority groups throughout northern Thailand, Laos, and Vietnam, as well as southern China. The genetic affiliation of Kradai itself is unresolved and has been the topic of some debate. The two most influential hypotheses are

that Kradai forms a larger group with Sino-Tibetan (e.g. Li 1976) and that Kradai is associated with Austronesian and Hmong-Mien (e.g. Benedict 1942; Sagart 2004).

1.2   Theoretical Assumptions

In this dissertation I adopt the basic tenets of the Minimalist Program (Chomsky 1995, *et seq.*). I provide brief overview of major components of the theory below. While I assume this theory, I do believe that many of the main observations and arguments that I make could be translated into other generative theories of phrase structure. The main purpose of the dissertation is to explore how much structure is necessary in Thai noun phrases, and what the precise structure and interpretation of various constructions within Thai noun phrases might be. These conclusions, at least, seem translatable.

In Minimalist syntax, syntactic structures are built derivationally, from the bottom up. This procedure begins with a lexical array or numeration, which is the set of roots and features which will enter into a computation. The members of the numeration then combine freely, forming a derivation, which feeds into the interfaces.

The derivation proceeds stepwise via a simple operation Merge. The output of Merge receives the label of one of the two syntactic objects that were combined. Generally, when an atomic syntactic object merges with a phrasal constituent, the head provides the label to the resulting structure, forming a $\bar{\text{X}}$ category in traditional terms. This $\bar{\text{X}}$ category can merge with additional phrasal constituents, leading to specifiers and adjuncts, a distinction that I assume, mostly based on empirical grounds; in Thai specifiers are always on the left, while adjuncts are always on the right. This distinction might follow from the precise nature of the features that trigger Merge, as I propose in section 6.4.3. The derivation *converges* if it satisfies well-formedness conditions at the interface with phonology and semantics (Chomsky 2004).

The well-formedness conditions at the semantic interface include the requirement that the derivation must be interpretable. Following Chomsky (1995), I assume a distinction between interpretable features — [F] — and uninterpretable features — [uF]. Uninterpretable features trigger the operation Agree (Chomsky 2000), wherein the uninterpretable feature initiates a search procedure, necessarily downward due to the bottom-up nature of the derivation, for its interpretable counterpart. Alternately, [uF], may be satisfied simply by merging a lexical item from the numeration which bears the relevant feature. Once valued, [uF] can delete, allowing convergence at the interface with semantics.

This same feature system can be used to account for categorical selection, as outlined by Svenonius (1994) and Matushansky (2006): selectional features are uninterpretable category features, [uN] for nouns, etc. Such features can be used to model the notion of extended projection from Grimshaw (1991) by assuming that each member in the extended projection of a lexical item contains an uninterpretable feature for the category of which it serves as a projection.

Members of the numeration can be merged into the structure at multiple points, provided that they are syntactically licensed in each position, deriving movement. This 'copy-theory' of movement also predicts straightforwardly that constituents can be interpreted in any of the positions in which they are merged, accounting for the existence of reconstruction effects, or cases where constituents are pronounced in a higher position than the one where they are interpreted, as observed by Chomsky (1993). There is a fair amount of debate about the nature of movement, whether it might involve copying and merging, forming a chain (e.g. Chomsky 1995; Nunes 2004), or simply remerge of the same object, ultimately leading to multidominant representations (e.g. Bachrach and Katzir 2009; Citko 2005; Epstein et al. 1998). Obvious empirical arguments for the former case arise from cases where a particular lexical item is pronounced twice, arguments for the latter case arise from cases where a single lexical item seems to be shared by multiple subtrees.

Returning to the well-formedness conditions at the interface with semantics, the most basic

condition is simply that the syntactic derivation can be interpreted as a well-formed semantic formula, the truth-conditions for the derivation (Davidson 1967). A syntactic objects α is translated into its semantic definition by the interpretation function $[\![\alpha]\!]$ according to some model $\mathcal{M}$ and a variable assignment function g. Composition between these syntactic object proceeds by application of semantic rules.

The semantic rules that play a role in this dissertation include Functional Application (Heim and Kratzer 1998, p. 44), the basic compositional mechanism, which is type driven. Derived Kind Predication (Chierchia 1998, p. 364) is a rule which applies specifically when kind expressions occur in object-level predicates. It is discussed only in chapter 3. Predicate Abstraction (Heim and Kratzer 1998, p. 96) also plays an implicit role as triggered by the Thai relative complementizer in chapter 4. Predicate Modification (Heim and Kratzer 1998, p. 65) is essentially set intersection, and applies in modification contexts within the noun phrase. This rule will be especially important in chapters 4 and 5. The type-driven nature of the interpretation procedure functions as a significant constraint on the syntactic derivation; if syntax does not assemble words in a way that allows them to be semantically composed, the derivation does not converge.

When type-mismatches occur, they can sometimes be fixed by making recourse to a small set of type-shifting operations (Partee 1987). Type-shifting applies in order to facilitate semantic composition, but they can only rescue certain cases. Thus, type-mismatches are a potential source of interpretive failure, ruling out an enormous class of ill-formed syntactic derivations, though it is not clear how freely such derivations can arise in the syntax. The introduction of type-shifting mechanisms into the interpretation procedure increases its power, but this power is limited: type-shifting operations generally do not 'add' meaning in any relevant sense, they simply adjust the meaning in order to allow the interpretation to proceed. Thus, I do not view these type-shifting operations as part of the numeration. However, syntactic objects in the numeration still might have the same interpretation as certain type-shifting operations, with definite articles, for example, being

the most obvious case.[1]

The phonological counterpart of semantic composition is the processes of spell-out. The syntactic derivation is transferred to the phonological interface, or spelled-out, in *phases* (Chomsky 2001), which consist of vP, CP, and, DP (cf. Fox and Pesetsky 2005; Uriagereka 1999). Once a phase has been spelled-out, it cannot be adjusted by further syntactic operations, the No Tampering Condition (Chomsky 2008). The most basic requirement for interpretability by phonology is that syntactic structure must be linearized, which means that they are mapped into a string of words ordered by strict precedence (Bachrach and Katzir 2009; Chomsky 2004; Fox and Pesetsky 2005; Kayne 1994). I do not assume the Linear Correspondence Axiom of Kayne (1994) in this thesis; I take right-adjunction to be a parametric choice set by Thai, though I contemplate a way to derive this aspect of Thai phrase structure in chapter 6. One particularly interesting consequence of this view of the syntax-phonology interface is that movement generates contradictory requirements on linearization, generally leading to the deletion of one of the copies (Bobaljik 2002; Nunes 2004; Pesetsky 1997). This part of the theory is reviewed in more detail in chapter 6.

I] further assume that a number of constraints apply at the interface of syntax and phonology, though I do not adopt any principled theory of such constraints. One of these constraints is Avoid Structure (Rizzi 1997, *inter alia*), which requires that syntactic derivations be as economical as possible. This constraint plays a major role in chapter 5. Additional constraints requiring isomorphism between meaning and form, inspired in part by (Bobaljik and Wurmbrand 2008), play a role in chapter 6.

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[1]While the existence of such type-shifting mechanisms have ben decried by methodological purists, it is worth noting that similar 'adjustments' to syntactic structure have also been proposed in the mapping from syntax to morphophonology (e.g. Embick and Noyer 2001; Embick 2003).

1.3 Overview of the Dissertation

Chapter 2 of this dissertation examines the clausal structure of Thai, focusing on issues that relate to the way arguments combine with verbs, operations that serve to increase or decrease the valency of verbs, and the syntax of tense, aspect, and modality. There are three general themes in this chapter. The first is that Thai word order is rigidly determined by the configuration of arguments within a clause. The second theme is establishing a distinction between verbal heads, which occur on the left, and clausal adjuncts, which occur on the right. Distinguishing between these different objects is not straightforward as they all have the same morphological and phonological properties, and they are independent, monomorphemic, words. I introduce a number of tests to show that they have distinct behavior. These tests reveal that some certain verbal heads, surprisingly, occur on the right. Following Visonyanggoon (2000) and Simpson (2001), I demonstrate that these postverbal heads can be generated by VP movement, the third major theme of the chapter.

Chapter 3 moves on to the syntax and interpretation of noun phrases in Thai. The first half of this chapter focuses on the semantics of bare nouns and classifiers, and mirrors in many ways the recent work of Piriyawiboon (2010). I begin by defending the neocarlsonian analysis of bare nouns as kinds in Thai (Chierchia 1998; Krifka 1995), and outlining how the different interpretations of bare nouns can be derived in such an analysis. I then outline a semantics for Thai classifiers, and present arguments for the analysis of classifiers as functional categories of the noun. Such an analysis necessitates the postulation of NP-movement in Thai noun phrases to account for their noun-initial word order (cf. Piriyawiboon 2010; Simpson 2005; Singhapreecha 2001; Visonyanggoon 2000). I also show that Thai plural markers exhibit a number of properties distinct from plural markers in inflectional languages. I then turn to the distribution of quantifiers in Thai, both those that occur with classifiers and that which do not. I argue for a mixed approach to these quantifiers; quantifiers without classifiers are generally analyzed as adjuncts, quantifiers expressing cardinality occur in

[Spec, ClfP], and two strong quantifiers which occur with classifiers, I argue, occupy a higher D position in Thai. I also examine the syntax of deictic modifiers, such as demonstratives, and argue that they are adjuncts, attaching to ClfP.

Chapter 4 discusses the syntax of embedded clauses in Thai, focusing especially on clauses that appear internal to noun phrases: relative clauses and noun-complement clauses. The single goal of this chapter is to argue for a unified analysis of the Thai complementizer *thîi*, which I argue always derives predicative meanings for clauses. Thus, it serves as a relative complementizer, binding a variable inside of the relative clause. The structure of relative clauses in Thai is addressed; I show that they involve movement and reconstruction, and argue that when relative clauses attach to bare NPs, they are derived via movement of the NP followed by reprojection, following Aoun and Li (2003). Regarding noun-complement clauses, I follow Potts (2002) and others in arguing that they are not complements at all, but modifiers, and that they combine with their head noun via the same semantic rule as relative clauses, Predicate Modification. In noun complement clauses, *thîi* abstracts over a variable corresponding to the proposition itself, and is thus translated as the type-shifting operation IDENT (Partee 1986). This analysis of *thîi* as a predicate-forming operator is extended to several other uses, including its occurrence in infinitival complements of control verbs. This chapter also contains an analysis of the Thai complementizer *wâa*, which occurs in noun-complement clauses with the 'relative' complementizer *thîi*. Several arguments against the analysis of *thîi* as a marker of Predicate Inversion by den Dikken and Singhapreecha (2004) are also provided.

Chapter 5 returns to noun phrase structure more generally. The topic of this chapter is a construction I label the classifier-modifier construction (CMC), in which a predicative phrasal modifier can license a bare classifier, resulting in a definite singular interpretation. I review the key properties of this construction, disentangle it from some putatively similar cases, and argue that the construction itself arises due to the presence of a null choice-functional determiner (cf. Rein-

hart 1997; Winter 1997), which takes the modifier as its complement. There are two subcases of the construction, one consisting of a CP complement of the determiner, identical to the analysis of relative clauses in Kayne (1994), and a second in which small clauses function as the complement of this determiner. Reconstruction data are presented to support this claim for relative clauses. I then address the question of how the modifier licenses the bare classifier, otherwise prohibited. I argue that this putative licensing is actually due to the alleviation of an economy constraint, Avoid Structure, which blocks noun phrases in which the D takes a bare ClfP complement in favor of a definite bare NP. This analysis can account for the tendency of languages that *do* allow definite bare classifiers to disallow definite interpretations of bare nouns. The existence of such a null determiner in other classifier languages is also explored, including Mandarin Chinese, which has a construction that shares properties with the CMC.

Finally, in Chapter 6 I examine quantifier float in Thai, arguing that it is driven by Quantifier Raising, or the movement of quantification NPs to receive scope. I show that quantifier-float is restricted to argumental quantifiers, but that it is restricted to quantifiers, and thus cannot be seen as part of a more general extraposition process. Using scope as a diagnostic for the position of the floated quantifier, I demonstrate that floated quantifiers can receive different scopal interpretations than their correlates in argument position, demonstrating that floated quantifiers are always interpreted in their floated position. I propose an analysis of quantifier float wherein they are separated from their argumental noun phrases at the interface with phonology by two conflicting requirements; one which requires that scopal elements be pronounced in a position where they receive transparent scope, and another which requires that nouns be pronounced in their argument position. This latter requirement is postulated to be particular to isolating languages such as Thai which lack the ability to mark syntactic roles via agreement or case. I conclude the chapter by pointing to a generalization about the distribution of quantifier float in classifier languages: quantifier float to the right is widespread, but is only allowed in languages where quantifiers can follow the noun within the

noun phrase itself. I argue that this generalization follows from what Fox and Pesetsky (2005) term

consistency, which states that linearization statements established within a phase must be respected

at later points. The presence of this effect thus provides evidence for the phasehood of the DP (cf.

Heck et al. 2008; Kramer 2009; Svenonius 2004).

Chapter 2

Thai Clause Structure

This chapter provides a general overview of Thai clause structure, covering topics including argument structure, tense, aspect, and modal marking, and the positions of adverbs. I focus narrowly on topics which elucidate structural facts about Thai clauses.

The chapter is composed of six sections. Sections 2.1-2.2 discuss predicates and serialization as they pertain to the argument structure of the clause. Section 2.1 introduces syntactic processes by which internal arguments are combined or introduced, while section 2.2 describes the syntax of functional heads or light verbs which introduce external arguments, such as causative and passive subjects. Sections 2.3-2.4 examine the syntax of aspect and modality, respectively, and as such are not concerned with argument structure, but rather the structure of the clause and the interplay between particles on the right and left periphery of the VP. The similarities between the syntax of modality and aspect in Thai are striking, and the analysis presented for the two reflects that similarity, relying heavily on earlier work by Simpson (2001) and especially Visonyanggoon (2000). Section 2.5 discusses issues relating to tense in Thai, focusing narrowly on whether functional T heads exist in Thai. Section 2.6 introduces basic facts about clausal adverbs.

2.1 The Thai VP

The analysis of syntactic structures in Thai is aided by the fact that word order in Thai is quite fixed, as is common in analytic languages. For example, observe that Thai objects must follow verbs. They cannot scramble with elements to their right such as adverbs (1-b):

(1) a. Nát [$_{VP}$ kin thúrian] lɛ́ɛw.
         Nat   eat durian   already
         'Nat already ate the durian.'

     b. *Nát kin lɛ́ɛw   thúrian.
         Nat eat already durian

The bracketing in (1-a) demonstrates that word order rigidity can be taken as a good first indication that verbs and their objects form a VP constituent. In other words, Thai is a strictly configurational language.

2.1.1 Ditransitives and applicatives

Similar generalizations hold in more complex verb phrases. Thus, Thai requires that themes precede recipients, meaning that it does not allow equivalents of the English dative construction (2-b):

(2) a. Nát [$_{VP}$ hây thúrian (kàp) Nít] lɛ́ɛw.
         Nat   give durian (with) Nit already.
         'Nat already gave the durian to Nit.'

     b. *Nát hâj Nít thúrian lɛ́ɛw.
         Nat give Nit durian already

While (2-a) indicates that the two objects form a constituent with the verb, that simplistic analysis does not actually capture the lack of a dative alternation in Thai. Larson (1988) proposed ditransitives are built of VP "shells," with verbs head-moving from one VP to the next. This is illustrated

for Thai below.

(3)

```
                    VP₁
            _____|_____
           V₁               VP₂
           |          _____|_____
          hâjᵢ       DP             V′₂
           ↑         /\         _____|_____
           ¦      thúrian      V₂        PP
           ¦                    |         /\
           ¦                    tᵢ     kàp Nít
           ¦_____¦
```
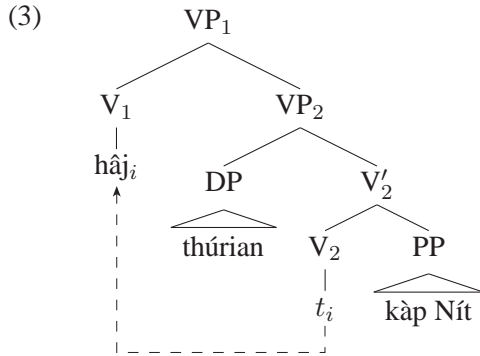
In Larson's proposal, the ditransitive structure in (3) is basic and the dative alternation, where the recipient precedes the theme, is derived from it in a passive-like A-movement operation.

There is evidence that (3) is the right approach to the ditransitive in Thai; in ditransitive verbs besides *hây* 'give,' the recipient is actually marked by *hây* (Thepkanjana and Uehara 2008):

(4)   a.   Nát **sòŋ** thúrian **hâj** (kàp) Nít
           Nat send durian give Nit
           Nat sent a durian to Nit.

     b.

```
                    VP₁
            _____|_____
           V₁               VP₂
           |          _____|_____
          sòŋ        DP             V′₂
                      /\         _____|_____
                   thúrian      V₂        PP
                                 |         /\
                                hâj     kàp Nít
```
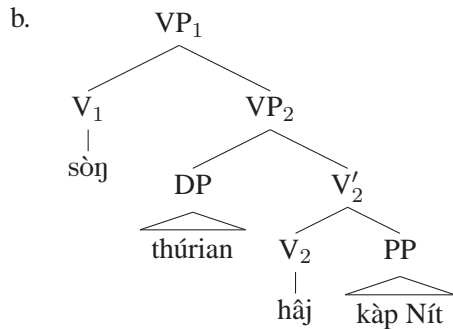
In (4), *hây* predicates a direct benefactive relationship between the internal argument of 'send,' which is the durian, and the recipient, who is Nit; Nit receives and benefits from the durian internal to the event.

It is important to note that 'durian' is an object of both 'send' and 'give,' and so the structure above qualifies as a well-formed serial verb, according to the argument-sharing hypothesis of Baker (1988b). In Baker's approach, the structure above would be recast as a single verbal projection:

(5)

```
                    VP
                    |
                    V'
           _____/|_____
          |         |         |
          V         DP        V'
          |         /\       / \
         sòŋ     thúrian    V    PP
                           |    / \
                          hâj  kàp Nít
```
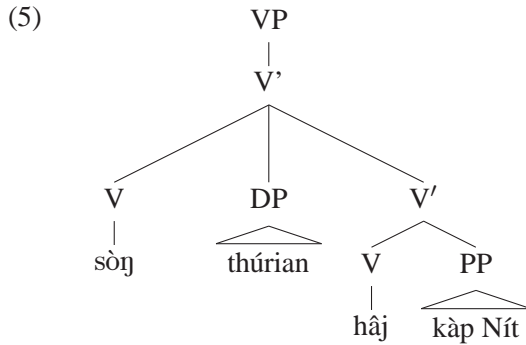
Collins (1997a) argues against such structures based on the distribution of a case-assigning post-position in Ewe, arguing that the shared argument for the second verb is actually a null controlled PRO. Such an analysis of Thai is indeed available, but whether it is the correct analysis, or one of the analyses above is correct, remains to be decided by future work.

In addition to marking change-of-possession ditransitives, the verb *hâj* 'give' also functions as a benefactive marker, as in sentences like the following

(6)   sŏmsàk **súu** năŋsǔu **hây** sŏmchaaj
      Somsak buy book   give Somchaay
      'Somsak bought a book for Somchaay.'   (Thepkanjana and Uehara 2008, ex. 15)

Note that in (6) the beneficiary is in a relationship directly with the theme: the book benefits Somchaay. These benefactive uses of *hây* presumably have the structure in (4-b) (or the one in (5)). There is a sense, then, in which the occurrence of *hây* 'give' as a main verb (2-a) can be considered the unmarked case of a larger pattern of benefactive/recipient dative marking by that verb.

The benefactive construction in (6) is what Marantz (1993) and Pylkkänen (2008) call a *low applicative*, where the benefactive argument is in a direct relationship with the internal argument of the matrix verb. They propose that these cases are represented with the dative (benefactive) argument structurally higher than the theme, as below:

(7)   *Low applicative* (cf. Pylkkänen 2008, ch. 2, ex. 6b)
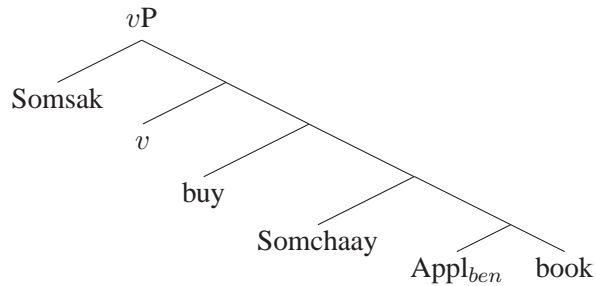
This structure cannot be the basic one for Thai, as dative constructions are generally impossible and the order of arguments in sentences like (6) is fixed. Thai benefactives could be derived from this structure by extensive movement, but there is little evidence for movement. Instead, it makes more sense to assume that low applicatives are represented either by the VP-shell structure in (4-b) or the serial verb structure in (5).

Thai also adds internal comitative and instrumental arguments with serialization. The two examples below represent instrumental and comitative high applicative verb series. Note that in both cases the first verb (=V_1) marks the more oblique argument, and that the subject functions as the subject of both verbs:

(8) Nát [$_{VP}$ ʔaw mîit tàt Nít]
     Nat   take knife cut Nit
     'Nat cut Nit with a knife.'

(9) Nát [$_{VP}$ phaa   Nít paj (rooŋ.phajabaan)]
     Nat   accompany Nit go hospital
     'Nat went to the hospital with Nit.'

In sentences like these, the order of the constituents is fixed.

There have been different proposals to account for the syntax of this kind of construction. In the argument-sharing approach to serialization in Baker (1988b, pp. 535-9), the instrumental and comitative serial verbs necessarily involve argument sharing. In the instrumental case, this argument sharing occurs due to the fact that 'cut' is actually ditransitive and thus takes both 'knife'

and 'Nit' as arguments. In the comitative case, the second motion verb is analyzed as unaccusative, and thus the object of accompany 'Nit' is also the internal argument of 'go.' The location argument, 'hospital,' is an optional second argument of 'go,' as confirmed by the optionality of such arguments in Thai. Baker's multi-headed VP analysis for each case is shown below:

(10) a. *Instrumental* (8)   b. *Comitative* (9)
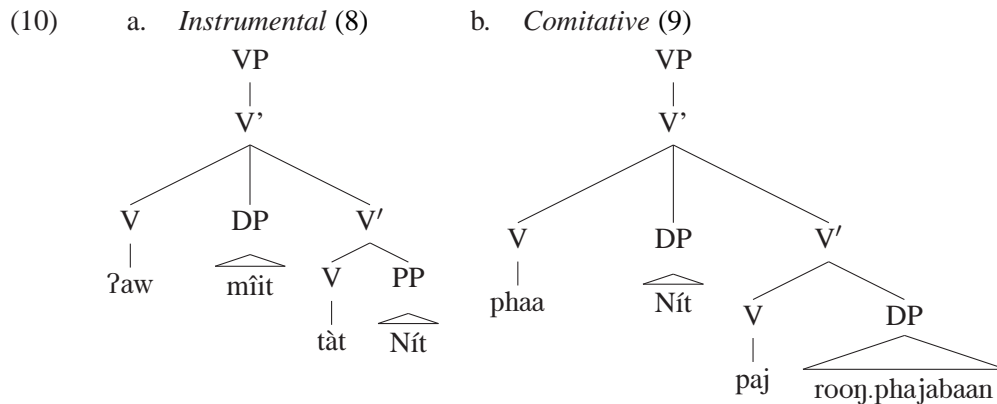
These patterns are identical to the ones in West African languages considered by Baker. In Baker's parametric approach to syntax, then, Thai would be considered a language which was [+serialization], which in his framework is due to a language's ability for a single projection to have multiple heads. According to Collins (1997a), these structures would involve a lower VP shell which took a PRO specifier controlled by the higher overt argument.

A completely different approach to these structures would be as applicative heads in the verbal projection, the proposal of Marantz (1993), Pylkkänen (2008), and proposed to account for all serial verb cases recently by Aboh (2009). In the framework of Marantz and Pylkānnen, both 'take' and 'accompany' would actually be *high applicatives*, meaning that they introduce an argument that has some relationship with the lower predicate. This analysis would require a different analysis of the argument structure of these verbs as well as their configurational structure, as we will see.

The simplest diagnostic for a high applicative is semantic, as the relationship of the applied argument is with the event itself rather than with the internal object of the matrix verb (Pylkkänen 2008, pp. 12-14). So in (8), the knife is not in a direct relationship with Nit, but rather is the

instrument by which the main verb, 'cut,' is carried out. Likewise, in (9), the Nit is not in a direct relationship with the hospital, but is a participant in the 'accompaniment' relation expressed by the main verb. In the approach of Pylkkänen (2008), high applicatives are combined with the main verb before the subject is introduced. But while low applicatives take two arguments, high applicatives only take a single argument in its specifier position:

(11)   *High applicative* (cf. Pylkkänen 2008, ch. 2, ex. 6a)

```
                    vP
                  /    \
               Nat      \
                  \      \
                   v      \
                    \      \
                   knife    \
                       \     \
                    Appl_inst  V   Nit
                        |      |
                      take    cut
```
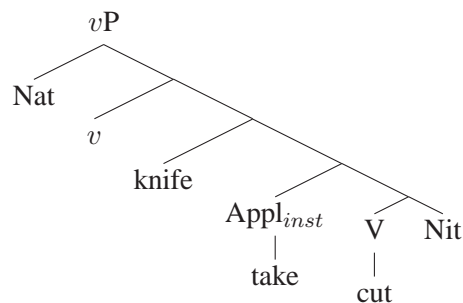
This tree predicts the wrong word order for Thai, as 'knife' follows the verb 'take,' but as more recent frameworks assume that the external argument is introduced by the higher v or Voice head, we could postulate that the higher verb moves past the instrumental argument to this higher position:

(12)

```
                    vP
                  /    \
              v_ag      VP_1
               |       /    \
             ʔaw_i    DP     V'_1
                      |     /    \
                    mîit  V_1    VP_2
                          |     /    \
                          t_i  V_2    DP
                               |      |
                             tàt     Nít
```
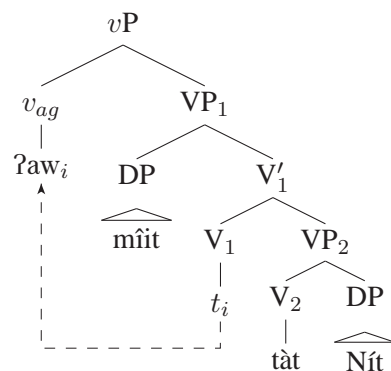
The same type of approach would be needed for the comitative cases as well.[1]

---

[1] In a world where external arguments are not introduced to the semantics until the vP level (Chomsky 1995; Hale and Keyser 1993, 2002), the composition of the two VPs would proceed by Event Identification Kratzer (1996), the same rule which composes the denotation of the VPs with the external argument. This approach could also be adopted in the Baker cases above to derive the meaning of a complex predicate before the actual agent was added.

Diagnostics should be offered to support the existence of V-to-v movement in Thai. These are hard to find, though, as many standard arguments cannot be applied. For example, examining the position of verbs relative to adverbs is pointless, as all adverbs occur to the right of the VP in Thai (see section 2.6). Additionally, while I have assumed that all of these structures are monoclausal, empirical evidence should be provided to show that this is the case. The clearest evidence would come from the distribution of negation and aspect. I leave these and further questions for later work.

2.2   External Arguments

In this section I introduce some background on the Thai causative (which will look familiar) and passive. As Thai is an analytic language, both causatives and passives are most productively realized in periphrastic constructions, rather than through some morphological or lexical operation. For a more complete descriptions of the passive and causative, see Thepkanjana 1986, ch. 2, Iwasaki and Ingkaphirom 2005, ch. 26-27.

2.2.1   Causatives

Several verbs can be used to mark causation in Thai, but only some of these do so mono-clausally. Two examples, *tham* 'do, make,' and *hâj*, are provided below:

(13) Nát **tham** Nít tòk.
      Nat make Nit fall
      'Nat made Nit fall.'

(14) Nát **hâj** Nít kin thúrian.
      Nat had Nit eat durian
      'Nat had/let Nit eat the durian.'

The glosses above demonstrate that these two causative verbs differ in the amount of causation attributed to the causer, with *tham* entailing complete control and *hâj* entailing only partial control

or permission. Because causatives introduced by *tham* assume physical causation of the event and absolutely no control on the part of the causee, they are incompatible with what Thepkanjana (1986, p. 46) terms "active" causees (see also Iwasaki and Ingkaphirom 2005, p. 326). For (14), this means that *tham* could not appear as the causative of (14-b) because eating is an action which involves retention of some control on the part of the speaker.

One other causative, *tham-hâj* is formed by compounding these two, and entails an intermediate level of causation:

(15)   Nát **tham-hâj**   Nít kin thúrian.
            Nat make-have Nit eat durian
            'Nat forced Nit to eat the durian.'

I assume that the combination of *tham* with *hâj* is a morphological process. Such V-V compounds are common in Thai, like in other analytic languages such as Chinese (e.g. Li 1990).

Hale and Keyser (1993, 2002) and others propose that causatives realize external-argument introducing v-heads, an analysis which makes natural sense for Thai:

(16)

vP_1
- DP
  - Nát
- v'_1
  - v_{CAUS}
    - tham-hâj
  - vP_2
    - DP
      - Nít
    - v'_2
      - v_2
      - VP
        - V
          - kin
        - DP
          - thúrian
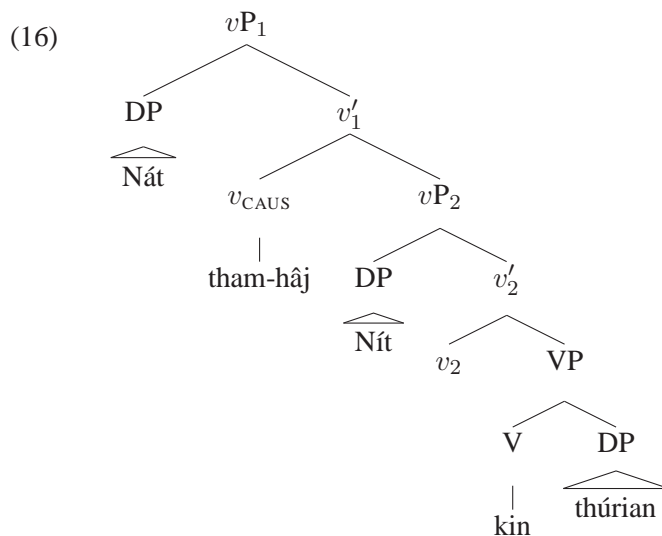
For the sake of consistency, I have included two separate vP projections in (16), one which introduces the external argument to the eating action and another which holds the valence-increasing causative head. It may be that the lower V always moves to v.

2.2.2 Adversative passives

Like causatives, the closest equivalent to a passive in Thai is formed periphrastically. Unlike languages where passives are formed derivationally from active verb forms, Thai passives tend to convey adversity or benefit on the part of the derived subject, for which lexical semantics of the passive verb itself is responsible. The adversative passive, formed by the verb *thùuk*, is illustrated below:

(17)   a.   Nít chók Nát.
               Nit   punch Nat
               'Nit punched Nat.'

            b.   Nát **thùuk**   (Nít) chók.
                 Nat undergo Nit   punch
                 'Nat was punched (by Nit).'

While it is often claimed that sentences with *thùuk* sound odd if the subject is not negatively affected (Wongbiasaj 1979a, p. 209), Iwasaki and Ingkaphirom (2005, p. 303) note that *thùuk* is used in more general contexts.

The key property distinguishing Thai passives like (17-b) from lexical or morphological passives is that rather than demoting the subject of the passivized verb, the Thai passive allows it to remain in its surface subject position. This is a consequence, at least in part, of the periphrastic nature of the causative, as the lower verb is directly embedded by the passive, retaining its transitivity. In that sense, the passive is parallel to the causative in (13)-(15). Importantly, though, the subject is optional in (17-b), and when it is absent, the interpretation is much closer to lexically derived passives in the sense that the subject of the lower clause is semantically obviated (Filbeck 1973, p.

34).

One question in the correct analysis of the passive is the category and size of the clause which serves as the complement of the passive. To determine the category, we can use negation, a common diagnostic for verbhood in Thai syntax. The following examples indicate that both the passive predicate itself and the lower predicate are verbal:

(18) a. dèk **thùuk** mɛ̂ɛ mâj rák.
    child undergo mother NEG love
    'The child isn't loved by his mother.'

   b. dèk mâj **thùuk** mɛ̂ɛ mâj rák.
    child NEG undergo mother NEG love
    'The child isn't not loved by his mother.'

The second question is the syntactic size of the embedded constituent. If it is a full clause (CP), we expect it to exhibit all the phenomena that full clauses do, including the full range of aspectual and modal marking characteristic of Thai verbs. Yet there is evidence that the embedded verb is small, as the lower verb cannot be modified by aspectual markers or modal markers at all (see sections 2.3 and 2.4 for more on these markers):

(19) a. ??dèk **thùuk** mɛ̂ɛ mâj khəəj rák.
     child undergo mother NEG PRF love
     'The child hasn't been loved by his mother.' (intended)
   b. *dèk **thùuk** mɛ̂ɛ rák mâj dâj.
     child undergo mother love NEG can
     'The child suffers his mother's inability to love him.' (intended)

The same facts hold when the subject is missing from the embedded clause, although in these cases there is even less reason to expect that the embedded clause is full-sized. So there is evidence both that the embedded predicate is a true verb rather than, say, a nominalized one, and also that the embedded clause is not a full-sized CP.

We can account for these facts as well as the difference of these two constructions if the passive structure is represented with the passive embedding an agentive vP when the subject is present (20-a) and a bare VP when it is not (20-b):

(20)　　a.

```
              vP₁
            /     \
         DP        v'₁
         |        /    \
       Nítⱼ   v_PAS     vP₂
               |       /    \
             thùuk   DP      v'₂
                     |      /    \
                    Nát   v₂      VP
                           |     /   \
                         chók   V     DP
                                |      |
                              chók   proⱼ
```

b.

```
              vP₁
            /     \
         DP        v'₁
         |        /    \
       Nítⱼ   v_PAS     VP
               |       /    \
             thùuk    V      DP
                      |       |
                    chók    proⱼ
```
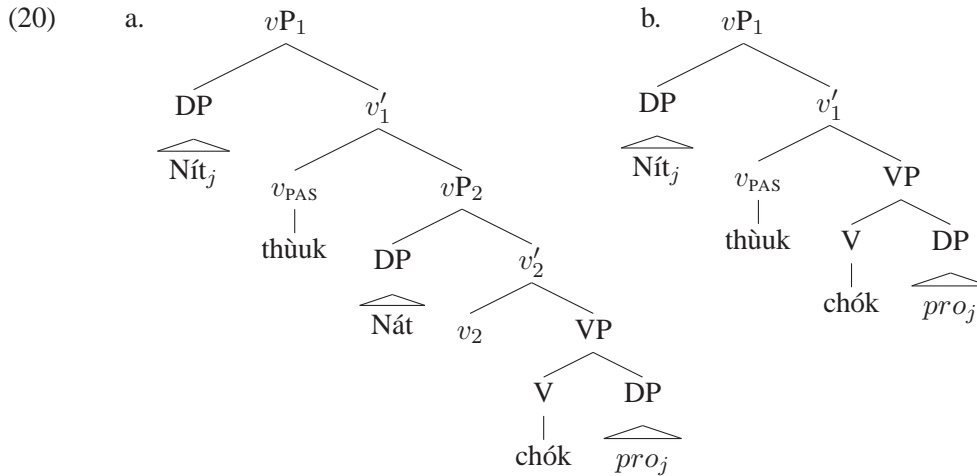
Besides the status of the passivized clause, another important issue is the status of the object of the passivized verb. There is actually a fair amount of work on this topic, including some of the earliest work on Thai syntax. There are several analyses on the market, including analyses relying essentially on A-movement (Chaiyaratana 1961, §4.6.6) to analyses of the passive position as derived by A-bar topicalization (Sudmuk 2003). Sudmuk's paper also contains an excellent review of other proposals, including the one that I adopt above, articulated clearly first in Wongbiasaj (1979a) and dubbed there the complementation approach, in which the object of the embedded verb is occupied by a null pronoun.

Evidence for this proposal comes from the fact that Thai is a pro-drop (or topic-drop) language, and from the fact that overt resumptive pronouns can appear in this position:

(21)　　Nát **thùuk**　Nít chók　khǎw.
　　　　Nat undergo Nit punch 3P
　　　　'Nat was punched by Nit.'

Another approach to these structures would be to follow the analysis of similar passives in Chinese proposed by Huang et al. (2009, ch. 4) where the gap is related to a null operator at the left edge of the embedded vP/VP.

Regardless of the correct analysis of passive gaps in Thai, the basic structure of the construction illustrates the general theme of the last two subsections, which is that valence-affecting operations in Thai are generally realized by overt syntactic heads . These heads are usually verbal, and these tend to stack on top of each other without too many changes to the internal syntax. This general tendency for Thai arguments to stay put is a theme which will come up again later in this section and also in chapter 6.

2.3 Aspect

While Thai has no obligatory inflection or tense marking on verbs, its system of aspect markers is rich and complex. Resultative and directional serial verbs, aspectual auxiliaries, and adverbs all interact to produce an array of different interpretations. Recent formal studies that investigate this system in detail are Koenig and Muansuwan (2005), Muansuwan (2002, ch. 3-4), and Visonyanggoon (2000, ch. 6). This section focuses on diagnostics for establishing the category of the different aspectual markers and for understanding the structural distinction between aspect markers at the right and left edge of VP.

Thai sentences without any aspectual morphology, like (22), are aspectually vague, and can be interpreted in any way appropriate to context:

(22)   Nát kin thúrian.
         Nat eat durian
         'Nat eats (habitually)/is eating/has eaten/ate durian.'

When overt morphemes do appear, a more restrictive meaning emerges:

(23)   a.   Nát **kamlaŋ** kin thúrian.
             Nat PROG   eat durian
             'Nat is eating durian.'

       b.   Nát **khəəj** kin thúrian.
             Nat PRF   eat durian
             'Nat has eaten durian.'

The aspectual morphemes preceding the verb in (23) have been given several names in the literature, I will call them pre-verbal aspect markers.

A number of other aspectual markers, however, are post-verbal, occurring at the right edge of VP:

(24)   a.   Nát kin thúrian **yùu**.
             Nat eat durian IMPFV
             'Nat is eating/eats durian.'

       b.   Nát kin thúrian **sèt**.
             Nat eat durian finish
             'Nat finished eating durian.'

The meaning of these two sentences is not identical to their putative equivalents in (23). While *kamlaŋ* in (23-a) is a true progressive marker (Visonyanggoon 2000, p. 195), *yùu* in (24-a) is imperfective, including habitual and repetitive aspects in its meaning (Visonyanggoon 2000, p. 210). Likewise, **khəəj** in (23-b) is an experiential perfect, implying the existence of some past experience of an event regardless of completion (Visonyanggoon 2000, p. 188-9), while *sèt* in (24-b) adds telicity and the entailment of completion to an action (Koenig and Muansuwan 2005, p. 343).

2.3.1   Evidence for a non-uniform analysis of aspect markers

The first question to ask about aspect markers is what their category might be. There are two syntactic tests in Thai that determine whether a given lexical item is a verbal head. The first is negation, and the second is based on whether a given verb can license ellipsis in an affirmative answer

to a polar question (Visonyanggoon 2000, ch. 5-6, Muansuwan 2002, ch. 4). These distinguish between the two preverbal aspect markers in (23):

(25)   a.   *Nát mâj **kamlaŋ** kin thúrian.
               Nat NEG PROG   eat durian

          b.   Nát **kamlaŋ** mâj kin thúrian.
               Nat PROG   NEG eat durian
               'Nat isn't eating durian.'

(26)   a.   Q: Nát **kamlaŋ** kin thúrian rɯ̌ɯ?
                  Nat PROG   eat durian Q
                  'Is Nat eating durian?'

          b.   A: ***kamlaŋ**
                 PROG

          c.   A: **kamlaŋ** kin
                 PROG   eat
                 'Yes, he is.'   (cf. Visonyanggoon 2000, ch. 5, ex. 33-34)

The examples above indicate that *kamlaŋ* is not a verbal category.

    However, the same tests illustrate that *khəəj* is a verbal category:

(27)   a.   Nát mâj **khəəj** kin thúrian.
               Nat NEG PRF   eat durian
               'Nat has not ever eaten durian.'

          b.   Nát **khəəj** mâj kin thúrian.
               Nat PRF   NEG eat durian
               'Nat has not eaten durian.' (i.e. He has experienced not eating durian in some context.)

(28)   a.   Q: Nát **khəəj** kin thúrian máy?
                  Nat PRF   eat durian Q
                  'Has Nat ever eaten durian?'

          b.   A: **khəəj**.
                 PRF
                 'Yes, he has.'   (cf. Visonyanggoon 2000, ch. 5, ex. 12-15)

Unlike the imperfective marker *kamlaŋ*, then, the perfective *khǝǝj* does behave as a verbal category. Words that can be used as answers to polar questions, like *khǝǝj* in (28), were first labeled "predicators" by Noss (1964, p. 74), a usage that will be followed below: *khǝǝj* is a predicator, and *kamlaŋ* is not.

The analysis provided for these differences in Visonyanggoon (2000) postulates that the negative marker *mâj* is restricted to the specifier position of verbal categories, accounting for why it can precede *khǝǝj* but not *kamlaŋ*. The sentence-final question marker also differs between (26-a) and . Visgonyanggoon proposes that the question marker *máy* in (28-a) includes negation, hence has the same restrictions as negation. As for predicators, Visonyangoon proposes that the ability of a verb to be a predicator corresponds to its ability to move to a higher head position that is dedicated to verum focus and polarity, the Pol of Laka (1990), followed by deletion of its complement. I spell this proposal out in more detail below.

This same split can be observed between the two postverbal aspect markers in (24). While the imperfective *yùu* is not a predicator, the completive *sèt* is:

(29)   a.   *Nát kin thúrian mâj **yùu**.
            Nat eat durian NEG IMPFV

       b.   Nát mâj kin thúrian **yùu**.
            Nat NEG eat durian IMPFV
            'Nat isn't eating durian.'

(30)   a.   Q: Nát kin thúrian **yùu**   máj?
               Nat eat durian IMPFV Q
               'Is Nat eating durian?'

       b.   A: ***yùu**
               IMPFV

       c.   A: kin.
               eat IMPFV
               'Yes, he is.'   (cf. Visonyanggoon 2000, ch. 5, ex. 53-55)

(31)   a.   Nát kin thúrian mâj **sèt**.
            Nat eat durian NEG finish
            'Nat hasn't finished eating durian.'   (cf. Muansuwan 2002, ch. 4, ex. 22)

        b.   Nát mâj kin thúrian **sèt**.
            Nat NEG eat durian finish
            'Nat hasn't finished eating durian.'

(32)   a.   Q: Nát kin thúrian **sèt** máj?
              Nat eat durian finish Q
              'Has Nat finished eating durian?'

        b.   A: **sèt** (lɛɛw)
              finish already
              'Yes, he (already) has.'

The facts about *yùu* indicate that the aspectual use of this marker is distinct from the the same word's occurrence as a locative copula meaning 'dwell,' which can be negated:

(33)   a.   Nít yùu bâan Nát
            Nit LOC house Nat
            'Nit is at/lives at Nat's house."

        (i)   Nít mâj yùu bâan Nát
            Nit NEG LOC house Nat
            'Nit isn't at/doesn't live at Nat's house."

As indicated in the glosses, *sèt* is also synonymous with a verb meaning finish, but behaves like a verb in its aspectual use. It seems, then, that the category of a given aspectual marker cannot be determined solely based on whether it has some corresponding verbal use. However, the difference in meaning between *yùu* in its main verb versus aspectual use is wider than that for *sèt*, which means 'finish' in either position.

    The resulting situation, restricting ourselves to these four verb markers, is one where position and verb-hood cross cut, creating a four-way distinction. In addition to the aspect markers above, I have added other representatives to each of the lists to show the generality of the distribution.

Specific diagnostics applying to each of these can be found in one of the references above:[2]

(34)

	Asp-VP	VP-Asp
+V	*khəəy* - 'PRF' *rə̂əm* - 'begin'	*sèt* - 'finish' *còp* - 'end' *ʔɔ̀ɔk* - 'SEMI-PERF'
-V	*kamlaŋ* - 'PROG' *phɤ̂ŋ* - 'just' *càʔ* - 'about to' *yaŋ* - 'still'	*yùu* - 'IMPFV' *tɔɔ* - 'continue' *khɯ̂n* - 'SEMI-PERF' *lɛ́ɛw* - 'ALREADY'

It is curious that [+V] aspectual markers tend to denote some sense of anteriority while [-V] aspect markers denote some meaning in the realm of imperfectivity or futurity, with the exceptions being *phɤ̂ŋ* 'just,' which would be expected to be +V, and *rə̂əm* - 'begin,' which we might expect to be -V. This tendency has not been noted in the literature. In many other ways, this chart is likely overly simplistic and misses deeper differences between the different categories. For example, it might well be that some of the preverbal aspect markers, especially, for example, *rə̂əm* 'begin,' actually form biclausal structures when they embed another verb; Muansuwan (2002, p. 155)suggests that *all* preverbal TAMs are raising verbs, a conclusion that seems unwarranted based on the distinctively non-verbal behavior of some preverbal aspect markers.

The aspect verbs above frequently co-occur in a single sentence. When they do, they are rigidly ordered relative to one another, both before the verb and after. While I do not go through the precise orderings and possible permutations of aspect markers, the fact that these markers cannot be freely scrambled indicates that a simple analysis where all the markers are adjoined to the VP on one side or the other is insufficient. Additionally, the distinct syntactic behavior of the different categories of aspect verbs in table (34) should have some structural or lexical explanation.

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[2]The abbreviation SEMI-PERF stands for the category of semi-perfective proposed by Koenig and Muansuwan (2000).

Below I present a basic proposal for each category of aspect marker. The conclusion will be that elements which are [+V] are aspectual heads in the extended projection of the verb, a sequence I may refer to as the projection line. When these heads follow the VP, it is because they have triggered VP-fronting to their specifier position. Preverbal aspectual markers that are [-V] actually show somewhat distinct behavior, and are analyzed either as specifiers or defective heads of aspectual projects. Postverbal aspectual markers that are [-V] are argued to be adjuncts across the board. This analysis is similar to the one argued for in Visonyanggoon (2000), though includes much of the data discussed by Koenig and Muansuwan (2005) as well.

2.3.2 Aspect markers and VP-movement

I will adopt the framework from Cinque 1999 to describe the data below. In this theory, the preverbal [+V] auxiliaries would be either heads or specifiers of dedicated aspect projections. Adopting this framework without question is methodologically dubious as it likely masks deeper differences between these particles that would take more work to tease apart, including whether some verbs might be better analyzed as instances of restructuring verbs or raising verbs in a biclausal structure (Cinque 2002, 2004; Wurmbrand 2001, 2004; Fukuda to appear).[3] Data that often plays a crucial role in these analyses is the ability of different aspectual verbs to be passivized, facts that have not been explored for Thai to my knowledge. When considered, these data may provide clarity, and force a revised or refined analysis of the [+V] markers in particular.

To begin, consider the preverbal aspect marker *khəəy*. The diagnostics in (27)-(28) revealed it to be verbal in nature. Up to this point, data has indicated that Thai is strictly right-branching. There is evidence, then, that *khəəy* is a head, as illustrated below. In the trees in the following two sections, I will remain agnostic about the introduction of subjects in Thai and will suppress the *v*P

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[3]See Jenks (2006) for some diagnostics which distinguish control and raising verbs in Thai and some candidates for verbs with these properties.

level unless it is relevant:

(35) a. Nát **khəəj** kin thúrian.
          Nat PRF   eat durian
          'Nat has eaten durian.'

      b.   Asp_{PRF}P

              Asp_{PRF}   VP

                khəəy   V   DP

                          kin   thúrian
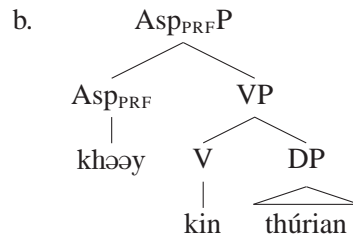
Cartographic frameworks like those of **Cinque** (1999) and **Rizzi** (1997) generally assume the theory of extended projections proposed by **Grimshaw** (1991), where the actual categorical feature of the verb is percolated up the heads in the clausal spine. In such a theory the restricted distribution of the negative particle *mâj* could be accounted for by postulating an uninterpretable categorical verb feature on the negative particle — [uV] — which could only be checked locally to [+V] categories; several configurations in which the checking could apply are possible. **Matushansky** (2006) makes use of such categorical features to account for selection, accounting for how these heads select one another. Visonyanggoon's account of [+V] auxiliaries' status as predicators could similarly be spelled out as a [uV] probe on Pol, the head where semantic polarity is interpreted (**Laka** 1990):

(36) a. Q: Nát **khəəj** kin thúrian máy?
             Nat PRF   eat durian Q
             'Has Nat ever eaten durian?'

      b. A: **khəəj**.
             PRF
             'Yes, he has.

c.
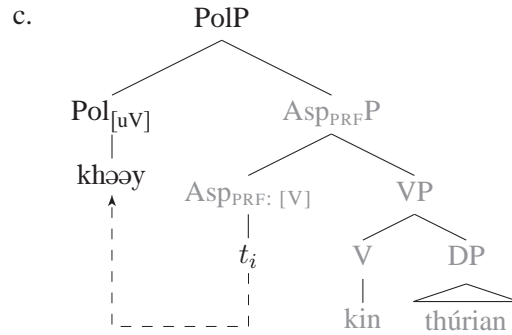
The grayed portion of the tree undergoes ellipsis. Evidence for this analysis comes from the fact that not only is *khəəj* a predicator, but when *khəəj* is present, the main verb cannot function as the predicator:

(37)   a.   Q: Nát **khəəj** kin thúrian máy?
           Nat PRF   eat durian Q
           'Has Nat ever eaten durian?'

      b.   A: ***kin**.
             PRF

This is the main argument for adopting head movement as an approach to the predicator construction. The inability of the main verb to move to Pol can be accounted for under the Head Movement Constraint (HMC) (Travis 1984), which prohibits heads from moving across intervening ones. Thus, the presence of *khəəj* blocks the movement of *kin* to Pol.

      Returning to the theme of extended projections, there are essentially two ways of accounting for postverbal [+V] aspect markers. Either with mixed branching, where Thai occasionally has right-headed projections, or with VP-movement, following the analysis of modals in Simpson (2001) and Visonyanggoon (2000). Below I briefly present arguments for the VP-movement analysis. For a defense of an analysis that does not rely on movement, see Koenig and Muansuwan (2005).

      The VP-movement analysis is illustrated below for the postverbal aspect marker *sèt* 'finish':

(38)   a.   Nát kin thúrian **sèt**.
           Nat eat durian finish

'Nat finished eating durian.'

b.

Asp$_{\text{COMPL}}$P

VP   Asp$'_{\text{COMPL}}$

V   DP   Asp$_{\text{COMPL}}$ t_i

kin   thúrian   sèt$_{\text{EPP}}$
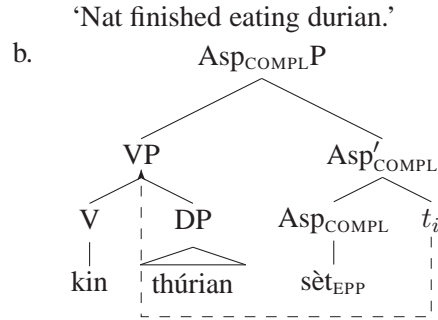
The idea is that postverbal heads with verbal properties have an [EPP] feature which triggers movement to their specifier position.[4] This analysis slightly complicates Visonyanggoon (2000)'s proposal that negation is located in verbal specifiers (see section 6.3.2), as the specifier of the aspectual head above is occupied, even though it can be negated (38). If multiple specifiers were allowed, some principled explanation would be required to restrict negation to an inner specifier position.

Evidence for this analysis again from the status of *sèt* as a predicator, meaning that it additionally blocks the verb's ability to serve as a predicator:

(39) a. Q: Nát kin thúrian **sèt** máj?
           Nat eat durian finish Q
           'Is Nat eating durian?'

      b. A: **sèt** (lέεw)
           finish already
           'Yes, he already has.'

      c. A: *kin (lέεw)
            eat already

The explanation once again is in terms of the HMC, which blocks the movement of *kin* past *sèt* to the Pol head position.

Neither the evidence from negation nor the evidence from the predicator test really distinguish a VP-movement account from a mixed-branching account, though, which is illustrated below:

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[4]It has been claimed that similar types of movement are common in the analytic Kwa languages of West Africa. See Aboh (2004) and his subsequent work.

(40) a. Nát kin thúrian **sèt**.
          Nat eat durian finish
          'Nat finished eating durian.'

  b.   Asp_{COMPL}P

(Tree diagram: Asp_{COMPL}P branches into VP and Asp_{COMPL}; VP branches into V and DP; V dominates *kin*, DP dominates *thúrian*; Asp_{COMPL} dominates *sèt*.)

Here, the postverbal aspect particle is still a verbal head, allowing to license negation and move to

Pol. So the analyses are equivalent with respect to the data seen so far.

Further data discussed by **Koenig and Muansuwan (2005)** seem to tip the scales.[5] Expanding

our empirical domain to more complex aspectual complexes, consider the paradigm below:

(41) a. Nát **kamlaŋ cà?**   kin thúrian **sèt**.
          Nat PROG   about.to eat durian finish

  b. Nát kin thúrian **kamlaŋ cà?**   sèt.
      Nat eat durian PROG   about.to finish

  c. ?Nát **kamlaŋ** kin thúrian **cà?**   sèt.
      Nat PROG   eat durian about.to finish

  d. *Nát **cà?**   kin thúrian **kamlaŋ** sèt.
      Nat about.to eat durian PROG   finish
      'Nat is going to finish eating the durian.'   (cf. **Koenig and Muansuwan** 2005, ex. 7)

These data illustrate that preverbal aspect markers can also appear postverbally in the event that a

postverbal aspect marker is already present. They also show that the preverbal markers must occur

in the same relative order regardless of whether they precede or follow the verb. Needless to say,

the preverbal markers cannot appear postverbally in isolation:

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[5]Koenig and Muansuwan (2005) actually take some of these facts as arguments *against* movement, to which I refer
the reader.

(42)   a.   Nát **kamlaŋ cà?**   kin thúrian.
            Nat PROG   about.to eat durian
            'Nat is going to eat durian.'

       b.   *Nát kin thúrian **kamlaŋ cà?**.
            Nat eat durian PROG   about.to

       c.   *Nát **kamlaŋ** kin thúrian **cà?**.
            Nat PROG   eat durian about.to

       d.   *Nát **cà?**   kin thúrian **kamlaŋ**.
            Nat about.to eat durian PROG

(cf. Koenig and Muansuwan 2005, ex. 7)

Together, the data in (41) and (42) indicate that when VP movement is triggered, it can move

recursively to higher projections:

(43)
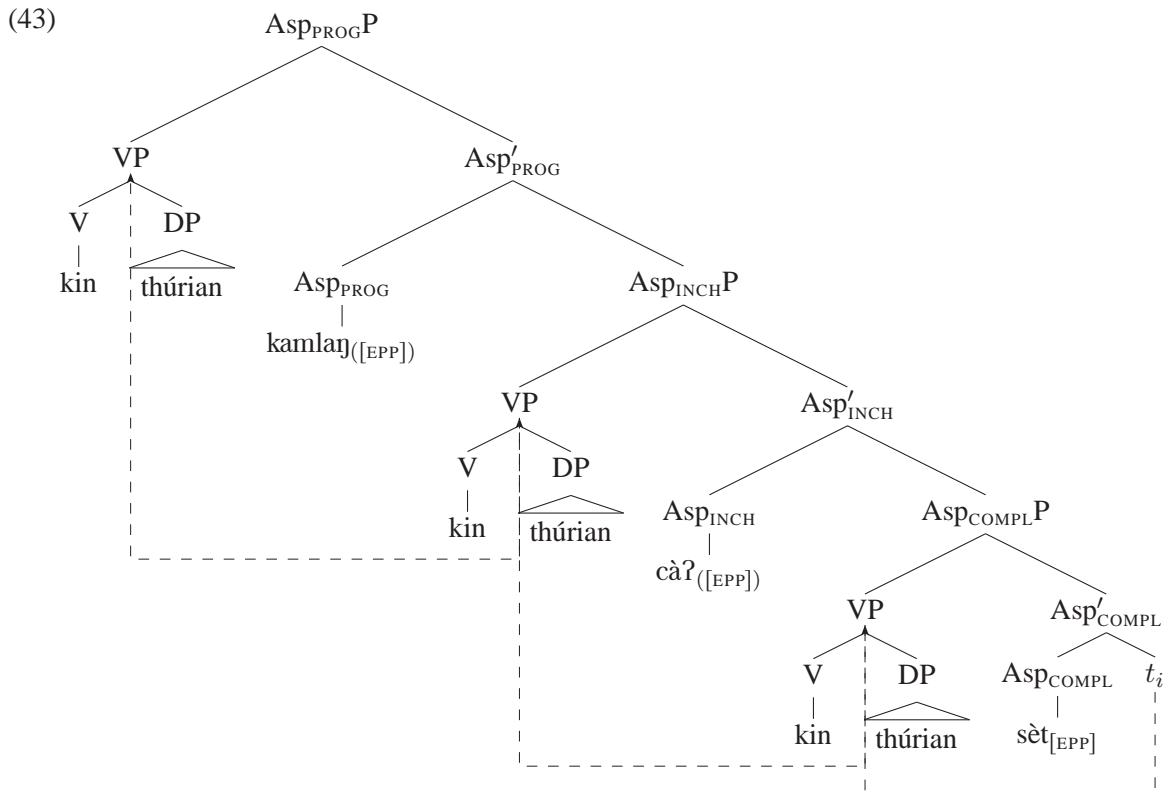
While movement to [Spec, Asp_PROG P] and [Spec, Asp_INCH P] is optional, it is only possible if initially

triggered by the movement of VP to [Spec, Asp_COMPL P], which is obligatory due to the [EPP] feature

on *sèt*. This fact could be accounted for if the [EPP] feature were allowed to percolate to higher functional projections. While feature percolation could be optional, the movement it triggered would be obligatory, similar to pied-piping in English.

This account avoids the deeper question of why VP movement occurs. One possibility is that it is related to the relative height of functional heads; only 'low' aspectual heads trigger VP-movement. Whether such an analysis is tenable is an open question I leave for future work.

2.3.3 Adjuncts, specifiers, and heads

Just as the predicator and negation test indicate that both preverbal and postverbal [+V] aspectual markers are verbal heads in the clausal spine, the same tests indicates that the preverbal [-V] aspect markers are not verbal heads. However, Visonyanggoon (2000) points out an important difference between different preverbal markers with respect to the predicator test, which necessitates a non-uniform analysis of [-V] preverbal aspect markers. While *kamlaŋ* and *phɯ̂ŋ* are heads, it seems that *càʔ*[6] and *yaŋ* are specifiers. The predicator test for each of the particles is shown below. I give two examples of each pattern to show that this subtle difference is a robust one:

(44) a. Q: Nát **kamlaŋ** kin thúrian rɯ̌ɯ?
          Nat PROG   eat durian Q
          'Is Nat eating durian?'

      b. A: *__kamlaŋ__
          PROG

      c. A: *kin
          eat

      d. A: **kamlaŋ** kin
          PROG   eat
          'Yes, he is.'   (cf. Visonyanggoon 2000, ch. 5, ex. 33)

---

[6]I will actually argue in section 2.5 that *càʔ* is not an aspect marker at all, contra the claims of Muansuwan (2002) and Koenig and Muansuwan (2005). I have left it in this discussion to show how its behavior with respect to the predicator test follows a general pattern.

(45)   a.   Q: Nát **phə̂ŋ** kin thúrian rɯ̌ɯ?
                 Nat PROG eat durian Q
                 'Did Nat just eat durian?'

        b.   A: ****phə̂ŋ**
                 PROG

        c.   A: **kin
                 PROG eat

        d.   A: **phə̂ŋ kin**
                 PROG   eat
                 'Yes, he did.'

(46)   a.   Q: Nát **càʔ**   kin thúrian mǎj?
                 Nat PROG eat durian Q
                 'Is Nat going to eat durian?'

        b.   A: ****càʔ**
                 PROG

        c.   A: ****càʔ** kin
                 PROG eat

        d.   A: kin
                 PROG eat
                 'Yes, he is.'   (cf. Visonyanggoon 2000, ch. 4, ex. 43)

(47)   a.   Q: Nát **yaŋ**   kin thúrian mǎj?
                 Nat PROG eat durian Q
                 'Is Nat still eating durian?'

        b.   A: ****yaŋ**
                 PROG

        c.   A: ****yaŋ** kin
                 PROG eat

        d.   A: kin
                 PROG eat
                 'Yes, he is.'   (cf. Visonyanggoon 2000, ch. 5, ex. 20)

To summarize, (44)-(45) demonstrate that the preverbal aspect markers *kamlaŋ* and *phôŋ* had to be repeated along with the main verb in response to a polar question. In contrast, (46)-(47) showed how *càʔ* and *yaŋ* could not be repeated with the verb, but do not block the verb's ability to be a predicator.[7]

The explanation provided by Visonyanggoon (2000, p. 204-5) for the requirement that both the verb and the aspectual marker be pronounced in (44)-(45) is that these aspectual heads lack the [+V] feature. They cannot move to the Pol position at all, and they block the movement of the main verb *kin* to the Pol position as well. Visonyanggoon proposes that in these cases the verb adjoins to the defective aspect head and the two move up to Pol together. A difficulty with this analysis is that it relies on rightward head adjunction of the verb to the aspect head. An alternative would to to say that movement to Pol is blocked completely by the defective head, and hence, ellipsis does not apply. The [uV] feature on the Pol head would have to be valued at a distance by Agree, represented by the solid curved line below (cf. (44-a)):

(48)
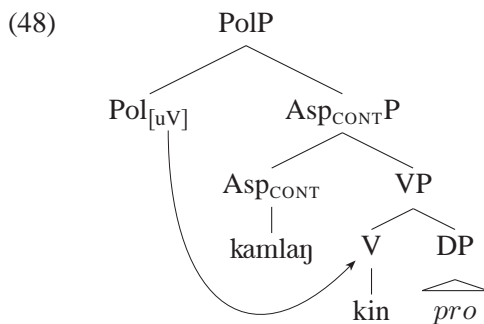
The absence of the subject and object are instances of topic-drop, which Thai allows (Hooncham-long 1991; Huang 1984). In either case, more work fleshing out the syntax of this type of aspect marker is needed, in particular resolving the categorically defective status of the aspect markers with their position in the extended projection of the verb.

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[7]The difference in the predicator pattern correlates to a difference in which question marker, a fact which Visonyang-goon (2000, p. 198-206) provides an analysis for in terms of the distinction between the two aspectual markers introduced below.

In either case, the analysis of these aspect markers must be different from the analysis of the pattern in (46)-(47), where the aspectual markers permit the verb to function as the predicator while they cannot do so themselves. Visonyanggoon (2000, p. 193) takes the ability of the verb to function as a predicator as evidence that these aspectual markers are not heads at all, but specifiers of a functional head in the clausal spine. This is illustrated below for *yaŋ* (cf. (48-d)):[8]

(49)
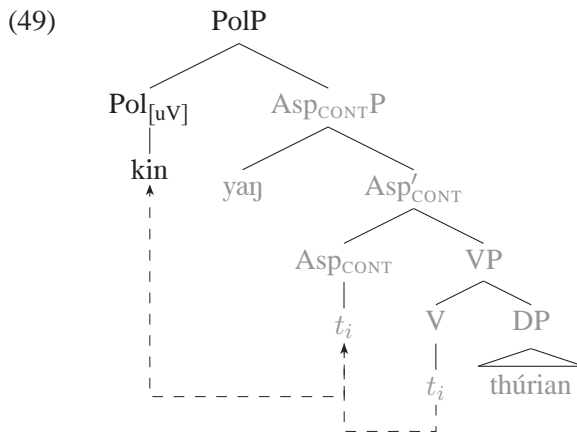
This is not equivalent to saying that *yaŋ* is an adverb or is adjoined to the clausal spine, as we will see below. It is descriptively useful to maintain a distinction between specifiers and adjuncts in Thai because subjects are on the left while clear cases of adjunction are always on the right, as we will see in section 2.6. In either case, in this analysis aspectual markers like *yaŋ* would necessarily be maximal projections rather than heads. Visonyanggoon mounts additional arguments for this position, including the fact that *yaŋ* occurs with both additive and iterative meanings similar to those for the German adverbial *noch*.

Another analysis of these non-predicator non-blocking markers is that they are heads located above Pol in the clausal spine. This analysis is particularly appealing for *càʔ*, a position that section 2.5 reveals further arguments for (see (71)). For our purposes, though, the non-uniform behavior of preverbal [-V] aspect markers with respect to the predicator test indicates that they should be given

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[8]Abbreviations: CONT=continuative.

different analyses. Some markers are defective heads below Pol, others are specifiers, in the case of

yaŋ, or heads above Pol, in the case of *cà?*.

Unlike preverbal [-V] aspect markers, postverbal [-V] markers cannot be negated and behave

uniformly with respect to the predicator test, shown again below for the imperfective *yùu* (see (29)-

(30)):

(50)   a.   Q: Nát kin thúrian **yùu** máj?
              Nat IMP eat   durian Q
              'Is Nat eating durian?'

   b.   A: ***yùu**
              IMP

   c.   A: kin.
              eat IMP
              'Yes, he is.'   (cf. Visonyanggoon 2000, ch. 5, ex. 53-55)

What is important for our purposes is that not only can postverbal [-V] markers not be predicators,

they do not block the verb from serving as a predicator. This indicates that postverbal [-V] aspect

markers are not heads. Because adjunction is uniformly and rigidly to the right in Thai (see section

??), and these markers can only appear postverbally, the most appealing analysis of them is as

clausal adjuncts:

(51)
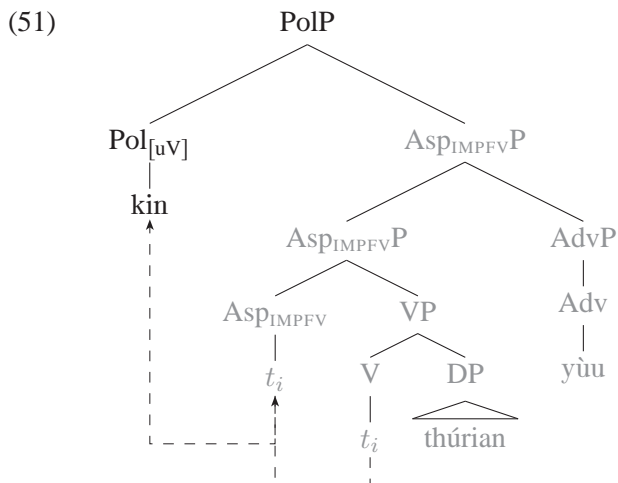
Because the adverb *yùu* is adjoined to the clause, it does not block the movement of the verb to the Pol head to serve as a predicator.

More evidence for this analysis is the fact observation unlike [+V] postverbal aspect markers, [-V] markers do not license the postverbal position of preverbal markers (cf. (41)). This is illustrated below with the postverbal marker *khŵn*, one of the semi-perfective verbs of Koenig and Muansuwan (2000, 2005):

(52)   a.   Nát **càʔ**   kin thúrian lûuk   nɯ̀ŋ **khŵn**.
           Nat about.to eat durian CLF^{round} one SEMIPRF
           'Nat will eat/have eaten a piece of durian.'

     b.   *Nát kin thúrian lûuk   nɯ̀ŋ **càʔ**   **khŵn**.
           Nat eat durian CLF^{round} one about.to SEMIPRF

                                 (cf. Koenig and Muansuwan 2005, ex. 18)

This difference is expected if postverbal markers are adjuncts, as they do not trigger VP raising, hence cannot feed the raising of the VP past normally preverbal aspect markers. In summary, then, postverbal [-V] aspect markers cannot serve as predicators and do not block the verb from doing so, indicating they are not heads. Corroborating their non-verbal nature is their inability to be negated. Additionally, the fact that they do not license postverbal occurrences of preverbal aspect markers indicates that they do not trigger VP-movement. Because adjunction is uniformly to the right in Thai, an analysis of postverbal [-V] aspect markers as clausal adjuncts accounts for all of these properties directly.

Below I provide a list of the different categories of aspect markers in Thai, their behavior with respect to various syntactic tests, and the analysis proposed for them in this section:

(53)

Marker	Position	$\pm$V	Cat	Pred	Blocks pred	NEG__	Pre→post
khǝǝj 'PRF'	__VP	+V	Head	✓	✓	✓	-
kamlaŋ 'PROG'	__VP	−V	Head	×	✓	×	-
yaŋ 'still'	__VP	−V	Spec	×	×	×	-
sèt 'finish'	VP__	+V	Head	✓	✓	✓	✓
yùu 'IMPFV'	VP__	−V	Adj	×	×	×	×

From left to right, the columns indicate whether the aspect marker is preverbal or postverbal, whether I have analyzed it as a verb; whether I have analyzed it as a head, specifier, or adjunct; whether it can function as a predicator; whether it blocks the main verb from serving a a predicator; whether it can be negated by the negative particle *mâj*; and whether it allows pre-VP aspect markers to appear postverbally. This last category is only relevant for postverbal aspect markers, as in the analysis above it is a diagnosis for VP-movement.

This concludes the section on grammatical aspect in Thai. There are three main points which should be emphasized before proceeding. First, there is good evidence that phrasal movement of the "core"-VP exists at the clausal level, triggered by functional heads higher in the clausal spine, notably those with completive meanings. Second, there is good evidence that many aspectual markers following the VP are rightward adjuncts, rather than heads that have triggered VP movement. Finally, as noted by Visonyanggoon (2000), these observations together help us maintain a uniform syntactic view of Thai as a head-initial language.

2.4 Modality

The issues raised by the syntax of modality in Thai are analogous to those discussed for aspect in the previous section. In particular, the structural position and categorical status of modal markers can be diagnosed using the predicator test and negation. Recent theoretical work on modality in Thai includes Simpson (2001) and Visonyanggoon (2000, ch. 5). While Simpson focuses on the postverbal occurrence of modal markers, Visonyanggoon provides a more general overview, including more details on the relative height of different modal markers. Both works try to show

that postverbal modal markers in Thai are verbal heads that trigger VP movement, the evidence for which is presented below.

We see the same two basic classes of modal verbs that we saw above for aspect verbs. While most modal verbs, like *tɔ̂ŋ* 'must', precede the VP, others, like *dâj* 'can,' follow it:

(54) Nát **tɔ̂ŋ** kin thúrian.
Nat must eat durian
'Nat must eat durian.'

(55) Nát kin thúrian **dâj**.
Nat eat durian can
'Nat can eat durian.'

Like with aspect markers, we can use negation and the predicator test to determine that these markers are verbal heads:

(56) a. Nát mâj **tɔ̂ŋ** kin thúrian.
Nat NEG must eat durian
'Nat doesn't have to eat durian.'

b. Nát **tɔ̂ŋ** mâj kin thúrian.
Nat NEG must eat durian
'Nat mustn't eat durian.' (cf. Visonyanggoon 2000, ch. 4, ex. 6b)

(57) a. Q: Nát **tɔ̂ŋ** kin thúrian máj?
Nat must eat durian Q
'Must Nat eat durian?'

b. A: **tɔ̂ŋ**
must
'Yes, he must.'

c. A: *kin.
eat
(cf. Visonyanggoon 2000, ch. 4, ex. 31)

(58) a. Nát kin thúrian mâj **dâj**.
Nat eat durian NEG IMPFV

'Nat can't eat durian.'

b. Nát mâj kin   thúrian **dâj**.
    Nat eat durian NEG   IMPFV
    'Nat can not eat durian.'   (cf. Visonyanggoon 2000, ch. 4, ex. 6a)

(59) a. Q: Nát kin thúrian **dâj**   máj?
          Nat IMP eat   durian Q
          'Can Nat eat durian?'

      b. A: **dâj**
          can
          'Yes, he can.'

      c. A: *kin.
             eat

                                                        (cf. Visonyanggoon 2000, ch. 4, ex. 57)

The table below gives a list of modal markers in Thai and their position relative to the VP:

(60)

	Mod-VP	VP-Mod
	tôŋ - 'must'	*dâj* - 'can' (root/deontic)
+V	*nâa* - 'should'	*pen* - 'can' (mental)
	khuan - 'should'	*wǎj* - 'can' (physical)

As the table shows, the postverbal modal markers in Thai all denote possibility, varying in the kind

of ability accorded to the speaker.[9] While the postverbal modal with the most general meaning —

dâj — can be substituted for the others, they never co-occur. In addition, *dâj* is the only modal of

the three which denotes permission as well as ability.[10] All three modals can be shown to be verbal

heads, as they all pass the predicator test and can be negated by *mâj*, as I showed for *dâj* in (58)-(59).

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[9]These modal markers each have an additional function as main verbs, *dâj* as 'acquire, get,' *pen* as predicative 'be,' and *wǎj* as 'shake, tremble.' These modal markers are not primarily alethic, as Simpson (2001) claims, which would mean that they denote necessary truths and thus take all possible worlds as their modal base. Instead, postverbal modals in Thai take either a root or deontic (*dâj* only) modal base, meaning that they rely on pragmatic knowledge about ability (root) or permission (deontic) attributed to the subject. The root meaning can also mean that a given event was possible due to general facts about a given world, such as there being a durian for Nat to eat in a sentence like *Nat can eat durian*. This latter source of possibility might have been the source as confusion, yet even in these cases the possibility is contingent on the world being a certain way.

[10]We will see in the following section that *dâj* has additional uses as well.

2.4.1   Postverbal modals and VP-movement

The same dilemma is found with post-VP modal verbs as was with post-VP aspectual verbs like *sèt* (see (38)-(43) and discussion), the modal marker must occur in the projection line of the main verb in order to serve as the predicator, but Thai is a generally right branching language. Additionally, both postverbal aspect markers and postverbal modal markers have semantic scope over the VP itself, so they they must be generated above VP. VP-movement accounted for the ability of post-VP aspect markers to serve as the predicator, which also accounted for the ability of preverbal aspect markers to occur after the VP just in case another post-VP aspect verb was present (see (41)). The data below demonstrate that these same arguments hold for modal markers, as postverbal *dâj* allows preverbal markers like *tɔ̂ŋ* to occur postverbally:

(61)　　a.　　Nát **tɔ̂ŋ**   kin thúrian **dâj**.
　　　　　　　Nat must eat durian can

　　　　　b.　　Nát kin thúrian **tɔ̂ŋ**   **dâj**.
　　　　　　　Nat eat durian must can
　　　　　　　'Nat must be able to durian.'　　　　　　(cf. Visonyanggoon 2000, ch. 4, ex. 81)

Again, *tɔ̂ŋ* cannot occur postverbally in the absence of *dâj*:

(62)　　*Nát kin thúrian **tɔ̂ŋ**.
　　　　　Nat eat durian must

　　　　　　　　　　　　　　　　　　　　(cf. Visonyanggoon 2000, ch. 4, ex. 80)

This shows that perhaps the account of postverbal aspect markers in section 2.3 by VP-movement should be extended to postverbal modal markers, as shown below:

(63)

Mod$_{\text{OBLIG}}$P

VP   Mod$'_{\text{OBLIG}}$

V   DP

kin   thúrian   Mod$_{\text{OBLIG}}$ Mod$_{\text{ABLE}}$P

tôŋ$_{([\text{EPP}])}$

VP   Mod$'_{\text{ABLE}}$

V   DP   Mod$_{\text{ABLE}}$ t_i

kin   thúrian   dâj$_{[\text{EPP}]}$
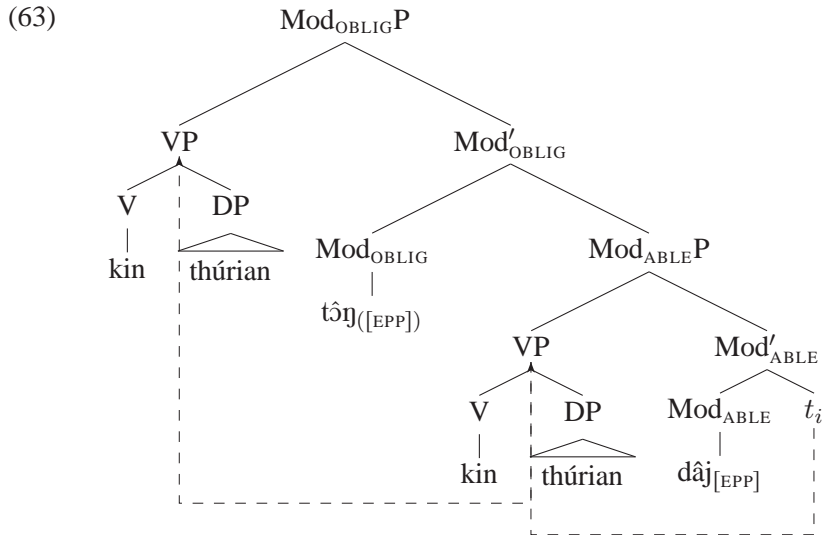
The optional movement past *tôŋ* can be accounted for if an EPP feature on *dâj* is optionally perco-
lated up to higher functional projections (though see below). Besides negation, the predicator test,
and the postverbal occurrence of preverbal aspect markers, Visonyanggoon (2000, ch. 4) presents an
additional argument for movement from coordination. In addition, Simpson (2001) argues in detail
against an analysis whereby the postverbal modal marker predicates the whole VP or clause. His
arguments focus on the lack of island effects in the moved VP, which he accounts for by claiming
that the elements can escape the VP before movement (or rather, can move from the lower copy of
the VP), which is not subject to these restrictions. He shows that true clausal subjects, in contrast, do
show these restrictions. While there is not space to review all of this evidence, there is good reason
to conclude that VP-movement is the correct account of the postverbal position of both aspect and
modal markers in Thai.

This rudimentary discussion is sufficient to show that the syntax of aspect and modality are
quite similar. Both categories are indicated with several markers, whose verbhood can be established
based on tests such as the predicator diagnostic and negation. These tests reveal that verbal heads
exist both before and after the VP. In both cases, the verbal markers occurring after the VP take
scope under those before the VP, and they allow preverbal markers to occur after the verb. These

facts have been accounted for in the literature with VP-movement, a proposal that seems to be supported by the available data.

2.5   Tense

Thai lacks obligatory tense marking on verbs or auxiliaries, and lacks inflectional tense morphology of any kind. So just as sentences can be vague with respect to aspectual interpretation (22), they can also be vague with respect to temporal interpretation:

(64)   Nát kin thúrian.
        Nat eat durian
        'Nat eats/ate durian.'

Of course, the temporal vagueness of sentences like (64) can be precisified with the addition of adverbs which make reference to time:

(65)   a.   Nát kin thúrian môa-waan-níi.
              Nat eat durian yesterday
              'Nat ate durian yesterday.'

        b.   Nát kin thúrian phrûŋ-níi.
              Nat eat durian tomorrow
              'Nat is going to eat durian tomorrow.'

Thus, when talking about yesterday, the event being referred to is clearly in the past, and when talking about tomorrow, the event occurs in the future. However, the fact that an expression makes reference to time does not necessarily provide evidence for a TP projection (Lin 2005, 2010; Sybesma 2007, cf.).

I will put adverbs aside in this section, and focus instead on a particle which has been claimed to realize future tense. The first is *càʔ*, which I included with the aspectual verbs in section 2.3, table (34), as meaning 'about to,' the analysis of Koenig and Muansuwan (2005). In the literature, though,

cà is often called future tense (e.g., Kanchanawan 1978 and in the appendix of Cinque 1999), as represented by simple cases like the following:

(66)   Nát **càʔ** kin thúrian phrûŋ-níi.
         Nat CÀ eat durian tomorrow
         'Nat is going to eat durian tomorrow.'

This sentence is more natural out of context than (65-b) would be, and the contribution of *càʔ* clearly relates to the events' occurring in the future. Additionally, *càʔ* occurs in infinitival complements of control and raising verbs. However, we will see that *càʔ* can be used in counterfactual environments similar to English *would*, and thus has no direct relationship with futurity per se. Instead, the correct characterization of *càʔ* seems to be as a pure marker of prospectivity, and is thus associated with a range of meanings associated with events occurring in the future of some reference time. Thus, while it could be identified as a T head, its semantics seem more related to modality than to tense.

2.5.1   Prospectivity versus futurity

In the traditional Reichenbachian approaches to the semantics of tense and aspect, they are distinct and cross-cutting categories. Thus, cases of "true" tense like the past tense marker of English can freely occur with most different aspectual categories in the language. This demonstrates that the primary function of genuine tense marking is to make reference to the times at which eventualities occur relative to the speech time (Comrie 1985; Enç 1997).

While future tense is probably the most common analysis of *càʔ* in the literature, it has also been analyzed as a prospective marker (Muansuwan 2002; Koenig and Muansuwan 2005), a modal marker of intention (Visonyanggoon 2000) or potentiality Muansuwan (2002), and a marker of "challengeability" (Iwasaki and Ingkaphirom 2005) or irrealis mood (Rangkupan 2001). In a way, the hesitancy of all of these analyses to label *càʔ* a future tense marker reflects the authors' awareness that its use extends beyond pure futurity. Some of these meanings are briefly reviewed

below.

To begin, the following example indicate that *càʔ* is not restricted to marking future tense, as it can occur in sentences which are about past events:

(67) khǎw **càʔ** ʔaan nǎŋsǔɯ mûa-khɯɯn ... tɛ̀ɛ faj dàp
      3P CÀ read book last.night   but power out
      'He would have read last night but the power was out.'

(Visonyanggoon 2000, ch. 4, ex. 35)

(68) mûa-waan-níi phǒm **càʔ** pay hǎa   phɯ̂an ... tɛ̀ɛ pay mâj dâj phrɔ́ʔ   pùat thɔ́ɔŋ
      yesterday   I   CÀ go search friend   but go NEG can because pain stomach
      'Yesterday I was going to see my friend, but I couldn't go because I had a stomachache.'

(Iwasaki and Ingkaphirom 2005, p. 125)

The speaker in this context is recollecting the anticipation of the future at some past event, the reference time. Because the reference time is prior to the utterance time, the occurrence of *càʔ* in these sentences is compatible with an analysis of *càʔ* as a modal or aspectual marker, but not as a tense marker.

Another place where *càʔ* is found is generics where the speaker is uncertain about the veracity of the given claim:

(69) pòkkatí trɛ́ffìk man   cà nên   mâak
      usually traffic 3INAN CÀ crowded very
      'Usually, the traffic is very crowded, right?'   (Iwasaki and Ingkaphirom 2005, p. 126)

This occurrence of *càʔ* seems to indicate that its meaning does involve a modal component. Thus, the best characterization of *càʔ* seems to be a prospective modal with generally irrealis meanings which denote futurity relative to some reference time, but crucially not the speaking time.

In section 2.3, we saw that *càʔ* does not function as a predicator, nor can it be negated. We also saw that it does not block the verb from serving as a predicator, repeated below, which we took

as evidence for the specifier status of other aspectual particles (49):

(70) a. Q: Nát **càʔ** kin thúrian máj?
     Nat PROG eat durian Q
     'Is Nat going to eat durian?'

   b. A: *****càʔ**
     PROG

   c. A: *****càʔ** kin
     PROG eat

   d. A: kin
     PROG eat
     'Yes, he is.'   (cf. Visonyanggoon 2000, ch. 4, ex. 43)

Another possible analysis of *càʔ* is as a modal head located higher than Pol in the clausal spine, in

which case it could not move to the Pol projection nor would it block the verb from moving there:

(71)   ModP$_{POT}$

   Mod$_{POT}$ PolP

    cà Pol$_{[uV]}$ VP

       kin V DP

         t_i thúrian
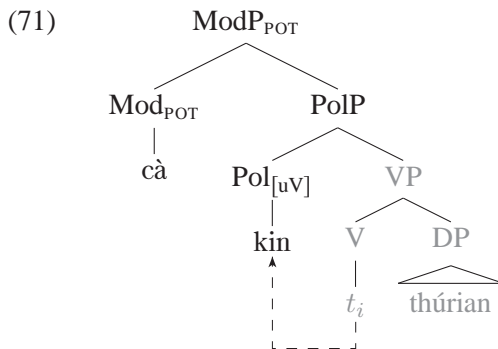
In the response to a polar question, the only element that is required is the polar head. The fact that

càʔ cannot be negated seems to indicate that it is not a [+V] head, though it still occurs in the clausal

spine.

   A final environment for *càʔ* suggests that this approach is on the right track: *cà* optionally

occurs in the complement of certain auxiliary verbs. An example is given below:

(72) Nát ʔàat (**càʔ**) kin thúrian.
  Nat probable POT   eat durian.

In these environments, *càʔ* is optional. Its semantic contribution is not immediately obvious, as the

meaning of the sentence does not change when it is absent. A list of some verbs that allow it in their

complement indicates further that it is a kind of potential marker (Iwasaki and Ingkaphirom 2005,

p. 130) :

(73)　　kùap càʔ　　'almost, nearly'
　　　　mák càʔ　　'likely to'
　　　　dǐaw càʔ　　'will immediately'
　　　　chák càʔ　　'begin to'
　　　　khuan càʔ　　'should'
　　　　nâa càʔ　　'should'
　　　　khoŋ càʔ　　'probably, likely'
　　　　ʔàat càʔ　　'probably, could'
　　　　kamlaŋ càʔ　　'about to'

All of the predicates signify some likely or imminent action. One possibility is that these are raising

verbs which take infinitival clausal complements (Jenks 2006) , based on the ability of negation to

occur in both the upper and lower clause (Jenks 2006):[11]

(74)
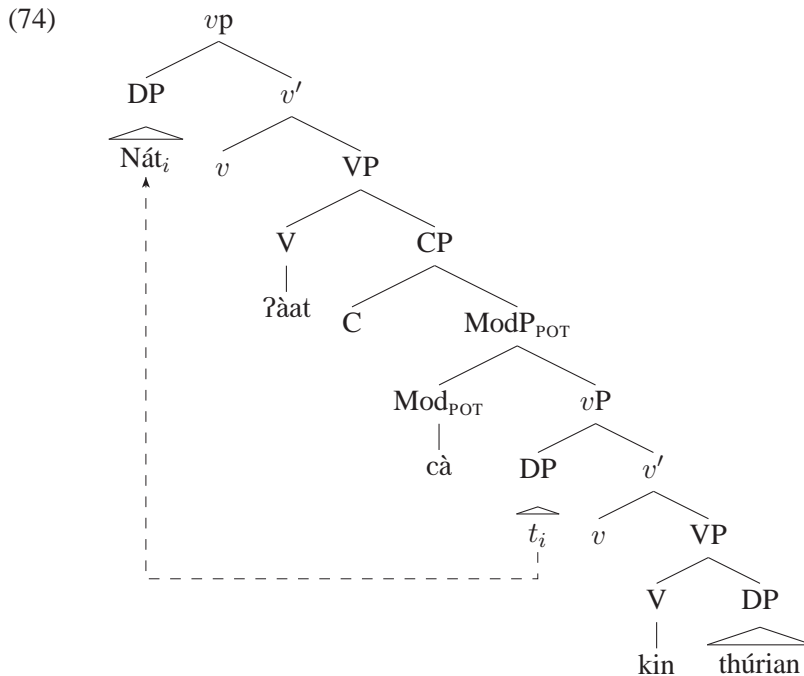
The predicator test seems to support this analysis, which reveals that *càʔ* must be repeated with the

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[11]For a different approach, see Singhapreecha (2010).

higher verb:

(75)   a.   Q: Nát **ʔàat**   **càʔ** kin thúrian châj máj?
                 Nat probable POT eat durian true Q
                 'Is it true that Nat is probably going to eat durian?'

       b.   A: **ʔàat**   **càʔ**
                 probable POT
                 'Yes, he probably is.'

       c.   A: ***ʔàat**
                 probable

       d.   A: *kin
                 PROG eat

                                         (cf. Visonyanggoon 2000, ch. 4, ex. 102)

This pattern is reminiscent of VP-ellipsis licensing by the English infinitive marker, *to*, which is also obligatorily included with a higher auxiliary or raising verb:

(76)   a.   Q: Does John have to leave? (.../hæf/...)

       b.   A: Yes, he has *(to). (.../hæs/...)

The parallels between the English and Thai patterns are striking. Both *càʔ* and *to* select lower verbs, and neither is a verb itself. In addition to the ellipsis licensing pattern above, like *càʔ*, *to* has been noted to contribute tense semantics particular to infinitives (Stowell 1982), and is analyzed as an Infl head by Chomsky (1986, p. 11) in his reformulation of phrase structure.

Proposals accounting for the response pattern in (76) and the distribution of VP-ellipsis below infinitival *to* argue that the relationship between *to* and the higher verb is subject to head-movement-like constraints. For Zagona (1988), this is because *to* must be phonologically bracketed with preceding material, while for Lobeck (1990), because the higher head governs the trace of *to* after incorporation. In either case, the parallels provide tenuous support for an analysis of *càʔ* as a high clausal head. In summary, while *càʔ* does seem to have syntax which we might expect

from a high clausal head, its use beyond future tense marking indicates that identifying it as a T^0 head is somewhat misguided. However, it does seem to occur in a high clausal head in roughly the same position in tense. While I do not resolve this issue, control complements of infinitives will be discussed again, in section 4.3.3.

Abusch (1985) proposes that English *would* and *will* involve the combination of a modal marker, WOLL, which combines with either past or future tense. Matthewson (2006) observes that in St'át'imcets, there is an overt morpheme *kelh*, which seems to be the equivalent of WOLL, minus tense marking. This also seems to be a viable analysis of Thai *càʔ*, though it is not clear to me how to accommodate the generic use of *càʔ* into this view. Likewise, the alternation between Thai sentences with and without *càʔ* is similar to Burmese, where the basic distinction is between realis and irrealis (Comrie 1985, pp. 50-51). This distinction marked by a pair of sentence-final-particles in complementary distribution, *-te* for realis and *-me* for irrealis. As Burmese is a head-final language, these final particles are likely heads and thus, also equivalent to Thai *càʔ* in that way.

2.6   Adverbs

In this section basic facts about adverbs in Thai are introduced. The main point will be that adverbs attach on the right in Thai, and that while some adverbs can be topicalized or scrambled, this operation is restricted both to a subset of the available adverbs as well as a few restricted positions at the periphery of the clause.

2.6.1   Rightward adjunction and focus

At the beginning of section 2.1, the rigid word order of Thai was discussed in relation to the VP and the arguments inside the VP. It was observed that internal arguments occur in a fixed order in Thai, and that adverbs must follow the VP. A more complete paradigm is given below, showing

that the aspectual adverb *lέεw* 'already' can only occur at the right edge of the VP:

(77) a. Nát [_{VP} kin thúrian] lέεw.
          Nat   eat durian   already
          'Nat already ate the durian.'

      b. *Nát kin lέεw   thúrian.
          Nat eat already durian

      c. *Nát lέεw   [_{VP} kin thúrian].
          Nat already   eat durian

      d. *lέεw   Nát [_{VP} kin thúrian].
          already Nat   eat durian

The rigidity of this rightward position for adverbs follows from the standard assumption that adverbs are adjuncts in conjunction with a language-particular property of Thai that places adjuncts on the right.

(78) [_{VP} [_{VP} kin thúrian] [_{AdvP} lέεw]]

The VP in (78) could of course be *v*P, PerfP, or any other higher projection, depending on one's assumptions about functional structure.

Evidence for rightward adjunction in Thai comes from the scopal properties of adverbs when more than one occur. The following sentences contain both a manner adverb, presumably merged low in the structure, and a temporal adverb, presumably merged higher. The natural order for these two elements is for the temporal adverb to follow the manner adverb. When the temporal adverb occurs to the left of the manner adverb, the temporal adverb is interpreted with focus:

(79) a. Nít tὲt   mǎa rεεŋ-rεεŋ mûa-waan-níi
          Nit kick dog hard   yesterday
          'Nit kicked the dog hard yesterday.'

      b. Nít tὲt   mǎa mûa-waan-níi || rεεŋ-rεεŋ
          Nit kick dog yesterday   hard
          'Nit kicked the dog hard YESTERDAY.'

This kind of variation in adverb order is taken by Cinque (1999, p. 3) as an instance of focus-driven movement, a deviation from the basic pattern. The interpretations indicated in the glosses support this conclusion. The generalization for focus seems to be that it is the element immediately after the VP which receives focus in Thai. Thus, neutral focus in (79-a) is on *rɛɛŋ-rɛɛŋ*, while displacing 'yesterday' to the position immediately after the VP allows it to receive focus. Further evidence that this alternation is focus driven comes from intonation: the focused element must be followed by a pause, indicated by horizontal lines above. This is due to prosodic pressure to associate focus with prominence by associating focused XPs with the edge of phonological constituents (Büring 2009).

The fact that scopally 'higher' adverbs generally on the right follows from the idea that adverbs are rightward adjuncts, as adjunction structures translate rightwardness into hierchically superior positions:

(80)   [$_{VP}$ [$_{VP}$ [$_{VP}$ kin thúrian] [$_{AdvP}$ rɛɛŋ-rɛɛŋ]] [$_{AdvP}$ mûa-waan-níi]]

Of course, LCA-based frameworks such as Cinque's would be unable to make use of rightward adjunction to account for these data, and would likely instead rely on successive leftward movement of the VP above leftward specifiers. The independent evidence for VP-movement in Thai from sections 2.3 and 2.4 provides circumstantial evidence for this conclusion.

I will continue to assume the existence of rightward adjunction throughout this dissertation without further comment. However, in chapter 6 the investigation of Thai quantifier float will lead to a reconsideration of the sources of rightward adjunction.

2.6.2   Adverb mobility and topicalization

While all Thai adverbs can occur sentence-finally, only 'high' adverbs, such as 'yesterday,' can be fronted to an initial position:

(81)   a.   mûa-waan-níi Nít tɛ̀t   mǎa rɛɛŋ-rɛɛŋ
                yesterday   Nit kick dog hard
                'Yesterday Nit kicked the dog hard.'

        b.   *rɛɛŋ-rɛɛŋ Nít tɛ̀t   mǎa mûa-waan-níi
             hard   Nit kick dog yesterday

Movement of the adverb to the sentence-initial position as in (81-a) can be seen as an instance of topicalization. Whether an adverb admits topicalization corresponds to its syntactic height, providing further evidence that elements' position farther to the right corresponds to structural height, at least as a default.

    Another distinction between 'high' and 'low' adverbs is that manner adverbs cannot scramble to the right of sentence-final honorifics:

(82)   a.   Nít tɛ̀t   mǎa rɛɛŋ-rɛɛŋ kháp
                Nit kick dog hard   HON:MSP
                'Nit kicked the dog hard.'

        b.   *Nít tɛ̀t   mǎa kháp   rɛɛŋ-rɛɛŋ
             Nit kick dog HON:MSP hard

In contrast, time adverbs can scramble to the right, though they must be preceded by a clear intonational break:

(83)   a.   Nít tɛ̀t   mǎa mûa-waan-níi kháp
                Nit kick dog yesterday   HON:MSP
                'Nit kicked the dog yesterday.' (polite)

        b.   Nít tɛ̀t   mǎa kháp   mûa-waan-níi
             Nit kick dog HON:MSP yesterday
             'Nit kicked the dog, yesterday.' (polite)

The interpretation of the adverb in (83-b) resembles an afterthought, and it is unclear how it should be incorporated into the syntactic structures we have suggested.

    The basic distinction between whether a given adverb can front or be scrambled to the right could be made to follow from more fundamental properties of the adverb, such as the height at which

it must be merged into the clause. The basic idea is that those adverbs which are fixed in the VP-final position are merged below vP, while those which can scramble to the left and right are, or can be, merged above vP. An alternative conception of the data would be to claim that manner adverbs are not adjuncts at all, but occur as part of a rightward branching shell structure within VP, as proposed by Larson (1988) and Cinque (1993) for English. Deciding between these two hypotheses would take us beyond our current goal of establishing basic facts about Thai clause structure.

2.7   Summary

This section provided an overview of Thai clause structure. VP-internal arguments were shown to be rigidly ordered. It was shown that adding additional arguments to the clause, whether internal or external, involved the addition of an overt head, analyzable as a light verb.

The syntax of aspect and modality is more complex. The different words that mark these categories exhibit distinct syntactic behavior, for one in their distribution before or after the verb, but also in their ability to license VP-ellipsis (i.e. to serve as predicators) and negation. Along with Visonyanggoon (2000) and Simpson (2001), it was argued that a small class of verbal VP-final aspect and modal markers trigger VP-movement to their specifier. I also concluded that the putative future tense marker *càʔ* is a high modal head marking prospectivity.

The last section briefly examined the distribution of a small number of adverbs and argued that they could be transparently analyzed as right-adjoined to the clause. It was shown that Thai adverbs differ in their ability to be scrambled and topicalized, corresponding roughly to their structural height.

Chapter 3

Thai Noun Phrase Structure

This chapter presents an overview of Thai noun phrases. Like the previous chapter on the clause, this chapter progresses systematically from smaller structures to larger ones, beginning with bare nouns, then proceeding to classifiers, plural marking, quantifiers, and finally looking at a number of deictic markers. I will not discuss relative clauses or other modifiers in this chapter, though this is a major topic in the next two chapters.

A brief note on terminology: while the term "noun phrase" is used for the complete constituent headed by a common noun, the terms "NP" and "DP" are used in more technical senses to refer to the maximal projections of the lexical noun and a functional head equivalent to English articles, respectively. I may sometimes use DP to refer to the complete extended projection of the noun, sometimes interchangeably with "noun phrase." In contrast, the term NP is used to refer to the immediate projection of the noun, including its complements or modifiers, but excluding higher functional projections such as classifiers phrases (ClfPs), for example.

Unlike the previous chapter, where the focus is primarily on syntax, this chapter focuses both on syntax and semantics. The reasons for this are twofold. First, the the issues dealt with in the core part of this dissertation are all problems at the interface as much as they are purely syntactic

issues. As such, having a clear groundwork for the syntax and semantics of Thai noun phrases is essential. Second, most of the clear arguments for the status of bare nouns as kinds are due to their semantics. The first half of the chapter deals more with semantics, while the second half, beginning with section 3.2.3, deals more with the structural properties of Thai noun phrases.

The Thai noun phrase has been a popular dissertation topic. Chapters 2-4 of Visonyanggoon (2000) deal with NP movement and nominal modification, Kookiattikoon (2001) studies classifiers in detail, and Singnoi (2000) investigates noun phrases generally from a construction grammar perspective, including clear presentations of compounding and nominalization in Thai. More recently, the dissertation by Piriyawiboon (2010) presents a more fine-grained discussion of the semantics of Thai nouns and noun phrases as well as a syntactic analysis of word order. Piriyawiboon's work is particularly important as it takes important steps towards providing a semantics for Thai noun phrases. Other dissertations on Thai noun phrases include Deepadung (1989), Savetamalya (1989), and Stein (1981). The latter, written in the framework of Montague Grammar, serves as one of the first formal semantic implementations of noun phrases in any classifier language, and in many ways anticipates the semantic analysis of classifiers of Krifka (1995) and Chierchia (1998) presented below.

3.1 Bare Nouns

This section discusses the distribution of bare nouns in Thai, focusing on their possible interpretations in different contexts, and how these interpretations can be accounted for semantically. Thai bare nouns can freely occur as arguments. These nouns have a flexible interpretation, partially modulated by the choice of predicate. In this section, the basic approach of Chierchia (1998, 2010) is adopted to Thai. Following Krifka (1995), Chierchia proposes that common nouns in classifier languages are interpreted as kinds, as in Carlson (1977)'s analysis of English bare plurals. This

proposal accounts for several properties of nouns in these languages including the availability of bare nouns in argument position, the scopelessness of bare nouns, the absence of obligatory plural marking, and the obligatory use of classifiers with numerals. A similar extension of Chierchia's theory was recently provided by Piriyawiboon (2010), whose analysis is very similar to the one I provide below, though details sometimes differ.[1]

3.1.1 Bare nouns as kinds

To begin, observe that in both subject and object position, Thai bare nouns can be interpreted as singular or plural, definite, or indefinite:

(1)   thúrian měn
        durian stink
        '(The/a) durians stink(s).'   (cf. Piriyawiboon 2010, ch. 3, ex. 1)

As we saw is true for vagueness in Thai with to aspect (section 2.3) and tense (section 2.5), the vagueness of bare nouns can be precisified in a number of ways, including by context. While the other sections in this chapter deal with the overt syntactic mechanisms for specifying the semantics of nouns, this section focuses on the interpretation of bare nouns. This will serve as important background for the semantics of classifiers and plurals introduced in the following sections as well.

Chierchia (1998) observes that "generalized classifier languages," such as Thai and Chinese, have the general ability to use bare nouns as arguments. In addition to allowing arguments to serve as bare nouns and having generalized classifier systems, Chierchia observes that these languages

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[1]As the analysis is presented quickly, the theoretical constructs may seem stipulatory to those with unfamiliarity with Chierchia's type-shifting approach. See Chierchia (1984), Partee and Rooth (1983), and Partee (1987) for more background on the theory of type-shifting.

lack *obligatory* articles or plural marking.[2]

Chierchia argues that this cluster of properties follows from a parametric difference in how nouns are interpreted in different languages, a difference he labels the Nominal Mapping Parameter. In some languages, such as Thai and Chinese, nouns must be interpreted as kinds. In Romance languages, on the other hand, where bare nouns can generally only occur with articles, Chierchia proposes nouns are interpreted as properties. Because English allows both kind-based and indefinite uses of bare nouns, but requires articles for definite noun phrases, Chierchia proposes that in English and other Germanic languages, nouns can be interpreted as kinds or as properties. While Chierchia's proposal remains controversial, as it proposes parametric variation in the lexical component of language, it has been quite influential. Analyses of nouns in Chinese (Yang 2000) and Japanese (Kurafuji 2004) have been successfully pursued under this view. Most importantly, it remains the only unified explanation for the correlation between the absence of articles, the absence of obligatory plural marking, the presence of generalized classifiers, and the general availability of bare nouns in classifier languages.[3]

To understand what is meant by 'kinds,' some background on semantic plurality is needed. Assume that in a given situation there are three durians, durian a, durian b, and durian c. Following work by Carlson (1977) and Link (1983), we can represent the domain of durian in such a situation with the semi-lattice below:

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[2]These last points are frequently misunderstood by Chierchia's critics. We will see in section 3.3 that Thai does have a manner of marking plurality, but unlike in inflectional languages, it is never obligatory. Likewise, it has been claimed that certain uses of demonstratives and the numeral 'one' in Thai is article-like, but Piriyawiboon (2010) demonstrates that these syntactic items are not bona fine articles (see section 3.5). Like with plurals, the clearest indication that these are not true articles is that they are never obligatory.

[3]The Nominal Mapping Parameter has been challenged by a number of authors based largely on the observation that not all languages neatly fall into one of Chierchia's categories. In particular, many languages, such as Hindi and Russian allow bare nominal arguments, but contain plural marking rather than classifier systems (Dayal 2004). Of particular interest in this category is Brazilian Portuguese, which allows both bare singular and bare plural nouns (Schmitt and Munn 1999). Wilhelm (2008) argues that Dëne Sųłiné presents a challenge to Chierchia's generalization, as the Athapaskan language allows bare nouns but lacks both plural marking and classifiers. Indonesian has been argued to contain a means of plural marking as well as a generalized classifier system (Chung 2000). See Chierchia (2010) and Dayal (2011a) for more recent discussions of these cases and others. None of these arguments really undermine the idea that bare nouns in these languages can denote kinds, the best evidence for which is still the scopelessness of bare nouns (see section 3.1.3).

(2)   {a, b, c}   ⟵ kind

    {a, b}   {a, c}   {b, c}   ⟵ sums (plural individuals)

      a   b   c   ⟵ atoms (individuals)
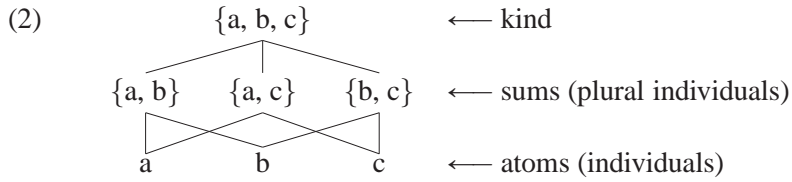
The top element in the semi-lattice is the set which is the union of all the sets below it. This set is the extension of the kind, literally all the durians in a given world or situation. The middle line represents sums or partial unions of individual durians, which in this case might be the denotation of noun phrases like "two durians." The bottom line represents individual durians, which will be referred to as atomic individuals or atoms in this model. The lines between the sets represent the subpart relation, $\leqslant$, read from bottom-to-top, which is a transitive relation. So $\{c\} \leqslant \{a, b, c\}$ (to be read as "c is a subpart of the sum a-b-c"). The subpart relation will play a crucial role in spelling out the semantics of kind denotations.

Returning to bare nouns in Thai, the kind denotation of a common noun like *thúrian* can be seen as a function from a world or situation w to all of the durians in that world:

(3) $\lambda w[\text{DURIAN}_w] = \text{DURIAN}$

Above, 'DURIAN' stands for the durian kind. I will use a small caps to indicate a kind constant, and a lowercase k as a variable for kinds. Kinds are of type $\langle s, e \rangle$, s being the type of worlds, which is generally supplied by the context.

Chierchia's approach is grounded in the theory of nominalization and predicativization developed in Chierchia (1984). There, he proposed that kinds and properties have coextensive counterparts. So the counterpart to the durian kind is the durian property, given below:

(4) $\lambda x[\text{DURIAN}(x)] = \text{DURIAN}$

Chierchia introduces two symmetric logical operations for mapping logical expressions from individuals such as kinds to predicates and back. The first operation, 'down,' represented '$\cap$', maps properties to kinds (5-a), while the second operation, 'up,' represented '$\cup$', maps kinds to properties (5-b).

(5)   a. $\cap\text{DURIAN}= \iota x\text{DURIAN}(x)$ $\langle e,t\rangle \rightarrow \langle e\rangle$

      b. $\cup d_k = \lambda x[x{\leqslant}k]$ $\langle e\rangle \rightarrow \langle e,t\rangle$

      c. $\cup\cap\text{DURIAN} = \text{DURIAN}$

      d. $\cap\cup d_k = d_k$ (cf. **Chierchia** 2010, ex. 33a-b)

'Up' and 'down' are both injective functions, meaning that they preserve the distinctness of elements in their domain; no two kinds are mapped onto the same property, and vice versa. This entails that the functions can be undone, as is shown in (6-c) and (6-d).

While bare nouns *can* be given an analysis as kinds, an equally important question is why they *should* be given such an analysis. There are several arguments for this position in the literature. The simplest argument, also one of the strongest, is that every language that allows bare nouns can use them to refer to kinds (**Gerstner-Link** 1988). Thai, of course, is no exception:

(6)   nŭu   klâj   sŭunphan
      mouse nearly extinct
      'Mice are nearly extinct.'   (Piriyawiboon 2010, ch. 3, ex. 2)

The predicate *sŭunphan* 'be extinct' requires a kind-denoting subject. While bare nouns can have other meanings in Thai, in the framework I am adopting the noun phrase in (6) is primary, and the other meanings for bare nouns, including indefinites, generics, and definite meanings, derive from the kind meaning, as will be shown below.

Piriyawiboon (2010, pp. 55-60) points to a number of empirical arguments supporting the analysis of bare nouns as kinds for Thai. One of these is the fact that bare nouns are vague with

respect to number. Thus, a sentence like the following makes no commitment with respect to the plurality of the bare common noun:

(7)   Nát súɯ năŋsɯ̌ɯ
        Nat buy book
        'Nat bought one or more books.'

The number the object is vague between a singular and a plural reading, just as it can be vague in terms of definiteness, as was shown in example (1). Arguments for vagueness and against ambiguity are given in section 3.3.1. The vagueness of bare nouns with respect to number is predicted by the kind analysis of bare nouns because the domain of kinds includes both individuals and pluralities.

Chierchia (1998) notes that if nouns in classifier languages are kinds, they would not be expected to show a true count vs. mass distinction. Piriyawiboon (2010) shows that this prediction holds of Thai, as predicative quantifiers such as *jɔ́ʔ* 'much/many' and *nɔ́j* 'little/few' do not distinguish between mass and count nouns:

(8)   a.   (mii) rûup   nɔ́ɔj/jɔ́ʔ
               (have) picture a few/a lot
               'There are a few/a lot of pictures.'

        b.   (mii) náam nɔ́ɔj/jɔ́ʔ
               (have) water few/much
               'There is a little/a lot of water.'   (cf. Piriyawiboon 2010, p. 58)

The absence of quantifiers that combine directly with nouns and reflect the count vs. mass distinction in classifier languages can be accounted for by the idea that kinds lack the internal complexity of properties. While count properties contain atomic units, and mass properties do not, kinds do not reflect this distinction because they represent only the totality of the property (cf. Chierchia 1998, 2010; Link 1983). While classifier languages do manifest a count vs. mass distinction, it is through the classifier system, which accesses instances of the kind, rather than at the level of bare nouns (cf. Cheng and Sybesma 1999).

3.1.2 Deriving different interpretations of bare nouns

The ability of bare nouns in Thai to function as arguments of kind-level predicates is the most basic argument for their interpretation as kinds, albeit not a very compelling one, given that bare nouns can also be arguments of object-level and generic predicates, as we will see in this section. Following Carlson (1977) and Chierchia (1998), I take the interpretation of kind-denoting nouns to be dependent on the sort of predicates with which they occur. While kinds need no modification when they occur with kind-selecting predicates (this selection can be captured by a type-driven semantics if we allow the system of types to be sorted), when they occur with object-level predicates, some adjustment must be made. The derivation of these different noun phrase meanings from kinds is provided below.

Beyond kind-level contexts, and putting aside predicative uses of noun phrases, there are basically three other ways in which bare nouns can be interpreted in Thai. These are 1) indefinite, 2) generic, and 3) definite. I walk through the derivation of each of these meanings from the kind-based meanings of bare nouns below.

In Thai, bare nouns can be interpreted as indefinite both in subject and object position. In subject position, the saliency of the indefinite interpretation is aided by the addition of a topic before the subject NP. This might be because the subject NP has a tendency to be interpreted as a topic in the absence of such an adverb.[4] Consider the following example:

(9)   mûawaan nǔu   khâw maa naj khrua.
         yesterday mouse enter come in   kitchen
         'Yesterday a mouse/mice came into the kitchen...'   (Piriyawiboon 2010, ch. 3, ex. 2)

In this sentence, what is being claimed is that the thing which ran into the kitchen was some actual

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[4]The availability of indefinite interpretations of bare nouns has been the topic of some debate in the literature on Mandarin Chinese; Cheng and Sybesma (1999) claim that such interpretations are unavailable in subject position. Yang (2000, ch. 2) has showed that such interpretations are indeed available, and like in Thai, they are made more salient by the addition of an independent topic. The free availability of indefinite interpretations is expected under the proposed analysis.

mouse, rather than all representatives of the mice kind in the world (or so we hope). Yet the subject

denotes a kind; how can this be?

Chierchia (1998, p. 364) proposes that episodic predicates like the predicate in (9) require

an object-denoting argument, and the insertion of a kind-denoting argument results in a type mis-

match. The grammar provides a way of automatically fixing this mismatch by a semantic rule called

'Derived Kind Predication':

(10)   *Derived Kind Predication* (DKP):

         If P applies to objects and k denotes a kind, then

         $[\![P(k)]\!] = \exists x[^{\cup}k(x) \wedge P(x)]$

DKP introduces an existential quantifier that binds the argument position of the predicate rather than

let it be occupied by the kind argument. The kind argument itself is shifted to a predicate, whose

argument is bound by the same existential quantifier.[5] Applying DKP to the sentence in (9) derives

the interpretation below, representing the VP as an unanalyzed intransitive predicate for simplicity:

(11)   RUN.INTO.THE.KITCHEN(m_k) = $\exists x[^{\cup}m_k(x) \wedge$ RUN.INTO.THE.KITCHEN(x)]

This is the desired meaning, with existential quantification over a 'mouse' property. DKP can also

account for the number vagueness of bare nouns in Thai. Thus, example (9), like example (7), would

be judged as true if more than one mouse ran into the kitchen yesterday. This is because when $^{\cup}$

applies to the kind, the resulting property contains both plural and singular individuals. Thus, the

variable bound by x ranges over both singularities and pluralities, accounting for the flexibility of

bare nouns with respect to plurality in existential contexts.

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[5]"Automatic" existential interpretations for bare arguments have been a standard analysis of certain kinds of existential readings since the existential closure rule of Heim (1982) (see also Diesing 1992a). Chierchia's proposal follows the idea of Carlson (1977), who argued that when predicates only hold of the entity correlates of kinds, grammar provides a semantic mechanism to mediate between the two.

Generic interpretations of bare arguments resemble existential interpretations. The main difference is that rather than having a quantifier be introduced by a semantic rule, genericity is interpreted as a quantifier which is introduced by an aspectual projection of the verb, where it takes the subject NP as its restriction and the VP as its scope:[6]

(12) a. nǔu   ʔaasǎj taam thôɔnáam.   (*generic*)
          mouse live   down sewer
          'Mice live in the sewer.'   (Piriyawiboon 2010, ch. 3, ex. 2)

      b. $\text{Gen}(x)[^{\cup}m_k(x) \wedge \text{LIVE.IN.SEWER}(x)]$

As is the case with DKP, though, the $^{\cup}$ operation allows the kind argument to be bound by the generic operator. The tacit assumption is that $^{\cup}$ will apply automatically due to the mismatch between the generic operator, which requires a predicate as its restriction, and the bare kind argument, which is an individual.

This assumption leaves the definite interpretation of bare noun phrases, which are allowed in a wide range of sentences in Thai including individual-level predicates, stage-level predicates, and episodic sentences. Unlike generic and indefinite noun phrases, definite noun phrases are of type $\langle e \rangle$, meaning that the presence of some DP-external operator cannot be relied on to derive the meaning.

There have been two approaches to bare noun definiteness in classifier languages. Chierchia (1998) assumes that definiteness in classifier languages is implemented by a phonetically null definite article (represented as ι):

(13) $\lambda k \iota x [^{\cup}k(x)\,]$

Chierchia proposes what he calls the "Blocking Principle," an economy condition that regulates

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[6]Here I am simplifying the semantics of generics somewhat, but the interpretation in (12) is compatible with more elaborated meanings. See the papers in Carlson and Pelletier (1995) for a review of genericity. The idea that generics are due to some quantifier originated with Carlson (1977).

availability of covert articles (p. 360, see also Dayal 2004). In this system, covert articles are only available if a language does not have the equivalent article overtly. That is to say, because Thai does not have an overt definite article, a definite article such as (13) is freely available.

The problem with this view, noted by Borer (2005, p. 88-89) is that there is no reason to expect that classifier languages lack articles. That is, if the semantics of definite operators in classifier languages are essentially identical to definite operators in languages with articles, why should classifier languages lack articles? We will return to this issue throughout the chapter, as classifiers do derive property-typed expressions. I will argue below and in chapter 5 that classifiers do require covert determiners to function as definite arguments.

Piriyawiboon (2010, p. 53) proposes instead that the definite interpretation *is* the kind interpretation, modulo context. Specifically, she claims that just as kinds correspond to the largest (supremum) plurality in a given world as its denotation, a definite interpretation corresponds to the largest plurality in a given situation smaller. This idea has been proposed elsewhere (Dayal 2011a; Jiang 2011; Trinh 2010). Under this view, definites are simply the extensional counterparts of kinds, which can be derived simply by supplying a world argument. We can label this operation which derives definite interpretations *Situation Restriction*, following Jiang (2011):

(14)   *Situation Restriction* (SR):

 If P applies objects, and k denotes a kind, and some situation s is supplied, then

 $[\![P(k)]\!]$ = P($\breve{}$k) in s.

Here the '$\breve{}$' operation is given its montagovian interpretation as a function from intensions of type $\langle s, X \rangle$ to extensions of type $\langle X \rangle$, X a variable ranging over (possibly complex) types. SR thus derives definite noun phrases, of type $\langle e \rangle$, from kinds, of type $\langle s, e \rangle$, where the world or situation is provided by the context. Under this view, the familiarity requirement on definites (Heim 1982) arises pragmatically from the restriction of SR to contexts containing an instance of the relevant

kind. The existential cases examined at the beginning of this section result when no such context is available, so DKP applies instead.

We thus have three semantic mechanisms for deriving the three interpretations of bare nouns aside from the kind interpretation itself. The kind interpretation of nouns arises transparently when nouns function as the argument of kind-level predicates. Derived Kind Predication applies as the default whenever an object level predicate applies to a kind. If there is a generic operator, on the other hand, the bare noun kind can serve as the restrictor of this operator.

We have seen that given the mechanisms above, the various meanings available for bare nouns in Thai can be derived. The fact that all of the meanings of bare nouns in Thai can be derived by semantic machinery is not a very convincing argument for the NP analysis of bare nouns. However, the ability of Thai bare nouns to receive these interpretations does constitute such an argument from simplicity: if the available interpretations can be derived from a kind-based semantics, additional functional structure has no explanatory power and should be discarded.

3.1.3   The scopelessness of bare nouns

A further empirical argument for the kind-based analysis of bare nouns, based on Carlson (1977), comes from the fact that bare nouns in classifier languages are scopeless, meaning they scope below other scope-bearing operators in a sentence. In this sense, bare nouns in Thai are like English bare plurals but unlike English noun phrases headed by the indefinite article *a(n)*. Bare nouns have been shown to be scopeless in both Mandarin Yang (2000) and Thai Piriyawiboon (2010). This argument is repeated below.

Consider the following pairs of English sentences, from Carlson (1977, ch. 2):

(15)   a.   Miles wants to meet a policeman.

        b.   Miles wants to meet policemen.

(16)   a.   Everyone read a book on giraffes.

         b.   Everyone read books on giraffes.

(17)   a.   John didn't see a spot on the floor.

         b.   John didn't see spots on the floor.

In each of the examples above, the (a) sentence is ambiguous between a wide and narrow-scope reading for the indefinite. On the other hand, the bare plural in the (b) sentences can only be interpreted with low scope. If bare plurals were simply indefinite plurals, as had been argued by others before, there would be no plausible explanation for this difference. Thus, Carlson argues that this difference constitutes evidence that bare plurals, but not indefinites, should be analyzed as kinds.

        Bare nouns in Thai and Chinese show nearly the same effect, but with the additional complication that definite interpretations of bare nouns are also available:

(18)   a.   Nít yàak phóp tamrùat
              Nit want meet policeman
              i. 'Nit wants meet a policeman/policemen.'   (want $> \exists$, *$\exists >$ want)
              ii. 'Nit wants to meet the policeman/men'

         b.   Nít yàak phóp tamrùat   săam khon
              Nit want meet policemen some CLF
              i. 'Nit wants to meet three policemen.'   (want $>$ three, three $>$ want)
              ii. 'Nit wants to meet the three policemen.'

(19)   a.   thúk khon ʔàan năŋ-sŭɯ rûaŋ jiiráap
              every CLF read book   about giraffe
              i. 'Everyone read a book/books about giraffes'   ($\forall > \exists$, *$\exists > \forall$)
              ii. 'Everyone read the book(s) about giraffes'

         b.   thúk khon ʔàan năŋ-sŭɯ rûaŋ jiiráap săam lêm
              every CLF read book   about giraffe some CLF
              'Everyone read three books about giraffes'   (every $>$ three, three $>$ every)

(20)   a.   chăn mâj hěn mɛɛw naj hôɔŋ
               I   NEG see cat   in room
               'I didn't see a cat/cats in the room.' $(\neg > \exists, {*}\exists > \neg)$
               'I didn't see the cat(s) in the room.'   (Piriyawiboon 2010, p. 45)

        b.   chăn mâj hěn mɛɛw săam tua   naj hôɔŋ
               I   NEG see cat   in   room
               'I didn't see (the) three cats in the room.'   (not > three, three > not)

Unlike English bare plurals, Thai bare nouns do show an ambiguity when they occur with other scope-bearing elements, but the ambiguity arises from the definite interpretations available to Thai bare nouns rather than the differences in scope. When Thai bare nouns are indefinite, they must receive low scope, as the (a-i) examples demonstrate. Chierchia (1998, p. 369) shows that the low scope of bare nouns is predicted by Derived Kind Predication, as kind-level expressions must be interpreted in their surface position.

Clear evidence that the ambiguity in definiteness in Thai bare nouns is distinct from the scopal ambiguity of English indefinites comes from the multiple ambiguity of Thai noun phrases with numerals both in scope and definiteness, shown in the (b) examples. The fact that numerals do allow scopal ambiguity indicates that they can be interpreted with genuine existential quantifiers. Thus, the inability of Thai bare nouns to receive wide scope indicates that they do not project a null existential quantifier.[7]

The unavailability of the definite interpretation in English bare plurals arises from the availability of definite *the* via the Blocking Principle, which prohibits covert semantic operators when overt ones are available (Chierchia 1998; Dayal 2004). The ambiguity between definite and scopeless interpretations bare nouns in Thai thus follows from the *unavailability* of a definite article, and the availability of Situation Restriction as a means to achieve definite interpretations from kinds.[8]

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[7]For more on the definiteness ambiguity of numerals, see chapter 5. For more on the scopal ambiguity of quantificational expression in general in Thai, see 6.

[8]In section 5.4.1, Situation Restriction will become relevant again, as not all classifier languages allow definite interpretations of bare nouns. It is proposed there that this might simply because such languages lack access to SR.

Thus, scope provides empirical evidence for a divide between bare nouns on one side and indefinites on the other. The scopelessness of bare nouns shows that they are empirically distinct from nouns with articles, and thus should not be analyzed by making recourse to null articles, at least not ones with any semantic content. Furthermore, if nouns always denoted properties, the absence of articles in classifier languages would be unexpected. Likewise, there is no reason to expect that these languages would not have obligatory plurals, which would occur in exactly the same positions as plurals in familiar western languages. Instead, they have classifiers, which realize the count/mass distinction independently. Both properties follow from a kind-based view.

The analysis of bare nouns as kinds in classifier languages will be assumed for the remainder of this dissertation. For classifiers, we will see that this semantics lends support to an independent proposal in the syntactic literature which claims that the word order in Thai DPs involves NP-movement. Additional crosslinguistic data and the status of the debate on DP versus NP in classifier languages will be revisited in section 5.4 of chapter 5 and in the conclusion in section 7.2.

3.2   Classifiers

In the introduction to their article about numeral classifiers in Thai, Hundius and Kölver (1983) make the following observation (p. 165):

> In comparison to other numeral classifier languages of the area, Thai employs numeral classifiers a) in the widest range of distribution in NP constructions, and b) in terms of an extremely diversified network of separate classes. Therefore, Thai (and its immediate cognates) offer the most differentiated evidence as to both the syntactic and semantic properties of this type of category.

This point is hard to overstate; every section following this one in this chapter discusses the interaction of different nominal elements with numeral classifiers. Therefore, an understanding of the syntax and semantics of classifiers is essential to understanding the Thai noun phrase as a whole.

Like many languages in East Asia and mainland Southeast Asia, Thai is a generalized numeral classifier language, which means that nouns cannot serve as the syntactic complement to cardinal numerals. Instead, numerals combine with a separate syntactic element, the numeral classifier:

(21)   a.   thúrian săam lûuk
             durian three CLF
             'three durians'

        b.   *thúrian săam
             durian three

        c.   *săam thúrian
             three durian

(21-b-c) show that numerals must occur with classifiers in Thai when tokens of a particular object are being counted. Measuring or counting sub-kinds constitute different ways of quantizing an object. These different ways of counting depend on different classes of morphemes which have the same putative distribution as classifiers.

3.2.1 A taxonomy for numeratives

There are a number of classifier-like elements, only some of which count as classifiers proper. These expressions together form a natural syntactic class based on their shared ability to immediately follow numerals. Following the rationale of Hundius and Kölver (1983) and others, I will refer to these terms collectively as *numeratives*. There are three types of numeratives, those that express concepts extrinsic to the head noun, those that express concepts intrinsic to the head noun, and those that do not occur with any head noun at all.

To begin, the following examples represent numerative expressions that denote measures, kinds, and containers:

(22)   a.   din-nǐaw sǎam kɔ̌ɔn
           clay   three lump
           'three lumps of clay'

       b.   náam-man sǎam chanít
           oil   three type
           'three types of oil'   (Hundius and Kölver 1983, p. 168)

       c.   yaa-sǐi-fan sǎam lɔ̀ɔt
           toothpaste three CLF:TUBE
           'three tubes of toothpaste'

This class of measuring expressions has received different names in the literature, including the recent term 'massifiers' (Cheng and Sybesma 1999). Despite its pith, this term is misleading as these expressions can combine with count nouns as well as mass nouns. Moreover, they themselves are countable. Instead, the term *extrinsic numerative* labels this category best, as they "express some notion of quantity or type which is *extrinsic* to the lexical content of the head noun; they provide additional information" (Hundius and Kölver 1983, p. 168).

     Extrinsic numeratives group together measure terms, such as those denoting length or volume, container words, group terms, and nouns meaning 'kind' or 'type.' These numeratives are not selective with respect to the head noun that they combine with, as long as that noun can be feasibly construed as being measured in terms of the unit expressed by the extrinsic numerative. Mass nouns are distinguished from count nouns by the fact that they can only combine with numeratives of this type, a fact which can be attributed to the fact that mass nouns do not contain 'stable atoms' in their extension (Chierchia 2010).

     The second type of numerative expression is numeral classifiers proper:

(23)   a.   nákrian sǎam khon
           student three CLF:PERSON
           'three students'

       b.   cîŋcòk sǎam tua
           gecko three CLF:BODY
           'three geckos'

    c.   thúrian sǎam lûuk
            durian three CLF:BALL
            'three durians'

While I will refer to this class of expressions as numeral classifiers or simply classifiers in this dissertation, a more precise label would be *intrinsic numeratives* because they rely on to semantic features which are intrinsic to the nouns with which they occur. Hundius and Kölver (1983) argue persuasively that classifiers do not emphasize different semantic aspects of their corresponding noun, as was claimed by Adams and Conklin (1973), arguing instead that classifiers add nothing besides the ability to be counted, a characterization which is often labelled as their "individuating" function in the functionalist literature (e.g. Bisang 1999). For a survey of Thai classifiers and the semantic features they refer to, see Hass (1942), Hundius and Kölver 1983, or Iwasaki and Ingkaphirom (2005, ch. 5). Thai classifiers pick out semantic field based primarily on social status for humans and animate objects and shapes for inanimate objects. In the majority of cases, the relationship is semantically transparent, if somewhat abstract.

    Classifiers are usually grammaticalized nouns in Thai. In many cases, they occur as independent nouns or as compounds. Thus, the classifier for round objects in (23-c), *lûuk*, is also a noun meaning 'ball,' and productively forms compounds such as *lûuk-taa* 'eyeball.' Like extrinsic numeratives, classifiers are a partially closed or semi-lexical class, as only a limited number of nouns in the language function as classifiers. However, many nouns in Thai function as their own classifier, as the following examples show:

(24)   a.   khon   sǎam khon
               person three person
               'three people'

        b.   phrathêet sǎam phrathêet
               country   three country
               'three countries'

      c.   laaj   sǎam laaj
              pattern three pattern
              'three patterns'

Below, this "repeater" construction will provide an argument for the NP-movement analysis of Thai noun phrase structure.

    The third class of expressions is much more limited, comprising of those numeratives that have no corresponding head noun:

(25)   a.   sǎam wan
              three day
              'three days'

        b.   sǎam bàat
              three baht
              'three Baht'

This group of classifiers are referred to as 'independent classifiers' by Hass (1942, p. 204). The majority of these classifiers, perhaps all of them, consist of monetary terms and time expressions. That being the case, it is plausible that this category is parasitic on the availability of a null head noun meaning 'money' or 'time', in which case independent classifiers could be collapsed with the extrinsic numeratives.

3.2.2 Classifier semantics

    The commonest view of classifiers, represented by Krifka (1995), Chierchia (1998, 2010), and before them in slightly different form, Stein (1981), is that they are relations between the (kind) denotation of the head noun and numerals. The obvious motivation for this analysis is that classifiers occur with numerals in every language in which they occur. This analysis entails that the lexical entry of classifiers contains a number argument, and thus, that this number argument must be saturated in order for the classifier to be interpretable.

These analyses are somewhat ambivalent about how the 'meaning' of the classifier is incorporated into the semantics. That is, while classifiers do not add any meaning to the head noun, the choice of the classifier is not free, but is restricted somehow by the grammar. I propose that this notion of 'agreement' is cashed out in the presuppositional content of the classifiers; classifiers introduce a presupposition that the object is of the relevant shape, animacy, function, etc. The 'content' of classifiers is thus analogous to gender on pronouns under analyses like the one in Heim and Kratzer (1998). Thus, classifiers are partial functions, defined only for kinds whose members satisfy their presuppositional content. This proposal accounts for the observation that if the incorrect classifier is used, sentences are not ungrammatical per se but sensed to be pragmatically odd, nearly meaningless, as is expected in cases of presupposition failure.

Pulling these two ideas together, below is the lexical entry for the classifier *lûuk*, synonymous with a noun meaning 'child', used for round objects and fruit:

(26)

$$[[\text{lûuk}_{\text{CLF}}]] = \begin{cases} \lambda k \lambda n \lambda x [^{\cup}k(x) \wedge \mu_{\text{AT}}(x) = n] & \text{if } ^{\cup}k \in \lambda x[\text{ball-like(x)}] \\ undefined & \text{otherwise} \end{cases}$$

What this definition says is that classifiers are measure functions that take a kind and a numeral and return atomic sets with the cardinality of the numeral. The notion of *atom*, from Link (1983), corresponds to the individuals making up the bottom line of the semi-lattice representing the nominal domain in (2). Extrinsic numeratives differ from classifiers in the makeup of the measure function μ; while classifiers pull out the atoms from the kind domain, extrinsic numeratives impose a measure on the domain, regardless of its internal structure.

This kind of semantics was initially proposed by Krifka (1995) to account for Mandarin Chinese, where nouns follow classifiers. Yet this analysis is problematic for Thai, because classifiers and nouns are not adjacent, but aseparated by numerals. There are two routes we can take to solve

this problem. The first is to tweak the semantics, reversing the order of arguments in (26). Classifiers would combine with numerals first, then combine with their kind argument. The other option is to alter the syntax so that nouns are underlyingly adjacent to classifiers. I argue for the latter solution below.

Another possibility for classifier semantics is that they do not actually contain a number argument at all. Such a view can accommodate the ability of Thai classifiers to occur with universal quantifiers (27-a), demonstratives (27-b), or relative clauses (27-c), rather than numerals:

(27)   a.   thúrian thúk lûuk
                durian every CLF
                'every durian'

        b.   thúrian lûuk níi
                durian CLF this
                'this durian'

        c.   thúrian lûuk thîi měn
                durian CLF REL stinks
                'the durian that stinks'

Similar considerations hold for languages such as Cantonese, where classifiers can occur 'bare' — without numerals — and seem to have the interpretation of definite articles (Cheng and Sybesma 1999, see also section 5.4).

In light of these data, one could propose that classifiers are not relations between numerals and kinds, but rather functions from kinds to atomic properties of those kinds.[9] An atomic property is a property that only holds of singleton individuals, that is, one that excludes plural individuals:

(28)

$$[[\text{lûuk}_{\text{CLF}}]] = \begin{cases} \lambda k \lambda x [^{\cup}k(x) \wedge AT(x)] & \text{if } ^{\cup}k \in \lambda x[\text{ball-like}(x)] \\ undefined & \text{otherwise} \end{cases}$$

---

[9]See Chierchia (2010) for a discussion of the notion of 'atomic property.'

This analysis could still accommodate the requirement that classifiers occur with numerals in classifier languages simply because atomic properties are necessary for counting, and classifiers are required in order to derive atomic properties. Ionin and Matushansky (2006) argue for this view of numerals on the basis of complex numeral expressions.

While the data in (27) seem to support the property theory of classifiers over a relational view, the structure of these examples may include a silent numeral 'one' in their syntax deleted under appropriate syntactic conditions. Looking at (27), we see that environments where 'one' is deleted are definite or contain an overt quantifier. It might be that an overt determiner is a necessary condition for the deletion of 'one.'

Another piece of evidence favoring the relational theory of classifiers is their syntactic similarity to extrinsic numeratives, especially measure phrases such as 'kilo' or 'centimeter,' which cannot be interpreted as properties. That is, measure expressions should contain numeral arguments because there is no clear sense in which 'kilo of x' defines a property. The basic problem is ontological. If I have even a little over one kilo of sand, there are many ways of partitioning this sand into a kilo, but I cannot say that I have many kilos of sand. The other side is that if I have less than a kilo of sand, I still want to be able to apply the 'kilo' measure to the sand, perhaps arriving at an expression such as 'half a kilo of sand.' This is so even though the amount of sand I have does not qualify as 'a kilo.' If measures are analyzed relationally, on par with (26), this problem does not arise.[10]

However, there is evidence that these measure expressions are syntactically or semantically distinct from classifiers in that they cannot occur in numberless constructions such as (27):

(29)   a.   *thúrian thúk loo
              durian every KILO

---

[10]Thanks to Gennaro Chierchia for extensive discussion of this particular point, both in his classes and in person.

    b. ??thúrian loo   níi
         durian KILO this

    c. ??thúrian loo   thîi měn
         durian KILO REL stinks

These examples negate the apparent parallel between measure phrases and classifiers. If measure phrases required a numeral, but classifiers did not, the contrast between (29) and (27) would follow from an analysis which did not rely on a covert 'one.' However, this contrast could also be based on a different source, a contrast in the ability of different kinds of numeratives to be referential. While measure expressions such as 'kilo' generally cannot be referential, perhaps for the reasons outlined above, classifiers themselves can be, because they are properties of individuals.
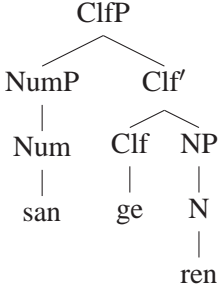
A final consideration in whether classifiers should be analyzed as properties or relations comes from the crosslinguistic distribution of classifiers. If classifiers did not contain a numeral argument, we might expect them to be much more common without numerals, occurring freely as predicates, for example. Yet in every language with a generalized classifier system, classifiers occur with numerals as the basic case, while their occurrence without numerals is much more restricted. This generalization follows if classifiers contain in their semantics a numeral argument, like measure functions such as 'kilo.' Under this view, differences such as whether measure phrases can be used referentially may have to be derived from semantic considerations. I adopt the relational view of classifiers throughout this dissertation. I lay out my analysis of 'one'-deletion later in this chapter, in section 3.4.

3.2.3   Classifiers as functional categories and NP-movement

The word order of noun, numeral, and numerative/classifier within the Thai noun phrase is fixed, in that order. This is one of two common orders for these constituents among classifier languages, the other being *numeral-classifier-noun* (Greenberg 1975; Jones 1970; Simpson 2005). In this section I will argue that the N-initial order in Thai is derived from the N-final order.

Beginning with Tang (1990), classifiers have been analyzed as functional projections of the noun,[11] a view that naturally accounts for N-final word orders like the one in Chinese:

(30) a. san-ge   ren
          three-CLF person
          'three people'
      b.

The analysis of classifiers as functional projections has become standard in the Chinese literature (Chen 1996; Cheng and Sybesma 1998, 1999; Li 1999; Wu and Bodomo 2009; Yang 2000, among others). Given that Thai is a right-branching language, like Chinese, but the noun and classifier are non-adjacent, deriving the Thai N-initial order from the Chinese N-final order would permit a unified analysis of noun phrase structure in the two languages (cf. Simpson 2005; Visonyanggoon 2000). The influence of the structure in (30) has extended beyond Chinese, as Borer (2005) and Chierchia (2010) attempt to generalize the classifier head as the locus of plural marking in inflectional languages.

This view that classifiers are functional projections of nouns has led to the proposal that the N-initial word order of Thai is derived by NP movement (e.g. Kookiattikoon 2001, ch. 2; Nguyen 2004, ch. 4; Piriyawiboon 2010, ch. 5; Simpson 2005; Singhapreecha 2001; Visonyanggoon 2000, ch. 2). These analyses propose that the word order is derived by phrasal NP-movement rather than N-movement based in part on the occurrence of adjectives and relative clauses adjacent to the noun in its initial position. While the NP-movement hypothesis is common, extensive empirical

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[11]Tang actually argues that classifiers and numerals form a single head. See Simpson (2005) for some arguments against this point.

argumentation for the status of classifiers as functional categories in Thai is harder to find. An alternative analysis is that classifiers and those elements combining with them are adjoined to the noun, which never undergoes movement (Deephuengton 1992; Tumtavitikul 1997):

(31)   a.   thúrian sǎam lûuk
             durian three CLF^{ball}
             'three durians'

        b.   i.   Base-generation hypothesis   ii.   NP-movement hypothesis
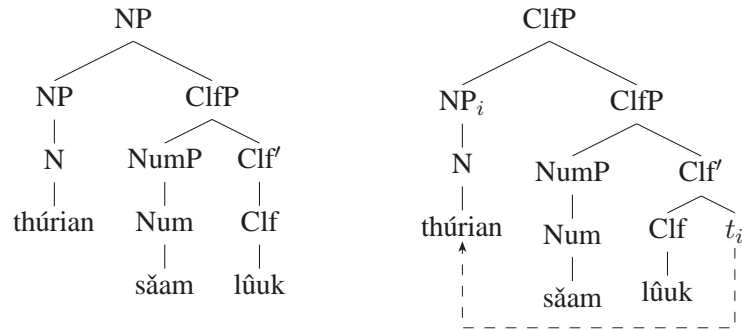
If we are to continue locating numerals in the specifier of ClfP, the movement of NP to [Spec, ClfP] entails that another specifier must be projected there. Of course, this problem does not exist in syntactic approaches that allow multiple specifiers (e.g. Ura 1996).

Semantically, the base-generation hypothesis requires the claim that Thai classifiers take their numeral argument before their kind argument. This proposal is also compatible with the Chinese structure in (30), though it would need to be tweaked so that the numeral and classifier form a constituent.

Below I present three arguments for the NP-movement analysis. These arguments focus on the role of the classifier in the noun phrase, particularly on its status as a functional head. The first argument is based on coordination, the second argument is based on the ability of classifiers to function as elliptical or anaphoric elements in discourse, and the final argument is the existence of repeater classifiers in Thai and languages with similar word order.

Beginning with coordination, consider a noun phrase like the following, with two coordinated

common nouns under the scope of a single classifier. The two glosses demonstrate that the noun

phrase is ambiguous:

(32) nákrian kàp khruu sìp khon
      student and teacher 10 CLF
      'students and ten teachers' *or* 'ten students and teachers'

We can see that the numeral and classifier in (32) can either scope over just the second noun phrase

or both noun phrases. This ambiguity can be captured by both analyses:

(33) a. 'students and ten teachers'
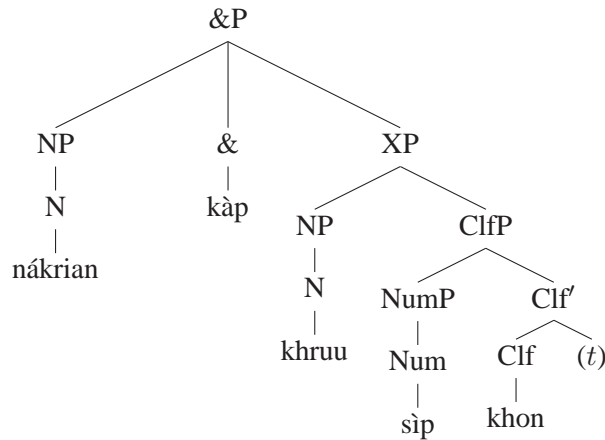
      b. 'ten students and teachers'
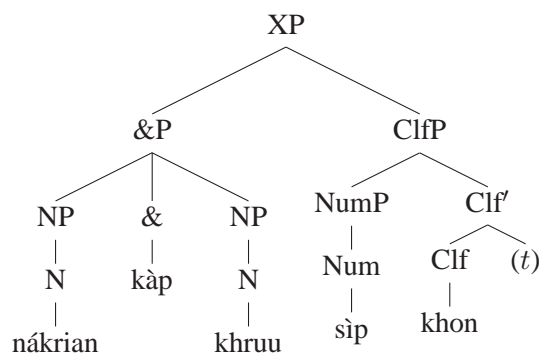
Example (32) indicates that that the coordinating conjunction *kàp* can coordinate nominal con-

stituents (Thomas 1979), but nothing about whether the classifier itself is a functional projection of

the noun or the modifier.

The following examples, which involve coordination of the classifier, suggest that classifiers are functional projections of the noun:

(34) a. nákrian khon   níi kàp (nákrian) khon   nán
          student CLF:PERSON this and student   CLF[person] that
          'this student and that student'

     b. nákrian khon   chàlàat kàp (nákrian) khon   ŋôo
          student CLF:PERSON smart   and student   CLF[person] dumb
          'the smart student and the dumb student'

     c. #nákrian khon   chàlàat kàp (*nákrian) ŋôo
          student CLF:PERSON smart   and student   dumb
          'the smart and dumb student'

In both (34-a) and (34-b), a constituent consisting of a classifier and a modifier, either a demonstrative or adjective, is coordinated to the exclusion of the head noun. In both cases, the second conjunct refers to a second group of individuals, rather than listing a second attribute for a single group or individual. In (34-a) and (34-b) such an ascription would lead to a contradition, as shown by the semantic degradedness of (34-c). This difference in interpretation corresponds to a difference in whether the noun can be repeated in the second conjunct or not. When it is not repeated, it is assumed that the noun is elided in the second conjunct, a natural conclusion as it is anaphoric to the noun in the first conjunct (see discussion of ellipsis below).

The difference between (34-a) and (34-b) on one hand and (34-c) on the other can be explained under the assumption that coordination of any projection of the noun results in coordination of the entire DP, while coordination of a modifier does not. This assumption is forced in a theory of grammar where extended projections and the lexical categories projecting them are in a biunique relationship. Because the classifier is a projection of the noun in the movement analysis, that analysis can account for these data:

(35)   a.   *NP-movement analysis of (34-b)*

```
                                    &P
              ┌──────────────────────┼──────────────────────┐
            ClfP                     &                     ClfP
         ┌────┴────┐                 │              ┌────────┴────────┐
        NPᵢ        Clf′             kàp           NPᵢ              Clf′
         │       ┌──┴──┐                            │           ┌────┴────┐
         N      Clf′    AP                          N          Clf′       AP
         │     ┌─┴─┐    ╱╲                          │         ┌─┴─┐       ╱╲
     nákrian  Clf  tᵢ  chàlàat              (nákrian)  Clf  tᵢ    ŋôo
               │                                        │
              khon                                     khon
```

       b.   *NP-movement analysis of (34-c)*

```
                          ClfP
                    ┌──────┴──────┐
                   NPᵢ           Clf′
                    │        ┌────┴────┐
                    N       Clf′       &P
                    │      ┌─┴─┐    ┌───┼───┐
                nákrian   Clf  tᵢ   AP  &   AP
                           │       ╱╲   │   ╱╲
                          khon  chàlàat kàp ŋôo
```
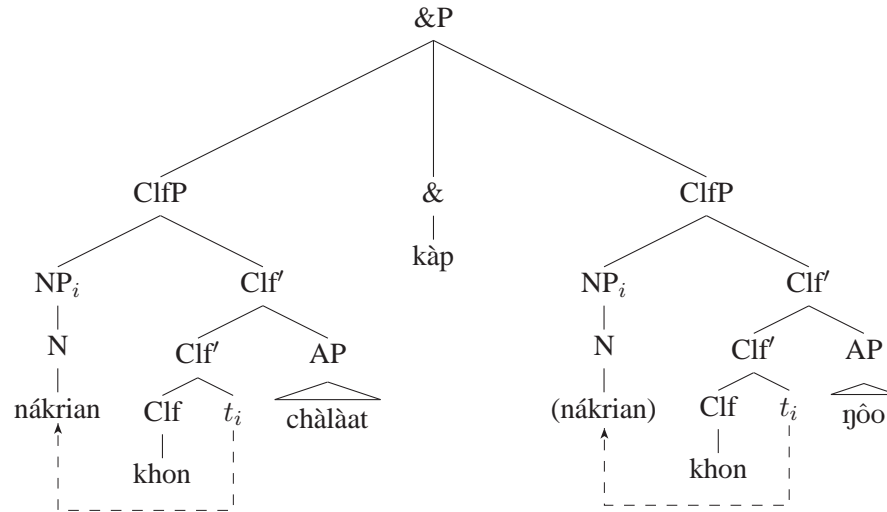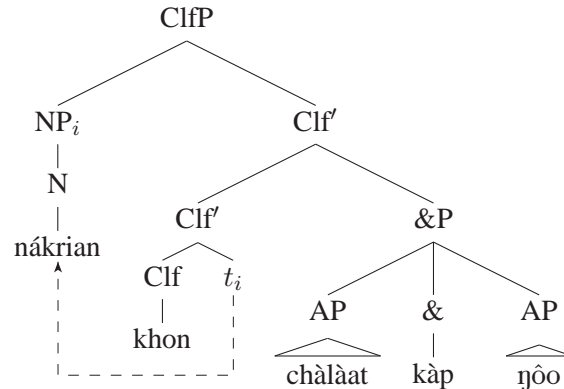
The difference between (34-b) and (34-c) is whether the entire DP is coordinated or only the adjective. This accounts for both the interpretive difference and the difference in the availability of the head noun. It is easy to see how (35-a) could be extended to the example with demonstratives in (34-a); the structure might in fact be identical. Before we turn to the base-generation hypothesis, observe that there is no ambiguity in (34-b); there is no interpretation of that noun phrase where something contradictory is being claimed about the student, as in (34-c). The only interpretation is that there are two students under discussion. The analysis in (35-a) captures the distinction because the classifier and adjective do not form a constituent to the exclusion of the entire DP.

These coordination facts cannot be accommodated by the base generation analysis. That analysis predicts that the classifier should form a constituent with the adjective, and hence, that (34-b) and (34-c) should be roughly identical in their available interpretations:

(36)   a.   *Problematic base-generation analysis of (34-b)*
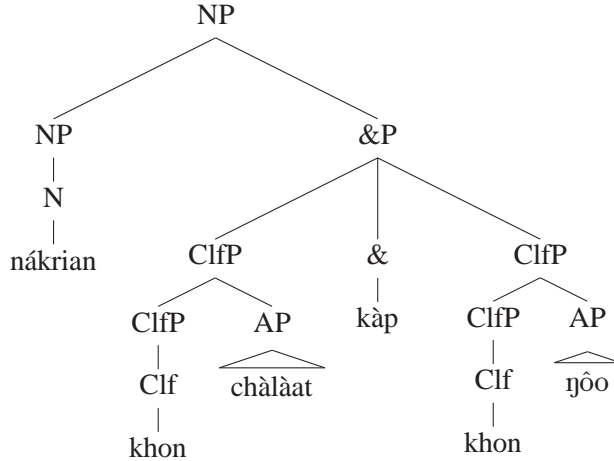
        b.   *Base-generation analysis of (34-c)*
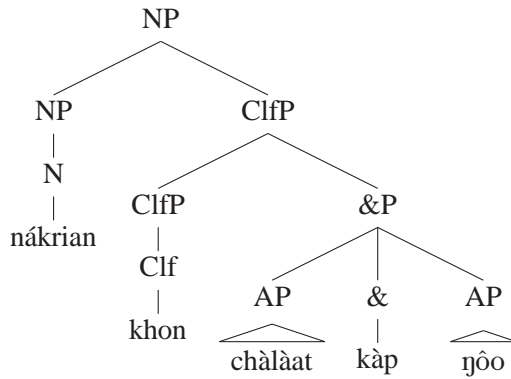
While we might expect the two structures in (36) to have different interpretations, it is not clear what they would be or how they would differ. The structure in (36-a) also appears to make the prediction that example (34-b) should be contradictory in the same way that (34-c) is. In short, it seems that the coordination data favor an analysis of classifiers as functional projections of the noun.

The second source of evidence for NP-movement comes from NP-ellipsis (following **Piriyaw-iboon** 2010, p. 108, also **Warotamasikkhadit** 1972, p. 59). In Thai, NP-ellipsis is licensed in any

environment where the noun is given, such as connected speech (37) or the answer to a question

(38):

(37) a. dèk sǎam khon   maa hǎa chǎn thîi bâan mûawaan
          child three CLF:PERSON come visit 1SG at   house yesterday
          'Three children came to visit me at home yesterday.'

      b. mâj rúu   càk sɔ̌ɔŋ khon.
          NEG know of two CLF:PERSON
          'I didn't know two of them.'

      c. tèe khon   ʔùuun pen láan   phîi   chaaj
          but CLF:PERSON other COP nephew older-sibling male
          'But the other one was my nephew through my older brother.'

(38) a. Q: mii thúrian kìi   lûuk?
             have durian how.many CLF:BALL
             'How durian do you have?'

      b. A: cèt   lûuk
             seven CLF:BALL
             'Seven.'

In both cases, the omitted NP is easily recoverable from the context. Whenever the noun is omitted,

though, the classifier must be present even though it is also recoverable from the context. While this

structure could be attributed to the selection of classifiers by the focal elements of the elliptical-DP

in both cases, the classifier itself may also license ellipsis of the noun.

The following examples suggest that NP-ellipsis is in fact licensed by classifiers, as NP-

ellipsis is impossible if the classifier is not present:

(39) a. Nát chɔ̂ɔp thúrian sùk.
          Nat like   durian ripe
          'Nat likes ripe durians.'

      b. sùan Nít chɔ̂ɔp *(thúrian) dìp.
          but Nit like   durian   unripe
          (intended) 'Though Nat likes unripe (ones).'

c.   sùan Nít chɔ̂ɔp (thúrian) bɛ̀ɛp/lûuk   dìp.
   but   Nit like   durian   SORT/CLF:BALL unripe
   'Though Nat likes the unripe sort/one.'

Example (39-a) makes a generic statement about the sort of durian that Nat likes, namely, ripe ones. In connected discourse, (39-a) does not license NP-ellipsis in (39-b) even though the noun is recoverable from context, just like in (37) and (38). (39-c) demonstrates that if either an extrinsic numerative meaning 'sort' or a classifier is used, NP-ellipsis is licensed. Hence, the examples in (39) together constitute strong evidence that NP-ellipsis cannot be licensed by a modifier, but must be licensed by a classifier.

  One theoretical view of ellipsis licensing holds that it must be licensed by a functional head with a filled specifier, with the head serving as a proper governor for the elided category. Thus, sluicing, VP-ellipsis, and N′-ellipsis in English have been unified by observing that each variety of ellipsis meets these structural criteria (Lobeck 1990, 1995; Saito and Murasugi 1990; Saito et al. 2008):

(40)   a.   CP   b.   IP   c.   DP

     DP   C′   DP   I′   DP   D′

     who   COMP   IP   Mary   I   VP   John's   D   NP

       [+wh]   [e]   is   [e]   [+poss]   [e]
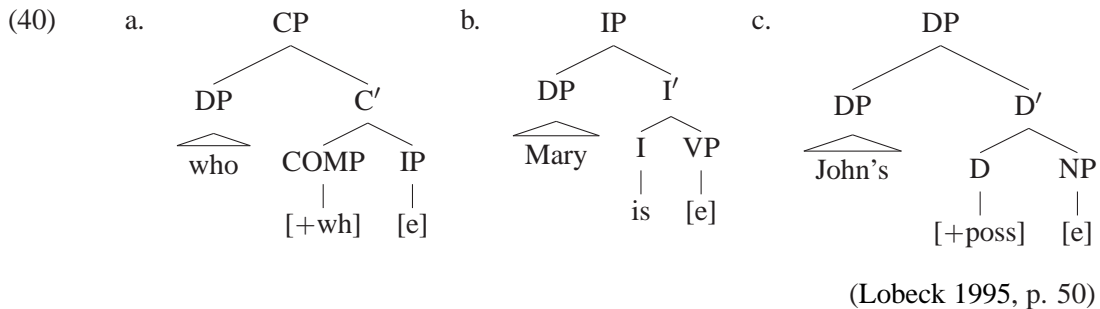
(Lobeck 1995, p. 50)

In addition to having a filled specifier, the functional heads in (40) are required to host a 'strong' agreement feature in order to license ellipsis (Lobeck 1995, p. 41). Looking more specifically at NP-ellipsis in English, Lobeck (1995) postulates that both functional heads within the English DP, D^0 and Num^0 (Ritter 1992; Rothstein 1988), can license NP-ellipsis.

  Turning back to Thai, we can account for the ability of classifiers to license ellipsis if classifiers head functional categories, provided that some modifier or specifier is in the projection of the

classifier:

(41)　　a. = (38-b)

```
                    ClfP
                   /    \
                NP_i     ClfP
                 |      /    \
                 N    NumP    Clf'
                 |     /\    /    \
                [e]  cèt   Clf    t_i
                 ↑          |
                 |         lûuk
                 └ - - - - - - - - ┘
```

b. = (39-c)

```
                    ClfP
                   /    \
                NP_i     ClfP
                 |      /    \
                 N    ClfP   AdjP
                 |    /  \    /\
                [e]  Clf  t_i dìp
                 ↑    |
                 |   lûuk
                 └ - - - - - - - ┘
```
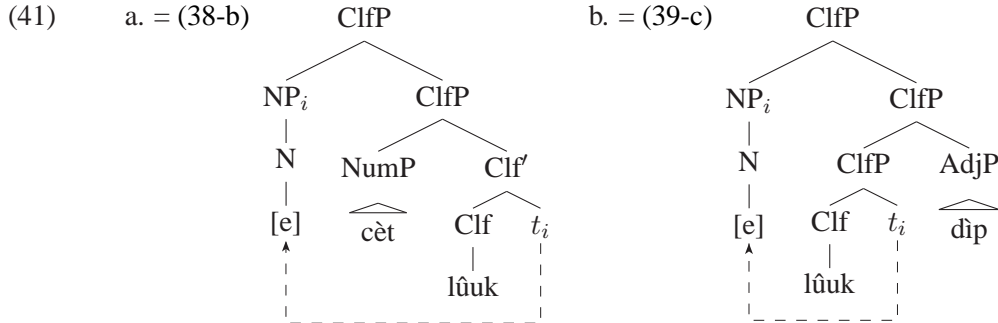
In these examples, the classifier head licenses the elided NP, which is its complement, represented as [e], as long as it contains either a specifier or adjunct. This proposal is very much in the spirit of current work on ellipsis, given that classifiers are the correlate of number marking in analytic languages (Chierchia 1998; Borer 2005), and Num^0 in English licenses ellipsis.

The base-generated analysis of classifiers cannot account for the ability of classifiers to license NP-ellipsis. If classifiers were adjoined to NP, the classifier would not be a head taking the NP as its complement, so it could not serve as a proper governor for the empty category representing the ellipsis site as in (40). Therefore, we find that the ability of classifiers to license NP-ellipsis provides evidence for the NP-movement analysis of DP-structure in Thai over the base-generation hypothesis.

The third argument for NP-movement comes from the repeater construction in Thai, wherein a noun serves as its own classifier. Examples of this construction are repeated below:

(42)　　a.　khon　săam khon
　　　　　　person three person
　　　　　　'three people'

　　　　b.　phrathêet săam phrathêet
　　　　　　country　three country
　　　　　　'three countries'

　　　　c.　laaj　săam laaj
　　　　　　pattern three pattern

'three patterns'

The number of nouns which occur in this "repeater" construction is quite large. Hundius and Kölver (1983) observe that the class is open, having found over five hundred nouns which can serve as their own classifiers. The nouns that can be used in repeater constructions fall into five distinct groups or categories, which are 1) abstract notions, 2) geographical units, 3) objects of irregular or variable appearance, 4) body part terms, and 5) taboo concepts. These nouns share the property of not being easily identified with any of the semantically regular patterns covered by the canonical classifiers, and thus the repeater construction seems to be a kind of last resort.

With several of these examples involving abstract nouns, the repeater construction is one of several options. These nouns can also occur with a classifier like *rûaŋ* 'story' or *yaŋ* 'type,' the latter actually an extrinsic numerative:

(43)   a.   panhǎa   sǎam panhǎa
             problem three problem

        b.   panhǎa   sǎam rûaŋ
             problem three CLF:STORY

        c.   panhǎa   sǎam yaŋ
             problem three type
             (a-c) 'three problems'

These examples show that the repeater construction is semantically and structurally identical to other kinds of classifiers. All that distinguishes the repeater construction from normal classifiers is the identity between the classifier and the noun.

The productivity of this construction indicates that its origin is grammatical rather than lexical. Maintaining a lexical explanation for repeaters would amount to the claim that certain nouns in Thai are listed in the lexicon both with the label N and with the label Clf, or that such relabelling was somehow a restricted lexical process.

Simpson (2005, p. 832) and (Piriyawiboon 2010, p. 83) suggest syntactic analyses of repeater classifiers involving head movement from N-to-Clf at the same time the NP-movement takes place. There is no theoretical reason to exclude such a derivation, and it accounts for the repeater construction straightforwardly, as illustrated below.[12] While I have been depicting trace positions with a lowercase t up to this point, this practice is no longer sufficient, as the derivation being proposed is only possible under the copy theory of movement:

(44)   =(43-c)
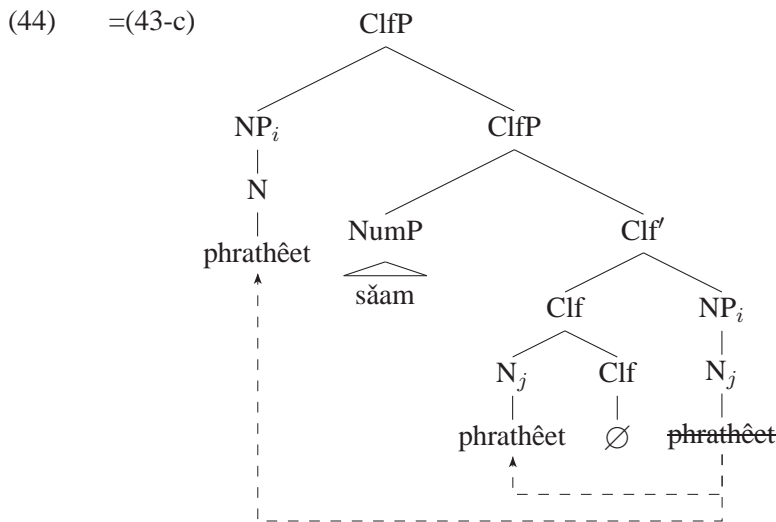
This proposal has interesting theoretical implications relating to the distinctness of chains and trace pronunciation. Principles of chain linearization prefer the heads of both chains to be pronounced (e.g. Bobaljik 2002; Nunes 2004), possibly because the two chains are distinct. The instance of head movement in (44) could also be described as due to the noun merging both in the N^0 head position as well as in the Clf^0 head position. Under the copy theory of movement, this just amounts to head movement. The motivation for head movement with nouns in the repeater construction may be the unavailability of a lexical item that can function as the classifier for these nouns, prompting the second merger of the noun head to this position to provide phonological

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[12]This proposal is reminiscent of the proposal by Chomsky (2008) that A-movement and A-bar movement can proceed in parallel from the same target position in certain cases, such as when subjects are the targets of wh-movement. However, in Thai the chains are distinct in that one is a sequence of heads while the other is phrasal movement.

support. For abstract nouns that can either serve as repeaters or appear with classifiers, such as *panhăa* 'problem' (43), it appears that the choice between an overt classifier and the repeater would might be due to a relatively weak lexical association between the two elements.

One prediction of this analysis is that repeater classifiers should only be found in classifier languages with NP-movement, as only in these languages will nouns participate in two distinct chains. A review of the literature provides initial confirmation for this prediction, as Goral (1979) explicitly observes: "In Thai, Lao, Burmese, and Lahu, the languages with the word order Noun + Num + CL, repeaters and partial repeaters are plentiful" (p. 33).[13] The flip side of this is the observation by Simpson (2005, p. 831) that classifier "optionality" is much more common in languages with the word order *Num-Clf-Noun*. He suggests that when the classifier is absent, the noun has simply moved to Clf^0. The other option seems to be the one taken by Mandarin Chinese, which has a generic classifier *ge* that is used with abstract nouns and other environments where the repeater might be expected. The availability of the general classifier would appear to obviate the necessity of N-to-Clf head movement, as the classifier head no longer would need phonological support. Thus, the repeater in Thai, the presence of the generic classifier in Mandarin, and optionality in other classifier languages might amount to a typology for understanding how classifier languages deal with cases where no lexical classifier is available.

A head-movement analysis of the repeater construction obviates the possibility of a base-generated analysis of classifiers in Thai. Even more, if the analysis of the repeater construction in (44) is correct, it not only provides evidence that classifiers are functional heads in Thai, but that they are functional heads which take NPs as their complement. If N^0 and Clf^0 were not local, head movement would be blocked by the Head Movement Constraint. Thus, the repeater construction

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[13]Goral goes on to observe that Khmer lacks repeaters, though it has the Thai word order. In my own brief work on Khmer, I have observed that Khmer classifiers are optional with inanimate nouns. Optionality might be due to the language's greater tolerance of phonetically empty functional heads, or that it is not a true generalized classifier language. Additionally, Japanese conspicuously lacks the repeater construction, indicating the structure of classifiers in that language might be different, as Saito et al. (2008) suggest on independent grounds.

provides a third piece of evidence that the NP-movement analysis of Thai noun phrases, especially in light of the typological distribution of repeater constructions in languages with *Noun-Num-Clf* word order.

To summarize, then, three empirical arguments have been presented to support the NP-movement derivation of Thai noun phrases. The first argument is the fact that the coordination of a classifier is interpreted as coordination of the entire DP, allowing the noun to be repeated in the second conjuct. The second argument is based on NP-ellipsis in Thai, which is licensed by classifiers. The final argument comes from the productivity of the repeater construction, which can be captured in an analysis that utilizes parallel head and phrasal movement, provided the noun and classifier heads are local at some stage in the derivation.

We have now seen that there are several reasons, both theory-internal and empirical, to believe that NPs in Thai originate as the complement of classifiers. However, these facts seem to bring an even more puzzling problem into relief, namely, the syntactic mechanism responsible for NP movement itself. I make the assumption that NP-movement is caused by an EPP feature on the functional projections of the DP. This proposal provides a pleasing synthesis of DP structure and clause structure in Thai.

The following sections refine and expand this view of Thai noun phrases. Unanswered questions include whether Thai has a D projection at all. However, before we turn to higher functional projections, I turn to lexical plurals in Thai, which provide support for the view of Thai nouns as kinds and the proposal that classifiers are functional heads.

3.3   Number and Lexical Plurals

Returning to the basic proposal of Chierchia (1998), the existence of kind-denoting common nouns is observed to correlate with a number of properties typologically. These correlations

include the existence of a generalized classifier system, the lack of articles, and the absence of plural/singular marking. One of the famous responses to Chierchia's proposal is Chung (2000), who observes that Indonesian represents a language with both classifiers and plurals.

In fact, it seems that most classifier languages have some means of marking plurality. However, plural marking in languages like Indonesian and Thai have some basic differences which distinguish them from true number-marking languages. Three characteristics of classifier languages with respect to plurality are listed below:

(45)   a.   Bare nouns can be interpreted as singular or plural.

     b.   Overt plural marking is pragmatically restricted.

     c.   Overt plural marking is lexically limited by the animacy hierarchy.

The pragmatic restrictions on plural marking include restrictions to given (specific) groups or plural entities in the discourse. In other words, plural marking in these languages is not obligatory for every instance where DPs have plural denotations, but occurs when specific reference is being made to a contextually established plurality. In some languages, such as Mandarin Chinese, these pragmatic restrictions also are manifested in that plurals formed by *-men* require definite readings (Iljic 1994; Li 1999). The restrictions based on the animacy hierarchy as well as the pragmatic restrictions on plural marking both provide evidence that plural markers in classifier languages are instances of *lexical plurals* or *non-inflectional plurals* (Acquaviva 2008). This means that the plural marker itself is a lexical item with its own particular semantics and distribution, rather than a morphological feature on the noun realizing a functional head. This is in line with the conclusion that Chinese *-men* is a collective marker (Cheng and Sybesma 1999, p. 537), similar to the analysis of Japanese *-tati* in Kurafuji (2004) and Nakanishi and Tomioka (2004).

This section details the two different ways of explicitly marking plurality in Thai. The first is by forming morphological compounds with the noun *phûak* 'group,' which also functions as an

extrinsic numerative denoting groups. The second is by reduplication of the noun. I examine each of these types of plural-marking in turn, but first illustrate (45-a) for Thai, regarding the various interpretations of bare nouns with respect to number. The pragmatic restrictions on use arise because of the semantics of each lexical plural marker. To the extent that Thai plurality can be shown to be lexical, the claim of Chierchia (1998) that classifier languages lack number-marking can be maintained.

3.3.1 The plural vagueness of bare nouns in Thai

Section 3.1 illustrated that Thai nouns can receive a number of interpretations with respect to definiteness, genericity, and so on, depending on the context. What was not illustrated there is that the number interpretation of bare count nouns in Thai is also vague, and subject to contextual determination. This is illustrated in an example like the following:

(46)   Nát súɯ nǎŋsɯ̌ɯ môa-waan-níi
         Nat buy book   yesterday
         'Nat bought one or more books yesterday.'

This sentence is true regardless of how many books Nat bought yesterday, as long as he bought one.

Rullman and You (2006) point out similar facts for bare nouns in Mandarin Chinese, and observe that the variable interpretation of examples like (46) could be due to one of two semantic factors, vagueness or ambiguity. If the noun *nǎŋsɯ̌ɯ* were vague, its meaning would simply include both singular and plural interpretations. This is the meaning predicted by Chierchia (1998) if the interpretation of bare nouns is driven by applying the DOWN operator to the kind denotation (5-b). On the other hand, if *nǎŋsɯ̌ɯ* were ambiguous, it would follow that it was be listed twice in the lexicon, once as singular, once as plural, and the correct lexical item would be selected depending on context.

Rullman and You present a number of diagnostics demonstrating that Mandarin bare nouns are vague with respect to number. These diagnostics can be extended to Thai, and point to the same conclusion. I will stick to a single diagnostic, as it demonstrate the vagueness of bare nouns particularly clearly. The diagnostic is based on VP-ellipsis, or a putatively similar operation in Thai, which we have already seen examples of when conducting the predicator test in section 2.3 and 2.4.

Take an example like the following, which has both a literal and an idiomatic interpretation in Thai, as shown by the glosses:

(47)   Nát plɔ̀ɔj   kaj
        Nat release chicken
        i. 'Nat let the chicken go.'

        ii. 'Nat made a careless mistake.'

These different meanings are disambiguated contextually, depending on whether or not we are actually talking about chickens, for example. What has been noted before about elliptical interpretations is that they are anaphoric to the interpretation of their antecedent. The following discourse serves as an illustration:[14]

(48)   Nát plɔ̀ɔj   kaj   lɛ́ʔ Nít gɔ̂ɔ dûaj
        Nat release chicken and Nit PRT too
        i. 'Nat let the chicken go and Nit did (let the chicken go) too.'

        ii. 'Nat made a careless mistake and Nit did (make a careless mistake) too.'

Crucially, the elided VP must be interpreted the same way as the antecedent VP, either literally or idiomatically. In other words, interpretations where Nat released a chicken but Nit made a stupid mistake unrelated to releasing chickens (or *vice versa*), are impossible.

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[14]I am ignoring the structure of the elided VP, irrelevant for the semantic purposes of this example. Of interest is the connective element *gɔ̂ɔ*, glossed as simply PRT for particle, which allows the verb to be omitted in the elided VP. There is very little work on this particle. See Iwasaki and Ingkaphirom 2005, ch. 13 for an overview of its uses, though there discussion does not mention the ability of the particle to license putative VP-ellipsis.

Applying this to number, what we find for Thai, as **Rullman and You** (2006) did for Mandarin, is that VP-ellipsis does not force the two nouns to have identical interpretations with respect to plurality:

(49)   Nát súɯ nǎŋsɯ̌ɯ môa-waan-níi lέʔ Nít gɔ̂ɔ dûaj
          Nat buy book yesterday   and Nit did too
          'Nat bought one or more books yesterday and Nit did (buy one or more books yesterday)

          too.'

So this sentence is felicitous in a context where Nat bought one book and Nit bought seven books, or vice versa. The felicity of this interpretation indicates that the Thai bare nouns are vague with respect to plurality, or, more precisely, that the different interpretations of bare nouns with respect to plurality are inherent to the semantics of bare nouns. This vagueness is a natural component of Chierchia's kind-driven interpretation of bare nouns.

3.3.2 Overt markers of plurality in Thai

Although Thai bare nouns are vague with respect to plurality, it does not follow that every expression in the language is vague, which brings us to the overt markers of plurality in Thai. The two basic ways of marking a noun phrase as plural in Thai are first by placing the noun *phûak* 'group, party' before a common noun (50-b), and second with reduplication, which is lexically restricted to a handful of human nouns (50-c) (**Piriyawiboon** 2010, pp. 89-92). These two forms of marking plurality can also co-occur (50-d):

(50)   a.   dèk jaŋ mâj tham kaan-bâan.
            child still not do   homework
            'The children still haven't done their homework.'

        b.   phûak-dèk   jaŋ mâj tham kaan-bâan.
            GROUP-child still not do   homework
            'The children still haven't done their homework.'

  c. dèk-dèk jaŋ mâj tham kaan-bâan.
    child-REDUP still not do homework
    'The children still haven't done their homework.'

  d. phûak-dèk-dèk jaŋ mâj tham kaan-bâan.
    GROUP-child-REDUP still not do homework
    'The children still haven't done their homework.'

These different expressions have slightly different meanings not reflected in the glosses, though they would be interchangeable in many contexts. Below I describe the lexical and syntactic distribution of each of these markers and sketch an analysis of each. The main point is that they are not inflectional plural markers, but instances of derivational morphology forming lexical plurals. The claim is that *phûak* heads a compound noun with collective semantics, while reduplication corresponds to a semantic maximalization operation.

  The prefixal instantiation of *phûak* seems derivative from its use where it also functions as a measure word meaning 'group, party':

(51) a. (mii) nákrian săam phûak
    (have) student three group
    '(There are) three groups/types of students.'

  b. nákrian phûak níi
    student group this
    'this group of students/these students'

  c. nákrian phûak chàlàat
    student group smart
    'the clever (group of) students'

The glosses indicate that the 'group'-denoting semantics of *phûak* are quite strong in these cases; the use of *phûak* is only licensed when some contextually salient plurality or pluralities have been established. (51-a) is somewhat unnatural, but is plausible in a situation where there are clear criteria with which to distinguish the students. If the students were simply standing around in different clusters of people, a different numerative, *klùm* 'bundle, crowd, collection' would be used.

The analysis of *phûak* in these environments can be subsumed under the more general analysis of measure words. In section 3.2, numerative expressions are analyzed as functions which take kinds and return atomic properties. The difference between genuine classifiers and extrinsic numeratives such as *phûak* is that the latter contain additional semantics which introduce the criteria for which atomization is based, such as with a measure function. All numeratives are assumed to contain presuppositional information about the physical properties of the entities that they could apply to (e.g. (26)). For a group or collective like *phûak*, though, the entities being picked out of the domain are pluralities rather than atomic individuals. Thus, it will be assumed that the use of *phûak* is restricted to contexts which include collections.

In addition to appearing as an extrinsic numerative, *phûak* can occur as a prefix on nouns, pronouns, and proper names. This is the apparent plural use in question:

(52)   a.   phûak-mǎa hàw tàlɔ̀ɔt
                GROUP-dog bark always
                "(The) dogs are always barking."

        b.   phûak-khǎw
                GROUP-3P
                'they'

        c.   phûak-raw
                GROUP-1P.PL
                'we'

        d.   phûak-Nát
                GROUP-Nat
                'Nat's group'

As shown in (52-a), *phûak* appears before common nouns. Piriyawiboon (2010) observes that its distribution is restricted to animate nouns. Before pronouns, as in (52-b-c), *phûak* would be used to refer back to a group for which there is some discourse antecedent. The use of *phûak* before proper nouns constitutes an instance of an associative plural (den Besten 1996; Daniel and Moravcsik 2008), and its denotation is a group of people contextually established to be associated with Nat.

The second way of marking plurality in Thai is with reduplication. Unlike *phûak*, which is quite productive, reduplication is lexically restricted to the following list of nouns:

(53)   a.   lûuk-lûuk   'children' (offspring)   child-REDUP
       b.   dèk-dèk   'children' (generally)   child-REDUP
       c.   phîi-phîi   'elder peers'   elder sibling-REDUP
       d.   nɔ́ɔŋ-nɔ́ɔŋ   'younger peers'   younger sibling-REDUP
       e.   phɯ̂an-phɯ̂an   'friends'   friend-REDUP
       f.   nùum-nùum   'young men'   young man-REDUP
       g.   sǎw-sǎw   'young women'   young women-REDUP
       h.   raw-raw   'we (all)'   we-REDUP

While they do not form a clear semantic class, the nouns above all refer to intimate relationships with people who are honorifically equivalent or inferior.[15] Rather than expressing that the relevant individuals form a group, plural reduplication seems to exhaustify the relevant relationship. Thus, *dèk-dèk* seems to refer to all of the children relevant to a particular context, rather than just a group of them. The use of reduplication with pronouns, illustrated in (53-h), seems to have the same effect, *raw-raw* meaning something like 'all of us here.'

The lexical restriction on plural reduplication and the requirement that *phûak* to occur before animate nouns are unsurprising, representing what Smith-Stark (1974) terms a plurality split. Corbett (2000) observes that the distribution of plurality splits are subject to constraints based on the Animacy Hierarchy (Comrie 1989, p. 185-200), his version of which is given in (54-a). The distribution of plurality splits is claimed to always contain a some continuous segment of elements on the Animacy Hierarchy downward from the top:

(54)   a.   speaker (1st person) > addressee (2nd person) > 3rd person > kin > human > ani-

            mate > inanimate

---

[15]Like in many Southeast Asian languages, the words for 'older sibling' and 'younger sibling' are used to refer to intimate peers from the same generation, depending on whether the peer is older than or younger than the speaker. In this sense, the terms are indexical, as they make reference to the age of the speaker. Like pronouns, these kinship terms are presumably very high on the animacy hierarchy.

b. *Constraint of the Animacy Hierarchy on the singular-plural distinction*:

The singular-plural distinction in a given language must affect a top segment of the

Animacy Hierarchy. (Corbett 2000, p. 56)

Applied to the two plural markers in Thai, the generalization in (54-b) accords with the fact that

phûak tends to prefer animate nouns, but includes pronouns as well. The segment of the hierarchy

picked out by plural reduplication is in the 'kin' domain. Likewise, the set of nouns in (53) seems

to end roughly at the 'kin' point in the hierarchy.[16]

3.3.3 Collectives

A plausible analysis of *phûak* is as a noun which productively combines with other lexical

categories to form a collective noun. Compounds are left-headed in Thai, as the following examples

demonstrate:

(55)   a.   ʔaahǎan-dèk   'baby food'   food-child
         b.   ŋən-dɯan   'salary'   money-month
         c.   thǔŋ-tháaw   'socks'   bag-foot

(Iwasaki and Ingkaphirom 2005, p. 37)

Thus, the position of *phûak* on the left side of a plural formed by it is the natural position of heads.

The ability of *phûak* to occur as a numerative makes it a natural candidate for a compound

head. This is because numerative expressions, especially classifiers, often serve as the heads of

compounds, though they can be semantically distinct in the two positions:

(56)   a.   baj-máûaŋ
              leaf-mango
              'mango leaf'

---

[16]Interestingly, the distribution of plural reduplication in Thai bears a close resemblance to the distribution of a Maori reduplication pattern that also marks the plural, which Corbett (p. 60-61) cites as an instance of a kin-based split, despite the fact that it includes 'child,' 'man,' and 'woman.' Corbett cites Bauer (1993, p. 353-354, 371, 593) as his source of Maori data.

b. baj-gə̀ət
leaf-to.be.born
'birth certificate'

c. chɔ̌ɔn sǎam baj
spoon three CLF:LEAF
'three spoons'

These examples demonstrate that while *baj* leaf does appear in some compounds where its meaning is fully transparent, it also occurs in compounds where its meaning is less predictable, such as in (56-b), where its use in the compound is only roughly connected to actual leaves. This latter meaning is more akin to the use of *baj* as a classifier, where it is used for two-dimensional elongated objects, such as pieces of silverware.

One canonical property of derivational morphology is that it results in a change in syntactic category. Thus, while *phûak* generally combines with nouns to directly form a noun denoting a group comprised of that noun's extension, it can also combine with nouns where its meaning is not simply a collection of the individuals in the denotation of the noun (57-a), as well as combining with verbs (57-b), adjectives, and adverbs (57-c):

(57) a. phûak-kàbòt   'rebel group'   GROUP-treason
      b. phûak-kɔ̀ɔkuan   'agitators'   GROUP-agitate
      c. phûak-pùan   'agitators'   GROUP-anxious
      d. phûak-phɔ́ɔŋ   'faction'   GROUP-alike

It should be noted that such examples are somewhat restricted and lexicalized, which *phûak* combines quite productively with animate nouns more generally.

The status of these compounds are nouns indicates that *phûak* functions as the head as well as the category-forming word. The structure of two of these examples is represented below, showing how the "prefixal" instantiation of *phûak* can combine with other nouns or with heads of other categories, as in (57-b):

(58)   a.   '(group of) dogs'   b.   'agitators'

```
            N                         N
           / \                       / \
          N   N                     N   A
          |   |                     |   |
       phûak  mǎa              phûak  pùan
```

Thus, *phûak* is categorically a noun which can combine with other lexical categories, forming a compound. Its morphological dependence might follow from its semantic status as a numerative, meaning that it must combine with a kind (or maybe a property) which provides the 'content' of the group. This forces the conclusion that proper nouns and pronouns are also of the N category in Thai, as has been claimed before for proper nouns by Longobardi (1994), among others.

An alternative analysis of *phûak* would be to generate in the Clf head position, and associate it with other elements syntactically, perhaps by head movement. Such an analysis resembles the analysis of plural marking in Chinese in Li (1999). However, this view of *phûak* is difficult to maintain in light of the N-V compounds above, as these verbs are not viable N heads, and thus would not be expected to project a classifier.

As was discussed above, compounds formed by *phûak* are only possible when they are pragmatically licensed by the existence of some group in the discourse. Thus, compounds headed by *phûak* are generally interpreted as definite in context, and give rise to partitive interpretations when they are combined with numerals:

(59)   chǎn mii ŋɯɯn hâj phûak nák-rian sǎam khon
        1SG have money BEN student 3   CLF
        'I have money for three of the students.'

Similar properties have been observed for plural markers in Chinese (Iljic 1994; Li 1999) and Japanese (Kurafuji 2004; Nakanishi and Tomioka 2004). I do not lay out a way of capturing this aspect of the meaning of *phûak* here, but simply note that the special pragmatic restrictions on its use provide further evidence against its status as a general plural marker, and for its status as a lexical

plural.

3.3.4 Plural reduplication

Moving on to plural reduplication, we find that like *phûak*, plural reduplication can be characterized as a lexical process in Thai. Plural reduplication is similar in form to 'coordinate' compound nouns:

(60)   a.   phɔ̂ɔ-mɛ̂ɛ   'parents'   father-mother
          b.   phîi-nɔ́ɔŋ   'peers/siblings'   older sibling-younger sibling

These compounds are headless, in the sense that their meaning consists of the conjunction of the two nouns which comprise the compound noun. The 'kin' related semantics of this compounding process is similar to plural reduplication as well, and like reduplicated plurals, the meaning of these compounds are necessarily plural. Additionally, both compounds have exhaustive meanings. While trivially true for 'parents,' the meaning of *phîi-nɔ́ɔŋ* 'siblings' seems to be 'all of one's peers or siblings in a particular situation.'[17]

Reduplication is a common lexical operation in Thai, applying to adjectives, adverbs, and verbs as well as nouns, though its meaning differs subtly in each case. However, in none of these cases does reduplication change the lexical category of the relevant lexical item, as the following examples demonstrate:

(61)   a.   Nát kin(-kin)   khâaw
             Nat eat(-REDUP) rice
             'Nat eats and eats rice.'

          b.   Nát kɔ̂ɔ dii(-dii)
             Nat also good(-REDUP)
             'Nat is also (very) good.'

          c.   Nát dəən   cháa(-cháa)
             Nat walks slow(-REDUP)

---

[17]For the connection between peers and siblings in Thai, see fn. 15.

'Nat walks slowly.'   (cf. Warotamasikkhadit 1972, p. 56-57)

In each case in (61), reduplication has no effect on the syntactic distribution of the lexical category it affects. The only result is a change in meaning.

Reduplicated plurals can occur in quantified noun phrases:

(62) a. dèk-dèk hâa khon
    child-REDUP five CLF:PERSON
    'five-person group of children'

   b. dèk-dèk thúk khon
    child-REDUP every CLF:PERSON
    'every person in the group of children'

   c. *dèk-dèk khon níi
    child-REDUP CLF:PERSON this

Unlike *phûak*-collectives, reduplicated plurals can appear with numerals without partitive interpretations, indicating that the reduplicated plural itself is of the same type as a bare noun. The ungrammaticality of (62-c) indicates that *dèk-dèk* must occur in a noun phrase with a plural extension. Syntactically, the examples in (62) provide evidence for the claim that reduplicated nouns are heads of the syntactic category N, and that they have the ordinary distribution for nominal heads within the DP.

So the main difference between *phûak*-collectives and plural reduplication is that the latter establishes a plurality comprised entirely of individuals without adding additional information about group-hood or needing additional context to license the existence of such a group. As a result, reduplicated plurals can have all of the meanings that bare nouns can, including generics, which refer to the totality of individuals in a given world:

(63) dèk-dèk tàm kwaa phûu-jaj
   child-REDUP short exceed adult
   i. 'The (group of) children are shorter than adults'

   ii. 'Children are shorter than adults.'

In summary, Thai bare nouns are vague with respect to number, as they can be interpreted as either singular or plural. The two ways of marking plurality overtly, with a compound formed by *phûak* or by reduplication, are restricted to a subclass of nouns corresponding to a segment of the Animacy Hierarchy. Both plural expressions have semantics beyond simple plurality as well, the former as a collective noun and the latter as a maximized plural. While much work remains to be done in working out the details of nominals headed by these types of nouns, the main purpose of this section is to demonstrate that Thai 'plural' markers do not pose a challenge to the idea that bare nouns in classifier languages denote kinds, and the claim in Chierchia (1998) that the presence of generalized classifiers correspond to the absence of number marking.

3.4 Quantifiers

This section examines quantifiers in Thai, focusing on locating their position in the Thai noun phrase. I propose that quantifiers which do not interact with classifiers are adjuncts while those which do select classifiers are part of the functional structure of the noun phrase. I examine the structure of complex numerals in Thai, and while multiplicative bases are analyzed as heads while the cardinals 1-9 are analyzed as specifiers. I thus argue that ordinary cardinal numerals do not project functional structure in Thai, pace Cheng and Sybesma (1999); Ionin and Matushansky (2006); Li (1999); Simpson (2005, and others). I also propose distinctions between the structure of strong and weak quantifiers selecting classifiers; while strong quantifiers head the DP in Thai, weak quantifiers occur in the specifier of ClfP, like cardinal numerals.

Thai expressions that indicate quantity fall into two basic categories, those that must occur with classifiers and those that do not. We have already seen examples of each type, as the expressions involving numerals were given in example (21) and elsewhere, while quantifiers meaning 'few' and 'much' were observed to not distinguish between their hosts in terms of the mass-count

distinction (8). Additional examples of each are provided below:

(64)   *Quantifiers requiring a classifier*

    a.   thúrian sǎam lûuk
        durian three CLF:BALL
        'three durians'

    b.   thúrian baaŋ lûuk
        durian some CLF:BALL
        'some durians'

    c.   thúrian thúk lûuk
        durian every CLF:BALL
        'every durian'

(65)   *Quantifiers not requiring a classifier*

    a.   thúrian yɤ́ʔ
        durian a.lot
        'lots of durian(s)'

    b.   thúrian suan-jàj
        durian part-EXH
        'most durian(s)'

    c.   thúrian tháŋ-mòt
        durian all
        'all durian(s)'

A well-known distinction among quantifiers is their variable ability to appear in existential sentences, a phenomenon generally known as the Definiteness Effect (Safir 1982). Quantifiers unable to appear in these sentences are 'strong determiners' while those able to appear beneath an existential are 'weak determiners ,' to use the terminology of Milsark (1977). In Thai, we find that the strong-weak distinction cross-cuts the distinction between quantifiers occurring with classifiers and those that do not:

(66)   *Quantifiers requiring a classifier*

    a.   mii thúrian sǎam lûuk
        have durian three CLF:BALL
        'There are three durians.'

    b.   mii thúrian baaŋ lûuk
        have durian some CLF:BALL
        'There is some durian.'

    c. *mii thúrian thúk lûuk
        have durian every CLF:BALL

(intended) *'There is every durian.'

(67)   *Quantifiers not requiring a classifier*

    a.   mii   thúrian yɔ́ʔ
           have durian much
           'There is lots of durian(s).'

    b. *mii   thúrian tháŋ-mòt
           have durian all-EXH
           (intended) *'There is all durian.'

    c. *mii   thúrian suan-jàj
           have durian part-big
           (intended) *'There is most durian.'

These examples clearly demonstrate that there is no correlation between the presence of a classifier and the strength of a quantificational determiner in Thai. Instead, what seems to be crucial is the semantics of the quantifier in question, as weak quantifiers are simply those that have existential quantificational force.

The table below lists several of each type of quantifier in Thai, though it is not exhaustive:

(68)

Quantifier	Meaning	Requires a CLF?	Strength
numerals	'1, 2, 3, …'	✓	Weak
baaŋ	'some'	✓	Weak
laaj	'several'	✓	Weak
kii	'how many?'	✓	Weak
tháŋ	'all/whole'	✓	Strong
thúk	'every'	✓	Strong
tɛ̀ɛláʔ	'each'	✓	Strong
mâak	'very/much'	×	Weak
yɔ́ʔ	'a lot'	×	Weak
nɔ́ɔj	'a little'	×	Weak
thâw-raj	'how much?'	×	Weak
tháŋ-mòt	'all'	×	Strong
sùan-jàj	'majority'	×	Strong
sùan-nɔ́ɔj	'minority'	×	Strong

The first challenge in providing an explanatory analysis of these quantifiers is understanding why certain quantifiers must occur with classifiers and other do not, and how this requirement is encoded in the grammar. Second, we can ask what the precise structural properties of the various quantifiers

are.

3.4.1 Numerals

Work on the structure of classifiers in any language generally assumes one of two structural positions for numerals. Either these quantifiers, including numerals, are heads, meaning that they are functional projections of the noun (e.g. Borer 2005; Cheng and Sybesma 1999; Ionin and Matushansky 2006; Simpson 2005; Singhapreecha 2001; Tang 1990; Visonyanggoon 2000),[18] or they are specifiers of the ClfP projection (e.g. Chierchia 2010; Fukui and Takano 2000; Piriyawiboon 2010; Saito et al. 2008; Watanabe 2006). These two approaches are illustrated below, both with and without NP-movement:

(69) a. Numerals as heads (NumH)   b. Numerals as specifiers (NumS)
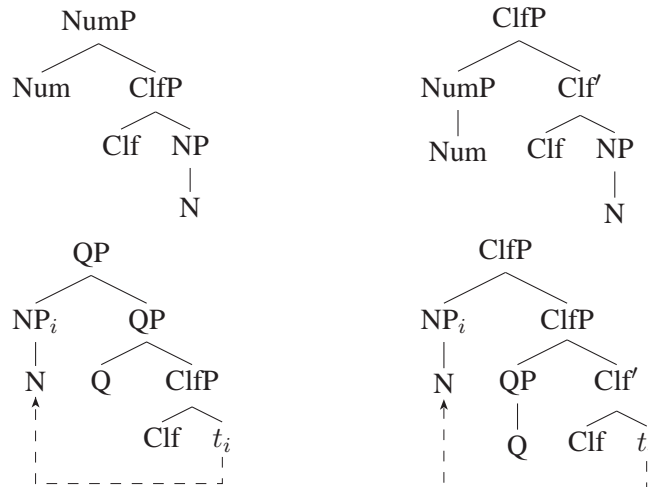
How can these two structures be distinguished empirically? Below, I will show that the structures make different predictions with respect to ellipsis, and that evidence favors the numeral-as-specifier (NumS) analysis in (69-b) over the numeral-as-head (NumH) analysis in (69-a). I also present an argument based on the word order of numerals and classifiers across languages. I then

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[18]Sometimes the head view of numerals actually analyzes the numeral and classifier as a single morphologically formed head in the syntax. I will not consider such analyses at length here. See Simpson (2005) for specific arguments against such a view, though his arguments do not necessarily bear on the choice between the two analyses below.

present an analysis of complex cardinals, specifically those involving multiplication, as involving a specifier-head structure identical to the specifier-head structure of classifiers, contra Ionin and Matushansky (2006).

To begin, recall the discussion of NP-ellipsis in Thai in section 3.2.3, which centered around the licensing conditions for ellipsis more generally. These conditions included the requirement that there be some functional head with a filled specifier position (see (40)). In the case of classifiers in Thai, NP-ellipsis is licensed only by classifiers, not by numerals, as the following example shows, a slightly expanded version of example (38):

(70)   a.   Q: mii   thúrian kìi   lûuk?
                  have durian how.many CLF:BALL
                  'How durian do you have?'

        b.   A: *cèt
                  seven
                  'Seven.'

        c.   A: *lûuk
                  CLF:BALL
                  'Seven.'

        d.   A: cèt   lûuk
                  seven CLF:BALL
                  'Seven.'

Despite the fact that the classifier is given in the question, it cannot be omitted in the answer. The distinction between classifiers and numerals in their ability to license ellipsis is captured naturally by the NumS analysis, as is the requirement that the numeral be present. This is due to the the ellipsis licensing schema of (40), which requires that a head have a filled specifier to license ellipsis.

In contrast, the NumH analysis has no explanation for either the ability of classifiers to license ellipsis, as their specifier is no longer filled, nor the inability of numerals to license ellipsis. If the licensing conditions for ellipsis were weakened so that a head with an unfilled specifier could serve as an ellipsis licensor, the quantifier-as-head theory would correctly predict that classifiers could

license ellipsis but overgenerate, predicting that numerals and other quantifiers could license ellipsis as well, contrary to fact.

Another piece of evidence favoring the NumS analysis is the cross-linguistic distribution of numerals and numeral classifiers. In extensive surveys of classifiers languages, both Greenberg (1975) and Jones (1970) observe that the numerals always precede classifiers as the basic word order in classifier languages. This is true for both head-initial languages such as Thai and Chinese and head-final languages such as Burmese and Japanese. This is captured naturally under the NumS analysis but is quite surprising under the NumH analysis, where the order of numeral and classifier would be expected to reflect the headedness of languages, with numerals following classifiers in strictly head-final languages. The lacuna of classifier languages with the *classifier-numeral* word order, then, could be taken as a serious problem for the NumH analysis.

Simpson (2005), noting that numerals always precede classifiers, proposes that this provides evidence that heads always precede their complements in the relevant languages. Yet Simpson observes that the number of word orders within noun phrases is quite diverse in classifier languages, and observes that NP-movement and NumP movement are both attested.[19] Yet Simpson does not acknowledge that there are no languages with ClfP movement to the exclusion of NumP. Such as in the hypothetical derivation below:

(71)   *Unattested classifier word order derivation*

$$
\begin{array}{c}
\text{NumP} \\
\diagup \qquad \diagdown \\
\text{ClfP}_i \qquad\quad \text{NumP} \\
\diagup\ \backslash \qquad\quad \diagup\ \backslash \\
\text{Clf}\ \ \text{NP}\quad \text{Num}\quad t_i \\
\mid \\
\text{N}
\end{array}
$$
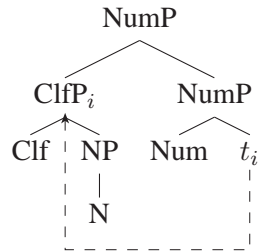
The addition of a DP layer makes several other word orders feasible.

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[19]Simpson is working within a framework where DPs are always projected, their specifiers are open, and demonstratives are assumed to always fill their head position. I take issue with these claims in the following section.

These hypothetical word orders are absent in the extensive survey of Jones (1970). Only five word orders are found, and these can be accounted for with just NP-movement and NumP-movement.[20]:

(72)

Word order	Derivation	Example
Dem-[Num-Clf]-N	None	Chinese
Dem-N-[Num-Clf]	NP-to-NumP	Burmese
N-[Num-Clf]-Dem	NP-to-NumP, NumP-to-DP	Thai
[Num-Clf]-N-Dem	NumP-to-DP	Vietnamese
N-Dem-[Num-Clf]	NP-to-NumP, NP-to-DP	Lisu (Lolo-Burmese)

This distribution is precisely what we might expect given a permutation of of three items, [Num-Clf], N, and Dem; i.e. 3! = 6. The missing word order, *[Num-Clf]-Dem-N, could be excluded by a ban on remnant movement (cf. Cinque 2005). The problem for the NumH analysis is that [Num-Clf] seem to behave as a constituent for movement, a fact which is predicted by the NumS analysis. In other words, the NumH analysis overgenerates, predicting that Clf-N sequences should be a constituent for movement, or that NP-to-[Spec, ClfP] movement should be possible.

This argument can be quantified. Given four elements, there are actually 4! = 24 possible word orders (permutations), fifteen of which do not involve remnant movement. The odds of randomly choosing any five particular items from fifteen possible choices is about three in ten-thousand.[21] This is the probability that the word orders in (72) occur by chance in a theory where both numerals and nouns are heads and phrasal movement can occur freely. I take this as strong evidence for the specifier analysis of numerals.

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[20]See references for examples of these word orders in the relevant languages. I am following Simpson in assuming that the demonstrative occupies D for now, though I argue against this conclusion in section 3.5. Simpson does not actually discuss the Lisu order, but it seems to be common in Loloish and Karenic languages (see, e.g., Yu 2007 for Lisu and Solnit 1997 for Kayah-Li (Karen)).

[21]The probability of selecting one combination out of all of the possible combinations of *n* objects taken *k* at a time is the reciprocal of the Choose function:

$$\left(\frac{n!}{k!(n-k)!} \right)^{-1}$$

If cardinal numerals are specifiers, we might wonder about the composition of complex cardinals. A prominent argument for the analysis of cardinals as heads is the recursive semantics of Ionin and Matushansky (2006) (I&M), who argue that multiplication is encoded in the grammar via recursive partitioning. Consider an example like the following:

(73)   (thúrian) sǎam rɔ́ɔj   lûuk.
       durian   three hundred CLF:BALL
       'Three hundred durians.'

I&M argue that in such a structure the classifier is interpreted as a predicate of type $\langle e, t \rangle$, and that each numeral, which I&M analyze as a head, is interpreted as a recursive function of type $\langle \langle e, t \rangle, \langle e, t \rangle \rangle$ from predicates to predicates, whose meaning is provided below:

(74)   a.
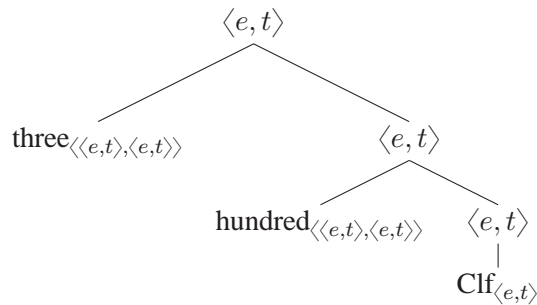
   b. $[[3]] = \lambda P \in D_{\langle e,t \rangle} \lambda x \in D_{\langle e \rangle} \exists S \in D_{\langle e,t \rangle} [\Pi(S)(x) \wedge |S| = 3 \wedge \forall s \in S, P(s)]$
   c.   S is a partition Π of an entity x if it is a cover of x and its cells do not overlap. (Ionin and Matushansky 2006, p. 318)

To paraphrase, the denotation of 'three books' is the set of all 3-membered sets in which none of the members overlap, and each member has the property of being a book. The specific cardinality of the members of the sets is not specified, so they could be 100-membered sets, in the case of 'three-hundred books.' The system proposed by I&M is powerful, and seems to predict that sequences such as *Three-five-seven books* meaning '$3 \times 5 \times 7$ books = 105 books' should be well-formed. But such expressions are not part of our linguistic system. I&M note that this is the case, and propose that these combinations are constrained by extra-linguistic factors (p. 336-337). Yet

while 'convention' often determines what is common or uncommon, relying on 'convention' to explain ungrammaticality seems advisable only as a last resort, when grammar-internal explanations have been fully exhausted. As such, I&M's failure to exclude these sequences can be considered a weakness of their proposal, especially in light of the proposal below which moves towards a more constrained grammatical theory of number.

While the system proposed by I&M overgenerates, there do seem to be examples where such recursive power is necessary. These are examples such as 'three-hundred thousand' where the appropriate cardinality is achieved by iterated multiplication '$3 \times 100 \times 1000 = 300,000$.' However, these examples only iterate multiplicative *bases*, or multiplicands, rather than cardinal numerals, i.e. 1-9, which can only ever act as multipliers. This does not only apply to powers of ten, but also to irregular bases such as *dozen*, as in expressions such as *three-hundred-dozen books*, which seem grammatically well-formed, if a little unusual.

Moving back to Thai, it is interesting to note that cases of iterated multiplication are far less common due to an enriched set of lexical powers of ten, illustrated below:

(75)   a. sìp   '10'   d. mɯ̀ɯn   '10,000'
        b. rɔ́ɔj   '100'   e. sɛ̌ɛn   '100,000'
        c. phan   '1,000' f. láan   '1,000,000'

These examples seem less exotic when we consider English multiplicative bases such as *dozen* '12' and *score* '20.'[22] It would seem, then, that multiplicative bases are subject to significant lexical variation between languages. In contrast, we would expect that the simple cardinal numerals 1-9 are largely invariant across languages, save perhaps in those using strictly quinary counting systems, which would presumably only possess the numerals 1-4.

Suppose that multiplicative bases are structurally distinct from the simple cardinal numerals 1-9. While multiplicative bases are heads, simple cardinals occur in the specifier of these head

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[22]It is interesting to observe that twelve and twenty often serve as the bases for whole counting systems in some languages, so-called duodecimal and vigesimal counting systems, respectively.

positions:

(76) a.
```
            ClfP₁
           /    \
       NumP      Clf′₁
        |        /   \
       Num    Clf₁   ClfP₂
        |      |      /‾‾\
      sǎam   phan    ...
    'three thousand'
```
b.
```
            ClfP₁
           /    \
       NumP      Clf′₁
        |        /   \
       Num    Clf₁   ClfP₂
        |      |      /‾‾\
      sǎam    sìp     ...
      'thirty'
```
c.
```
            ClfP
           /    \
       NumP      Clf′
        |        /   \
       Num    Clf    ClfP₂
        |      |      /‾‾\
      sǎam   lûuk    ...
      'three CLF'
```
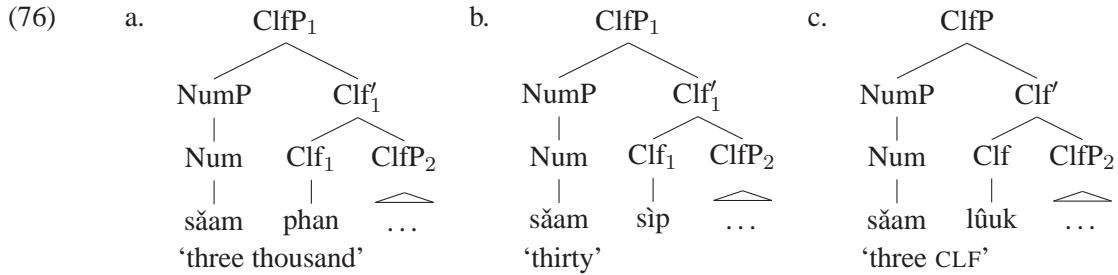
As the examples above demonstrate, this analysis accounts for the ability of multiplicative bases, but not simple cardinals, to iterate. It assumes that multiplicative bases are identical to classifiers not only in being heads, but also in their syntactic category. Thus, the lexicalization of multiplicative bases in languages like Thai eliminates structural complexity in the DP.

The semantics of multiplicative heads above the classifier itself are similar to the one proposed by Ionin and Matushansky (2006) with the addition of a semantic argument position for numerals. I assume that the numerals 1-9 are arguments of type $\langle e \rangle$ which simply denote the corresponding cardinality. The meaning of multiplicative bases is thus roughly equivalent to the semantics for classifiers, with the exception that they take properties rather than kinds as their input. This ensures that these heads attach above the ClfP projection rather than below it.

In Thai, there are several pieces of evidence supporting the syntactic distinction between multiplicative bases and simple cardinals. First among these is ellipsis, which has served as a reliable diagnostic for head-hood already in this section. The following example demonstrates that like classifiers, multiples of ten such as *phan* '1,000' license ellipsis:

(77) a. Q: mii faràŋ   kìi   khon   naj kruŋthêep?
            have westerner how.many CLF:PERSON in Bangkok
            'How many westerners are there in Bangkok?'

  b. A: hâa phan
        five thousand

  c. A: hâa phan   khon
        five thousand CLF:PERSON
        'Five thousand.'

The ability of multiplicative bases to license ellipsis contrasts with the behavior of simple cardinals, which cannot, as was shown earlier in example (70). Thus, evidence from ellipsis supports a distinction between simple cardinals and multiplicative bases.

This distinction potentially explains the fact that in classifier languages such as Burmese and Nung, classifiers are optional in the presence of multiples of 10 (Aikhenvald 2000, p. 100). This is not the case in Thai, however, and we would not want to assume that classifiers are actually optional in these languages, but rather that their deletion is licensed by the presence of these higher multiplicative bases. Classifiers cannot be truly optional because their semantic role of extracting atomic properties from kinds is required for computing the value of any higher numerals.

More specific evidence that multiplicative bases have the status of classifiers comes from the ability of *kìi* 'how many' to combine with multiplicative bases. Otherwise, *kìi* is restricted to occurring with classifiers:

(78)   mii faràŋ   kìi   phan   khon   naj kruŋthêep?
        have westerner how.many thousand CLF:PERSON in Bangkok
        'How many thousand westerners are there in Bangkok?'

However, the observation that *kìi* treats multiplicative bases and classifiers alike is not surprising in light of the fact that it simply has the distribution of simple cardinal numerals.

One question that this analysis leaves open is why numerals can only occur in the specifier of the topmost multiplicative base. This is especially problematic in light of the semantics I am adopting for classifiers, and hence multiplicative bases, in which they necessarily take a numeral argument. One way out is to assume that heads dominated by additional bases contain a null numeral 'one' in their specifier. This aspect of the analysis is somewhat stipulatory at this point, though below I will revisit the idea of a null numeral 'one.'

In this section I have argued that simple cardinal numerals are specifiers of ClfPs, while complex cardinal numerals are conglomerates of specifiers and heads, with multiplicative bases

serving as classifier-like heads. Evidence for this claim came from ellipsis and the universality of the *numeral-classifier* word order. To account for these structures, I proposed that classifiers can iterate within the Thai DP.

3.4.2   Other quantifiers selecting classifiers

To this point, we have only dealt with numerals, which are weak quantifiers. Additional weak quantifiers which occur with classifiers include *baaŋ* 'some' and *lǎaj* 'several.' Strong quantifiers which occur with classifiers include *thúk* 'every' and *tháŋ* 'all/the whole.' These two groups of quantifiers are distinct in that while the strong quantifiers can co-occur with numerals, the weak quantifiers cannot:

(79)   a.   thúrian tháŋ săam lûuk
                  durian all   three CLF
                  'all three durians'

         b.   thúrian thúk   săam lûuk
                  durian every three CLF
                  'every three durians'

(80)   a.   *thúrian lǎaj   săam lûuk
                   durian several three CLF

         b.   *thúrian baaŋ săam   lûuk
                   durian every several CLF

The ability of strong quantifiers in (79) to co-occur with numerals provides evidence for a higher functional position above the ClfP. I propose that this projection is the DP, and that these quantifiers are D-heads:

(81)

```
                        DP
                      /    \
                  NP_i      D′
                   |       /   \
                thúrian  D_[uN]   ClfP
                  ↑      |       /    \
                  |     thúk  NumP    Clf′
                  |            |      /   \
                  |          sǎam   Clf    t_i
                  |                  |
                  |                 lûuk
                  └──────────────────┘
```
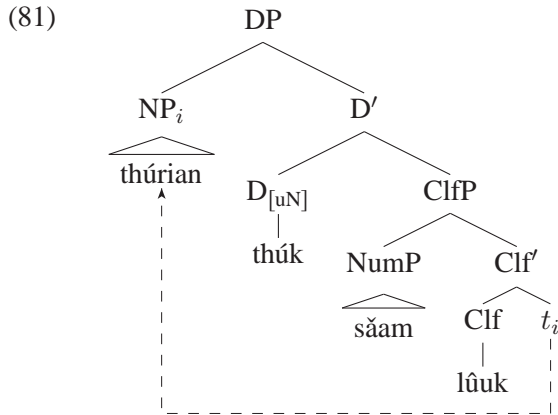
This D-head necessarily triggers NP-movement to its specifier, as we have seen. Suppose that this is motivated by the categorical selection requirements of D, realized as an uninterpretable category feature [uN] following the theory of selection in Matushansky (2006).

Of course, the strong quantifiers *thúk* 'every' and *tháŋ* 'whole' can also occur without numerals:

(82)   a.   thúrian tháŋ lûuk
            durian all   CLF
            'the whole durian'

       b.   thúrian thúk lûuk
            durian every three CLF
            'every durian'

Note that the semantics of the quantifier *tháŋ* is not directly equivalent to any English quantifier, though it is close to 'the whole,' and when combined with *sɔ̌ɔŋ* 'two' has a meaning identical to 'both.'

When they do not occur with numerals, we can assume that [Spec, ClfP] is filled with a null numeral 'one,' resulting in an atomic property. While the universal quantifier *thúk* simply quantifies over that property, the universal quantifier *tháŋ* quantifies over subparts of a single instance of the property denoted by its NumP complement. I will not implement a particular semantics for these

quantifiers, but note that in both cases they would be interpreted as generalized quantifiers, with the

ClfP serving as their restrictor.[23]

On the other hand, the inability of the weak quantifiers such as *baaŋ* 'some' and *lǎaj* 'several' to occur with numerals seems to provide evidence that they themselves occupy [Spec, ClfP]. Evidence for this position comes from their ability to occur in the specifier of multiplicative bases, which were argued to also contain a dedicated specifier position for numerals:

(83)   thúrian lǎaj   rɔ́ɔj   lûuk
         durian several hundred CLF
         'Several hundred durian'

Both quantifiers are vaguely associated with a certain numeral range. For *baaŋ* 'some' this is perhaps two to four, while for *lǎaj* 'several' this is roughly five to nine.

Further evidence that weak quantifiers occupy [Spec,ClfP] comes from their ability to occur with strong quantifiers:

(84)   a.   (?)thúrian tháŋ lǎaj   lûuk
               durian   all several CLF
               'all of the several durians'

         b.   (?)thúrian tháŋ baaŋ lûuk
               durian   all some CLF
               'all of the some durians'

Some Thai speakers do find these noun phrases awkward, however, or at least more awkward than those with numeral. This might be because for some speakers, these weak quantifiers must co-occur with a null existential determiner.

An analysis of these weak quantifiers is provided below. In cases where no overt strong quantifier is available, D is presumably filled by a covert D head:

---

[23]See chapter 6 for more on the interpretation of Thai quantifiers.

(85)

```
                        DP
                    ╱       ╲
                NP_i          D′
               ╱    ╲       ╱    ╲
            thúrian   D_[uN]      ClfP
                       │        ╱    ╲
                       ∃     NumP      Clf′
                            ╱  ╲      ╱   ╲
                          lăaj   Clf    t_i
                                  │
                                lûuk
```
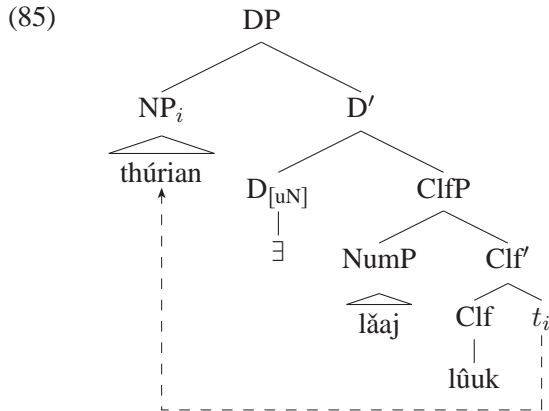
To sum up, the ability of these quantifiers to combine with strong quantifiers, even marginally, seems to indicate that they do not occur in the same position as the strong quantifiers, but in the same position as numerals, confirmed by the fact that weak quantifiers cannot co-occur with cardinal numerals.

To conclude, note that we have now seen two cases where a null numeral 'one' is needed, once with the iterated multiplicative bases in the previous section, and once here with universal quantifiers. These two cases are similar in that they involve an overt head position above the numeral. Thus, I would like to propose that the deletion of the numeral 'one' in Thai applies freely whenever ClfP contains an overt head above it within the same functional projection. This is a descriptive generalization in the context of my analysis, but it seems to cover the relevant cases and will provide a way of accounting for additional cases where no numeral is present later in this chapter as well as in chapter 5.

3.4.3 Quantifiers without classifiers

As mentioned above and in section 3.1.1, quantity expressions which occur without classifiers generally can occur with nouns that are notionally either mass or count. In the table in (68), several such expressions of quantity which occur were listed, but there are clear differences between these elements, both in terms of their internal structure and their semantics.

Take, for instance, the quantity expression *yɔ́ʔ* 'a lot' and the degree expression *mâak* 'very/much.' These can occur together, with the degree expression *mâak* modifying the quantity expression:

(86)   mii   thúrian yɔ́ʔ mâak
         have durian a.lot very
         'There are a lot of durian.'

This seems to indicate that *mâak* is actually a degree operator rather than a quantifier per se. The ability of *mâak* to modify adjectival predicates confirms this view, a property it shares with the quantity expression *nɔ́ɔj* 'a little':

(87)   thúrian lûuk níi jàj mâak / nɔ́ɔj
         durian CLF this big very / a.little
         'This durian is very big / somewhat big.'

This use is not available for *yɔ́ʔ*, which only can indicate quantity:

(88)   *thúrian lûuk níi jàj yɔ́ʔ
         durian CLF this big a.lot

However, *yɔ́ʔ* and nɔ́ɔj can modify VPs that denote quantifiable events:

(89)   a.   mûa-kɯɯn Nít nɔ́ɔn yɔ́ʔ(-yɛ́ʔ) / nɔ́ɔj
                last.night Nit sleep a.lot   / a.little
                'Nit slept a lot / a little last night.'

         b.   mûa-waan-níi Nít tham ŋaan yɔ́ʔ(-yɛ́ʔ) / nɔ́ɔj
                yesterday   Nit do   work a.lot   / a.little
                'Nit did a lot / a little work yesterday.'

Note that in these adverbial uses, *yɔ́ʔ* can be partially reduplicated, as is common for adverbs. This reduplicated use can also modify nouns, however:

(90)   Nít mii   thúrian yɔ́ʔ(-yɛ́ʔ) naj bâan
         Nit have durian a.lot   in house
         'Nit has a lot of durian at home.'

There are several other reduplicated variants of each of these modifiers.

The main point I would like to draw out of this discussion is that these weak quantifiers which do not require classifiers occur in a variety of syntactic environments which are not limited to those inside of the noun phrase. Based on this observation, along with the fact that these elements follow the noun or VP that they modify, an obvious analysis of these elements is as simple adjuncts. This conclusion is similar to the analysis by Doetjes (1997) of quantifiers which show a similar lack of selectivity in French, Dutch, and English, such as *a lot*.

On the other hand, the quantifier *tháŋ-mòt* is slightly more selective in that it generally occurs with DPs. This quantifier is composed of two morphemes, *tháŋ* 'all,whole,' introduced in the previous section, and the intransitive verb *mòt* 'empty, finished':

(91) thúrian tháŋ-mòt měn   mâak
      durian all   smelly very
      'All of the durian are very smelly.'

This quantifier does seem to have adverb-like uses, especially in introducing quantity expressions containing classifiers, in which it seems to have a meaning closer to 'altogether:'

(92) a. nákrian mii   tháŋ-mòt hâa-sìp hâa khon
          student have all   five-ten five CLF
          'Altogether there are fifty-five students'
      b. chǎn hen phûuchal tháŋmòt   sǎam khon —— John, Peter lέp Mike
          1SG see man   altogether three CLF   John Peter and Mike
          'I saw three men altogether: John, Peter, and Mike.'   (Piriyawiboon 2010, p. 78)

In both of these examples, the quantifier seems to exhaustify the predicate, rather than the noun phrase per se. So like the weak quantifiers above, a plausible analysis of *tháŋ-mòt* is as an adjunct, albeit one with complex internal structure. In section 3.4.2 I proposed that the quantifier *tháŋ* is a D head. This is not necessarily at odds with the current proposal, and it is not unlike the way that the English expression *altogether* contains a quantificational determiner even though it does not function as an argument.

The last two quantificational elements which occurred without classifiers were the proportional modifiers *sùan-jàj* 'majority' and *sùan-lék* 'minority.' They literally mean 'big-part' and 'small-part.' The 'big' and 'small' part of the expression can also be occupied by the quantifiers *mâak* 'very/much' and *nɔ́ɔj* 'a little', discussed above, e.g. *sùan-mâak* 'majority' and *sùan-nɔ́ɔj* 'minority.' These expressions lack the superlative readings of the English quantifiers *most* and *least*. To achieve that reading, Thai must apply the superlative ending *thîi-sùt* to *mâak* 'very/much' and *nɔ́ɔj* 'a little': e.g. *mâak-thîi-sùt* 'the most' and *nɔ́ɔj-thîi-sùt* 'the least.'

The idea that the 'majority' and 'minority' expressions headed by *sùan* 'part' do not involve a classifier is actually somewhat misleading. In fact, the noun *sùan* itself is an extrinsic numerative (i.e. measure word) meaning 'part'. Evidence for this conclusion comes from its ability to occur with quantifiers, e.g. *sǎam sùan* 'three parts', *thúk sùan* 'every part'. The second component of these expressions is arguably a deictic element which licenses the classifier. Evidence for this view is that *sùan* can be licensed by deictic elements, e.g. *sùan-nɯ̄ŋ* 'a part' and *sùan-níi* 'this part'. *Sùan* has also been lexicalized as a classifier used for body parts and organs, though this is arguably now an independent word.

In summary, we have seen in this section that the system of quantifiers in Thai is rich and complex. Some quantifiers have been treated as projections above the ClfP, including multiplicative bases, which I argued were akin to classifiers themselves, and strong quantifiers, which I argued headed the Thai DP. Others quantifiers occupy specifier positions, such as cardinal numerals and those weak quantifiers which select for quantifiers. Finally, those quantifiers which did not occur with classifiers were argued to be adjuncts to the noun phrase.

3.5   Deixis

This section provides a brief overview and analysis of a class of elements which are deictic, meaning that their interpretation is context dependent. I will argue in this section that the class of deictic elements in Thai are adjuncts to the ClfP projection, contra earlier work arguing that they are heads of a D or Spec projection.

Deictic modifiers in Thai are a class of elements which require classifiers, and which pick out a particular atom in the context. They are syntactically a natural class in that they all follow classifiers rather than preceding them. These modifiers include demonstratives, which mark a three-way distinction in Thai (93-a), an unstressed variant of the numeral 'one' (93-d), 'sole' (93-c), and a wh-/indeterminate element equivalent to English 'which' (93-d):

(93)   a.   thúrian *(lûuk) níi/nán/nôon
            durian CLF   this/that/yonder
            'this/that/yonder durian'

       b.   thúrian *(lûuk) nɯŋ
            durian CLF   one
            'a certain durian'

       c.   thúrian *(lûuk) diw
            durian CLF   sole
            'the single durian'

       d.   thúrian *(lûuk) nǎj
            durian CLF   which
            'which/any durian'

These four deictic elements cannot co-occur:[24]

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[24]In some cases, repeating the deictic modifier can is licensed by multiple occurrences of the classifier:

(94)   thúrian lûuk nɯŋ lûuk níi
       durian CLF one CLF this
       'this one durian'

(95)   *thúrian lûuk nɯŋ níi
       durian CLF one this

Deictics also include a class of ordinal deictics, including ordinal numerals, formed with

the relative marker *thîi*+numeral (96-a), *rɛ̂ɛk/sùt-tháaj* 'first/last' (96-b), and *nâa/kɔ̀ɔn* 'next, fu-

ture/previous, former' (96-c):

(96)   a.   thúrian *(lûuk) thîi nɯ̀ŋ/sɔ̌ɔŋ/etc.
            durian CLF   REL one/two/...
            'the first/second durian'

       b.   thúrian *(lûuk) rɛ̂ɛk/sùt-tháaj
            durian CLF   first/last
            'the first/last durian'

       c.   thúrian *(lûuk) nâa/kɔ̀ɔn
            durian CLF   next/previous

These ordinal elements cannot occur together, but they can occur with demonstratives, which must

occur to their right:

(97)   thúrian sǎam lûuk rɛ̂ɛk   níi
       durian three CLF sole/first this
       'these first three durians'   (cf. Deephuengton 1992, ex. 81)

In the absence of numerals, classifiers modified by a deictic modifier must be interpreted

as singular. Most of these modifiers also must be interpreted as definite; the one exception is the

unstressed 'one' in example (93-b), which can be used in presentational sentences to introduce new

discourse referents.

However, this unstressed 'one' is distinct from English *a(n)*, as it requires a specific indefinite

interpretation, as shown by its inability to take narrow scope below higher scopal operators:

This may indicate that deictic modifiers attach to a dedicated position in the noun phrase, and that in some cases repeat-
ing them requires recourse to apposition. Alternately, this may be evidence for classifier recursion, as is suggested in
different contexts by Singhapreecha (2001). Last, classifier recursion could be generated by spelling out multiple copies
of movement, as suggested for repeater classifiers in section 3.2.3. I take issue with Singhapreecha's particular analysis
in section 5.2.1, but more work is needed to understand the correct analysis and limits of classifier recursion.

(98) a. Nít hăa   dèk khon nɯɯŋ
          Nit search child CLF one
          'Nít it is looking for a particular child.'   (*look for > ∃, ∃ > look for)

      b. Nít yaŋ mâj phóp dèk khon nɯɯŋ
          Nit still NEG meet child CLF one
          'Nit hasn't met a particular child.'(*¬ > ∃, ∃ > ¬)

(98-a) shows that when the unstressed 'one' occurs below an intensional verb, it can only receive a transparent reading. Opaque readings, where the identity of the child is not know, are not allowed. Likewise, (98-b) demonstrates that the unstressed 'one' must take scope above negation. In contrast, true indefinite articles would be expected to show scopal ambiguity in these cases. Note that in Thai, the narrow scope reading can be unambiguously obtained simply by replacing the object noun phrase with a bare noun in both cases (cf. section 3.1.3).

The requirement that these deictic modifiers occur with classifiers is not too surprising.[25] I assume that deictic modifiers occur with classifiers in order to pick out individuals in the atomic domain, and as such must have that domain made accessible to them by classifiers.

A common view of demonstratives in the literature on Thai is that they head a DP projection above the ClfP, in essentially the same position I proposed that strong quantifiers occur. This is

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[25]This claim is actually false for demonstratives. Hundius and Kölver (1983), Visonyanggoon (2000), and Piriyawiboon (2010) observe that demonstratives can occur with *inanimate* nouns without an intervening classifier, in which case the noun phrase can be interpreted as referring to a particular kind, or a plurality, rather than to a particular individual:

(99) a. dâj nam thoorásàp (khrɯ̂aŋ) níi paj sɔ̂ɔm
          ASP take telephone CLF   this go fix
          'I took this telephone to go fix.'
      b. thoorásàp níi càʔ   maa phrɔ̂ɔm kàp nâacɔɔ sǎmphàt
          telephone this PROSP come set   with screen touch
          'This telephone comes with a touch-screen.'   (Piriyawiboon 2010, p. 85)

In (99-a) we see that the classifier is optional, but regardless of whether it is there, the object noun phrase refers to a particular object. However, when the classifier is absent, the noun phrase can be plural. In (99-b), on the other hand, the classifier is absent and the noun phrase refers to a particular kind of telephone. Both of these cases are somewhat surprising, as there is an overt numerative, *yaŋ*, which means 'kind' and is generally used in exactly cases such as (99-b). I will put these cases aside for now, because I do not know how to account for them, nor the animacy restriction particular to demonstrative optionality. It may be related to the fact that lexical plural markers can only occur with animate nouns (section 3.3.3), meaning that there is some covert counterpart to this marker for inanimate nouns and kinds. Resolving this issue is admittedly essential to the complete picture.

the view adopted by Piriyawiboon (2010) and Simpson (2005).[26] Both of these analyses must assume additional 'roll-up' movement of the ClfP or NumP to this higher DP projection in order to accommodate the sentence-final position of the demonstrative.

While it is true that languages such as Thai which lack definite articles often make use of demonstratives in cases where, e.g., English would use a definite article, the two should not be conflated. Piriyawiboon (2010) clearly demonstrates that demonstratives in Thai are not equivalent to articles in that they do not show the property of *consistency*, which distinguishes demonstratives from non-demonstrative definites (Dayal 2004; Löbner 1985). Observe that while the English example in (100-a) is a contradiction, the Thai sentence in (100-b) is fine, like its English translation:

(100)   a.   #The boy is sleeping and the boy is not sleeping.

        b.   dèk khon nán nɔɔn yùu tὲɛ dèk khon nán mâj-dâj nɔɔn yùu
           child CLF that sleep PROG but child CLF that NEG   sleep CLF
           'That child is sleeping but that child is not sleeping.'   (Piriyawiboon 2010, p. 49)

Thus, while demonstratives are used in definite environments,They also contain 'more' semantics than simple definite articles do, allowing them to be used felicitously in examples such as (100-b). Piriyawiboon (2010) still pursues an analysis of demonstratives as heads, though she argues that they occupy a 'Spec(ific)' head, rather than a DP head.

Yet is not obvious that demonstratives should be analyzed as heads. Analyses of demonstratives in inflectional languages such as Romance and Germanic often observe that they seem to be bimorphemic, with one element corresponding to a definite marker and the other corresponding to the marker of location (Bernstein 1997; Leu 2006). Dryer (1992, pp. 120-122) observes that in some languages, the order of demonstratives and nouns does not correspond with the order of articles and nouns, with demonstratives resembling adjectives in their placement.

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[26]An alternative view of demonstratives is provided by Visonyanggoon (2000), who argues that they occupy [Spec, ClfP]. She analyzes Num-Clf juxtaposition as resulting from head movement of the classifier, so I put her analysis aside for the present discussion. In many ways her analysis is similar to the one I propose here in spirit.

Because definiteness is rarely marked overtly in classifier languages, an alternative to analyzing demonstratives as overt instances of D is to analyze them on par with adjectives, adjoined perhaps to the ClfP itself. This idea is outlined in (101-b), along with the alternative analysis of demonstratives as D heads in (101-a):

(101)   a.   *Demonstratives as D heads*   b.   *Demonstratives as adjuncts*
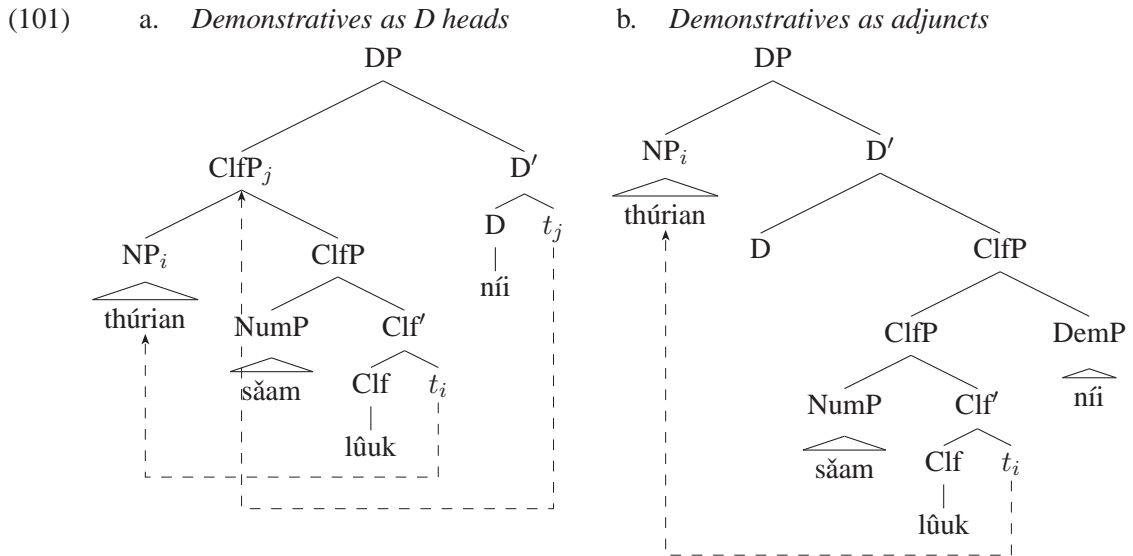
I have included a numeral in these examples, but in the cases where no numeral is present, I assume that a null 'one' is present, as described in section 3.4.2 and 3.4.1. In addition, I assume that even if deictic elements are adjuncts, their presence forces the addition of a D head above the ClfP projection, which is either definite or indefinite depending on the features inside the clause. See chapter 5 for more details on the nature and distribution of this silent D head.

Regarding the ordinal deictic elements above, note that ordinal numbers in particular are phrasal and thus could be accommodated into a view of deictics as modifiers, as in (101-b). Likewise, the fact that ordinal modifiers can co-occur with demonstratives indicates that at least one of these elements is an adjunct. However, the inability of other deictic elements to co-occur seems to favor the head approach in (101-a).

However, there may be an independent semantic explanation for the inability of certain deictic elements to co-occur. Consider the deictic elements in (31). Some of these, such as the demonstra-

tives, imply the existence of other individuals in the discourse. However, the only other definite deictic element, *diw* 'sole, single' excludes the existence of other individuals in the discourse. Likewise, ordinal deictic modifiers may not be able to co-occur because they all refer to some position an object holds in some ordered space or time. Thus, an explanation for the inability of these deictic elements to co-occur seems to be available on independent grounds, obviating the co-occurrence facts as an argument for the head analysis.

An additional complication for the head analysis of demonstratives is the analysis of quantifiers as D heads in section 3.4.2. Unlike demonstratives, these heads do not trigger movement of their entire complement to their specifier position. Moreover, they can co-occur in some restricted cases:

(102)   nákrian táŋ sǎam khon níi
          student all three CLF this
          'All three of these students'

In order to maintain the head analysis of demonstratives, demonstratives and strong quantifiers would have to head different projections in the nominal spine. Moreover, demonstratives would have to be analyzed as structurally higher than these strong quantifiers, as they presumably trigger movement of the whole QP complex to their specifier position, as in (102-a). However, there is a clear sense in which the demonstrative in (102) seems to scope below the universal quantifier, as in the translation. This follows from the adjunct analysis of demonstratives but not the head analysis, where they would necessarily scope above the quantifier. It is also not clear how a demonstrative could be interpreted above a quantifier, provided that the quantifier does not produce referential noun phrases.

A final argument against the head analysis comes from the crosslinguistic distribution of these elements in classifier languages. As noted by Dryer (1992), languages which lack articles are good candidates for being languages in which demonstratives have the distribution of adjectives. This

is exactly what we find in Thai: the position to the right of the classifier follows directly from the independent availability of right adjunction in Thai.

In fact, if we look at other classifier languages, there is a clear correlation between the order of adjectives and relative clauses relative to the noun and the order of demonstratives relative to the noun. Thus, in strictly head-final languages such as Japanese and Burmese, demonstratives precede the head noun, along with modifiers. In Japanese, when demonstratives attach to nouns, they receive the same genitive marker as adjectives (103-a). When they occur anaphorically, however, they do not (103-b):

(103)   a.   ko/so/a-no   inu -wa ooki desu
                  this/that/yonder-GEN dog -TOP big COP
                  'This/that/yonder dog is big.'

            b.   ko/so/a-re   -wa   ooki desu
                  this/that/yonder -TOP big   is
                  'This/that/yonder (thing) is big.'

Saito et al. (2008) have recently argued on the basis of NP-ellipsis that several other elements which attach to the noun via *-no* are, in fact, adjuncts rather than incorporated into the functional structure of the clause. Furthermore, because demonstratives are on the left periphery of the noun phrase in Japanese and Burmese, which are both head-final, there does not seem to be a way of deriving the position of these demonstratives with leftward movement. Likewise, in Vietnamese, functional morphemes generally precede the noun, including numerals and classifiers. However, demonstratives, adjectives and relative clauses all follow the noun (Nguyen 2004). In Chinese dialects, of course, all modifiers, including demonstratives, occur on the left. Thus, I conclude that because demonstratives generally are correlated with the position of adjuncts, they are adjuncts to ClfP, and that the restrictions on co-occurrence observed above are due to semantics.

3.6 Summary

This chapter has discussed Thai noun phrase structure in depth, building up the structure from the level of the bare noun to the higher functional structure of the clause. An analysis has been pursued which is compatible with the view that Thai noun phrases are headed by common nouns which are interpreted as kinds, following the work of **Krifka** (1995) and **Chierchia** (1998). We saw that one benefit of this analysis is that it is able to provide a coherent explanation for the requirement that classifiers occur with numerals and other distributive quantifiers.

A semantics for classifiers was adopted in which they always contain a numeral argument, but only after combining with their kind-denoting nominal complement. This entailed that NPs must move from a position to the right of the classifier in Thai, a proposal that found support from the observation that classifiers have several properties of functional heads in the noun phrase.

While Thai does have ways of making reference to pluralities, we saw that the grammatical means for marking plurality were restricted, both lexically, in that they could only occur with a subset of Thai nouns, and pragmatically, in the case of the collective marker *phûak*.

Quantifiers were seen to broadly fall into two groups, those that occurred with classifiers and those that did not. Most of the quantifiers which occur without classifiers were argued to be nominal adjuncts. Evidence was presented demonstrating that numerals do not project their own level of structure, but sit in the specifier of the ClfP, though multiplicative bases were argued to project additional functional structure by analogy with classifiers, based in part on their ability to license ellipsis, like classifiers and unlike numerals. Besides numerals, quantifiers occurring with classifiers were split into strong and weak, with the former occupying a high D head and the latter occupying the same position as numerals, the specifier of ClfP.

Finally, it was argued that deictic modifiers, such as demonstratives, are adjuncts to ClfP rather than functional heads, contra **Simpson** (2005) and **Piriyawiboon** (2010), among others.

The structure I have argued for in this section departs from the earlier literature on Thai on a number of grounds, while in others it is quite standard. For example, the notion that NPs move in Thai is not novel, nor is the idea that classifiers head functional projections above the NP. However, in proposing that numerals and demonstratives do not head functional projections, I am at odds with many proposals about noun phrase structure which do not share these views, both about Thai (Simpson 2005; Piriyawiboon 2010) as well as about Chinese (Cheng and Sybesma 1999; Li 1999). In addition, the idea that multiplicative bases have essentially the structure of classifiers is novel. Finally, the idea that strong quantifiers head the Thai DP avoids the roll-up phrasal movement which was associated with earlier analyses of Thai phrase structure cited above. I will come back to this D head in chapter 5, and argue that it can be filled by a null element, as I argued it was in the section on deictics above.

These latter aspects of my analysis provide the grounds for the following two complementary generalizations about Thai noun phrase structure:

(104) a. When classifiers are absent, Thai noun phrases are bare NPs.

     b. When classifiers are present, Thai noun phrases project DP.

We saw throughout this chapter that bare nouns are tremendously flexible in the range of interpretations that they permit, in terms of (in)definiteness and number. However, the addition of the classifier always restricts these interpretations, generally due to the presence of additional functional words which mark the noun phrase as definite, quantificational, etc. The next three chapters focus on different aspects of bare nouns, the DP, and quantificational noun phrases in turn, but together they will further develop a framework which maintains the generalizations in (104).

Several aspects of noun phrase structure did not receive sufficient attention in this chapter. This was not really by design, but more because they did not interact in obvious way with the notional categories analyzed here, and there has been limited independent work on them. One

obvious area is the syntax of possessors, especially important in light of the role that possessors have played in shaping our understandings of DP structure. For some discussion of possessives, see Piriyawiboon (2010, p. 79-81).

Another domain which has remained largely unexamined is the syntax of basic nominal modifiers, particularly adjectives and relative clauses. While relative clauses will be a major focus of the next two sections, I will not take up the topic of adjectives. A theoretical question which has attracted a fair amount of attention is whether adjective is a syntactic category at all in Thai (Post 2008; Prasithrathsint 2000; Warotamasikkadit 1996, among others). Visonyanggoon (2000, p. 47-53) presents several arguments against this conclusion, however, clearly establishing the existence of adjectives in Thai.

Chapter 4

Generalized Clausal Modification

This chapter examines the syntax and interpretation of clausal modifiers within noun phrases in Thai. The primary focus is on the proper analysis of the Thai relative complementizer *thîi*, arguing that it functions both as a complementizer and as a relative operator. Thus, I propose, in every environment where *thîi* occurs before a clause in Thai, that clause has the semantic type of a property. In addition to appearing before relative clauses, *thîi* also appears before noun-complement clauses, where there is no obvious gap for the relative operator to bind. I argue that the proper analysis of noun-complement clauses takes them to be nominal modifiers, and that *thîi* in noun-complement clauses binds a variable corresponding to the proposition denoted by the clause itself. I also extend this proposal to account for the presence of *thîi* in clefts and infinitive complements of verbs.

Thai is one of several languages where relative clauses and noun-complement clauses are marked with the same particle, along with Mandarin Chinese (Simpson 2003), Korean (Sohn 2001, p. 309) and Khmer (Comrie and Horie 1995). Below, the Thai particle is shown in the relevant environments, first introducing a relative clause (1), and then a noun-complement clause (2):

(1)   [$_{NP}$ nákrian$_i$ [$_{RC}$ **thîi** khruu khuan tii ___$_i$]] son mâak
      student   THÎI teacher should hit *ec*   naughty very
      'The student that the teacher should hit is very naughty.'

(2)   chăn mày chɔ̂ɔp [$_{NP}$ khwaam.khít [$_{NCC}$ **thîi** wâa khruu khuan tii nákrian]]
      1SG NEG like   idea   THÎI COMP teacher should hit student
      'I don't like the idea that teachers should hit students.'

In both environments, *thîi* is obligatory.

At first pass, the simple claim that *thîi* is a complementizer in (1) and (2) appears sufficient, given that it proceeds clauses in both examples. Yet in noun complement clauses, *thîi* is followed by another particle, *wâa*. This particle is glossed COMP because it also introduces the complements of verbs, from which *thîi* is absent:

(3)   chăn phûut **wâa** khǎw cà yáay bâan
      1SG say   COMP 3   FUT move house
      'I said that she's going to move.'

Clearly, then, the most natural analysis of *wâa* in (3) is as a complementizer, which brings us to the main empirical puzzles that this chapter attempts to answer: What is *thîi*? Why does only *wâa* occur in verbal complements? And why are both *wâa* and *thîi* required in noun complement clauses?

Relative clauses and noun-complement clauses are often seen as having different kinds of syntactic relationships with the head noun; relative clauses are modifiers, while noun-complement clauses are complements. This claim has challenged, however. For example, Stowell (1981, p. 203) argues that noun-complement clauses are appositive modifiers, rather than nominal complements (see also Grimshaw 1990 and Moulton 2009, ch. 2). In this chapter I propose a unified analysis of relative clauses and noun-complement clauses. While their derivation differs in terms of whether the noun can originate inside of the clause, as is the case in relative clauses, I argue that their structure and interpretation is nearly parallel.

A separate theoretical issue is raised by relative clauses in languages like Thai and Chinese

that lack determiners. Thai relative clauses allow interpretations that implicate reconstruction of the head noun into the relative clause. Yet influential accounts of reconstruction such as the head-raising account of Kayne (1994) analyze the relative CP as the complement of a determiner, with the head noun originating inside the CP. Thai noun phrases lack definite determiners, however, and bare nouns freely occur as arguments. Below I argue that in Thai relative clauses, *thîi* functions simultaneously as a relative operator and a complementizer, similar to the analyses of Adger and Ramchand (2005) and Cheng and Sybesma (2006). I also propose, following the proposal of Aoun and Li (2003) for Mandarin, that Thai bare nouns can be derived by reprojection of the NP above the relative clause, deriving a structure that is nearly identical to the traditional adjunction structure for relative clauses.

If *thîi* is a relative operator, it is unclear why it occurs in noun-complement clauses. Following Potts (2002), I propose that noun-complement clauses are nominalized propositions type-shifted to properties in order to semantically combine with the nouns they modify; *thîi* is responsible for this shift to the property type, as with relative clauses. Under this view, the complementizer *wâa* is a semantic nominalizer for propositions, a preliminary stem to the formation of properties. This proposal accounts both for the absence of *thîi* in verbal complements, as well as for the presence of *wâa* there, as clauses there function directly as the argument of verb. Thus, the central claim of this chapter is that *thîi* occurs before relative clauses and noun-complement clauses because both are interpreted as properties, and both combine with their head noun by Predicate Modification.[1] This analysis is further generalized to the distribution of *thîi* in other clausal environments, such as in clefts and infinitive clauses, which I argue also function as predicates.

A different approach to *thîi* has been pursued by den Dikken and Singhapreecha (2004), who proposed that *thîi* functions as a LINKER, a marker of DP-internal predicate inversion. I examine

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[1]A similar structural claim, albeit without the modern syntactic and semantic implementation, is made by Ekniyom (1982, p. 60-61).

this proposal closely and argue that their analysis does not generalize to the full distribution of the particle *thîi*. The LINKER analysis is also based on problematic assumptions about Thai classifiers, which play a crucial role in the predicate inversion proposal.

The structure of the chapter is as follows. Section 4.1 introduces the distribution of *thîi* and sets up the analysis. I start with relative clauses in section 4.1.1 and extend the analysis to noun-complement clauses in section 4.2. Section 4.3 briefly examines the occurrence of *thîi* in contrastive clefts and infinitives, arguing that the analysis presented in the earlier sections can be extended to those cases as well. Arguments against the proposal by den Dikken and Singhapreecha (2004) are presented in section 4.4.

4.1   *Thîi* as a Relative Complementizer

While we saw in (1) and (2) that *thîi* introduces clauses, this use is historically derived from its use as a noun/classifier meaning 'place' (4-a), with an intermediate stage where *thîi* was used as a preposition (Kullavanijaya 2008). The following examples show that the noun/classifier use and the propositional use of *thîi* still occur in modern Thai:

(4)   a.   raanʔahaan níi   mii sǎam **thîi**
              restaurant   this has three CLF:place
              'This restaurant has three locations.'

        b.   ráan.ʔahǎan **thîi** Boston
              restaurant   at   Boston
              'Restaurants in Boston'

The historically and synchronically nominal nature of *thîi* is not unique among Thai propositions. For example, the possessive preposition *khɔ̌ɔŋ* also has a use as a noun meaning 'thing, possession.'

Recall that *thîi* occurs before relative clauses and noun complement clauses (NCCs) in (1) and (2), respectively. In NCCs, *thîi* is optionally followed by another particle, the complementizer

wâa. Historically related to a verb meaning 'to say' (e.g. Thepkanjana 1986, p. 222-225), *wâa* is

the complementizer for clausal complements of verbs, whether embedded propositions or questions

(for discussion see Ruangjaroon 2005, ch. 2-3):

(5) a. chăn khít/phûut **wâa** khăw cà   yáay bâan
         1SG think/say COMP 3   FUT move house
         'I think/said that she's going to move.'

     b. chăn rúu   **wâa** khăw cà   yáay bâan
         1SG know COMP 3   FUT move house
         'I know whether she's going to move.'

     c. chăn tăam **wâa** khăw cà   yáay bâan máj
         1SG ask   COMP 3   FUT move house YNQ
         'I asked whether she's going to move.'

If *wâa* is a complementizer, it is not clear why *thîi* also appears in NCCs.

   Early accounts of *thîi* in Thai relative clauses identify it as a relative pronoun (Hass 1964,

p. 243, Warotamasikkhadit 1972, p. 48). Kuno and Wongkhomthong (1981b) also implicitly

support this analysis, stating "without making a theoretical claim ... we can informally say that

... *thîi* performs the function of the object... and ... subject of the verb" (p. 196). However, *thîi*

does not resemble any pronominal morphemes in Thai, especially given its locative origin. Other

syntacticians, such as Ekniyom (1982) conclude that *thîi* is a complementizer, based primarily on

the argument that it precedes NCCs, which do not contain a gap, as we have already seen.

   The relevant distribution of *thîi* and *wâa* before finite clauses is summarized below:

(6)

	thîi	*wâa*	*thîi-wâa*
Relative Clause	+	–	–
N-complement	–	(–)	+
V-complement	(–)	+	–

As the table shows, *thîi* occurs with relative clauses, while *thîi-wâa* occurs only in NCCs. The

wâa column has been put in parentheses for the NCC row; *wâa* does occur alone in noun phrases

in some limited environments, but only as nominalized VPs identical to independent cases of V-complementation (see section 4.2.1). Likewise, the *thîi* column is in parentheses for the V-complement row because while V-complements with *thîi* do occur they are reducible to NCCs (see section 4.3.1). The list above does not exhaust the environments where each particle is found. In section 4.3 I show that *thîi* also occurs before infinitival clauses, and suggest an extension of the analysis presented below to that environment.

Listing these environments brings the problem of the status of *thîi* into sharp relief. While *thîi* is necessary whenever there is a gap in the embedded clause, supporting the view that it is an operator, it also occurs in NCCs, where there is no obvious gap. A natural solution to this dilemma is to analyze *thîi* as simultaneously an operator and a complementizer. To this end, I propose that *thîi* is identical to what has been called a relative complementizer in many languages, including other East and Southeast Asian languages such as Mandarin Chinese (Li and Thompson 1981, p. 579-585) and Vietnamese (Nguyen 2004, p. 59-60). Dedicated relative complementizers also occur in the isolating Kwa languages of West Africa, including Yoruba (Bamgbósé 1975), Akan (Saah 2010), and Gungbe (Aboh 2005), and are also found in Bulgarian (Krapova 2010), Swiss German (van Riemsdijk 1989, 2003), and Gaelic languages such as Irish (McCloskey 1979) and Scots Gaelic (Adger and Ramchand 2005). A recurrent pattern in these languages is that the relative complementizer seem to serve the role of complementizer and relative operator simultaneously.

4.1.1 The syntax and semantics of relative clauses

The standard analysis of relative pronouns in English is as operators that bind a variable located in the gap within the relative clause:

(7) $[_{CP} \text{Op}_i \ldots [_{TP} \ldots x_i \ldots]]]$

These relative operators thus take clauses and return semantic sentences with the interpretation of a property. This 'predicativizing' function of a relative operator, often referred to as predicate or lambda abstraction, is uncontroversial, going back at least to Quine (1960). Once the relative clause has the denotation of a property, the relative head is composed with the relative clause by Predicate Modification (e.g. Heim and Kratzer 1998, p. 65), essentially set intersection. Far more controversial is the question of how the relationship between the relative clause operator and the gap is established, and what the syntactic relationship is between the relative clause and the head noun.

There have been three main syntactic analyses suggested for relative clauses. They differ primarily on how the 'head' of the relative clause, which is the noun that the relative clause modifies, is identified with the gap within the relative clause. There are two separate problems identified with relative clauses. The first is the fact that the head noun sometimes seem to behave as if it is internal to the relative clause, referred to as the 'connectivity problem' by Bianchi (2002a,b). The second issue is how the relative clause attaches to the NP, called the 'attachment problem' by Bianchi (2002a,b) Three standard analyses combining different solutions to these problems are given below:

(8)　　a.　　*Head external analysis*　　b.　　*Head-raising analysis*

```
        NP                              DP
       /  \                            /  \
     NP    CP                         D    CP
     |    /  \                            /  \
     N  Op_i  C'                        NP_i   C'
          ┆  / \                        |     / \
          ┆ C⁰  TP                      N    C⁰  TP
          ┆    /\                       ↑       /\
          ┆  …t_i…                      ┆      …t_i…
          └──────┘                      └────────┘
```

　　c.　　*Matching analysis*

```
        NP
       /  \
     NP    CP
     |    /  \
     N  N̶P̶_i   C'
         ┆   / \
         ┆  C⁰  TP
         ┆     /\
         ┆   …t_i…
         └──────┘
```
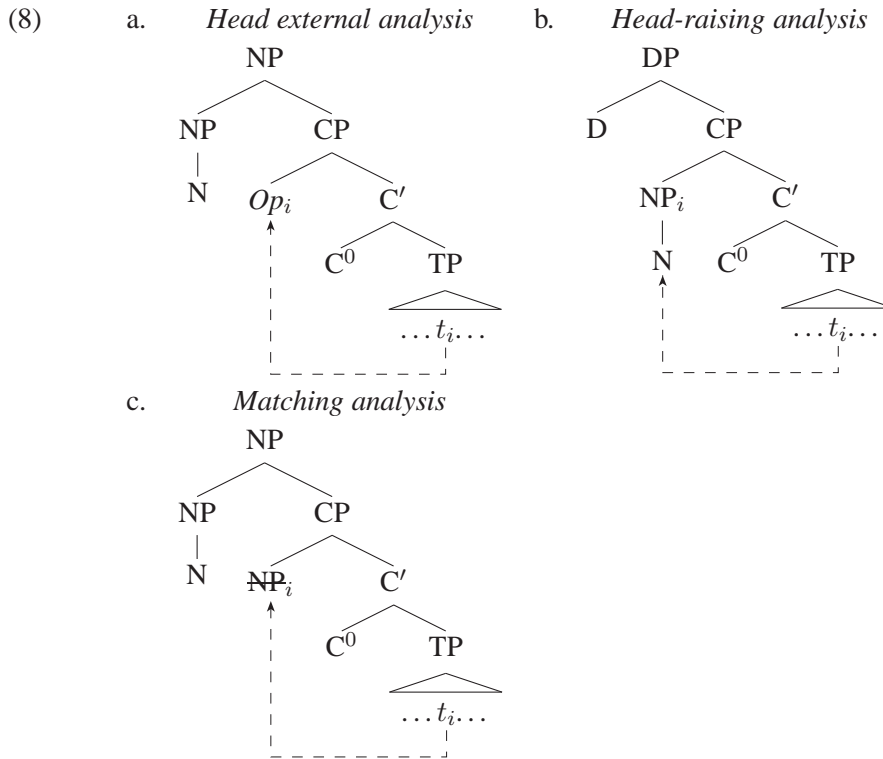
In the head external analysis (8-a), the relative head does not have any correlate inside the relative clause. Instead, an operator, which in English can be identified as the relative pronouns *which* or *who*, is associated with the gap position. The relative clause, including its operator, is right-adjoined to the NP. In the head-raising analysis in (8-b), the relative NP originates inside the relative clause and moves to the specifier of the relative CP. The head external and head-raising analyses thus provide different answers to both the connectivity problem and the attachment problem; only the latter analysis predicts that the relative head should exhibit connectivity with the relative clause. The matching analysis in (8-c) posits that the relative clause is adjoined to the noun, but in place of an operator is an elided copy of the head NP which is elided under identity with the head noun. This analysis thus combines the mode of attachment from the head external analysis with the solution to connectivity provided by the head-raising analysis, though the predictions for the two analyses are

not the same.[2]

The correct analysis of *thîi* is, to some extent, independent of the appropriate analysis of Thai relative clauses. All of the above theories have ways of accommodating relative operators and complementizers, so the identity of *thîi* is not completely contingent on that analysis. However, the correct analysis of Thai relative clauses does impact the way that we characterize the relationship of *thîi* with the relative head. The following two sections provide arguments that the head-raising analysis for Thai relative clauses is correct for Thai, and examines the implication of this conclusion for *thîi*. Section 4.1.2 argues that movement is implicated in Thai relatives, while section 4.1.3 argues that reconstruction effects force an analysis where the relative head is interpreted internal to the relative clause. Yet adopting the head-raising analysis leads to an additional problem: Thai lacks any overt determiner, an element which Kayne (1994)'s analysis of head-raising relatives crucially relies on (cf. (8-b)). In light of this dilemma, I propose in section 4.1.4 that in Thai head-raising relative clauses, the NP both moves and projects, an idea I borrow from the analysis of relative clauses in Aoun and Li (2003). This derives a structure nearly identical to the traditional head-external analysis for relative clauses with the addition of a trace of the relative head inside of the relative clause.

4.1.2 Evidence for movement

Evidence for movement in Thai relative clauses comes from two areas. First, Thai relativization is sensitive to the locality restrictions on long-distance dependencies discovered by Ross (1967).

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[2]Recent proponents of the head-raising analysis include Aoun and Li (2003); Kayne (1994); Bianchi (1999) and Bhatt (2002); a prominent critique can be found in Borsley (1997). Recent proponents of the matching analysis include Citko (2001); Salzmann (2006) and Sauerland (1998). The head-external analysis has arguably fallen out of favor for English. Recent arguments against its tenability can be found in Safir (1999) and Sauerland (1998). For a comparison of the theories, historical references, and discussion of the empirical issues bearing on the decision between them, see Bhatt (2002); Bianchi (2002a,b); Hulsey and Sauerland (2006); and Salzmann (2006). Hulsey and Sauerland argue that relative clauses are ambiguous between the head-raising and matching analysis, arguably the current consensus for English, a position also held by Bhatt (2002) and others. Salzmann (2006) argues that the matching analysis alone is sufficient to account for reconstruction, though I note problems with this approach below.

Second, relativization in Thai leads to weak and strong crossover violations (Postal 1971; Wasow 1979). Both factors lead to the conclusion that Thai relative clauses are derived by a movement operation of some kind.[3]

To begin, the examples below demonstrate that Thai relativization is sensitive to constraints on movement across complex NP islands (9) and adjunct islands (10). The example below illustrates ungrammaticality due to relativization across a complex NP island: the relative gap is located in a relative clause within a noun phrase which is an argument of the main relative clause:

(9)   a.   *wan.níi chăn hěn [$_{NP}$ măa$_i$ [$_{RC}$ thîi Nít rúucàk dèk$_j$ [$_{RC}$ thîi __$_i$ kàt __$_j$]]]
           today 1SG see   dog   THÎI Nit know child   THÎI *ec* bite *ec*
           '*Today I saw the dog that Nit knows the child that bit.'

      b.   *wan.níi chăn hěn [$_{NP}$ măa$_i$ [$_{RC}$ thîi Nít rúucàk dèk$_j$ [$_{RC}$ thîi __$_j$ yiŋ __$_i$]]]
           today 1SG see   dog   THÎI Nit know child   THÎI *ec* shoot *ec*
           '*Today I saw the dog that Nit knows the child that shot.'

The example below illustrates that relativization is ungrammatical out of an adjunct island. The relative gap is located inside of an adjunct clause inside a relative clause:

(10)   a.   *wan.níi chăn hěn [$_{NP}$ măa$_i$ [$_{RC}$ thîi Nít glúmcaj [$_{CP}$ phrɔʔ   __$_i$ kàt Nɔ́ɔj]]]
            today 1SG see   dog   THÎI Nit worried   because *ec* bite Noy
            '*Today I saw the dog that Nit is worried because bit Noy.'

       b.   *wan.níi chăn hěn [$_{NP}$ măa$_i$ [$_{RC}$ thîi Nít glúmcaj [$_{CP}$ phrɔʔ   Nɔ́ɔj yiŋ __$_i$]]]
            today 1SG see   dog   THÎI Nit worried   because Noy bite *ec*
            '*Today I saw the dog that Nit is worried because Noy shot.'

The (a) versus (b) examples for both (9) and (10) demonstrate that it does not matter whether the

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[3]This conclusion differs with the claim of Hoonchamlong (1991) that Thai relative clauses are not derived by movement. The examples in this section were checked with several native speaker Thai linguists, as well as in a survey taken by over fifty native speakers of Thai. In fact, in earlier work I reported Hoonchamlong's examples and concluded, with Hoonchamlong, that Thai relative clauses did not involve movement. The judgments of an anonymous reviewer reviewing a submitted draft of this chapter and her colleagues conflicted with Hoonchamlong's judgments, which prompted me to conduct an extensive online survey (n=66) with native speakers of Thai testing Hoonchamlong's examples as well as some others at issue in an earlier draft. The judgments of these speakers agreed with the reviewer and did not agree with Hoonchamlong. As such, the analysis was revised to reflect the observation that Thai relative clauses are sensitive to standard restrictions on movement.

extraction site is in the subject or object position of the island. In either case, the resulting sentence is ungrammatical.[4] Locality restrictions on long-distance dependencies such as relativization are generally attributed to the presence of movement. Thus, the ungrammaticality of (9-b) and (10-b) implicates movement of some kind in the derivation of Thai relative clauses.[5]

Further evidence for movement comes from the presence of weak crossover effects in Thai. Weak crossover occurs when operator movement applies across a coindexed pronoun:

(12) ??chǎn chɔ̂ɔp [NP dèk$_i$ [RC thîi [NP mɛ̂ɛ   khǎw$_i$] rák   __$_i$]]
     1SG like   child   THII   mother 3   loves *ec*
     '??I like the child$_i$ who his$_i$ mother loves.'

As weak crossover is found in cases where operator movement has taken place (e.g. Lasnik and Stowell 1991), it provides further evidence that movement is involved in the derivation of Thai relative clauses. This finding corroborates the evidence from islands above.[6]

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[4]A similar, but much more complex, example is claimed by Hoonchamlong (1991) to be grammatical (ch. 3, ex. 111). However, the survey (fn. 3) revealed this sentence to be unacceptable, contrary to the claims of Hoonchamlong:

(11) *wan.níi chǎn hěn [NP nák.khǐan [RC1 thîi nít bɔ̀ɔk nɔ̀y [CP wâa   [DP naŋsɨ̌ɨ [RC2 thîi __ wícaan __]]
     today 1SG see   writer   that Nit tell Noy   COMP   book   THÎI EC criticize *ec*
     mii chɨ̂ɨ.sǐaŋ   ]]]
     have name.famous
     i. 'Today I saw the writer$_i$ that Nit told Noy that the book$_j$ that he$_i$ criticized *ec*$_j$ is famous.'
     ii. 'Today I saw the writer$_i$ that Nit told Noy that the book$_j$ that *ec*$_j$ criticized him$_i$ is famous.' (Hoonchamlong
     1991, ch. 3, ex. 111, but marked as grammatical)

[5]Resumption in gap positions seems to have an ameliorative effect on island violations in Thai. However, resumption does not lead to complete grammaticality, and is only allowed when the context licenses focus on the resumptive pronoun. Subject resumption generally leads to greater amelioration than object resumption (perhaps ? for subjects versus * or ?? for objects). However, it is also the case that while resumptive pronouns degrade grammaticality, they seem to do so much less for subjects than objects. Thus the extent to which resumptive pronouns ameliorate island violations is subordinate to the extent to which such resumptive pronouns are allowed in the first place. See section 4.1.4 for a suggested analysis for resumption.

[6]Ideally, further evidence for movement could be found from strong crossover effects. Yet these effects are difficult to establish for Thai. It is both a subject and object topic-drop language (Hoonchamlong 1991; Huang 1984) and marginally allows resumption. As a result, when a relative clause contains two coindexed pronouns or gaps not in a A-binding configuration in Thai, the first pronoun can always be interpreted as a resumptive pronoun while a later gap could always be seen as an instance of topic-drop. Because of this, the claim by Hoonchamlong (1991, p. 202) that Thai lacks strong crossover effects, based on examples such as (13), should be taken with a grain of salt:

4.1.3   Evidence for reconstruction

In this section I establish the existence of several instances of reconstruction (or connectivity) in Thai relative clauses.[7] I follow Chomsky (1993) in interpreting these instances of reconstruction as evidence for a copy of the head noun inside the relative clause. This evidence forces the consideration of the head-raising analysis of relative clauses in the following section.

I consider two kinds of reconstruction effects in Thai relative clauses. The first kind of reconstruction effect is idiom reconstruction, where the idiomatic interpretation of a head noun is retained despite relativization (cf. Brame 1968; Schachter 1973). The second kind of reconstruction involves deictic modifiers. As scopal elements, these modifiers give rise to ambiguities which indicate they can be interpreted in multiple positions within the relative clause (Bhatt 2002).[8]

In Thai, as in English, there is a common idiom about nuts falling out of trees that carries the

(13)   a.   ?chǎn   phûŋ hěn [$_{NP}$ dèk$_i$ [$_{RC}$ thîi   khǎw$_i$ bɔɔk wâa   Nít chôɔp]]
          1P.SG just see   child   THII 3   say   COMP Nit like
          '??I just saw the child$_i$ who he$_i$ said that Nit likes (him)$_i$.'
    b.   ?chǎn   phûŋ hěn [$_{NP}$ dèk$_i$ [$_{RC}$ thîi   khǎw$_i$ bɔɔk wâa   (khaw)$_i$ chôɔp Nít]]
          1P.SG just see   child   THII 3   say   COMP 3   like   Nit
          '??I just saw the child$_i$ who he$_i$ said he$_i$ likes Nit.'

First, many speakers find these examples degraded, including an anonymous reviewer. Second, to the extent that they are marginally grammatical, their grammaticality arises from the possibility of interpreting the matrix subject of the relative clause (the person who is doing the saying) as a resumptive gap, and the lower gap/pronoun as an instance of optional topic drop, which is allowed in both subject and object position in Thai. Because strong crossover leads to sharp ungrammaticality, and subject resumption leads to mild ungrammaticality, that speakers likely favor an interpretation based on resumption. Because of this the examples above do not tell us anything about the status of Thai relative clauses with respect to strong crossover. These difficulties in accounting for strong crossover effects in languages which allow resumption is also discussed in McCloskey (2006). The problem does not arise in the weak crossover cases, because the possessive pronoun does not license topic drop, so the object gap must be the tail of the A-bar chain. See section 4.1.4 for a suggested analysis for resumption.

[7]For a detailed review of reconstruction effects, see Sportiche (2006).

[8]I do not consider reconstruction effects related to binding and anaphora. Anaphoric dependencies in Thai are still not fully understood, and the data I have received from speakers have shown substantial variation. For example, Thai has been claimed to lack Condition C of the binding theory (Lasnik 1989), which has been reframed as a claim that Thai allows binding to be realized by a copy operation (Larson 2006; Lee 2003). An additional complication involves the fact that the general-purpose reflexive anaphor in Thai, *tua-eeŋ*, also has logophoric uses, and can appear in subject position (Haddad 2007; Hoonchamlong 1991). The logophoric use in particular makes it difficult to force anaphoric interpretations when assessing grammaticality. Regarding quantificational binding of variables, variable binding in pro-drop languages such as Thai has been observed to be sensitive to whether pronouns are overt. Given the already complicated data regarding resumption (see fn. 5), here too we find multiple difficult theoretical questions which cross purposes.

meaning that children are often similar to their parents. The idiom is:

(14) lûukmáaj lòŋ mâj klaj ton
      nut   fall NEG far tree
      a. 'The nut doesn't fall far from the tree.'
      b. 'Children aren't that different from their parents.'

Below, we see that the subject of this expression can be relativized, and its idiomatic meaning retained:

(15) a. lûukmáaj [RC thîi lòŋ klaj ton] nán   hǎa yâak
          nut   THÎI fall far tree   TOPIC find difficult
          a. 'Nuts that fall far from the tree are hard to find.'
          b. 'Children that are different from their parents are hard to find.'

      b. lûukmáaj [RC thîi lòŋ mâj klaj ton] tham-hâj phɔ̂ɔ-mɛ̂ɛ sàbaaj-caj
          nut   THÎI fall NEG far tree   CAUS   parents   content
          'Children that aren't different from their parents put their parents at ease.'

In (15-a), both an idiomatic meaning and a non-idiomatic meaning are available, because the predicate *hǎa yâak* is compatible with both. In (15-b), on the other hand, only the idiomatic reading is available, again due to the semantic properties of the predicate.

The availability of the idiomatic interpretation for *lûukmáaj* 'nuts' as 'children' in (15) indicates that there is a copy of a relative head inside of the relative clause. The ability of this element to receive either an idiomatic interpretation or the non-idiomatic interpretation indicates that it can be interpreted either within or outside of the relative clause.

Further evidence for the head-raising analysis of relatives in English is provided by Bhatt (2002), who showed that adjectival modifiers can be interpreted in various positions inside of the relative clause. The specific class of modifiers which are necessary to make this argument are the class of deictic modifiers from section 3.5, which generally require a classifier. As such, these examples do not involve bare nouns per se, but they still implicate the existence of movement in Thai relative clauses:

(16) bòtkhwaam chabàb sùttháaj thîi nít phûut wâa chɔɔmskíi khǐian chǔu wâa on phases.
      paper   CLF   last THÎI Nit say WÂA Chomsky write name WÂA on phases
      'The last paper that Nit said that Chomsky wrote is "On Phases."'

This sentence can have two interpretations based on the scope of *sùttháaj* 'last.' The first is that

Nit named several papers that Chomsky has written, and that the last paper that she named was 'On

Phases.' The second interpretation is that Nit made an explicit claim about the papers that Chomsky

has written, namely, that the most recent or final paper that he wrote was 'On Phases.'

Following the discussion in Bhatt (2002), suppose that these two readings can be character-

ized as a 'high' and a 'low' reading because *sùttháaj* 'last' is interpreted in the matrix CP of the

relative in the first case and the embedded CP of the relative in the second. These readings can be

correlated with various relative clause-internal positions of the relative head, which I assume moves

cyclically through the CP of the relative clause, as illustrated in (17-a):

(17) [$_{CP}$ ~~last paper~~$_i$ Nit said [$_{CP}$ ~~last paper~~$_i$ that Chomsky wrote ~~last paper~~$_i$]]]

The high reading arises when the relative head is interpreted above the higher CP, while the

low reading arises when the head is interpreted inside the lower CP. The superlative modifier must

take scope above a proposition, here, either of the CPs (Heim 1995, cited in Bhatt 2002, p. 87):

(18) a. λx [$_{CP}$ [book x] last: Nit said [$_{CP}$ that Chomsky wrote x]]

      b. 'the set of x such that x is the last book such that Nit said that Chomsky wrote x'

      c. λx [$_{CP}$ Nit said [$_{CP}$ [book x] last: that Chomsky wrote x]]

      d. 'the set of x such that Nit said that x is the last book such that Chomsky wrote x'

The logical notation in (18) represents the relative CP as a property or predicate abstracted over a

variable inside of the reconstructed relative head. I have not yet said anything at this point about

what the role of *thîi* is nor where predicate abstraction arises. The goal here is to illustrate that the

two readings of 'last' arise from the interpretation of the relative head within different positions inside of the CP. Because the low reading, in particular, must involve the interpretation of the modifier inside the embedded clause within the relative, there must be a copy of the relative head within the relative clause.

Bhatt (2002) demonstrates that the matching analysis cannot account for the low reading in (18-c), because the matching analysis requires that the relative head be interpreted twice, both outside of the relative clause, in the NP projection, and inside of the relative clause.[9] However, these two positions lead to conflicting interpretations due to the different scopal properties of 'last' in these two positions. Based on this argument, we can conclude that Thai relative clauses must involve head-raising.

4.1.4 Reprojection and head-raising relatives

The evidence for movement and reconstruction together point towards the conclusion that Thai relative clauses must be analyzed as instances of what have been called head-raising relative clauses. Many recent analyses of head-raising relative clauses crucially rely on the presence of a determiner, inspired by the original analysis of **Kayne** (1994) in which the relative CP is the complement of D^0. For languages that lack articles, such as Thai, it is not obvious that a null D should be posited in every instance where a relative clause is present, especially given that the motivation for such an element would be purely theory internal.

Mandarin Chinese is a useful language for comparison because like Thai, Mandarin lacks

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[9]Salzmann (2006, p. 126-7) proposes a matching analysis for German relative clauses that avoids **Bhatt** (2002)'s problem with the raising analysis. Basically, he asserts that only one copy of the head noun (either the relative clause external or the relative clause internal) is interpreted in those cases where there is some positive licensing requirement on the noun, such as that it occur in a specific binding domain. The need for superlative modifiers to take scope might count as one such positive licensing requirement. Bhatt anticipates such an analysis, however (section 7.3.2), and points out that the matching analysis is essentially a subcase of ellipsis. Well-known cases of ellipsis require that both the licensing element and the elided element are interpreted. (In fact, the interpretation of the elided element is the reason we assume ellipsis is a real empirical phenomenon in the first place). In this light, Salzmann's claim that some cases of the matching analysis can have only one of the two NPs interpreted would constitute a unprecedented case of ellipsis, and in fact would undermine the argument for ellipsis, and hence, the matching analysis, in the first place.

articles, and also like Thai, Mandarin has an invariant relative clause marker that primarily occurs noun phrase-internally. Two analyses of Mandarin relative clauses attempt to reconcile evidence for the head-raising analysis with the absence of articles. The first proposal is by Simpson (2003), who argues that the relative clause-final particle *de* in Mandarin serves the equivalent of Kayne's relative D, and that in Mandarin this D requires that the IP move to its specifier:

(19)   a.   [$\_i$ qu Beijing] de ren
              ec go Beijing   DE person
              'the person that went to Beijing'
        b.
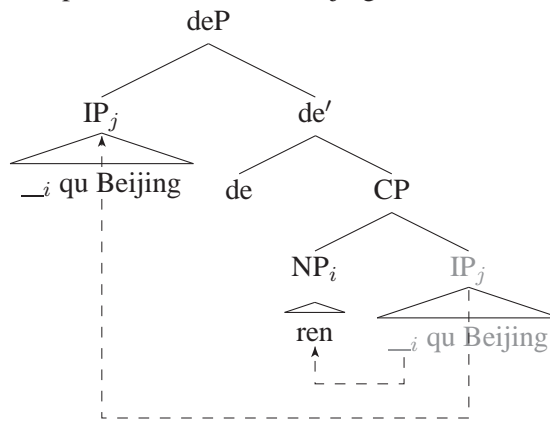
(Simpson 2003, ex. 10-12)

This proposal mirrors the derivation suggested by Kayne (1994, p. 94) for N-final relative clauses.[10] Additional proponents of Simpson's proposal are Saito et al. (2008), who cite the observation that *de* licenses N-bar ellipsis in Chinese as an argument for its status as a functional head.

However, Simpson's idea that *de* realizes the D category is problematic, as *de* can take scope below higher projections such as number and determiners, as we will see. This property of *de* is inconsistent with the standard semantic and syntactic characterization of D as a an argument-forming operator, generally of type $\langle et, e \rangle$ (e.g. Abney 1987; Stowell 1991; Szabolcsi 1994, and chapter 5). Furthermore, *de* does not impose any interpretive restrictions on Mandarin noun phrases; they can still be definite, indefinite, generic, and so on.

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[10]This derivation involves remnant movement. Thus, this analysis is like Aoun and Li (2003)'s proposal below in that the final structure the trace of the head NP is not c-commanded by the head NP itself.

In a thorough analysis of relative clauses in Mandarin Chinese, Aoun and Li (2003) conclude that there is no evidence that Mandarin relative clauses implicate the presence of a null D (though see section 5.4.3). However, Aoun and Li do provide evidence that minimal NPs are systematically reconstructed into Mandarin relative clauses. Moreover, they argue that the reconstructed NPs are able to project functional structure which is not reconstructed. They account for this seeming paradox by arguing that moved constituents can project, leading to adjunction-like structures, illustrated below (cf. Aoun and Li 2003, p. 159):

(20)

ClfP
- NumP
  - . . .
- Clf′
  - Clf⁰
  - NP
    - CP
      - . . . NP$_i$ . . .
    - NP$_i$
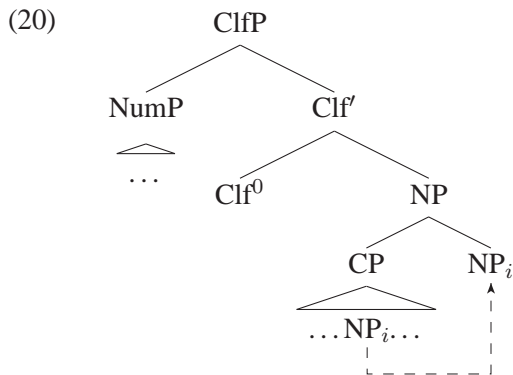
The idea is that the NP moves from inside the relative clause, merges with the relative clause, and then the NP itself projects.[11] In addition to NP reconstruction, Aoun and Li present arguments from coordination that the NP constituent can be conjoined with the relative clause without necessarily referring to two individuals. In other words, the whole relative clause+NP constituent is interpreted as a property.

Aoun and Li argue that the structure in (20) arises because the projection of the higher NP node can occur before the labeling of the higher NP node. In other words, there is an intermediate stage where the upper NP segment in (20) is unlabeled:

(21)   [$_\alpha$ CP NP]

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[11]The ability of NPs to serve as relative heads arises in part from the fact that bare nouns can serve as arguments in Mandarin, obviating Borsley (1997)'s arguments that relative clause traces must be DPs. Of course, it is unclear whether arguments must be DPs at all in languages like Mandarin and Thai.

In theory, they argue, the α node in (21) should be able to assume the category of either of its two daughter nodes.

This assumption is nonstandard; a more common position is that the trigger or probe of movement labels the resulting projection, rather than the moved element (Chomsky 1995, p. 328). A corollary of this proposal, then, is that moved elements must not necessarily c-command their trace, as it is the CP which c-commands NP in (21) rather than the inverse, assuming a definition of adjunction and c-command that incorporates the segment-category distinction (Chomsky 1986; May 1985). Thus, Aoun and Li argue that movement must only satisfy the Extension Condition of Chomsky (1995) rather than a c-command requirement.

Aoun and Li are not the only syntacticians to have claimed that the goal of movement can project. One common application of projecting movement (or reprojection) has been free-relatives (Citko 2008; Donati 2006; Iatridou et al. 2001), where it has been used to capture the generalization that the category of the free relative as a whole is determined by the category of the free relative head (Bresnan and Grimshaw 1978; Groos and van Riemsdijk 1981). In addition, Bury (2003) and Bayer and Brandner (2008) argue that the movement of simple wh-expression can be construed as head movement to C with the moved element projecting. Similarly Bhatt (1999, 2002) and Iatridou et al. (2001) suggest that NPs might project in normal head-external relative clauses as well, as in the analysis of Aoun and Li. There is some disagreement in the literature about whether only head movement can give rise to reprojection, as is claimed by Donati (2006) (see also Chomsky 2008, p. 145). While such a theory would arguably be more principled, the approach of Citko (2008) as well as the reprojection schema of Georgi and Müller (2010) give rise to systems where larger phrasal constituents can project after movement.

Following Aoun and Li and others, Thai noun phrases with relative clauses can be analyzed by reprojection in order to account for the availability of reconstruction in the absence of an overt determiner. Yet the moved NP in Thai and Chinese does not seem to have the form of a wh-operator,

and in fact, must have standard nominal features given that it functions as an argument in the matrix clause. In this light, I assume that Thai *thîi*, as well as Chinese *de*, are relative complementizers, functioning simultaneously as operators and complementizers. This claim resembles the analysis of dedicated relative complementizers in Scots Gaelic by Adger and Ramchand (2005). This proposal could be further articulated by saying that *thîi* and *de* are [+pred] in the feature system of Rizzi (1990) or have a [Λ] feature in Adger and Ramchand's system (cf. Cheng and Sybesma 2006 for Mandarin). In the expanded left periphery of Rizzi (1990), these complementizers would occupy Force^0, the highest position in the CP field.

The idea for Thai is presented below with a simple example:

(22) a. dèk$_i$ thîi mǎa kàt __$_i$
          dog THII dog bit *ec*
          '(the) child(ren) that the dog bit'
      b.

The main benefit of adopting an analysis in terms of reprojection is that we can carry over our analysis of bare nouns from chapter 3 into the analysis of relative clauses. The analysis of such structures as bare NPs is motivated by the observation that bare nouns with relative clauses can be definite, indefinite, generic, etc., just as bare nouns themselves can.

I take reprojection to be a 'last resort' operation, only necessary to satisfy the projection of a higher head (cf. Iatridou et al. 2001, p. 224-5). In the case of bare nouns, this higher head is the verb, which requires a nominal argument. Thus, one benefit of an analysis based on reprojection is that it provides a natural account for environments where CP appears to project, rather than NP. Thus, in the following sections I argue that in certain cases where *thîi* heads verbal complements

(section 4.3.1) and control clauses (section 4.3.3), the constituent as a whole has the CP label rather than an NP label.

Even in relative clauses, NP is only forced to project when no additional functional structure is present. To this end, the following chapter proposes that Thai does possess a null determiner that can take CP complements. Unlike relative clauses with bare nouns, these cases include classifiers and are marked by a necessarily referential interpretation. In such cases, I claim that CP is able to project because a higher D head is available to mark the argument as nominal.

What is still unclear in this analysis is how movement is motivated. The simplest option is claiming that *thîi* bears an uninterpretable categorical N feature, [uN], and an EPP feature requiring movement. A potential problem with this proposal is that it would predict that only subject extraction is grammatical, as skipping the subject would result in a violation of minimality/attract closest. In light of this problem, an alternative analysis would be to introduce the relative head into the derivation with some feature which made it uniquely visible to the probing head, perhaps the ID feature of Adger and Ramchand (2005).

If one of the NPs within the relative clause does remerge with the *thîi*, the standard case, it would constitute movement and form a chain with its lower copy, which would then be interpreted as a variable for binding by *thîi*:[12]

(23) $[_{NP} [_{NP} \text{dek}_i] [_{CP} \lambda x \dots x_i]]$

Another possibility is that a pronoun could be merged in the lower position, one that is listed separately in the numeration, which would then be bound by a noun that merged with *thîi*:

(24) $[_{NP} [_{NP} \text{dek}_i] [_{CP} \lambda x \dots \text{pro}_i(x)]]$

---

[12]The variable might also be made available because of a principled semantic rule which applied to lower copies, such as Trace Conversion (Fox 1999).

While this derivation cannot account for reconstruction effects, in their absence such base-generated

derivations of relative clauses cannot be excluded on principled grounds. Adger and Ramchand

(2005) argue that such representations are subject to the same locality restrictions that would be

observed on relative clauses derived by movement. Note, then, that in the absence of NP move-

ment and reprojection, the representation in (24) is identical to a traditional head-external, right-

adjunction structure for relative clauses.

This analysis predicts that the NP merged with *thîi* must not necessarily originate from within

the relative clause. This prediction is confirmed in that Thai allows gapless relative clauses, like

other languages including Swiss German (van Riemsdijk 2003), Chinese (Cheng and Sybesma

2006), and Japanese (Kuno 1973), among others:

(25) [NP chút khrûaŋkɛ̂ɛw [RC thîi kháw tham kɛ̂ɛw hǎaj   paj sɔ̌ɔŋ baj]] pen
          set crystal   THII 3   do   glass disappear PRF two CLF COP:PRED
      khɔ̌ɔŋkhwǎn tèŋŋaan kháw
      gift   wedding 3
      (lit.) 'The crystal set that he lost two glasses is his wedding present.'   (Hoonchamlong

      1991, p. 181)

Such examples are unsurprising from the perspective of the current analysis, as the only requirement

on the element merged with *thîi* is that it be (or contain) an NP. It is interesting that in languages

that allow gapless relative clauses, the relative operator is invariant regardless of the category or

case properties of the gap. This generalization is trivially true for Japanese, which lacks a relative

operator altogether, but does non-trivially hold for Chinese and Thai, as we have seen, as well as

Swiss German, which uses *wo* 'where' regardless of the category of the head. This generalization

is explained by the current analysis, as the relative operator is of category C and thus does not vary

with the status of the gap.[13]

A potential problem for this account is free relatives, which Ekniyom (p. 62-63) and Hooncham-long (p. 179-180) both note can lack overt heads:

(26) a. **thîi** khun hěn __ khɯɯ tùk   'Sears'
        THII you   see *ec* SPEC building
        'What you see in front of you is the Sears Tower.'

   b. chǎn mâj chɯa   **thîi** khun bɔ̀ɔk __
      1SG NEG believe THII 2   tell *ec*
      'I don't believe what you said'   (Hoonchamlong 1991, p. 179-180)

However, both authors point out that *thîi* in these examples can be preceded by dummy nouns:

(27) a. sìŋ   **thîi** khun hěn __ khɯɯ tùk   'Sears'
        thing THII you   see *ec* SPEC building
        'What you see in front of you is the Sears Tower.'

   b. chǎn mâj chɯa   sìŋ   **thîi** khun bɔ̀ɔk __
      1SG NEG believe thing THII 2   tell *ec*
      'I don't believe what you said'   (Hoonchamlong 1991, p. 180-181)

Thus, it is not implausible that the free relatives in (26) are headed by a null element as well, and that that these are, in fact, headed relative clauses.

These cases could involve movement or not; I see the flexibility of the proposed analysis in accounting for these different cases as a strength. More importantly, in section 4.2 I argue that noun-complement clauses constitute an additional case where the head noun is merged with *thîi* despite the absence of movement.

Rizzi (1997) proposes that relative complementizers are located high in the CP field, in the ForceP projection. However, given that *wâa* is associated with finiteness, which Rizzi (1997) locates

---

[13]It is unclear what is bound inside of the relative clause in gapless relative clauses. Hoonchamlong (1991) argues that the head is associated with a null 'ProPP,' similar to the suggestion by van Riemsdijk (2003) that these examples always involve association of the head noun with an adjunct in the relative clause. A different approach is taken by Cheng and Sybesma (2006) for Chinese, who argue that the relative operator in these examples binds an event or situation variable inside the relative clause.

in a 'Fin' projection below 'Force,' we might wonder why the two cannot co-occur in relative clauses. The answer I provide below, in section 4.2, is semantic, as I argue that *wâa* is interpreted as a clausal nominalizer, making it opaque to relativization.

The interpretation of relative clauses in Thai is complicated by the analysis of bare nouns in classifier languages as kinds, as proposed in chapter 3. In particular, it is unclear how to compose the kind-denoting head noun with the relative clause, which is a property. This issue is discussed in some detail by Krifka (1995), who proposes that modified kinds are interpreted as *concepts*, which are like kinds minus the requirement that they be natural. This idea can be incorporated into the present analysis by making use of the predicativizing '$\cup$' and nominalizing '$\cap$' operators of Chierchia (1984) (see (5) of chapter 3). The $\cup$ operator applies to the kind denotation of the NP, allowing it to be composed with the CP projection by Predicate Modification. The CP projection also denotes a property due to the interpretation of *thîi* as a lambda operator. The resulting property is then closed by the $\cap$ operator at the NP level after reprojection. These type-shifting operators apply automatically during the mapping from syntax to semantics, triggered by type-mismatches in the semantic composition.

(28) a.

$$
\begin{array}{c}
\text{NP}_3 \\
\langle e \rangle
\end{array}
$$

Tree structure:

- NP$_3$ $\langle e \rangle$
  - $\cap$ $\langle \langle e,t \rangle, e \rangle$
  - NP$_2$ $\langle e,t \rangle$
    - NP$_1$ $\langle e,t \rangle$
      - $\cup$ $\langle e, \langle e,t \rangle \rangle$
      - NP$_i$ $\langle e \rangle$ — dèk — CHILD
    - CP $\langle e,t \rangle$
      - C$_{[uN]}$ $\langle t, \langle e,t \rangle \rangle$ — thîi — $\lambda\phi\lambda x.[\phi(x)]$
      - TP $\langle t \rangle$ — măa kàt __$_i$ — bite(DOG,x)
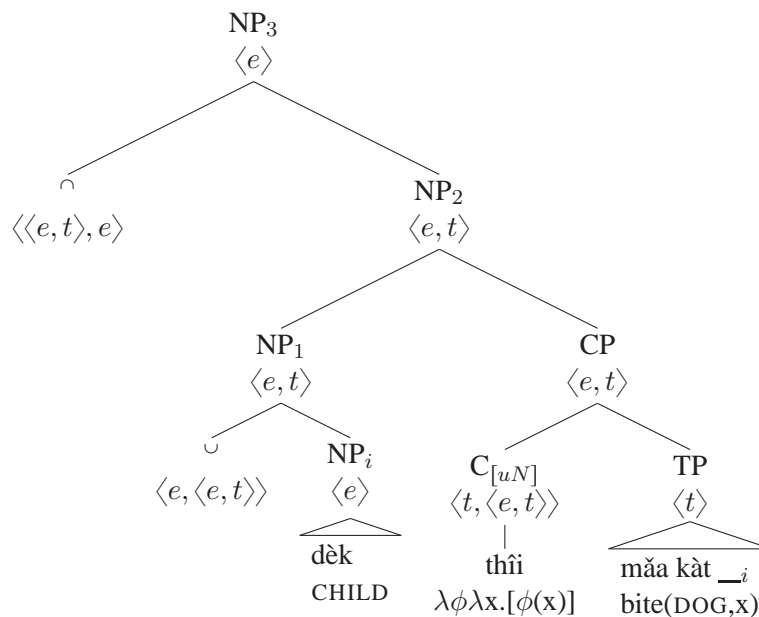
b. (i) $[\![\mathrm{NP_1}]\!] = \lambda x[^{\cup}\mathrm{CHILD}(x)]$
(ii) $[\![\mathrm{CP}]\!] = \lambda x[\mathrm{bite}(\mathrm{DOG},x)]$
(iii) $[\![\mathrm{NP_2}]\!] = \lambda x[^{\cup}\mathrm{CHILD}(x) \wedge \mathrm{bite}(\mathrm{DOG},x)]$ (by Predicate Modification)
(iv) $[\![\mathrm{NP_3}]\!] = ^{\cap}[\lambda x[^{\cup}\mathrm{CHILD}(x) \wedge \mathrm{bite}(\mathrm{DOG},x)]]$

If one wanted to retain a syntactic analysis of bare nouns in Thai and Chinese as NPs without higher functional structure, but adopt a semantic analysis that treated them as properties, one could dispense with the '$^{\cup}$' and '$^{\cap}$' operators in (28). Such analyses, such as those by Krifka (2003) and Dayal (2004), still rely on the availability of type-shifting operators to derive the different meanings that are available for bare NPs, such as accounting for definite interpretations by use of the ι operator (cf. Partee 1987).

To summarize, in this section I provided a head-raising analysis of relative clauses in Thai that differs from the now-standard analysis of Kayne (1994) in two ways. First, rather than assuming that the head NP raises to [Spec, CP], I proposed that the head NP itself projects upon merger with the projection of *thîi*. Second, I proposed that *thîi* itself functions both as a C^0 and as a relative operator in Thai. I also argued that the derivation of relative structures in Thai is quite flexible. Movement is one option, while another is merger of a separate NP with the relative clause.

The following section discusses the restrictions on omission of *thîi* in Thai. I argue that these restrictions provide support for the analysis of *thîi* as a relative complementizer.

4.1.5 The optionality of *thîi* in subject relative clauses

In an early study of relative clauses in Thai, Kuno and Wongkhomthong (1981b, KW) discovered that *thîi* is obligatory in Thai relative clauses with the exception of subject relatives:

(29) a. khon [RC (thîi) __ súu náŋsŭu lêm níi]
person THII *ec* buy book CLF this
'people who bought this book' (KW, p. 198)

b. sìŋ [RC *(thîi) khon súu __]
thing THII person buy *ec*

'things that people buy' (KW, p. 205)

As pointed out by KW, this situation is the exact opposite of the one found in English, where complementizers are only obligatory in subject relative clauses.

In addition to being restricted to subject position, the interpretation of relative clauses without *thîi* is different from relative clauses with *thîi*. The following contrast illustrates the difference:

(30) a. phǒm mây chôɔp [NP khon **thîi** sùp burìi]
    1sg.m NEG like person THÎI smoke cigarettes
    'I don't like people who smoke.' *or* 'I don't like the people who are smoking.'

   b. phǒm mây chôɔp [NP khon sùp burìi]
    1sg.m NEG like person smoke cigarettes
    'I don't like people who smoke.'   (KW, p. 221)

The relative clause modifying the object in (30-a) can either refer to the generic class of smokers or people who are smoking in a particular situation. That is, the sentence can either mean that I don't like smokers in general, or that I don't like a particular person or group of people who happen to be smoking at the next table. When *thîi* is absent, as in (30-b), only the generic meaning is available.

This same contrast explains the unacceptability of the following example without *thîi*:

(31) phǒm mây chôɔp [NP khon *(thîi) sùb burìi nay khanàʔ thîi aacaan kamlaŋ
   1sg.m NEG like person THÎI smoke cigarettes in moment that teacher PROG
   sɔ̌ɔn]
   teach
   'I don't like people who smoke while teachers are teaching.' (KW, p. 221)

The group denoted by the relative clause is not a well established kind, like smokers, but is restricted to smokers in a particular situation. Because the property denoted by the relative clause does not refer to the general property of being a smoker, *thîi* must introduce it.

There are two facts that need to be explained. First, *thîi* is only optional with subject relatives, and second, these *thîi*-less subject relative clauses must be interpreted generically. The most

straightforward account of both facts is that relative clauses without *thîi* are bare vP participles. Unlike true relative clauses, where the head noun originates internal to a clause, participles can be analyzed as adjectival modifiers adjoined to the NP:

(32)   a.   NP   b. $\lambda x[\text{person}(x) \wedge \text{smoke}(x, \text{cigs})]$

(tree diagram for a.:)
NP vP
khon   sùp burìi

(tree diagram for b.:)
NP vP
$\lambda x[\text{person}(x)]$ $\lambda y[\text{smoke}(y, \text{cigs})]$
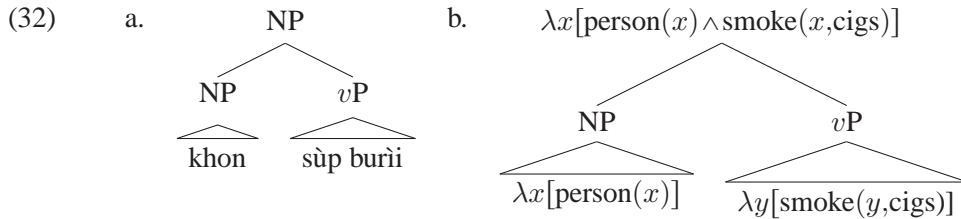
As (32-b) illustrates, *thîi* can be absent in subject relatives because the type of vP is already the same as the type of relative clauses, as the subject position is unsaturated. These participles can be directly composed with the head noun by Predicate Modification, without any need for the relative operator associated with *thîi*. Under this analysis, when *thîi* is present the additional structure requiring subjects would be present as well. The saturated subject position would then need to be abstracted over by *thîi*. In addition, the restriction on the interpretation of relative clauses without *thîi* indicates that they lack the functional heads above vP such as tense. This analysis dovetails with the idea that *thîi* also functions as a complementizer, which we would expect to be absent in phrases where higher clausal projections were also absent. Thus, the restrictions on the omission of *thîi* follow directly from the idea that *thîi* is a relative complementizer interpreted as an operator.

4.2   Noun Complement Clauses as Propositional Modifiers

The proposal that *thîi* is an operator, while natural for relative clauses (RCs), makes its presence in noun-complement clauses (NCCs) a puzzle. Because NCCs do not contain any obvious A-bar dependencies with the external nominal head, they are not generally analyzed with a relative operator. Of course, languages with overt operators such as English do not include such operators in NCCs.

Section 4.2.1 begins by demonstrating that NCCs in Thai do not have the expected syntax of complements. Section 4.2.2 focuses on the contribution of the complementizer *wâa*, arguing that it functions to derive argumental propositions, of type e, from propositions, following Chierchia (1984) and Potts (2002). Following this observation, section 4.2.3 demonstrates that the propositional nouns that occur with NCCs, such as 'idea' and 'rumor', can be interpreted as properties of propositions. Section 4.2.4 lays out the analysis of NCCs in Thai as clausal modifiers. NCCs are interpreted as propositional properties because *thîi* abstracts over the propositional variable introduced by *wâa*, though it does so by means of a type-shifting operation, IDENT (Partee 1986). Thus, *thîi* is given essentially the same syntax and semantics in NCCs as in relative clauses. In this way, the analysis of NCCs and RCs are unified, in that both are predicative modifiers of nominals (cf. Stowell 1981, p. 203, Grimshaw 1990, Moulton 2009, ch. 2). Section 4.2.5 deals with the specific fact that NCCs must follow relative clauses, and suggests that this follows from the specificational nature of NCCs.

4.2.1 Noun-complement clauses are not complements

This section presents evidence that NCCs with *thîi* are not syntactic complements of the noun. First, the order of RCs and NCCs relative to the noun is restricted, but not in the way that we would expect if NCCs were complements; NCCs must follows RCs. Second, the NCC can occur in the classifier-modifier construction (see chapter 5), which is limited to nominal modifiers. Third, I show that instances of genuine clausal complementation within the noun phrase, such as complements of event nominals, occur without *thîi*.

I begin with a puzzle. While relative clauses can precede NCCs as in (33-a), occurring directly adjacent to the noun, NCCs cannot precede relative clauses (33-b):[14]

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[14]This fact was discovered by an anonymous reviewer; earlier drafts indicated that either order of NCC or relative was allowed. The survey discussed above (fn. 3) confirmed that NCCs must follow relatives in Thai.

(33) a. chăn mày chûɯə [NP khàaw-lɯɯ [RC thîi chăn dây-yin __ mɯɯə-chaaw-níi] [NCC
          1SG NEG believe   rumor   THÎI 1SG hear *ec* time-morning-this
          thîi wâa khăw cà   yáay bâan]]
          THÎI COMP 3   PROSP move house
          'I don't believe the rumor that I heard this morning that he'll move.'

      b. *chăn mày chûɯə [NP khàaw-lɯɯ [NCC thîi wâa   khăw cà yáay bâan] [RC thîi
          1SG NEG believe   rumor   THÎI COMP 3   IRR move house   THÎI
          chăn dây-yin __ mɯɯə-chaaw-níi   ]]
          1SG hear *ec* time-morning-this
          'I don't believe the rumor that he'll move that I heard this morning.'

There are, in principle, two explanations for the ordering restriction in (33). The first is from syntax,

wherein the combination of relative clauses with nouns is somehow closer than the combination of

NCCs with nouns. The second potential explanation for (33) is semantic, where the compositional

interpretation of NCCs and RCs must compose RCs with nouns before NCCs.[15]

Besides RCs, another element that can intervene between nouns and NCCs is a classifier.

This is illustrated below:

(35) chăn mâj chûɯə [NP khàaw-lɯɯ **rûaŋ**   [CP thîi wâa   khăw cà   yáay bâan]]
      1SG NEG believe   rumor   CLF^{prop} THII COMP 3   PROSP move house
      'I don't like the idea that he's going to move'

Most propositional nouns *khàaw-lɯɯ* select the classifier *rûaŋ*, literally a noun meaning 'story' or

'matter.' Because classifiers are generally analyzed as functional projections of the noun (e.g. Cheng

and Sybesma 1999; Simpson 2005; Tang 1990), the ability of this projection to intervene between

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[15]Attentive readers may have noticed both English glosses in (33) are grammatical. This may follow from the availability of extraposition in English, but not in Thai, as demonstrated in the following example:

(34) a. chăn hen [NP dek [CP thîi khruu khɯɯy tii __]] mɯɯə-chaaw-níi
          1SG see   child   THÎI teacher PRF hit EC time-morning-this
          'I saw the child that the teacher hit this morning.'
      b. *chăn hen [NP dek t_i] mɯɯə-chaaw-níi [CP thîi khruu khɯɯy tii __]$_i$
          1SG see   child   time-morning-this   THÎI teacher PRF hit EC

This suggests that the NCC-RC order in English may in fact be due to extraposition of the RC, a topic I leave for future research.

the noun and an NCC is at odds with the idea that the NCC is the phrase-structural sister of the noun.[16] This argument is especially significant in light of the fact that arguments in Thai have a tight syntactic relationship with their predicate, as was shown for nominals in section 2.1.

A third argument that NCCs are adjuncts comes from an examination of different kinds of nominalizing morphology in Thai. While in earlier examples I translated the noun *khwaam-khít* as 'idea,' its literal meaning is 'thought,' as it is derived from the verb *khít* 'think' via the derivational prefix *khwaam* 'sense, essence, gist'. The distribution of *khwaam* is restricted, as it generally only combines with adjectives and stative verbs, generally resulting in abstract nouns. Another nominalizing morpheme in Thai is *kaan*. This prefix, also a noun meaning 'fact, matter' is restricted to verbs referring to activities and results in event nominalizations.[17] Hass (1964, p. 29) observes that nominalizations resulting from *kaan* have essentially the same flavor as English *-ing* gerunds do. When transitive verbs are nominalized by *kaan*, their objects occur directly after them, unmarked:

(36)   [$_{DP}$ kaan-khǐian còt-mǎay] nâa-bùa
        KAAN-write letters   boring
        'Writing letters is boring.'

Returning to our discussion of NCCs, verbs like *khít* 'think' can occur with both kinds of nominalization, though the clauses that occur with the different nominalizations are distinct:

(37)   a.   khwaam-khít   [$_{CP}$ thîi wâa   khruu khuan tii nákrian]
              KHWAAM-think   THÎI COMP teacher should hit student
              'the idea/thought that teachers should hit students'

         b.   kaan-khít   [$_{CP}$ (*thîi) wâa   khruu khuan tii nákrian]
              KAAN-think   THÎI COMP teacher should hit student
              'thinking that teachers should hit students'

---

[16]Example (35) is apparently an example of the classifier-modifier construction (CMC), which chapter 5 proposes involve a null determiner which takes a clausal complement.

[17]For more on the distribution of two prefixes, see Prasithrathsint 1996, 2006.

Like NCCs generally, the clause which accompanies the *khwaam* nominalization in (37-a) must be introduced by both *thîi* and *wâa*. However, when 'think' is nominalized by *kaan*, its complement looks just like a verb-complement clause (cf. (5)). This follows the general pattern observed for *kaan* nominalizations observed in (36), in that the form of the complement does not change if the verb is nominalized. It is clear, then, that clauses introduced by *thîi* differ in some crucial way from true clausal complements.

This difference can be represented with different constituent structures. Suppose that we can represent different nominalizing morphemes in the syntax with a categorical n head (Embick and Marantz 2008). The difference between *khwaam* and *kaan* is in whether nominalization occurs before or after the verb combines with its object:

(38)   a.   b.
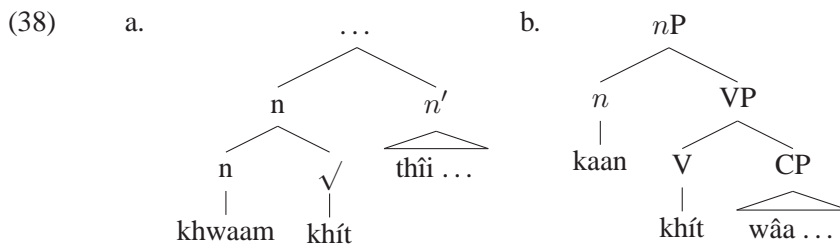
In (38-a), we see the derivation for *khwaam-khít* 'thought.' There, the categorical n-head *khwaam* combines with the bare root, deriving a noun directly. In (38-b), on the other hand, the categorical n-head *kaan* takes as its complement an entire VP. This means that the verb can select its object before the whole phrase is nominalized. We can see that this analysis accounts for the differences between the two structures cleanly. Together, the distinctiveness of verb-complements and NCCs, the morphological similarity of NCCs with RCs, and the ability of RCs and classifiers to intervene between between nouns and NCCs all suggest that NCCs are not nominal complements.

4.2.2 Propositional arguments

As indicated in the previous section, the complementizer *wâa* introduces clausal comple-
ments of verbs:

(39)   chăn khít   [$_{CP}$ *(**wâa**) Waan cà   yáay bâan]
        1SG think   COMP   Waan FUT move house]
        'I think that Waan is going to move.'

Why is *wâa* necessary here? One possibility is that *wâa* marks finiteness. While it is restricted to
finite clauses, this idea in itself is insufficient, as *wâa* does not occur in finite relative clauses.

Chierchia (1984) proposes that complementizers are nominalization operators for proposi-
tions. Potts (2002) implements this idea via the NOM/∩ type shift of Chierchia (1984), specially
defined for propositions:

(40)   If $p \in D_{\langle s,t \rangle}$, then $^{\cap p}(p) = [\iota x^p : \forall w \in p : w \leqslant x^p]$ and $^{\cap p}(p) \in D_{\langle e \rangle}$. (Potts 2002, p. 57)

The conditional clause on the left in (40) restricts the specialized propositional NOM function to
the domain of propositional variables. The output of NOM is an element of the e domain, as we
see in the right hand side of the equation. The ι operator is a definiteness operator and binds the
sorted variable x^p, defined for propositions. The middle part of the equation states that all of the
worlds which are in the set denoted by p are subparts ($\leqslant$) of the individual generated by $^{\cap p}(p)$,
where the subpart operation is as defined in the theory of plurality in Link (1983). The overall
effect of this operator is to convert the propositional function which assigns world to truth values
into the maximal set of worlds in which the proposition is true, i.e., a group of worlds, or a plural
propositional individual.

Under this view, *wâa* is necessary in these cases because it derives an argumental type for the
proposition, and thus allows a CP to function as a verbal argument:

(41)   a.

```
                    . . .
                     |
                    VP
                  /     \
                 V       CP
                 |      /   \
               khít    C     TP
                       |    /  \
                      wâa  Waan cà yáay bâan
```

    b.

```
                    . . .
                     |
          λy[think(y,[WAAN-WILL-MOVE])]
                  /          \
                 V        [WAAN-WILL-MOVE]
                 |           /      \
          λxλy[think(y, x)]  C       TP
                            |       /  \
                           ∩p   λw[will.move_w(WAAN)]
```
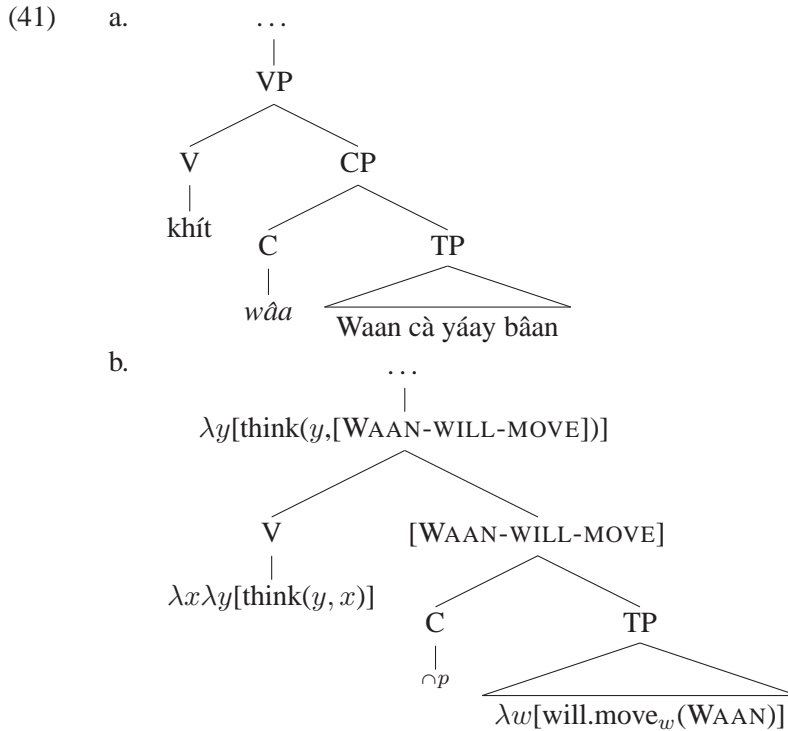
The bracketed proposition [WAAN-WILL-MOVE] represents a propositional individual which serves
as the internal argument of the verb *khít* "think."

Further evidence for this view comes from the fact that *wâa* is also used in naming and
quoting environments:

(42)   a.   dèk   khon níi (mii) chûɯ (wâa) ŋít
              child CLF   this have name COMP
              'This child's name is "Nit".'

        b.   Nít phûut wâa   "chǎn jùu thîi   nǎj"
              Nit said   COMP I   LOC place which
              Nit said, "Where am I?"

In (42-a), the word *chûɯ* is a noun, and the juxtaposition of this noun with the name, and optionally
wâa, seems to be a case of apposition. In (42-b), the presence of quotation is clearly evident in
the shift in the use of pronouns. The fact that *wâa* can be used in both of these environments is
somewhat unsurprising, as quotation has been identified as a kind of naming (cf. Parsons 1982).

However, *wâa* is not restricted to quotative uses, as normal cases of embedding can be bound by matrix arguments, as shown below:

(43)   dèk thúk khon khít wâa cà   klàb bâan
        child every CLF think COMP PROSP return home
        'Every child things that he will go back home."

Because the embedded clause in (43) contains a bound variable subject, it cannot literally express the content of each child's thoughts. This provides evidence against a uniform analysis of Thai clausal embedding as quotation. Yet as naming and quoting both involve uses of expressions from the object language as linguistic arguments or expressions, the proposed analysis of *wâa* can likely accommodate these cases. The introduction of names is a complication, however, and indicates that *wâa* may have some type and category flexibility, as it is not restricted to clausal environments.

If *wâa* is in fact an argument-forming operator, it provides the first part of the explanation for why *wâa* is absent in relative clauses: relative clauses are not arguments. However, as my central claim is that NCCs are also not arguments, this explanation is incomplete. The next few sections lay out the semantic and syntactic function of *thîi* in embedded clauses, and provide the missing pieces of this puzzle, at the end of section 4.2.4.

Another possibility is that *wâa* introduces a function from truth values to truth values. There are essentially two such functions, one which maps truth values onto themselves, and the other which provides the opposite truth value (i.e. negation). Caponigro and Polinsky (2011) demonstrate that clausal complements of verbs in Adyghe have the form of relative clauses with the addition of an applicative marker, which they argue introduces this function over truth values. This view does seem compatible with the use of *wâa* as well, particularly in interrogative complements. However, such an analysis does not lend itself to the unified view of *thîi* that I present below, in particular because propositional nouns and NCCs under the former view are not combined by Predicate Modification, unlike relative clauses, despite their putatively similar syntax.

4.2.3 Propositional properties

Returning to NCCs, the basis of the proposal by Stowell (1981, pp. 197-203) that NCCs are not arguments is semantic. That "thoughts" and "rumors" are properties of propositions is clearly shown in that propositional function as the nominal predicates in copular sentences such as (44-a), while propositional 'predicates' require specificational/equative copular sentences, as in (44-b) (Higgins 1973; Potts 2002; Stowell 1981):

(44)   a.   That he's going to move is (just) a rumor.

          b.   The rumor is that he's going to move.

The evidence that (44-a) is predicational while (44-b) is specificational in English is the distribution of articles, as the predicate nominal in (44-a) is indefinite. In English, we can conclude from this fact that propositional nouns such as *rumor* can be interpreted as type $\langle e, t \rangle$, as properties of propositions.

In Thai the distinction between predicational versus specificational/equative copular sentences is even clearer, as they are distinguished by different lexical copula (**Kuno and Wongkhomthong** 1981a). In (45-a) the nominal *khàaw-lɯɯ* 'rumor' is functioning as the predicate nominal.

(45)   [thîi [$_{CP}$ wâa   khǎw cà   yáay bâan]] **pen** [$_{NP}$ khàaw-lɯɯ]
          THÎI   COMP 3   PROSP move house   BE   news-rumor
          'That he's going to move is a rumor.'

In (45-a), the propositional noun *khàaw-lɯɯ* 'rumor' is the predicate object of *pen*, which is restricted to predicational environments. These facts indicate that nouns such as *khàaw-lɯɯ* can denote properties of propositions.[18]

---

[18]Example (45-a) demonstrates that sentential subjects must occur with *thîi*. I take this as an indication that the subject in (45-a) is a noun phrase, rather than a CP. The simplest argument for this conclusion is that a 'dummy' noun/classifier, *rûaŋ* 'story, matter,' can be inserted in (45-a) before *thîi*:

In contrast, CPs can occur as bare complements of the specificational/equative copula *khɨɨ*. These complements can optionally be introduced by *wâa*, though when it occurs it must be followed by a pause, and some speakers find these examples degraded. However, *thîi* can never occur following *khɨɨ*, as shown in (48-b).[19] Additionally, propositions containing *wâa* cannot occur as the complement of the predicational copula *pen* (48-c):

(48) [NP khàaw-lɨɨ] **kɨɨ** [CP (ʔwâa) khǎw cà   yáay bâan]
         news-rumor   EQ   COMP 3   PROSP move house
      'The rumor is that he's going to move.'

To account for these facts, I will adopt an analysis of predicational clauses in which they are made up of two arguments, one predicative and the other referential. In Thai, because nouns denote kinds, the noun *pen* actually takes a nominal kind as its predicative argument, and shifts it up to a property (49-a). This correctly predicts that only nominals can serve as the complement of *pen*, not predicates such as adjectives and prepositional phrases. Following the analysis of English equatives in Heycock and Kroch (1998), I consider specificational/equative clauses headed by *khɨɨ* to require

---

(46) [NP rɨ̂aŋ thîi [CP wâa khǎw cà   yáay bâan]] pen [NP khàaw-lɨɨ]
         matter THÎI   COMP 3   PROSP move house   BE   news-rumor
      'That he's going to move is a rumor.'

The same facts hold for non-copular sentences with sentential subjects:

(47) a. [NP (rɨ̂aŋ) thîi [CP wâa khǎw cà   yáay bâan]] (man) yɛ̂ɛ mâak
              matter THÎI   COMP 3   PROSP move house   it   bad very
          'That he's going to move is a rumor.'
      b. *[CP wâa khǎw cà   yáay bâan] (man) yɛ̂ɛ mâak
              COMP 3   PROSP move house   it   bad very

If *thîi* is absent, the reslting clause headed *wâa* is ungrammatical (47-b). The straightforward explanation of this fact is that the dummy nominal *rɨ̂aŋ* can be elided in these contexts, but is always structurally present. This entails, in turn, that subjects must be noun phrases in Thai.

[19]Earlier versions of this chapter misreported the data, claiming that clauses introduced by *thîi* could occur as the complement of *khɨɨ*. An anonymous reviewer pointed out that such examples were ungrammatical. The reviewer did not indicate that *wâa* could occur in complements of *khɨɨ*, however, but these examples were found to be only marginally ungrammatical in a large-scale survey (fn. 3). Furthermore, a corpus search revealed that the string *khɨɨ wâa* followed by a full clause is not uncommon.

type-identity between their two arguments. This proposal provides a natural account of the fact that only referential noun phrases can follow *khʉʉ* (Kuno and Wongkhomthong 1981a).

(49) a. $[\![pen]\!] = \lambda k \lambda x [^{\cup}k(x)]$

   b. $[\![khʉʉ]\!] = \lambda x \lambda y [x=y]$

This entails, then, that propositional nouns are kinds which can be shifted to the type of properties, while CPs are referential, having the type of individuals:

(50) a.
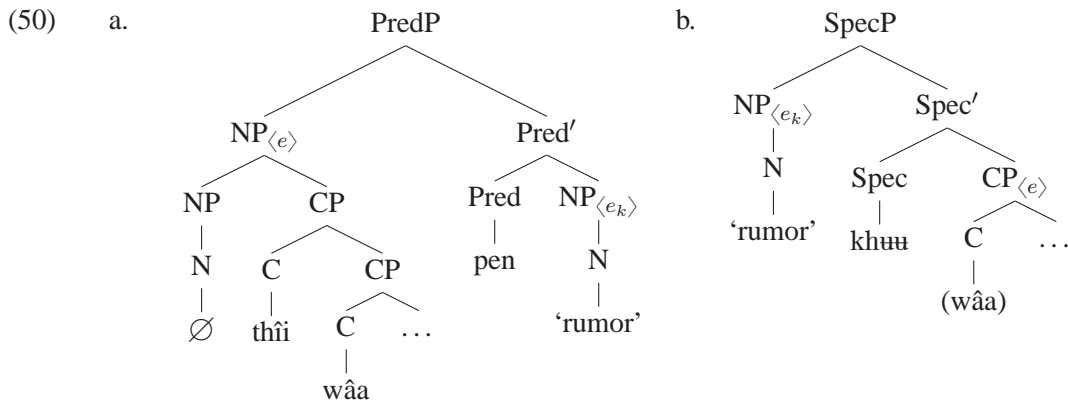
Thus, the subject of *pen*-copula as in (50-a) have as their subject an NCC with a null nominal. The predicate is a bare noun which is a kind. This kind can be shifted to a property, a role which is built into the meaning of the predicative copula itself.

4.2.4   NCCs as modifiers

In section 4.1.1 I proposed that *thîi* is a relative complementizer which is interpreted as an operator. There, the relative head NP moves from the relative clause to merge with the CP, where the NP itself projects. However, in the proposed analysis, *thîi* was endowed with an uninterpretable noun feature, [uN], which could be satisfied either by movement or by externally merging an noun with CP:

(51)   a.   chăn mày chôɔp khwaam-kʰít **thîi** wâa   khruu khuan tii dèk
            1SG NEG like   idea   THÎI COMP teacher should hit child
            'I don't like the idea that the teacher has hit children.'

    b.
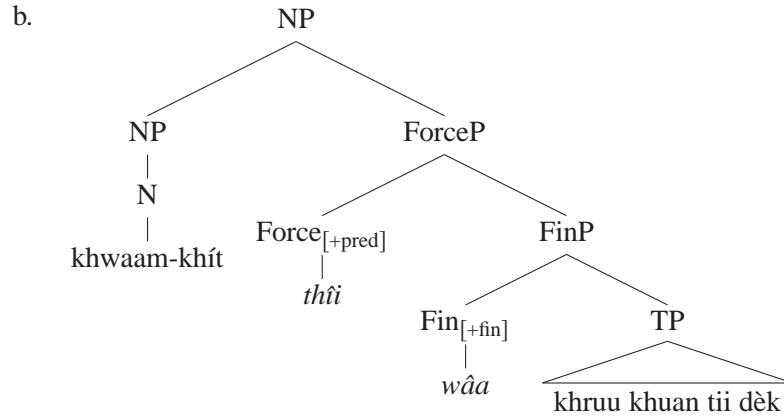
Under this view, the syntactic relationship between propositional nouns and NCCs is syntactically identical to the relationship between relative heads and relative clauses: the noun merges with the CP and projects, leading to an apparent adjunction structure in both cases.

We are now in a position to understand why *thîi* is necessary before NCCs. As propositional nouns like *rumor* and *idea* are, or can be shifted to, properties of propositions, of type $\langle e, t \rangle$, these words cannot combine directly with a nominalized proposition, such as those headed by *wâa*, as this would produce an expression of type $\langle t \rangle$:

(52)   a.   *khwaam-khít wâa   khruu khuan tii dèk
            idea   COMP teacher should hit child
            'the thought that teachers should hit children.'

b. *

```
                          CP
                          ⟨t⟩
                 ╱                  ╲
              NP                      C′
              ⟨e,t⟩                   ⟨e⟩
            ╱───╲                 ╱        ╲
       kwaam-khít             C              TP
       λx[idea(x)]        ⟨⟨s,t⟩,e⟩         ⟨s,t⟩
                              │           ╱──────╲
                            wâa      khruu khuan tii dèk
                          λψ[∩ᵖψ]    λw[hit_w(TEACHER)(CHILD)]
```

c.   (i) $[\![C']\!] = [\text{TEACHER-HAS-HIT-CHILDREN}]$

     (ii) $[\![CP]\!] = \text{idea}([\text{TEACHER-HAS-HIT-CHILDREN}])$
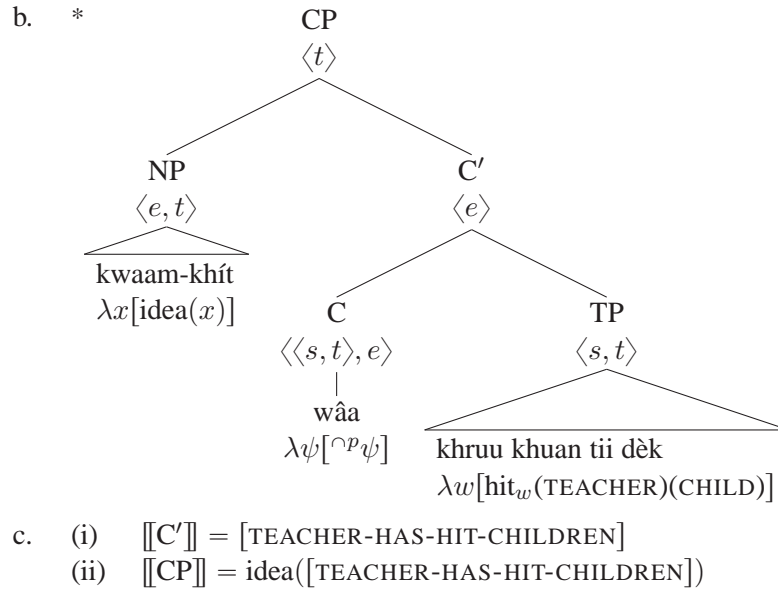
Without *thîi*, the DP above is predicted to be a well-formed sentence on its own, contrary to fact.

What we want instead is to compose NCCs and propositional nouns within the noun phrase with the same semantic rule we used for relative clauses in section 4.1.1, Predicate Modification. This is where *thîi* comes in. We need *thîi* to bind a variable within the CP, generating a predicate.

When its complement is a nominalized proposition, I argue, following the analysis of NCCs in Potts (2002, ex. 41), that *thîi* is interpreted as IDENT, which derives predicates from arguments (Partee 1986). The definition of IDENT is given below:

(53) $\text{IDENT}(x) = \lambda y[y = x]$

The application of IDENT is forced because there is no variable in the complement of *thîi* for it to bind, because the clause itself has been semantically 'sealed' by *wâa*. This forces *thîi* to be interpreted as a type-shift from this propositional individual to a propositional property.

When IDENT applies to the propositional individual, we get the right result, a complex predicate which is of type $\langle e, t \rangle$ which can be combined with the propositional noun by Predicate Modification. Below, I provide the interpretation of (51) under this analysis (I omit the type shifts from

and to the kind denotation of the noun):

(54) a.

$$NP_2$$
$$\langle e, t \rangle$$

$$NP_1$$
$$\langle e, t \rangle$$

khwaam-k^{h}ít
$$\lambda x[\text{idea}(x)]$$

ForceP
$$\langle e, t \rangle$$

Force
$$\langle e, \langle e, t \rangle \rangle$$

thîi
$$\lambda \,\text{x}\lambda\text{y}[y = x]$$

FinP
$$\langle e \rangle$$

Fin
$$\langle \langle s, t \rangle, e \rangle$$

wâa
$$\lambda \psi [^\cap{}^p \psi]$$

TP
$$\langle s, t \rangle$$

khruu khuan tii dèk
$$\lambda w[\text{hit}_w(\text{TEACHER})(\text{CHILD})]$$

b. (i) $[\![\text{FinP}]\!] = [\text{TEACHER-HAS-HIT-CHILDREN}]$
(ii) $[\![\text{ForceP}]\!] = \lambda y[y = [\text{TEACHER-HAS-HIT-CHILDREN}]]$ (by IDENT)
(iii) $[\![\text{NP}_2]\!] = \lambda x[\text{idea(x)} \wedge [x = [\text{TEACHER-SHOULD-HIT-CHILDREN}]]]$ (by Predicate Modification)

Thus, the propositional predicate derived by the IDENT instantiation of *thîi* involves a propositional predicate which can be combined with propositional nouns by Predicate Modification. The NP as a whole then has the same type as the propositional noun, type $\langle e, t \rangle$. Of course, the role of *thîi* in (54) is subtly different to its role in RCs; it is interpreted as IDENT, rather than simply as a lambda-operator.

The benefit of this account, however, is that it explains why the complementizer *wâa* cannot be present in relative clauses. Because *wâa* semantically 'seals off' the clause below it, the presence of *wâa* in relative clauses would block the ability of *thîi* to abstract a predicate over one of the arguments of its complement.

4.2.5 The ordering restriction on NCCs and relatives

As was demonstrated in section 4.2.1, NCCs must follow relative clauses in Thai. This fact is not expected under the analysis above, as noun phrases containing NCCs and RCs have the same category and interpretation. In the following discussion it is argued that NCCs are deictic, implicated by the IDENT type-shift. Their obligatory occurrence to the right of relative clauses then should be seen as a instance of the general observation that specific modifiers occur higher in the DP than do non-specific ones, though no specific analysis is presented.

Another related problem is that NCCs and relative clauses cannot be coordinated, as shown by the following example:

(55)   *chăn mày chɔ̂ɔp [NP khàaw-lɨɨ [NCC thîi wâa   khăw cà   yáay bâan] lɛ́ʔ [RC thîi
        1SG NEG like   rumor   THÎI COMP 3   PROSP move house and   THÎI
        chăn dây-yin mɨɨə.chaaw.níi   ]]
        1SG hear   time.morning.this
        '*I don't like the rumor that he'll move and that I heard this morning.'

The analysis above incorrectly predicts that this coordination should be grammatical because both relative clauses and noun-complement clauses are CPs headed by *thîi*.

However, there is a crucial difference between NCCs and relative clauses in that NCCs can only occur once, while relative clauses can recur:

(56)   a.   chăn mày chɔ̂ɔp [NP [NP măa [CP thîi dèk tii   ]] [CP thîi [RC hàw mâak]]]
             1SG NEG like   dog   THÎI child hit   THÎI   bark much
             'I don't like dogs that children hit that bark a lot.'

       b.   *chăn mày chɔ̂ɔp [NP [NP khàaw-lɨɨ [NCC thîi wâa   Nít cà   laaʔɔ̀ɔk càak ŋaan
             1SG NEG like   rumor   THÎI COMP Nit PROSP resign   from work
             ]] [NCC thîi wâa   khăw cà   yáay bâan]]
                 THÎI COMP 3   PROSP move house

The fact that relative clauses can iterate freely is rooted in the recursive definition of Predicate Modification, which takes two properties and returns a property. However, if NCCs also combine

with the noun by Predicate Modification, their inability to recur is puzzling. However, NCCs are distinct from relative clauses because they also require the application of IDENT, which means that they denote singleton properties.

(57)   a. $[\![\text{NP in (56-a)}]\!] = \lambda x[\text{dog(x)} \wedge \text{hit(child,x)} \wedge \text{barks(x)}]$

        b.   *$[\![\text{NP in (56-b)}]\!] = \lambda x[\text{idea(x)} \wedge [x = [\text{NIT-WILL-MOVE}]] \wedge [x = [\text{NIT-WILL-RESIGN}]]]$

The meaning in (57-b), resulting from multiple NCCs, is a contradiction, as it identifies the relevant "rumor" with two separate propositions. This problem clearly rises from the multiple applications of *ident*. No such problem is encountered in (57-a), however, as there is no conflict in a dog having both properties denoted by the relative clause.

One way of accounting for the restriction on the order of relative clauses and NCCs is semantic; relatives combine with nouns before NCCs because relatives must be informative. After an NCC has combined with its head noun, the proposition has been identified, and no further modification is necessary. This amounts to an appeal against Predicate Modification with singleton sets. Beyond this suggestion, I will leave the motivation for this ordering restriction unresolved.

In summary, the analysis of *thîi* as an operator introduced in the previous section can be extended to NCCs, with *thîi* shifting an argumental CP into a property via IDENT. The purpose of *thîi* in both NCCs and relative clauses is to abstract a predicate from a clause, thereby allowing the clause to be composed with the noun by Predicate Modification.

4.3   Other Environments for *Thîi*

In this section I demonstrate that the analysis I proposed for *thîi* can be extended straightforwardly to the occurrence of *thîi* in environments beyond obvious relative clauses and noun complement clauses. I examine three environments: verb-complements, contrastive specificational clefts,

and infinitives. In the first case, I argue that when *thîi* precedes the complement of a verb, it involves a concealed NP, and thus has essentially the structure of the CMC. The latter two environments are important because *thîi* has been analyzed as something other than a relative complementizer in both constructions: Ruangjaroon (2005) proposes that *thîi* is a definite marker in constrastive clefts, while Singhapreecha (2010) argues that *thîi* functions as a complementizer dedicated to introducing infinitival complements. The goal of this section is just to demonstrate that the use of *thîi* in these environments is compatible with the general semantic analysis of *thîi* as a generalized predicate-generating complementizer as laid out in the last two sections.

4.3.1   Verb complement clauses with *thîi*

Ekniyom (1982) observes that certain verbs can take complements which are headed either by *thîi* or *wâa*:

(58)   a.   jàaj   khon nán chนัฺa   **wâa**   sǎamii   mâj   khəəj nôɔkcaj kɛɛ ləəj
             woman CLF   that believe COMP husband NEG PRF   cheat   3   at-all
             'That woman believes in *the notion* that her husband never cheats behind her back.'

       b.   jàaj   khon nán chนัฺa   **thîi**   sǎamii   mâj   khəəj nôɔkcaj kɛɛ ləəj
             woman CLF   that believe THII husband NEG PRF   cheat   3   at-all
             'That woman believes in *the fact* that her husband never cheats behind her back.'
             (Ekniyom 1982, p. 74)

As the glosses indicate, there is a clear difference in the interpretation of these two sentences, in that the latter presupposes the truth of the embedded clause while the former does not. The classic analysis of factive clauses by Kiparsky and Kiparsky (1970) conjectured that the difference between factive complements and non-factive complements could be reduced to the presence of a null nominal head in factives.

Thai provides direct evidence for this analysis. This is because the *thîi* complement in (58-b) can be followed by *wâa* and preceded by an overt 'dummy' noun such as *rûัɯɑŋ* 'matter' with no change in meaning:

(59) jàaj   khon nán chûa   rûɯəŋ **thîi wâa** sǎamii mâj khəəj nɔ̂ɔkcaj kɛɛ ləəj
      woman CLF   that believe matter THII COMP husband NEG PRF cheat 3   at-all
      'That woman believes in the fact that her husband never cheats behind her back.'

The presence of *thîi* permits factive interpretations because it allows the meaning of the factive head

noun to be intersected with the meaning of the proposition. Syntactically, such cases might either

involve reprojection of the NP, as above, but they might also allow projection of the CP, given that

such clauses function as the internal argument of the verb.

4.3.2 Contrastive clefts

Ruangjaroon (2005, ch. 4) examines the structure and interpretation of examples such as

(60-a) and (60-b):

(60)   a. Ník thîi __ pen   khon tham caan tɛ̀ɛk.
           Nik THII *ec* PRED person CAUS plate break
           '*Nick* was the one that broke the plate'

       b. khraj thîi __ pen   khon tham caan tɛ̀ɛk.
           who THII *ec* PRED person CAUS plate break
           '*Who* was the one that you think broke the plate?'

Initially, there seems to be no obstacle in analyzing *thîi* as a relative complementizer in these sen-

tences, as it is followed by a gap, and this gap is associated with the nominal preceding *thîi*. But

therein lies a problem: if *thîi* introduces a relative clause, and everything following *thîi* is part of the

relative clause, these sentences lack a main predicate altogether.

Ruangjaroon is particularly interested in examples such as (60-b) as apparent instances of

wh-movement. She argues that if these examples are clefts they do not need to be seen as instances

of *wh*-movement. Ruangjaroon carefully goes through diagnostics which illustrate that the informa-

tion structural properties of (60) are similar to those familiar from contrastive focus. First, (60) is

associated with an existential presupposition, that is, it is associated with the presupposition 'some-

one broke the plate'. Second, the sentences in (60) are associated with a uniqueness presupposition, that is, that there is only one person in either case that broke the plate. Last, the sentences above must be interpreted with contrastive focus on the initial noun phrase.

While Ruangjaroon proposes that (60) should be analyzed as a cleft, in the structure she gives *pen* functions as the main predicate, and *Ník thîi* or *khraj thîi* is the subject. In this context, she claims that *thîi* in these examples functions as a definite marker, given that uniqueness is a property of definiteness. A simplified version of this analysis is given below:

(61)

```
              IP
           /      \
         DP        I′
        /  \      /   \
    Ník thîi     I      NP
                 |     /    \
                pen  khon tham caan tɛ̀ɛk
```
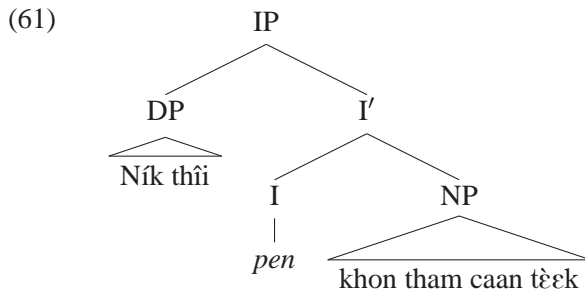
(cf. Ruangjaroon 2005, p. 20)

In this analysis, the examples in (60) are seen as simple predicational copular sentences. It is not clear what the source of the focused interpretation is in this analysis, nor is it clear that this has the structure that would be expected of a cleft, as there is no relative clause.

In addition, a number of problems arise in identifying *thîi* as a definiteness marker. First, the noun phrases **Nik thîi* and **khraj thîi* are meaningless in isolation, and cannot occur in any construction besides those in (60). Neither can *thîi* appear with common nouns, e.g. **mǎa thîi* 'dog THII.' It is not even clear that *thîi* forms a constituent with the preceding noun in (60). Moreover, it is strange that a definite marker would occur with both a proper noun, which is inherently definite, and a wh-expression, which is inherently indefinite.

An alternative derivation was proposed by Ekniyom (1982) which allows us to retain the analysis of *thîi* as a relative complementizer as well as providing an account for the focus on the subject. Ekniyom proposed that these examples are inverted specificational copular sentences, with

an initial copula, specificational *kh͟u͟u͟*, deleted. This latter fact accounts for the apparent lack of a main predicate in (60) under an analysis where the entire constituent following *thîi* is a relative clause.

Ekniyom (1982) provides three simple arguments for this analysis. First, contrastive clefts such as (62-a) can be preceded overtly by the specificational copula *kh͟u͟u͟* as in (62-b), though she observes most speakers prefer to omit the copula:

(62)   a.   phûuyĭŋ khon níi ŋajlâʔ thîi chûaj phajaabaan phŏm.
                woman CLF this FOC THII help take-care 1
                'It is this lady who took care of me.'

        b.   kh͟u͟u͟ phûuyĭŋ khon níi ŋajlâʔ thîi chûaj phajaabaan phŏm.
                SPEC woman CLF this FOC THII help take-care 1
                'It is this lady who took care of me.'   (Ekniyom 1982, p. 141-2)

In Ekniyom's examples there is an overt focus marker following the initial noun phrase. These markers are optional, and their semantic effect is stylistic; the noun phrases they attach to are interpreted with focus in these examples regardless of whether the focus markers are present.

The second piece of evidence that this construction is an inverted specificational copular sentence is that (62-a) can be negated. When it is, the negative counterpart of *kh͟u͟u͟*, *mâj châj* 'not correct', occurs sentence-initially:[20]

(63)   mâj châj   phûuyĭŋ khon níi lɔ̀ɔk thîi chûaj phajaabaan phŏm.
        NEG correct woman CLF this FOC THII help take-care 1
        'It is not this lady who helped take care of me.'   (Ekniyom 1982, p. 141)

Last, the sentence in (62) can occur in a standard SVO order where the specificational copula becomes obligatory. This is also possible for the negated version of the sentence in (63):

---

[20]The specificational copula *kh͟u͟u͟* is a positive polarity item and cannot occur under negation. See Chiravate (1999) for more on the polarity sensitivity of Thai copula.

(64)   a.   thîi chûaj phajaabaan phǒm khɯɯ phûuyǐŋ khon níi ŋajlâʔ.
              THII help take-care   1   SPEC woman CLF this FOC
              '(The person) who helped take care of me is this lady.'

        b.   thîi chûaj phajaabaan phǒm mâj châj   phûuyǐŋ khon níi lɔ̀ɔk.
              THII help take-care   1   NEG correct woman CLF this FOC
              'It is not this lady who helped take care of me.'   (Ekniyom 1982, p. 142-3)

In these sentences, the subject is an apparently headless relative clause, which, as shown in section 4.1.4, can be analyzed as headed relative clauses with a deleted head. To account for the absence of *khɯɯ* when it occurs initially, as in (62-a), Ekniyom proposes a rule of 'Initial Identificational Copula Deletion,' which examples such as (62-b) demonstrate is optional. Thus, the apparently abnormal distribution of *thîi* in contrastive clefts and the mysterious absence of a main predicate can both be explained by Ekniyom's proposal that these sentences are derived by fronting the predicate of a specificational copular sentence followed by deletion of the specificational copula. Under this analysis, the view of *thîi* as a relative complementizer can be retained.

4.3.3   Infinitives as properties

    The final relevant environment for *thîi* is before infinitives, both infinitival relative clauses such as (65-a) and infinitival complements of control verbs such as (65-b):

(65)   a.   Nít mii nǎŋsɯ̌ɯ thîi cà ʔ   ʔàan lɛ́ɛw
              Nit has book   THII PROSP read already
              'Nit already has a book to read.'

        b.   Nit jàak thîi càʔ   tham kaanbâan
              Nit want THII PROSP do   homework
              'Nit wants to do her homework.'

While I will not discuss infinitival relatives such as (65-a) in any detail, it is clear that the analysis of *thîi* as a relative complementizer can be straightforwardly extended to these examples: the head noun *nǎŋsɯ̌ɯ* 'book' is identified as the object of the infinitival relative, which is abstracted over

by *thîi*. The control complement in (65-b) is more difficult to account for, however, as control complements are clausal arguments, rather than nominal modifiers.

Singhapreecha (2010) proposes that *thîi* in control complements such as (65-b) should be analyzed in parallel with the analysis of the Italian prepositional complementizer *di* in Kayne (2000). In particular, she proposes that *thîi* is base-generated in a ThiiP projection above the main predicate *jàak* 'want' and triggers movemnt of an IP headed by the prospective/irrealis marker *càʔ* to its specifier position. Then, *thîi* moves to a higher projection, Modal(Irrealis)P, where it triggers movement of the remnant VP to its specifier:

(66)

M(Irrealis)P

VP$_k$ — jàak __$_j$

M(Irrealis)′

M(Irrealis) — thîi$_i$

ThiiP

IP$_j$ — PRO càʔ tham kaanbâan

Thii′

Thii __$_i$

VP$_k$

V — jàak — __$_j$

(cf. Singhapreecha 2010, ex. 53)
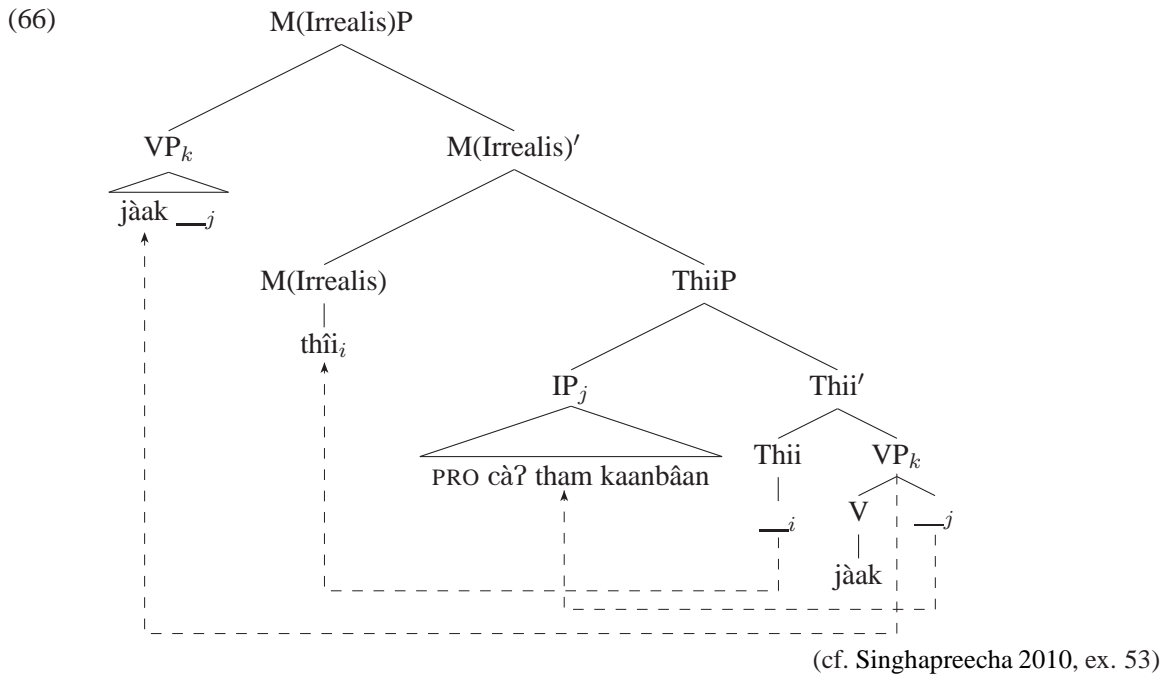
In lieu of a more detailed discussion, two observations are in order. First, it is not clear why *thîi* is merged above the matrix VP, considering that *thîi* is not a verbal head marking aspect or modality. Second, it is not clear why the ModalP is associated with *thîi*, and is the highest functional head in the matrix clause, given that the clear locus of the irrealis meaning in this sentence is the embedded clause, and the clear reflex of this meaning is the prospective marker *càʔ*, which occurs in the

embedded clause.

Under the view of *thîi* as a relative complementizer, infinitival complements of control verbs can be analyzed without these complications. Following the analysis of control in Chierchia (1984), control complements can be viewed as intensional properties of type $\langle s, \langle e, t \rangle \rangle$. Unlike in Chierchia's analysis, where control complements are analyzed as simple VPs, we can analyze these complements as full CPs, headed by *thii*, and with the caseless, subject oriented null category PRO base-generated in subject position:

(67)

```
                    . . .
                     |
                    VP
            _____/_____
           V                  CP
           |            _____/_____
          jàak        NP_i              C'
                       |          _____/_____
                       N         C               IP
                       |         |          _____/_____
                      PRO       thîi       __i           I'
                                                    _____/\_____
                                                   I            VP
                                                   |          __/\__
                                                   cà      tham kaanbâan
```
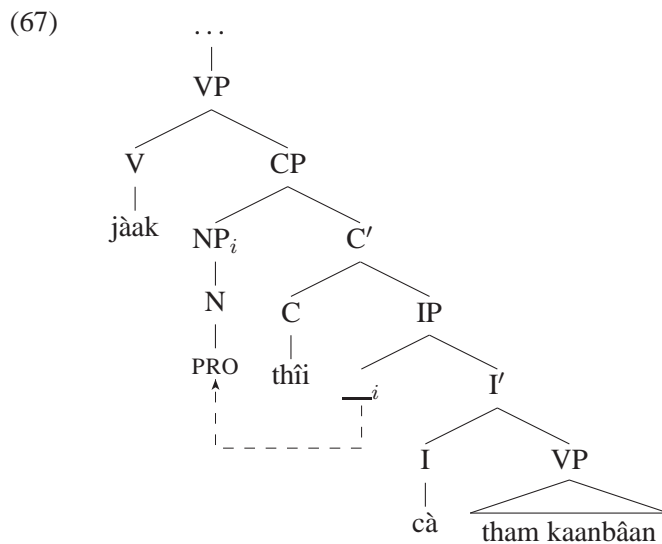
PRO is bound by *thîi*, resulting in a property, and the [uN] feature of *thîi* is checked by movement of PRO to the specifier of CP. Unlike in relative clauses, however, in control complements the CP projects in order to satisfy the selectional restrictions of the selecting verb.

An interesting consequence of this proposal is that it accounts straightforwardly for the observation in Jenks (2006) that *thîi* is optional in control complements of verbs. This is because control clauses may be able to occur as 'reduced' clauses with an unsaturated subject argument, as I proposed to account for the optionality of *thîi* with subject relative clauses in section 4.1.5. Thus, the analysis of *thîi* as a relative complementizer can be uniformly maintained whenever it precedes a clause, whether finite or infinitive. However, it is now clear that the label 'relative complemen-

tizer' is somewhat of a misnomer, as we have seen that *thîi* occurs whenever a clause needs to be interpreted as a property.

4.4   Against *Thîi* as a Marker of Predicate Inversion

A completely different approach to the syntax of *thîi* is taken by den Dikken and Singhapreecha (2004, DS). In a comparative study of French and Thai noun phrases, DS examine instances of direct and indirect modification of nouns by adjectives in both languages:

(68) a.   une   pizza chaude
           a-FEM pizza hot-FEM

      b.   une   pizza **de** chaude
           a-FEM pizza DE hot-FEM
           Both: 'a hot pizza'   (French, DS ex. 2)

(69) a.   dèk   kèŋ
           child smart

      b.   dèk   **thîi** kèŋ
           child THÎI smart
           Both: 'the/a smart child'   (Thai, cf. DS ex. 3)

DS propose that (69-b) and (68-b) involve predicate inversion (PI), a focus-related A-movement operation. For the examples above, they argue that the particle intervening between the noun and adjective is a LINKER, a syntactic pivot for PI. Another similarity is indicated in the interpretation: both (69-b) and (68-b) can be interpreted with contrastive focus on the adjective (though see below for the optionality of this interpretation for Thai).

While DS acknowledge the occurrence of *thîi* before subject relative clauses (1) and noun-complement clauses (2), they take this distribution to be an argument for their analysis, especially in light of the presence of *wâa* in NCCs. They argue that both environments involve PI. Yet we have seen that *thîi* is generally obligatory in both of these constructions, and we would not want to
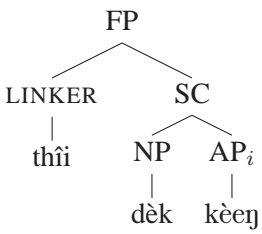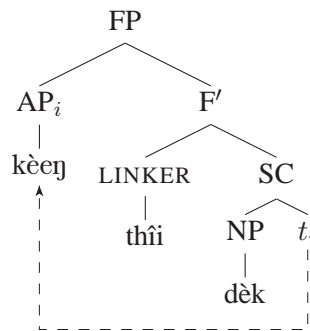
say that an information-structurally driven operation such as PI is obligatory. While this casts initial doubt on their proposal, in the two following subsections I will show that the PI-based analysis is problematic both because of its assumptions about Thai noun phrase structure and because of the general distribution of *thîi*. In addition, I show that the occurrence of *thîi* before adjectives as in (69) can be reduced to its occurrence before subject relative clauses, favoring a reduction of these cases *thîi* to the relative complementizer analysis.

4.4.1 Problems with the derivation

Predicate Inversion was proposed to account for specificational copular sentences (Moro 1997), and has been argued to occur within DPs as well (den Dikken 1998). In the constructions for which PI has been proposed, semantic predicates appear in the surface position that subjects usually occupy, a property which serves as a basic diagnostic for PI. For copular sentences, this results in a direct reversal of subject and object. To cite an example from Moro (1997), a predicational copular sentence like *The picture of the wall is the cause of the riot* can be inverted to form the specificational *The cause of the riot is the picture of the wall*, where the DP *The picture of the wall* is argued to be the underlying subject in both sentences. The most compelling argument for this account comes from the observation that subextraction from the object of a specificational copular sentence is not allowed, while it is possible in predicational copular sentences and objects of transitive verbs.

However, in the putative examples of PI in (68-b) and (69-b), the subject (noun) and predicate (adjective) occur in their canonical order. To maintain a PI-based account, DS propose a Duke-of-York derivation where after PI applies, an additional movement reinstates the original order. The arguments for this analysis are based on particular details of Thai DP syntax, then extended to French. For that reason, the remainder of this section will argue that the analysis is untenable for Thai, removing the basis for such an analysis of the French construction as well.

The first step in the derivation proposed is PI,[21] which begins when the LINKER, *thîi*, merges with a small clause (70-b-i).[22] The adjective then moves to the empty specifier position of *thîi* (70-b-ii):

(70)   a.   dèk *thîi* kèeŋ
               child THÎI talented
               'The/a talented child'

    b.   i.

```
                FP                          ii.            FP
              /    \                                     /    \
        LINKER      SC                               AP_i      F'
           |       /  \                                |      /   \
         thîi    NP    AP_i                          kèeŋ  LINKER   SC
                 |      |                                    |     /  \
               dèk    kèeŋ                                  thîi  NP   t_i
                                                                  |
                                                                 dèk
```

We can see that the output of PI is A-*thîi*-N, which is unattested in Thai.

Because of this, DS propose another step in the derivation reinstating the original order of noun and adjective. To this end, DS claim that in Thai, multiple classifiers can occur within a single noun phrase, and that a classifier can intervene between a noun and an adjective, following Singhapreecha (2001). There are significant empirical questions about the validity of this claim (see below), but I will repeat the example below to provide a full discussion of their derivation:

(71)   (*?)   rôm (khan) jàj   săam khan nán
               umbrella CLF big   three CLF that
               'those three big umbrellas'   (DS, ex. 32)

DS claim that the classifier is in complementary distribution with *thîi* in sentences like (70-a) (p. 20). In light of this claim they propose a null classifier is present when predicate inversion ap-

---

[21]DS present the derivation of a more complex DP with two classifiers and an overt demonstrative (pp. 20-21, ex. 35a-c), which has been simplified, *mutatis mutandis*, to focus only on the central component of their proposal.

[22]This proposal is repeated in den Dikken (2006, ch. 5), where the small clause also contains a null RELATOR. The same arguments apply to both versions of this proposal.

plies. Because classifiers are usually analyzed as heads in the functional projection of nouns (Tang 1990; Cheng and Sybesma 1999), the LINKER moves to Clf^0 by head movement (72-a). This head-movement permits the NP to move to the specifier of the ClfP (72-b), reinstating the original order of subject and predicate:[23]

(72)   a.

```
              ClfP
            /      \
   Clf/LINKER_x     FP
        |          /    \
       thîi      AP_i    F'
        ↑         |     /   \
        |       kèeN  t_x   SC
        |                  /   \
        |               NP_j   t_i
        |                |
        |               dèk
        └----------------┘
```

b.

```
              ClfP
            /      \
         NP_j      Clf'
          |       /      \
         dèk   Clf/LINKER_x   FP
          ↑       |          /    \
          |      thîi      AP_i    F'
          |                |      /   \
          |              kèeŋ   t_x   SC
          |                          /  \
          |                        t_j   t_i
          └---------------------------┘
```
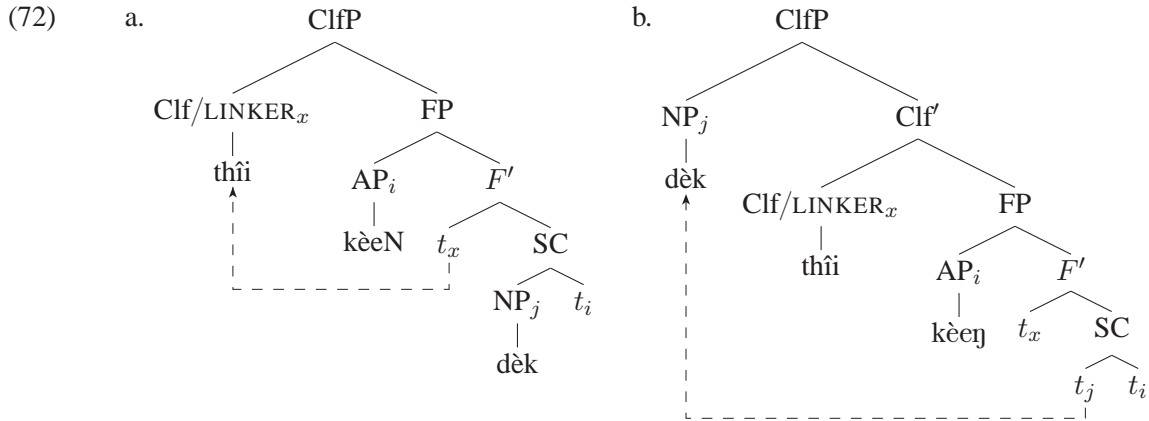
The motivation for each of these steps is different. While PI occurs because of focus on the adjective, head movement in (72-a) may occur in order to provide phonological support for the classifier head. As for the uninversion in (72-b), classifiers cannot be interpreted independently of the nouns that project them, and it is not surprising that the classifier and noun might need to occur locally. Assuming a universal base of functional projections, DS propose to extend the derivation in (72) to French and beyond.

The problems with this derivation center around the example in (71). I have that example as ungrammatical in parentheses because there is a significant lack of clarity in the literature about the availability of such constructions. For example, Visonyanggoon (2000) marks the following, nearly equivalent, sentence, as ungrammatical:

---

[23]This step involves movement of the whole remnant small clause in den Dikken 2006, see fn. 22, irrelevant for the discussion below.

(73)   *naaj khon kɔ̀n   sɔ̌ɔŋ khon
       boss CLF former two CLF

<div align="right">(Visonyanggoon 2000, ch. 3, p. 82)</div>

These sentences are ungrammatical in part because the *classifier-adjective* sequence in (73) requires that the noun phrase be interpreted as singular, which would prohibit the use of the numeral. This sentence is somewhat different in that the modifier following the classifier is not predicative. Nevertheless, in the survey discussed above (fn. 3) such sentences were found to be ungrammatical. The survey sentences all involved animate head nouns, while DS's examples involve inanimate head nouns. Still, speakers find sentences such as (71) awkward with the classifier present.[24]

To begin with, contrary to DS's claim that the classifier and *thîi* are in complementary distribution, examples like the one below are quite natural:

(74)   a.   dèk **khon thîi** kèeŋ
            child CLF THII talented
            'the child who is talented'

       b.   *dèk **khon** kèeŋ   **thîi**
            child CLF talented THII

       c.   *dèk **thîi khon** kèeŋ
            child THII CLF talented

Examples (74-b-c) demonstrate that the word order in (74-a) is the only grammatical one. Yet the word order in (74-a) is not predicted by the derivation in (73), while (74-b-c) are, contingent on different constraints. (74-b) would result if the overt classifier blocked the head movement of *thîi*. If *thîi* moved and left-adjoined to the classifier, the ungrammatical order in (74-c) would result. Example (74-a) could only result from rightward head-adjunction of *thîi* to the classifier, prohibited

---

[24]The question remains why such examples have persisted in the literature. They seem to amount to cases of misanalysis, or perhaps ambiguity of analysis for speakers. Visonyanggoon (2000) demonstrated that while similar constructions are allowed, they actually amount to cases where classifiers are used predicatively, and the class of classifiers which can be so used is limited. It might be that the predicative use of classifiers, especially with adjectives such as 'big' in Thai, are grammatical for some speakers. With animate nouns, however, these predicative classifiers and 'true' classifiers can be clearly distinguished. See section 5.2.1 and Visonyanggoon (2000), pp. 70-74 for discussion.

by DS's assumption of the Linear Correspondence Axiom (Kayne 1994).

A more basic problem is with the constituency in (72); evidence from coordination (discussed already in section 3.2.3) suggests that the classifier does not form a surface constituent with *thîi*-Adj. When two *thîi*-Adj constituents are coordinated, the DP can be interpreted as referring to a single individual or set of individuals with a complex set of properties (75-a). Yet when Clf-*thîi*-Adj are coordinated, the DP must be interpreted as referring to two separate individuals or sets of individuals (75-b):

(75) a. dèk **khon** [**thîi** kèeŋ] lɛ́ʔ [**thîi** rûay]
    child CLF THII talented and THII rich
    'The rich and talented child(ren)'

  b. dèk [**khon thîi** kèeŋ] lɛ́ʔ (dèk) [**khon thîi** rûay]
    child CLF THII talented and child CLF THII rich
    'The rich child(ren) and talented child(ren)'

The meaning of the second example is not changed if the head noun is repeated in the second conjunct. This indicates that conjunction of the classifier corresponds to conjunction of the entire DP. These facts do not follow from the structures in (72), but are compatible with an analysis where *thîi* forms a constituent with the adjective, as in the relative complementizer analysis.

Another problem is DS's assumption that the classifier occurring before the adjective in (71) is optional. This is only partially true. In Thai, classifiers can occur outside of quantificational environments before adjectives and relatives clauses in what I have already called the classifier-modifier construction (see ex. (35)), where they give rise to a definite singular interpretation:

(76) a. dèk thîi kèeŋ
    child THII talented
    'The/(A) child(ren) who is/are talented who are talented'

  b. dèk khon (thîi) kèeŋ
    child CLF THÎI talented
    'The talented child'

This definite interpretation only becomes evident without an overt demonstrative or quantifier, however. Because overt demonstratives require a definite interpretation, they mask the effect of the classifier, as in (71). This is why the classifier appeared optional to DS, whose examples almost all include demonstratives. In fact, the presence of the classifier triggers a definite interpretation for the noun phrase, so it is not strictly optional. The classifier-modifier construction in (76-b) is the topic of chapter 5.

To summarize, there are at least three independent reasons to doubt whether a classifier phrase is always present in N-*thîi*-A constructions. First, classifiers can occur adjacent to *thîi* in a position that cannot be accounted for by the predicate inversion analysis (74-a). Second, the classifier does not form a constituent with the *thîi*-A unit (75). And third, an overt classifier before adjectives affects the interpretation and structure of the DP, casting doubt on an analysis which assumes that it might always be present (76).

4.4.2 The productivity of *thîi*

Even if a way around these structural issues could be found, an independent problem is related to the distribution of *thîi*. DS contend that *thîi* is restricted to quantificational environments with contrastive focus on the adjective, as has been observed for the French N-*de*-A construction in (68-b). I show in this section that the Thai construction is more productive than its French counterpart, both in terms of its interpretation and its syntactic distribution.

Previous literature on the French N-*de*-A construction in (68-b) (Azoulay-Vicente 1985; Hulk and Verheugd 1994) observes that it is restricted to quantificational environments, including indefinites, wh-constructions, and focus constructions. In addition, N-*de*-A is associated with a particular information structural profile, where the adjective is discourse-given but contrastively focused. DS make the connection between the French and Thai constructions explicit by claiming that they share these properties. Curiously, in the literature on N-*thîi*-A in Thai, the restricted interpretation and

distribution of the French N-*de*-A construction have never been noticed. Below I show that this is because they do not exist.

Beginning with the syntactic distribution of N-*thîi*-A versus N-*de*-A, while the French construction generally appears in quantificational environments, there are exceptions, as it cannot appear in full *wh*-phrases or full quantifier phrases:

(77)   a.   *Quel homme d' intelligent connais-tu?
           which man   DE intelligent know-you

        b.   Paul a   développé toutes les analyses (*de) compatibles avec la théorie
           Paul has developed all   the analyses DE   compatible with the theory
           chomsskienne.
           Chomskyan.
           'Paul has developed all analyses compatible with Chomskyan theory.' (DS, fn. 1)

In contrast, *thîi* is licit in these environments, a fact which DS do not observe:

(78)   a.   khun rúu   cak phúu.chay (thîi) kèŋ   khon nǎj
           you know of man   THII smart CLF which
           'Which smart man do you know?'

        b.   Paul khâw.caj   thrítsàdii (thîi) sápsɔ́ɔn   thúk yaŋ
           Paul understand theory   THII complicated every CLF:TYPE
           'Paul understands every type of complicated theory.'

These data show that the quantificational restriction on N-*de*-A does not hold for Thai N-*thîi*-A.

Moreover, the Thai construction does not have to occur in a quantificational environment at all; it is compatible with both definite (79-a) and generic (79-b) DPs, both of which are non-quantificational:

(79)   a.   náŋsɯ̌ɯ thîi nâa-sǒn-caj lêm níi
           book   THII interesting CLF this
           'this book that's interesting'

        b.   tóʔ   (thîi) sǔuŋ hǎa.yâak
           table THII tall   rare

            'Tall tables are rare.'

Together, these examples show that the Thai construction has a more general syntactic distribution than N-*de*-A. This observation casts doubt on whether the two constructions share the same structure or derivation.

      For interpretation, unlike N-*de*-A, contrastive focus on the adjective is not a necessary condition for N-*thîi*-A. To see this, consider the following discourse:

(80)   a.   ʔóʔ   súɯ tóʔ   tua (thîi) sǔuŋ máy
              NAME buy table CLF THII tall   YNQ
              Q: 'Did Oh buy the table that's tall?'

        b.   mày.chày ʔóʔ   súɯ kâw.ʔîi (thîi) sǔuŋ
              no   NAME buy chair   THÎI tall
              A: 'No, he bought a tall CHAIR.'

The question establishes 'tall table' in the discourse. The response only differs from the question in the content of the noun, resulting in contrastive focus on 'chair'. The adjective remains given. Still, N-*thîi*-A is possible in the response. So we cannot conclude that the adjective must be contrastively focused for *thîi* to occur, contrary to the claims of DS.

      It is true that N-*thîi*-A is allowed, perhaps even preferred, in contexts where contrastive focus is on the adjective. This could be accounted for in part by an analysis of N-*thîi*-A in Thai as a subject relative clause. Like many isolating languages, adjectives do not require a copula when they serve as a clausal predicate in Thai:

(81)   dêk khon níi kèeŋ   mâak
        child CLF this talented very
        'This child is very talented.'

The absence of any copula in *thîi*-A is not a problem for its status as a subject relative. As relative clauses are fully productive, their presence in generic and definite DPs, as well as with or without

contrastive focus on the adjective, is expected. In fact, relative clauses would intuitively be pro-nounced or perceived with greater emphasis on the predicate than in basic adjectival modification by virtue of the fact that adjectives there are the main predicates of a structural clause.

In summary, all of the problems in this section, including the distribution of classifiers, the constituency of *thîi*-A, and the productivity of N-*thîi*-A can be accounted for under the analysis that of *thîi*-A is simply a subject relative clause. On the other hand, the French construction, with its focus-related interpretation and distributional restrictions, requires a different analysis. But the problems with the PI analysis of *thîi* undermine the plausibility of such an analysis for French.

4.5   Summary

In this chapter clausal modification of Thai nouns was investigated through the distribution of the particle *thîi*. I proposed that *thîi* functions simultaneously as a complementizer and as a relative operator, following the analysis of the Scots Gaelic relative complementizer in Adger and Ramchand (2005). I argued that this view of *thîi* can be generalized to every instance of *thîi* before clauses, including its use in noun-complement clauses, clefts, and in infinitives. What all of these environments share is the fact that a CP is interpreted as a property. Noun phrase internally, that property is combined with the noun by Predicate Modification, while infinitives are presumably characterized by semantically taking clausal complements which have the type of properties.

A central question raised by my proposal is the extent to which my analysis of *thîi* can be extended to relative complementizers in other languages. This is obviously an empirical question, centered around the issue of whether other languages with dedicated relative complementizers also use these complementizers in noun-complement clauses and infinitives. There are promising signs, however. For example, in Khmer relative clauses and noun-complement clauses are introduced by the same particle *dael* (Comrie and Horie 1995), which seems to be the Khmer counterpart

of *thîi*. In Bulgarian, a dedicated relative complementizer meaning 'where' is used to introduce factive complements of verbs (Krapova 2010), though it is not clear if this same complementizer is also used with noun-complement clauses. And in Gungbe, fact-clauses and relative clauses are both introduced by the same 'relative' complementizer, though they differ in the position of the definiteness marker in the noun phrase (Aboh 2005). Likewise, Caponigro and Polinsky (2011) observe that the Circassian language Adyghe uses relative clauses where many other languages would resort to embedded CPs. These extend verbal complements, which are argued to involve a null nominal head, just as in my analysis of Thai verbal complements headed by *thîi* in section 4.3.1. Other languages, such as Japanese, lack a relative marker of any kind, though only noun-complement clauses in Japanese contain complementizers (Matsumoto 1988), just as *wâa* is only present in noun-complement clauses in Thai. In Mandarin Chinese, noun complement clauses are introduced by the relative marker *de*, but it is also used with modifiers which are not clauses. This wider distribution for *de* may be related in that it is not necessarily categorically specified as a complementizer in the same way that *thîi* is in Thai.

Another major issue which arose in the analysis of Thai relative clauses was how to derive relative clauses using the head-raising relative in noun phrases without an overt article. Because bare nouns modified by relative clauses have the same range of interpretations that bare nouns themselves do, postulating an article with relatives modifying bare nouns would undermine the kind-based analysis argued for in chapter 3. Rather than positing such a determiner, I argued, following Aoun and Li (2003) and suggestions in Bhatt (2002), that the raised NP in relative clauses can itself project. This projection by the moved element was proposed to be optional, subject in part to the selectional requirements of the selecting head. I would like to emphasize at this point that there may be alternative structures available for Thai relative clauses, including a matching or head-external analysis. To the extent that they are empirically necessary, however, head-structures represent the most difficult cases theoretically because the head noun originates inside of the relative

clause.

The following chapter continues the investigation of head-raising relative clauses but asks instead whether there is ever evidence for a determiner with such relative clauses, and what the properties of this determiner are. I argue, based on the properties of the classifier-modifier construction, that such a determiner is sometimes present, and that while it does take clausal complements, it cannot occur in unmodified noun phrases.

Chapter 5

The Classifier-Modifier Construction

Numeral classifiers are so named because their most salient trait is their obligatory accompaniment of numerals. However, the assertion that classifiers must accompany numerals is a necessary but not sufficient description of their syntax in many languages. That is to say, while classifiers must occur with numerals in most classifier languages, they also occur in other environments that have received less attention.

This chapter focuses on one such construction in Thai. It is noted in very early descriptions that in some cases, classifiers could be licensed by modifiers in Thai (Hass 1942; Jones 1970):[1]

(1)　　a.　thúrian sǎam lûuk
　　　　　　durian　three CLF
　　　　　　'(the) three durians'

　　　　b.　thúrian lûuk thîi měn
　　　　　　durian　CLF REL stinky
　　　　　　'the durian that is smelly'

I will refer to the construction in (1-b) as the Classifier-Modifier Construction (CMC). There are two challenges for any adequate formal syntactic (and semantic) treatment of the CMC.

---

[1]Hass's actual examples are not instances of the true CMC, but cases of the 'false' possessor raising construction in section 5.2.1.

The first challenge is understanding how relative clauses and other modifiers 'license' classifiers in the CMC. As the following example shows, bare *noun-classifier* sequences are ungrammatical in Thai:
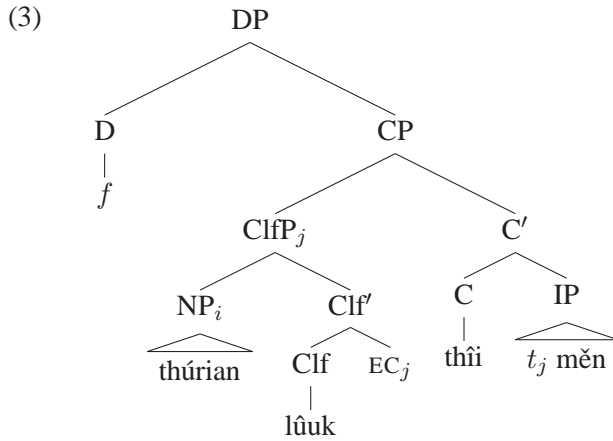
(2)   *thúrian lûuk
         durian CLF

Thus, the presence of the classifier in (1-b) is contingent on the presence of the modifier *thîi měn*.

Relative clauses and other modifiers are traditionally analyzed as adjuncts, and thus neither need to be licensed, nor are they necessary for licensing other elements of the clause. In contrast, we saw evidence in chapter 3 that classifiers are heads in the functional spine of the Thai DP which occur with overt specifiers, such as numerals. This ClfP can project a higher DP, headed by strong quantifiers, for example. We also saw that classifiers were generally required by deictic modifiers. Relative clauses, on the other hand, freely occur with bare nouns, making their ability to license classifiers all the more puzzling.

The second challenge presented by the CMC is semantic: while noun phrases containing numeral-classifier sequences such as (2-a) can be interpreted either as indefinite or definite, noun phrases containing the CMC must be interpreted as definite, as shown by the gloss in (1-b). There is no overt syntactic reflex of this obligatorily definite interpretation. This syntax-semantics mismatch, too, must be accounted for.

Below I outline an analysis of the CMC that relies on a null determiner, which takes the relative clause as its complement, inspired by the analysis of relative clauses from Kayne (1994). The bare classifier phrase occurs as the subject of this predication relation. This structure is illustrated below:

(3)

```
                    DP
            _____
           |                   |
           D                   CP
           |            _____
           f           |                |
                     ClfP_j             C'
                  _____         _____
                 |        |       |          |
                NP_i     Clf'     C          IP
                 △      _____    |        _____
              thúrian  |     |    thîi    t_j  měn
                      Clf   EC_j
                       |
                      lûuk
```

The strongest evidence I present for this analysis, in section 5.3.3, demonstrates that the classifier

and deictic modifiers that follow it must be reconstructed into the CP. These data closely resemble

the evidence for reconstruction presented in the previous chapter. While before it was proposed that

head-raising can lead to reprojection, below I propose that the CP must project in cases of the CMC

in order for the derivation to converge. I extend this analysis to cases where classifiers are licensed

by adjectives and prepositional phrases, which I argue involve small clause complements of D.

The structure in (3) accounts for the definite interpretation of the CMC by positing a null

determiner, which I will argue is interpreted as a choice function based on more nuanced facts about

the interpretation of the CMC with numerals. However, it is less obvious how (3) can account

for the licensing puzzle. My proposal is that this structure accounts for licensing because it is

structurally distinct from cases such as (2), where D must take the ClfP as its complement. I argue

such free-standing bare classifiers are in *competition* with bare nouns, preferred based on principles

of *structural economy*. However, when bare classifier phrases occur as the external head in a relative

clause structure such as (3), I argue that structural economy is alleviated. This claim leads to the

analysis of similar cases in unrelated languages, as well as a proposed explanation for the availability

of bare nouns and bare classifiers across classifier languages.

The structure of this chapter is as follows. I begin, in section 5.1, with an outline of the

basic structural and semantic properties of the CMC. These properties include the status of the

classifier in the CMC (section 5.1.1), the interpretation of modifiers in the CMC (section 5.1.2), and

the observation that the CMC is more accurately associated with specificity rather than definiteness

(section 5.1.3). Two constructions that on the surface resemble the CMC are examined in section

5.2, and distinguished from the CMC. In section 5.3, the D-CP analysis of the CMC is detailed,

including the idea that the D in the CMC is interpreted as a choice function (section 5.3.2). I further

argue in section 5.3.3 that this null D can take CP as well as small clause complements. Section

5.3.4 contains the argument that the apparent licensing effect of the modifier in the CMC is due

to the alleviation of an economy condition, Avoid Structure. This analysis makes crosslinguistic

predictions about the complementarity of definite bare nouns and definite bare classifiers, which I

argue are by and large correct (section 5.4.1). I also ask whether all classifier languages might have

an equivalent of the null determiner to which I attribute the CMC in Thai (section 5.4.2).

5.1   The Nature of the CMC

This section makes three basic observations about the CMC. Section 5.1.1 examines the clas-

sifier in the CMC, showing that is a 'true' classifier as it can satisfy the selectional requirements

of numerals and other distributive quantifiers. The range of modifiers that can appear in the CMC

and the generalization that they only allow intersective readings is introduced in section 5.1.2. Last,

section 5.1.3 describes the interpretation as a whole of DPs containing the CMC. I will show that

these DPs must be interpreted as singular and definite when bare, but can also be interpreted as

specific indefinite when numerals occur before the classifier.

5.1.1   Classifiers as functional heads

We saw in the introduction that what is surprising about the CMC is that classifiers are li-

censed by putative modifiers. Below we see that this same classifier can be preceded by a numeral

or quantifier as well:

(4)   a.   thúrian sǎam lûuk thîi měn
             durian 3   CLF REL stinky
             'the three durians that are smelly'

        b.   thúrian thúk lûuk thîi měn
             durian every CLF REL stinky
             'every durian that is smelly'

These examples show that the classifier appearing in the CMC is indeed a 'true' classifier.

Earlier I concluded, following the work of other linguists, that classifiers in Thai should be regarded as functional projections of the noun. One piece of evidence for this conclusion was the coordination of noun phrases containing classifiers, which must be interpreted as the coordination of two separate DPs ((34)). Similar examples are repeated below, focusing specifically on the coordination of classifiers occurring in the CMC:

(5)   [$_{DP}$ thúrian lûuk thîi měn   ] lɛ́ʔ [$_{DP}$ lûuk thîi sùk]
          durian CLF REL stinky   and   CLF REL ripe
        'the durian that is smelly and the durian that is ripe'

Despite the plausibility of an interpretation where the durian is both smelly and ripe (most ripe durian are, in fact, quite smelly), that interpretation of (5) is not available. Instead, the coordination must be interpreted as referring to two separate objects: one smelly, one ripe. If the classifier is removed from the second conjunct, however, an interpretation with coordinated properties is available. This examples shows that the classifier does not form a constituent with the modifier, as is expected if it is a functional projection of the noun. This conclusion precludes an analysis of the CMC based on a non-standard analysis of its classifier.

5.1.2 Modifiers after classifiers

Below I examine properties of the modifier in the CMC. First, to qualify as a case of the CMC, modifiers must follow the classifier. This is because modifiers only license classifiers when they follow them:

(6)   a.   thúrian [$_{CP}$ thîi měn   ]
          durian   REL stinky
          '(the) durian(s) that is/are smelly'

        b.   thúrian lûuk [$_{CP}$ thîi měn   ]
            durian CLF   REL stinky
            'the durian that is smelly'

        c.   *thúrian [$_{CP}$ thîi měn   ] lûuk
            durian   REL stinky CLF

These examples rule out another class of analyses; those relying on the general semantic contribution of the relative clause within the noun phrase. For example, Dayal (2005) analyzes a number of other instances of licensing by relative clauses by appealing to the idea that clausal modifiers supply DPs with a situation variable they might otherwise lack. Such an analysis could not be extended to Thai in light of the data in (6). Because relative clauses can only license classifiers when they follow them, the ability of relative clauses to provide the noun phrase with a situation variable on its own cannot provide an adequate account of the CMC.

All of the examples of the CMC up to this point have contained relative clauses, but other modifiers also occur in the CMC. This class is broad, including relative clauses (7-a), adjectives (7-b) (preferably reduplicated) and prepositional phrases (7-d):

(7)   a.   [$_{DP}$ thúrian lûuk [$_{CP}$ thîi měn   ]] yùu khâaŋ-nôɔk
            durian CLF   REL stinky   LOC side-out
          'The durian that's smelly is outside.'

        b.   [$_{DP}$ thúrian lûuk [$_{AP}$ měn-měn   ]] yùu khâaŋ-nôɔk
            durian CLF   stinky-REDUP   LOC side-out
          'The smelly durian is outside.'

    c.   [$_{DP}$ thúrian lûuk [$_{PP}$ bon tɔ́ʔ   ]] měn   mâak
         durian CLF   on table   stinky very
         'The durian on the table smells really bad.'

Possessive NPs can occur in the CMC only with contrastive focus on the possessive PP:

(8)   [$_{DP}$ thúrian lûuk [$_{PossP}$ khɔ̌ɔŋ Nít]] yùu khâaŋ-nɔ̂ɔk
         durian CLF   POSS Nit LOC side-out
         'NIT's durian is outside.' (not Nat's)   (cf. Piriyawiboon 2010, p. 79)

Piriyawiboon (2010, p. 79) presents the same example as ungrammatical, and it is indeed unnatural without contrastive focus. At this point it is unclear whether (8) is an instance of the CMC proper or a separate phenomenon.

There are a number of interpretational differences between modifiers that directly follow nouns in Thai and those which follow classifiers. These differences, first noted by Kookiattikoon (2001), roughly correlate with the distinction between attributive and predicational modification (Bolinger 1967; Cinque 2010; Larson 1998; Larson and Takahashi 2007, among others).

To begin, consider the following examples which involve verbal modifiers of nouns:

(9)   a.   ná-rian tên-ram
         student dance
         'a dance student'

    b.   khruu wáaj-náam
         teacher swim
         'a swim teacher'

    c.   nók phûut-dâj
         bird speak-can
         'a talking bird'   Kookiattikoon (2001, p. 188)

In the examples above, the verbal modifier of the noun is interpreted attributively, arguably as a compound, modifying the basic reference of the noun. So rather than referring to general students, (9-a) makes reference to students of dance in particular. Likewise, (9-b) makes reference to teachers

that are swimming instructors, while (9-c) refers to the kind of bird which is capable of talking.

When classifiers intervene, the verbs then describe the current activity or state of the reference of the noun:

(10)   a.   nák-rian khon tên-ram
             student CLF dance
             'the student who is dancing'

        b.   khruu   khon wáaj-náam
             teacher CLF swim
             'the teacher who is swimming'

        c.   nók tua phûut-dâj
             bird CLF speak-can
             'the bird that can talk'   Kookiattikoon (2001, p. 189)

These differences in the interpretation of the adjective in (10) and (9) are distinct in at least two dimensions. First, while the modifiers in (10) are interpreted restrictively, those in (9) are not. Second, while the modifiers in (10) are stage-level or predicative modifiers, those in (9) are interpreted as generic or individual-level modifiers.

Adjectives also have different interpretations depending on whether they directly follow the noun or if a classifier intervenes:

(11)   a.   nák-tên   sǔaj
             AG-dance beautiful
             'a beautiful dancer' (beautiful person or dances beautifully)

        b.   nák-tên   khon sǔaj
             AG-dance CLF beautiful
             'the/some beautiful dancer' (only a beautiful person)

(12)   a.   phɨan kàw
             friend old
             'a familiar friend' *or* 'a long-standing friend'[2]

---

[2]Note that these examples cannot mean 'aged,' which in Thai is a different adjective, *kɛ̀ɛ*, when applied to people.

    b.   phẁan khon kàw
           friend CLF old
           'the/some familiar friend' (only)   (Kookiattikoon 2001, p. 194)

In both of these examples, the adjective occurring directly after the noun has two available interpretations. In (11-a), it can be interpreted as either making an assertion about the quality of the dancer or making an assertion about the person who is dancing. This contrast disappears in (11-b), where only the latter interpretation is available. Similarly, there are two interpretations available in (12-a), that the friend is familiar, or that the friend has been a friend for a long time. When the classifier intervenes, only the former interpretation is available.

    Finally, Kookiattikoon (2001) observes that while nominal modifiers of nouns are allowed directly following the noun, a classifier cannot intervene:

(13)   a.   nák-rian (*khon) phɛ̂ɛt
              student CLF   medicine
              'a medical student'

        b.   khruu (*khon) físìk
              teacher CLF   physics
              'a physics teacher'

        c.   nók (*tua) pàa
              bird CLF forest
              'forest bird'   (Kookiattikoon 2001, p. 188-189)

All of these modifiers are non-intersective in the sense that they identify a subkind of the kind denoted by the head noun rather than naming an independent property that holds of the head noun.

    In all of these examples, we see that when modifiers follow classifiers, they must be interpreted predicatively. By *predicatively*, I mean they are interpreted as if they were the main predicate of a clause. Semantically, this analysis entails that these modifiers denote a set or characteristic function defined by the property described by the modifier. Only predicational modifiers are allowed after classifiers in Thai, which is not surprising inasmuch as the CMC constitutes a case of

indirect modification (Sproat and Shih 1988), or cases where nominal modifiers are not directly jux-taposed with nouns, a point made by Visonyanggoon (2000). I will return to these generalizations about the interpretation of modifiers later, in section 5.3.3.

5.1.3 Definiteness, specificity, and singularity

Just as modifiers have a special interpretation when they follow classifiers, so do noun phrases as a whole have a special interpretation when they contain an instance of the CMC. Noun phrases containing the CMC must be referential. While cases without numerals must be definite and singu-lar, instances of the CMC with numerals can be specific indefinite:

(14) a. [[N-Clf-Mod]] 'Bare CMC' = singular and definite

  b. [[*N-Num-Clf-Mod*]] 'Num + CMC' = specific indefinite or definite

Below I present diagnostics for definiteness and specificity to illustrate this generalization.

The easiest way to see the referential restriction on the CMC is to first present sentences where it is prohibited, including generics (15), and presentational or existential constructions (16).

(15) *taam-thamadaa thúrian lûuk sùk-sùk wǎan mâak
      generally   durian CLF ripe   sweet very
      'Generally ripe durian are very sweet.' (intended)

(16) a. *mii thúrian lûuk sùk-sùk khâŋ-nôɔk
          exist durian CLF ripe   outside

  b. *mii thúrian sǎam lûuk sùk-sùk khâŋ-nôɔk
      exist durian three CLF ripe   outside

(cf. Visonyanggoon 2000, p. 81)

Furthermore, noun phrases containing the CMC can serve as complements of the equative or speci-ficational copula *khɯɯ*, but they cannot occur as the complement of the predicative copula *pen*:

(17) a. Nik **khɯɯ**   khon thîi chán rák
            COP:EQ CLF REL 1SG love
          'Nick is the person that I love.'

      b. *Nik **pen**   khon thîi chán rák
            COP:PRED CLF   REL 1SG love

(Ruangjaroon 2005, p. 105)

The impossibility of the CMC in (17-b) demonstrates that instances of the CMC must be inter-

preted referentially, and thus cannot occur in predicative positions (see section 4.2.3 of chapter 4 for

details).

The next few examples show that the CMC does occur in environments where we would

expect definite noun phrases. In (18-a), umbrellas are introduced into the discourse. The CMC

is used to refer to them in (18-b), where they are both unique and familiar, characteristic traits of

definite noun phrases (Heim 1982; Löbner 1985):

(18) a. Nát súɯ [[rôm   sǐi-dɛɛŋ nɯ̀ŋ-khan] lɛ́ʔ [rôm   sǐi-dam   nɯ̀ŋ-khan]]
            Nat buy   umbrella color-red one-CLF   and   umbrella color-black one-CLF
          maa.
          PRF
          'Nat bought one red umbrella and one black umbrella.'

      b. tɛ̀e mɯ̀a klap bâan, khǎw mâj chɔ̂ɔp [rôm   khan sǐi-dɛɛŋ   ]
            but when return home 3S   NEG like   umbrella CLF color-red
          'But when he returned home, he didn't like the red umbrella.'

In this context, *rôm* 'umbrella' in (18-b) is anaphoric, and the adjective *sǐi-dɛɛŋ* 'red' is focused,

just as in the gloss, where primary focus must be on the adjective *red*, because *umbrella* is given by

the discourse.

The CMC can be used in this same environment even if a numeral precedes the classifier:

(19) a. Nát súɯ [[rôm   sǐi-dɛɛŋ sɔ̌ɔŋ-khan] lɛ́ʔ [rôm   sǐi-dam   sǎam-khan]]
            Nat buy   umbrella color-red two-CLF   and   umbrella color-black three-CLF
          maa.
          PRF

'Nat bought two red umbrellas and three black umbrellas.'

b. tèe mûa klap bâan, khǎw mâj chɔ̂ɔp [rôm   sɔ̌ɔŋ-khan sǐi-dɛɛŋ]
   but when return home 3s   NEG like   umbrella two-CLF   color-red
   'But when he returned home, he didn't like the two red umbrellas.'

Thus, the presence of the numeral before the CMC does not preclude definite interpretations, even though no explicit marker of definiteness is present in either case.

Further evidence for definiteness is the *consistency* effect of Löbner (1985), which distinguishes true definite noun phrases such as (20-a) from demonstrative noun phrases such as (20-b):

(20)   a. #The boy is sleeping but the boy is not sleeping.

        b.   That boy is sleeping but that boy is not sleeping.

Piriyawiboon (2010) applies this test to Thai demonstrative noun phrases and shows that, like the English demonstrative noun phrases in (20-b), Thai demonstrative noun phrases do not exhibit consistency effects. However, in DPs with bare CMCs, consistency effects do arise:

(21)   #[[dèk   khon thîi son   ] nɔɔn yùu] tɛ̀ɛ [[dèk   khon thîi son   ] mâj.dâj nɔɔn
         child CLF REL naughty sleep IMP but   child CLF REL naughty NEG   sleep
       yùu]
       IMP
       #'The naughty boy is sleeping but the naughty boy is not sleeping.'

Thus, we can conclude that *bare* CMCs, that is, those without a quantifier preceding the classifier, must be interpreted as definite.

Instances of the CMC preceded by a numeral also show consistency:

(22)   #[[dèk   sǎam khon thîi son   ] nɔɔn yùu] tɛ̀ɛ [[dèk   sǎam khon thîi son   ]
         child some CLF REL naughty sleep IMP but   child some CLF REL naughty
       mâj.dâj nɔɔn yùu]
       NEG   sleep IMP
       # 'The three naughty boys are sleeping but the three naughty boys are not sleeping.'

However, if the CMC is preceded by a 'true' indefinite quantifier such as *baaŋ* 'some', consistency effects do not arise:

(23)   [[dèk   baaŋ khon thîi son   ] nɔɔn yùu] tɛ̀ɛ [[dèk   baaŋ khon thîi son   ]
          child some CLF REL naughty sleep IMP but   child some CLF REL naughty
        mâj.dâj nɔɔn yùu]
        NEG   sleep IMP
        'Some naughty boys are sleeping but some naughty boys are not sleeping.'

This is the reason the characterization of the CMC above has been restricted to cases with numerals. (23-b) shows that the presence of a non-numeral indefinite quantifier allows non-referential readings.

Partitives provide evidence for further splits in the interpretation of the CMC. Specifically, Num+CMC allow partitive readings (24-b) but bare CMCs do not:

(24)   a.   mii măa sǐi   dam săam tua   khâaw bâan maa …
              have dog color black 3   CLF enter   house come
              'Three dogs came into the house.'

        b.   …sɔ̌ɔŋ tua sǐi   dam rɔ̂əm hàw-hɔ̌ɔn
                    2   CLF color black begin   bark
              'Two of the black dogs started barking'

        c. *… tua sǐi   dam rɔ̂əm hàw-hɔ̌ɔn
                 CLF color black begin bark
              'One of them began barking.'

Enç (1991) has showed that partitives are specific because they are anaphoric to a definite set, but they are not maximal. The contrast above clearly thus shows that when numerals are present, the CMC can receive specific indefinite interpretations, though instances of the bare CMC can only be interpreted as definite.

The following table summarizes the interpretations available to noun phrases containing the CMC:

(25)

	Definite	Specific indefinite	Existential	Generic
*(N)-*CLF*-modifier*	✓	×	×	×
*(N)-weakQ-*CLF*-modifier*	✓	✓	×	×

The basic generalization is that all noun phrases containing the CMC must be interpreted as specific. In addition, specific indefinite interpretations require a weak quantifier before the classifier.

5.1.4 Summary

I conclude that classifiers occurring in the CMC should be regarded as 'canonical' classifiers in the sense that they are functional projections of the noun and they can serve as the restriction for numerals. The class of modifiers which can follow the classifier in the CMC is quite broad; the only major constraint is that they these modifiers must receive predicative interpretations. Finally, it was shown that noun phrases containing the CMC must be interpreted referentially.

5.2 Intruders: Two False Cases of the CMC

Two Thai constructions appear superficially similar to the CMC but should be distinguished from it. The first intruder is a construction involving predicative noun-adjective compounds. Some of the nouns in this construction superficially resemble classifiers, but Visonyanggoon (2000) has already shown that these cases are distinct. The second intruder is a construction involving deictic modifiers from chapter 3, section 3.5. These cases are more similar to the CMC in that they involve real classifiers, but deictic modifiers are semantically distinct from the modifiers occurring in the CMC proper.

5.2.1 Noun-adjective compounds

In some recent work on Thai noun phrases (Singhapreecha 2001), the claim has been made that multiple classifiers can appear in the same noun phrase. On the surface, these examples do bear

resemblance to the CMC:

(26)   nók tua lék   sǎam tua nán
         bird CLF small three CLF DEM:that
         'those three small birds' (Singhapreecha 2001, ex. 1)

Examples of this sort were also observed by Hass (1942, p. 204). The examples that Hass presents

to support her conclusion involve the same classifier as Singhapreecha, *tua*, literally, 'body.' Sing-

hapreecha proposes an abstract structure to account for sentences such as (26), which involves mul-

tiple ClfP projections and obligatory roll-up movement of the entire DP. This analysis of the Thai

noun phrase also serves as the background for the analysis of the particle *thîi* in den Dikken and

Singhapreecha (2004). Were the classifier-adjective sequence in (26) truly an instance of the CMC,

it would demand a significantly more complex analysis than the one I introduce below, perhaps

along the lines of Singhpreecha's proposal.

However, Visonyanggoon (2000) presents several arguments that the first instance of the

classifier *tua* in (26) is not actually a true classifier, but rather part of a complex modifier similar

to English compound adjectives such as *big-bodied*, *full-bearded*, or *rosy-eyed*, as well as more

idiomatic cases such as *blue-collar* and *black-tie*. That the putative classifier *tua* 'body' occurs as

the first part of the compound adjective in (26) in addition to serving as the classifier for animals is

only by coincidence.

The first argument to support this claim is the observation that modifiers such as *tua-lék* can

occur with human common nouns, which take a different classifier. This classifier can co-occur

with a compound adjective containing *tua*, as the following examples show:

(27)   a.   phûu-yǐŋ tua   sǔuŋ sǎam **khon**
               woman   body tall   three CLF
               'three tall women'

         b.   *phûu-yǐŋ tua   sǔuŋ sǎam **tua**
               woman   body tall   three CLF

In both examples, *tua-sŭuŋ* serves as an adjectival modifier. Like *tua-lék* in (26), this compound adjective is made up of the noun *tua* 'body' and an adjective that describes a physical property of that body. Now while *tua* also serves as the classifier for animals, it cannot be used for human beings, which take the classifier *khon* 'person.' Thus, the example above clearly demonstrates that the first instance of *tua* in (26) should not be considered a true classifier.

In addition, the set of adjectives that can be combined with a noun such as *tua* is limited to those describing physical dimensions. Hence, **tua-chalàat* 'body-intelligent' is ill-formed (Visonyanggoon 2000, p. 72). In contrast, there are no such restrictions on the modifier that can appear in the CMC, modulo those constraints on the interpretation of modifiers in the CMC discussed in section 5.1.2.

When nouns are modified by these compound adjectives, they do not see any of the restrictions on definiteness or number that were observed for genuine instances of the CMC. For example, noun phrases containing compound adjectives can occur in existential sentences:

(28) mii phûu-yĭŋ tua   sŭuŋ săam **khon** yùu   khâaŋ-nɔ̂ɔk
      exist woman   body tall   three CLF   (LOC) outside
      'There are three tall women outside.'

Genuine instances of the CMC cannot occur in existential sentences, as we saw in example (16).

If we try to produce instances of the CMC where a true *classifier-modifier* sequence precedes a *numeral-classifier* sequence, the result is ungrammatical:

(29) *dèk khon chalàat   săam khon
      child CLF intelligent three CLF

The initial *classifier-adjective* sequence indicates that the noun phrase is singular, but following *numeral-classifier* sequence contradicts this requirement.

The strongest piece of evidence that the putative *classifier-adjective* sequence in (26) is not an instance of the CMC is the fact that these sequences can serve as clausal predicates:

(30)   a.   phûu-yĭŋ khon nán tua-sǔuŋ
               woman   CLF that body-tall
               'That woman is tall.'

        b.   lûuk-pòoŋ bay níi lûuk-too
               ballon   CLF this ball-big
               'This balloon is big.'   (Visonyanggoon 2000, p. 73)

This is the same kind of direct predication observed for adjectives generally, which do not require a copula to function as predicates in Thai.

In conclusion, the *tua-lék* sequence in (26) should not be analyzed as multiple instances of a classifier within a noun phrase but rather as an adjective formed by the compounding of a noun with an adjective, producing a compound adjective.[3] As such, our analysis of the CMC and Thai noun phrases should not account for such modifiers, as they comprise a distinct phenomenon from the CMC.[4]

5.2.2   Deictic modifiers again

The predicates in the previous section are distinct from the CMC because they do not contain a true classifier. Yet the instances of deictic modification discussed in section 3.5 did involve a true classifier, and like instances of the CMC, they obligatorily receive definite, singular interpretations

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[3]One problem with this analysis is that the adjective is on the right in these cases while compounds in Thai are generally left-headed, as we saw in chapter 3 in the discussion of plurals. As these 'compounds' generally involve inalienably possessed body parts, they are probably instances of possessor raising.

[4]Visonyanggoon (2000, p. 105, fn. 4) discusses another construction where two classifiers do seem to occur in the same noun phrase. These classifiers must be separated by an intonational break, however, and as such Visonyanggoon analyzes this phenomenon as an instance of DP apposition.

Additionally, Hundius and Kölver (1983) indicate that *classifier-adjective* sequences can iterate indefinitely according to their speakers, but in practice such noun phrases are almost never used and most speakers find them awkward. However, some speakers do admittedly accept these examples. Such putative instances of "classifier-spreading" might be an obvious candidate for an analysis in terms of apposition, following Visonyanggoon's suggestion for similar cases.

when a numeral is absent:

(31) a. thúrian lûuk níi/nán
          durian CLF this/that
          'This/that durian'

      b. thúrian lûuk nɯɯŋ
          durian CLF INDEF
          'A certain durian'

      c. thúrian lûuk rɛ̂ɛk
          durian CLF sole
          'The sole durian'

As I argue in section 3.5 that these deictic elements are, in fact, modifiers, these cases could be collapsed with the CMC, as in the analysis of Visonyanggoon (2000), who suggests that they compete for a position in [Spec, ClfP].

There are several reasons to be suspicious of an account collapsing deictic modifiers and the CMC. First, diectic modifiers are clearly semantically distinct from 'true' instances of the CMC because they are neither predicative nor intersective. Thus, deictic modifiers constitute an exception to the predicative interpretations required for cases of the CMC (section 5.1.2).

Second, deictic modifiers usually must follow classifiers,[5] while the predicative modifiers appearing in the CMC can modify the noun directly, as we saw for relative clauses throughout chapter 4. Moreover, when predicative modifiers follow the noun, they can still be followed by classifiers, as long as that classifier is independently licensed (32-a). Such pre-classifier positions are impossible for deictic modifiers (32-b):

(32) a. thúrian thîi sùk sǎam lûuk
          durian REL ripe three CLF
          'Three durians that are ripe'

---

[5]The exception is again the ability of demonstratives to occur without classifiers as discussed in 3.5 and as observed by Hundius and Kölver (1983). Such cases must involve a null classifier head.

b. *thúrian rêɛk sǎam lûuk
   durian first three CLF

This difference indicates that the deictic modifiers are distinct from normal predicative modifiers in that they must attach high in the structure. While this difference does not preclude an analysis of predicative modifiers as adjoined to ClfP, as was proposed for deictic modifiers, such an analysis does not solve the licensing problem. I will argue in section 5.3.4 that the licensing problem does not arise with deictic modifiers because they must occur with a classifier to be interpreted.

Finally, when both predicative modifier and deictic modifiers follow a noun, the predicative modifier must follow the deictic modifier:

(33) a. thúrian lûuk diw thîi sùk
          durian CLF only REL ripe
          'the only durian that's ripe.'

      b. *thúrian lûuk thîi sùk diw
          durian CLF REL ripe only

(34) a. thúrian lûuk rêɛk bon tóʔ
          durian CLF first on table
          'the first durian on the table'

      b. *thúrian lûuk bon tóʔ   rêɛk
          durian CLF on   table first

Deictic and predicative modifiers cannot be ordered freely, indicating that they are not structurally identical. This difference plays a crucial role in the analysis of the CMC below. However, deictic modifiers continue to remain relevant for our discussion, both in sections 5.3.3 and in section 5.3.4.

5.3   The D-CP analysis of the CMC

My analysis of the Classifier-Modifier Construction in Thai below is novel, although the central intuition behind the analysis is shared with earlier work. The intuition is that definite and specific readings of Thai noun phrases involving a classifier arise due to the presence of a null

determiner. The novel component of my proposal is that this null determiner can take clauses functioning as modifiers, including relative clauses and small clauses, as its complement. I argue that while bare classifier phrases satisfy the semantic requirements of this determiner, a structural economy constraint rules out these cases due to the availability of definite bare nouns in Thai.

5.3.1 Earlier analyses of the CMC

Before introducing my analysis, I begin by briefly reviewing the proposals of Piriyawiboon (2010) and Visonyanggoon (2000), and showing where they fall short. The most recent analysis of the CMC was provided by Piriyawiboon (2010), who simply labels the construction "specific modified NPs." Piriyawiboon assumes that the adjective appearing in the CMC is right-adjoined to the NP. The second difference is that Piriyawiboon proposes that a sub-projection of the NP, the lower segments created by adjunction, is moved to the specifier of ClfP, followed by movement of the ClfP to the specifier of a higher Spec(ific)P:

(35)   a.   bâan lăŋ jàj
          house CLF big
          'the big house'

     b.
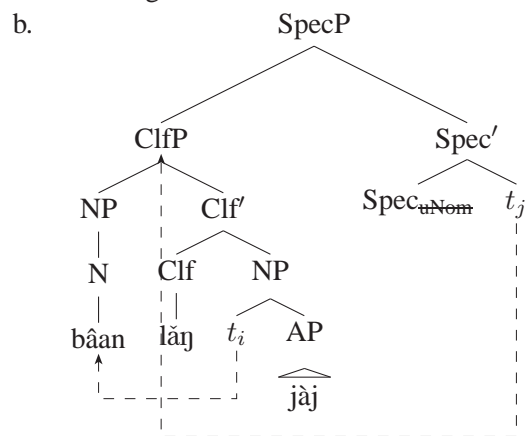
(Piriyawiboon 2010, p. 107-108)

One problem with this proposal is theory-internal. Contemporary theories of movement (re-merge, internal merge, etc.) assume that it is driven by downward probes attracting the closest

category that matches the type of the probe. Thus, movement should target the largest NP segment, rather than the smaller one.

This problem could be avoided by adopting a structure where the AP is right-adjoined to the ClfP rather than NP:

(36)
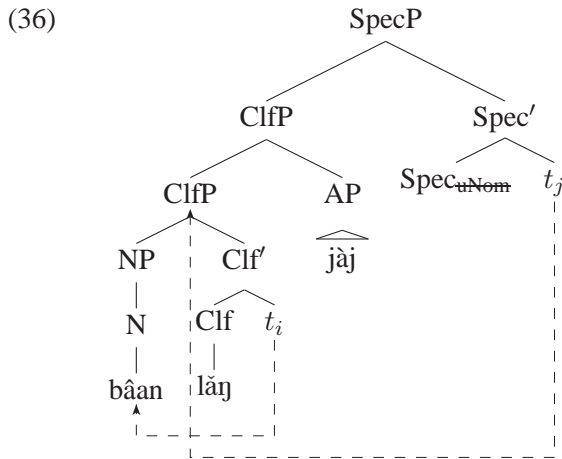
This proposal is similar to the one of Visonyanggoon (2000), only she assumes that the modifier is in [Spec, ClfP] (on the left) and is stranded by head-movement of the classifier to Num^0. She makes this assumption based on a parallel between deictic modifiers and the CMC.[6]

These proposals agree that the referential nature of the CMC should be attributed to a null D above the classifier. However, neither proposal accounts for the classifier licensing problems of the CMC, as modifiers function as adjuncts in both cases. The standard analysis of modifiers as adjuncts is precisely the source of the licensing problem, as described above.

5.3.2 The null determiner

A good starting point is the source of the definite and specific indefinite interpretations associated with the CMC. One option is associating the referential interpretation with the classifier itself,

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[6]In fact, Visonyanggoon (2000) only considers cases of the CMC involving adjectives after the classifier. It is not completely clear whether these adjectives are instances of the CMC or deictic modifiers. One relevant consideration is that simple adjectives are not able to follow other deictic modifiers, unlike relative clauses. However, this may be due to a garden-path effect, as an adjective following a demonstratives is most likely to be interpreted as a main predicate.

as proposed by Cheng and Sybesma (1999), to account for definite bare classifiers in Cantonese. While I delay full discussion of this approach (section 5.4.2), the most obvious problem with this proposal is that classifiers frequently occur in indefinite noun phrases. This is unsurprising from the perspective of the semantics provided in chapter 3, where ClfPs denote properties. I conclude that classifiers cannot be the source of the referential interpretation.

Instead, I follow the proposals outlined above in associating the referentiality of the CMC with a null determiner. The novel aspect of my proposal is that this determiner takes the modifier as its complement, as in the analysis of relative clauses proposed by Kayne (1994, p. 86-92):

(37)   *Structure for bare CMC with relative clause*

   a.   thúrian lûuk thîi měn
         durian CLF REL stinky
         'the durian that is smelly'
   b.   DP
                    ╱   ╲
              D$_{[uN]}$ CP
                           ╱   ╲
                    ClfP$_{[N]i}$ C′
                    ╱   ╲   ╱   ╲
              thúrian ∅ lûuk   thîi t_i měn
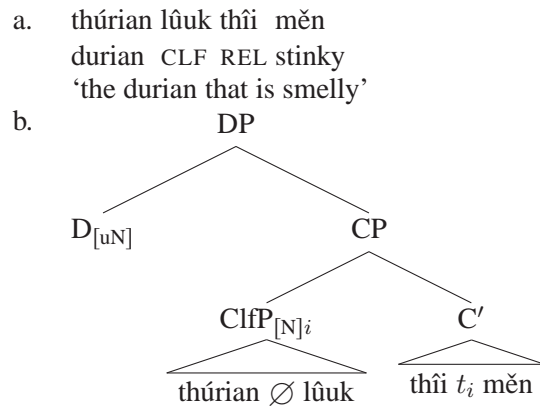
One of the reasons that relative clauses can occur as the complement of D is semantic: definite and referential determiners are of type $\langle\langle e, t\rangle, e\rangle$, and thus must take complements with the semantic type of properties (cf. Stowell 1991; Partee 1986). On the syntactic side, I assume that D bears an uninterpretable N-feature, [uN], which must be valued locally by by an accessible NP. This view echoes the analysis of c-selection by Matushansky (2006). While the complement of D is not required to bear an N-feature, it must contain an accessible NP. There is no way of knowing whether this ClfP moves to [Spec, DP] in (37), as such an operation would be string-vacuous.

Positing a null D allows us to account for the absence of an overt numeral with the classifier.

At several points in chapter 3, I argue that while classifiers require a numeral argument, when the numeral is *nùŋ* 'one' it can be deleted, as long as a higher head is present above the ClfP. This null numeral is represented above as the empty set. We saw, for instance, that strong quantifiers generally license a null 'one', though they could occur with higher cardinals. The presence of D, then, can be tied to the availability of 'one' deletion, in a way made more precise below.[7]

The next question is how to interpret D. The generalization about the interpretation of noun phrases with the CMC (section 5.1.3) is repeated below:

(38) a. $[\![\text{N-Clf-Mod}]\!]$ = definite

  b. $[\![\textit{N-Num-Clf-Mod}]\!]$ = specific indefinite or definite

Definiteness interpretations are generally attributed to an ι-operator (e.g. Partee 1987), which encodes maximality and familiarity, while specific indefinites are generally analyzed as choice functions (Chierchia 2001; Kratzer 1998; Matthewson 1999; Reinhart 1997; Winter 1997).

Chierchia (2005) notes that the ι-operator is simply a special choice function that encodes uniqueness and familiarity. He then argues that definites and specific indefinites are identical except for the requirement that a specific indefinite must be existentially closed, a position argued for independently in Chierchia 2001, as in the original analysis of Reinhart 1997. This leads Chierchia to propose that there is only one choice functional operator, which I will call D_{CF}.[8] Chierchia argues that the presence of an existential operator is regulated by a feature on D_{CF}, [$\pm$def]. The uniqueness typical of definites arises due to the pragmatic restriction of the CF domain; definites arise when the context only contains a single individual (or plural individual).

Let's spell this analysis out in a little more detail. The question is how the [$\pm$def] feature

---

[7]The particular analysis or arguments in this chapter do not hinge on the existence of a null numeral 'one,' and seem to be generally compatible with the

[8]This resembles Matthewson (2001)'s claim that in St'át'imcets, a Salish language, the determiner is always interpreted as a CF.

on D_{CF} interacts with definite-marking elements lower in the DP. This interaction excludes strong quantifiers, because they are in complementary distribution with the null D_{CF} (see below). Likewise, we can say that true indefinite quantifiers, such as *lăaj* 'several,' cannot occur as the complement of D_{CF}, because they require a true existential determiner or predicate. This assumption is motivated by the fact that non-numeral indefinites in the CMC did not trigger consistency effects (23). This leaves numerals, including the null variant of 'one' implicated in definite cases of the CMC.

Let us say that D_{CF} can be freely selected in the numeration with either of the two settings for [±def], the null hypothesis. Numerals are featureless, and do not place any constraints on D_{CF}. To account for the definiteness of bare CMCs, I assume that there is a null allomorph of the numeral 'one' licensed by the [+def] feature on D_{CF}. Finally, only when D_{CF} is [−def] can existential closure of the choice function itself apply, resulting in specific indefinite readings. The dependency of existential closure on [-def] might be because existential operators themselves probe for [def] features, and are deleted when they do not encounter any [-def] DPs. This proposal is quite stipulatory. Confirmation would come by establishing an interaction in locality between potentially definite DPs and their ability to undergo existential closure, a project which has not been undertaken.

As a choice function, D_{CF} can take any complement of type $\langle e, t \rangle$ as long as it contains an accessible NP to check its [uN] feature. This proposal restricts the type of CP complements of D_{CF} to relative clauses without further stipulation, because relative clauses have the type of properties with an external nominal head. In the following section I will argue that small clauses also can occur as the complement of D_{CF}, and they they can also receive property-typed interpretations.

This proposal predicts that ClfP should be able to occur as the complement of D because it is of type $\langle e, t \rangle$ (see section 3.2.2). This prediction is partially correct. The following example demonstrates that noun phrases with overt numerals can be interpreted as definite; specific indefinite interpretations are also available. I take such ClfPs to be the complement of D_{CF}:

(39) a. thúrian sǎam lûuk
          durian 3   CLF
          '(the) three durians'
      b.
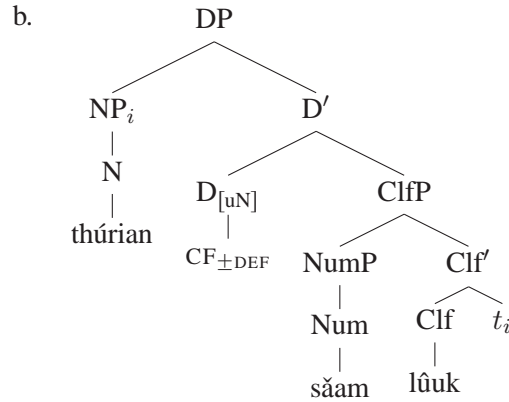
Only the cases of bare classifiers and bare nouns remain. As I argued in Chapter 3, following Chierchia 1998 and Piriyawiboon 2009, nouns in Thai are interpreted as kinds of type $\langle e_k \rangle$, which permits an analysis of definite bare nouns as bare NPs, lacking D. NPs thus cannot function as the complement of D_{CF} because they are the wrong type.

On the other hand, bare ClfPs, i.e. those with null 'one', *are* of type $\langle e, t \rangle$, and as such they are incorrectly predicted to serve as the direct complement of null D (see ex. (54-a)). This brings us to the heart of the licensing problem. The question is how the modifier complementation structure can permit bare ClfPs while they are ruled out when they occur as the direct complement of D_{CF}. (See section 5.3.4 below.)

The CF analysis of D extends to all cases where the CMC is bare or contains a numeral. This same analysis could also be extended to apparent cases of the CMC which involve a strong quantifier such as *thúk* 'every':

(40) thúrian thúk lûuk thîi   měn
      durian CLF REL stinky
      'the durian that is smelly'

However, it is not obvious that (40) is actually an instance of the CMC because the interpretation is

strongly quantificational (i.e. prohibited in existential sentences) regardless of whether the modifier is present.

Because strong quantifiers are located in D (section 3.4.2), they alternate with D_{CF}. As an instance of D, we expect that like D_{CF}, *thúk* can either occur with a CP complement or ClfP complements, in which case the modifier in (40) is analyzed as an adjunct to this ClfP:

(41)
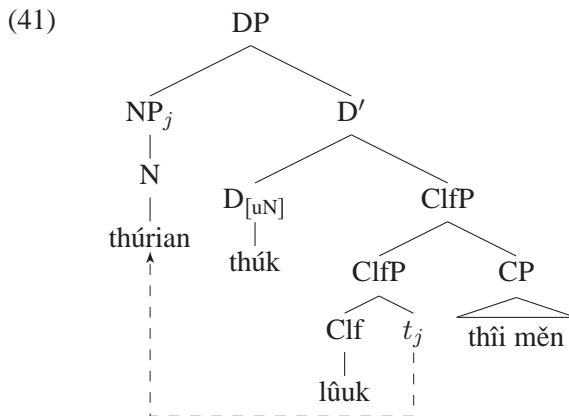
The idea that D is filled with either a quantificational determiner or with the choice function is natural under the view of noun phrase interpretations adopted in Partee (1986). Partee argues that argumental noun phrases have either the type of generalized quantifiers ($\langle\langle e, t\rangle, t\rangle$) or of individuals ($\langle e\rangle$). As DPs are necessarily argumental, we would expect them to have one of these two types. While the presence of syntactic elements which gave rise to quantificational readings has been established, we now know how individual-typed noun phrases containing a classiifer can be derived, through D_{CF}.

To summarize, the referential interpretations characteristic of the CMC can be attributed to a null determiner interpreted as a choice function: D_{CF}. D_{CF} is endowed with a [uN] feature which requires that it c-command an accessible NP in addition to a [±def] feature. The semantics of choice functions are rich enough to account for the full range of CMC interpretations, including the interpretation of definite and specific indefinite noun phrases, which vary depending on the feature setting of [±def]. The [+def] feature licenses 'one' deletion. D_{CF} alternates with overt quantifica-

tional determiners such as *thúk* 'every.' D_{CF} can take any complement as long as it is of type $\langle e, t \rangle$. This analysis predicts that D_{CF} should be able to take bare classifiers as its complement, contrary to fact. Before the question of why bare classifiers are ungrammatical is addressed, the following section deals with the internal structure of the CMC, and how to account for the predicative restriction on modifiers in the CMC (section 5.1.2).

5.3.3 The internal structure of the CMC

The analysis of the CMC outlined above had two ingredients. The first was the null determiner, D_{CF}. The second was the ability of D_{CF} to take a CP complement, following the analysis of relative clauses in **Kayne** (1994). The full proposed structure and derivation is provided below, including the movement of the NP from its position as the sister of the classifier:

(42)
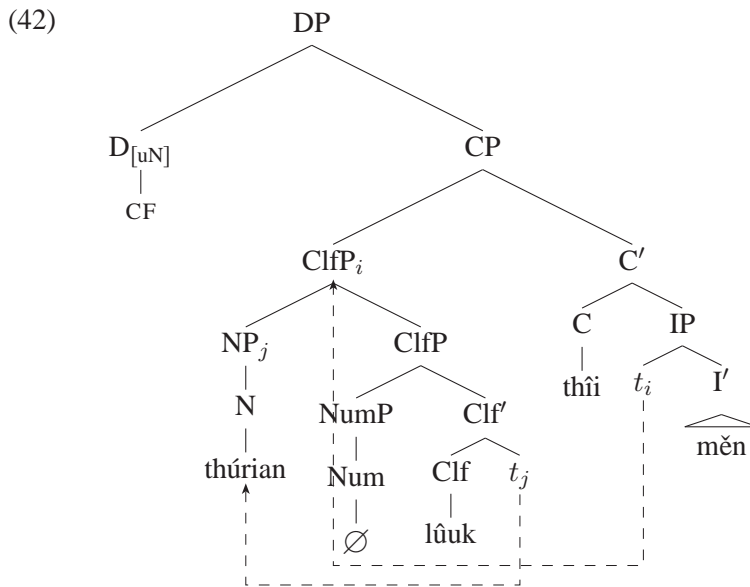
In section 4.1.4 I proposed that when raising relative clauses in Thai were headed by bare NPs, these NPs could reproject after merger. However, following **Iatridou et al.** (2001), I take this reprojection operation to be optional. In fact, reprojection is probably the marked option. Reprojection is unnecessary in (42) because the D head, an extended projection of N, serves as the topmost projection.

In section 4.1.2 evidence from island violations and weak crossover demonstrated that Thai relative clauses involve movement. Section 4.1.3 provided further evidence for this claim, showing that idiom reconstruction was available. Evidence was also provided from the semantic reconstruction of deictic modifiers into the clause, arguments borrowed from Bhatt (2002), which specifically implicated the head-raising analysis of relative clauses. These data became relevant again in section 5.2.2 to show that deictic modifiers are distinct from the CMC, the relevant fact being that deictic modifiers could not be freely ordered with respect to the CMC.

The examples from section 5.2.2 are repeated below:

(43)   a.   thúrian lûuk diw thîi sùk
              durian CLF only REL ripe
              'the only durian that's ripe.'

        b.   thúrian lûuk rɛ̂ɛk bon tóʔ
              durian CLF first on table
              'the first durian on the table'

We concluded before that because the relative clause must follow the deictic modifier, both cannot be simply adjoined to the ClfP.

We now have a principled way of accounting for this asymmetry: while the modifier is adjoined to ClfP, the relative clause, and apparently the prepositional phrase (see below), are both complements of D_{CF}:

(44)
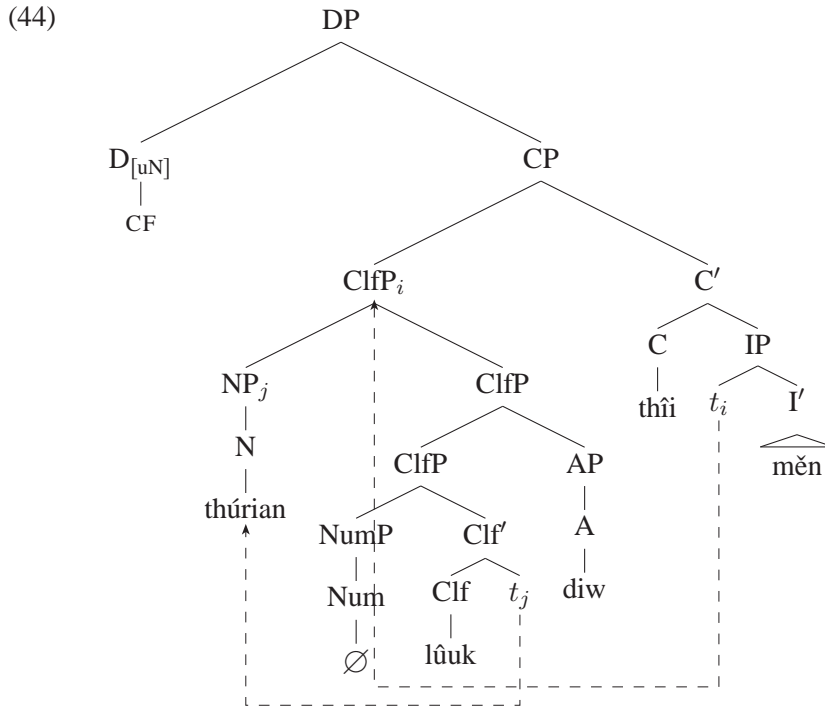
Adopting a head-raising analysis for (43) accounts for an additional facet of its interpretation, namely that the deictic modifier must be interpreted inside of the relative clause. That is, (43-a) can be uttered in contexts where there are additional durians, but none are ripe, but not in contexts where there is only one durian that happens to be ripe.

The reconstruction data from section 4.1.3 already points to this conclusion. Specifically, example (16) of chapter 3 shows that not only must the relative head be reconstructed into the relative clause, but also that it can be reconstructed in one of two positions:

(45) bòtkhwaam chabàb sùttháaj thîi nít phûut wâa chɔɔmskíi khǐian chɯ̂ɯ wâa on phases.
      paper   CLF   last   THÎI Nit say   WÂA Chomsky write name WÂA on phases
      'The last paper that Nit said that Chomsky wrote is "On Phases."'

Recall that the two readings are 1) Nit mentioned several papers of Chomsky's and the last one he mentioned is 'On Phases' and 2) Nit claimed that the last paper that Chomsky wrote is 'On Phases.' This duplicates Bhatt (2002)'s novel argument for head-raising. Because these examples require

that the deictic modifier be reconstructed into the relative clause, they entail that the entire *noun-classifier-deixis* sequence must be part of the relative head rather than just the noun itself. Therefore, the classifier in these examples is not a projection above the relative clause, but originates inside of it.

Kayne's proposal about D-complementation is usually associated with relative clauses. However, he also proposes that possessives and some prepositional phrases can function as the complement of D (p. 101-105). For Thai, we can extend the analysis of the relative clause in (45) to the instances of the CMC in which adjectives, prepositional phrases, and possessives license the classifier (repeated from example (7)):

(46) a. [DP thúrian lûuk [AP měn-měn   ]] yùu khâaŋ-nɔ̂ɔk
         durian CLF   stinky-REDUP   LOC side-out
         'The smelly durian is outside.'

     b. [DP thúrian lûuk [PossP khɔ̌ɔŋ Nít]] yùu khâaŋ-nɔ̂ɔk
         durian CLF   POSS Nit   LOC side-out
         'Nit's durian is outside.'

     c. [DP thúrian lûuk [PP bon tɔ́ʔ]] měn   mâak
         durian CLF   on table   stinky very
         'The durian on the table smells really bad.'

Kayne argues that postnominal possessives in English such as *of John's* as well as PPs are the predicates of an unpronounced IP.[9] This analysis could be extended to the Thai examples above by analyzing them as reduced relative clauses.

Because both of these modifiers can occur as main predicates without any intervening copula, possessives and adjectives could be analyzed as reduced relatives:

(47) a. thúrian lûuk nán [AP měn-měn   ]
         durain CLF that   stinky-REDUP
         'That durian really stinks.'

---

[9]Kayne's analysis of *of John's* is actually much more complex: *of* is the complementizer, *John* is the subject, and *'s* is the internal predicative head which has a copy/trace of the relative head as its complement (p. 102).

b. thúrian lûuk nán [PossP khɔ̌ɔŋ Nít]
durain CLF that POSS Nit
'That durian belongs to Nit.'

However, these elements freely modify nouns as well, and presumably do not always project clausal structure. Whether or not they might be reduced relative clauses remains an open question.[10]

However, there is reason to think that not all modifiers in (47) are reduced relatives. When they function as predicates, prepositional phrases and possessives generally require a copula:

(48) a. thúrian *(yùu) [PP bon tɔ́ʔ]
durian LOC on table
'The durian is on the table.'

However, the copula *yùu* can be omitted if it occurs in putative small clause environments, such as in the complement of the verb *hěen* 'see':

(49) phǒm hěn Nít (yùu) [PP bon tɔ́ʔ]
I see Nit LOC on table
'I saw Nit on the table'

The subject of the PP has changed from a common noun to a proper noun in (49) in order to exclude an interpretation where the PP was simply a modifier of the noun.

As the locative copula can be omitted in small clauses, one possibility is that D_{CF} can take small clauses in addition to relative clauses as its complement in Thai, illustrated below for a PP modifier in the CMC:

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[10]I am glossing over some complications involved in the possessive. As Nattaya Piriyawiboon (p.c.) has pointed out, possessive predicates do require a copula if the subject is animate.

(50)

```
              DP
           /      \
        D[uN]      SC
                 /     \
            ClfP[N]      PP
            /    \       /\
      thúrian ∅ lûuk   bon tɔʔ
```
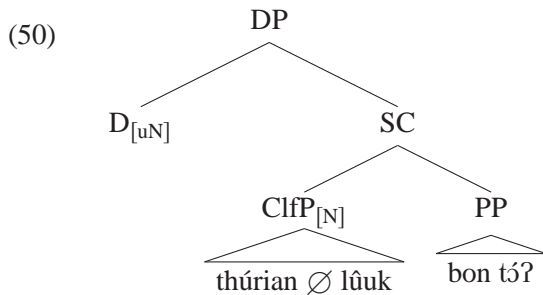
The small clause structure in (50) is headless, congruent with early analyses of small clauses (Hoek-
stra 1988; Kayne 1984; Stowell 1981, 1983). Modern analyses of small clauses frequently analyze
them as headed by a functional category that must be present to mediate any predicational relation-
ships, which I follow Bowers (1993) in labeling PredP (Adger and Ramchand see also 2003; den
Dikken see also 2006; Mikkelsen see also 2005). This more articulated small clause structure is
shown below:

(51)

```
              DP
           /      \
        D[uN]      PredP
                  /     \
            ClfP[N]      Pred′
            /    \       /    \
      thúrian ∅ lûuk  Pred     PP
                               /\
                            bon tɔʔ
```
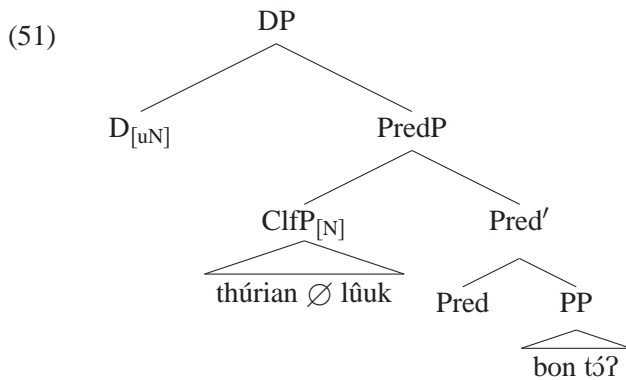
Whether the small clause structure in (50) or (51) is adopted, small clauses are necessary
to account for the occurrence of PPs in the CMC. Generalizing over the relative clause and small
clause cases, we can say that the null choice functional determiner characteristic of the CMC can
take either a CP or a small-clause complement. In both cases, then N-Clf constituent occurs as the
specifier of this category.

Now recall from section 5.1.2 that modifiers in the CMC must be interpreted predicatively.
Both the (reduced) relative clause and the small clause analysis provide a direct explanation for this

distinction. Regarding the relative clause analysis, Cinque (2010) observes that predicative interpretations for modifiers are correlated with specific syntactic positions with remarkable regularity in a number of languages. He proposes that this observation can be derived by positing (reduced) relative structures as a source for these positions. Positing a relative source for these modifiers accounts for their predicative readings because structurally, the modifiers are analyzed as the main predicate of the embedded relative clause. Thus, by analyzing the modifiers following the classifier in the CMC as (reduced) relative clauses, their predicative interpretation follows directly.

The small clause analysis ((50) or (51)) also provides a direct account for the predicative interpretation of modifiers in the CMC because 'true' small clauses are associated with predication (Bowers 1993; Rothstein 1995). Furthermore, predicative small clauses are structurally distinct from non-predicative small clauses, as attested by their behavior in both wh-extraction — only predicative small clauses are not islands — and in the distribution of the copula — only optional in predicative small clauses (den Dikken 2006; Moro 1997, 2000; Rothstein 1995). The idea that small clauses can occur noun phrase internally is commonplace, and has been used to account for phenomena as diverse as predicate inversion (Corver 1998; den Dikken 1998; den Dikken and Singhapreecha 2004; den Dikken 2006), basic nominal modification (den Dikken 2006), and determiner spreading in Greek (Campos and Stavrou 2004; Ioannidou and den Dikken 2009). Many of these analyses assume that the small clause is the complement of D. While I take issue with their analyses of predicate inversion in Thai in section 4.4, the DP-internal small clause structure for Thai proposed by den Dikken and Singhapreecha (2004) is an obvious predecessor for the structure I am proposing here, though they do not propose that the small clause is necessarily selected by a null determiner.

We must conclude that in the relevant environments, both small clauses and relative clauses are interpreted as type $\langle e, t \rangle$. I outlined an analysis of relative clauses in chapter 4 where they combine with their noun by Predicate Modification, which intersects a derived NP property with the

relative clause property. When the NP projects, the intersected property can be shifted back into a kind via the property-to-kind operator 'up' (section 3.1.1). When the CP projects, however, no shift takes place, and the resultant intersected property is shifted to an referential type by D_{CF}:

(52)   a.   thúrian lûuk thîi ___ měn
           durian CLF REL   smelly
           'the durian that is smelly'

   b.
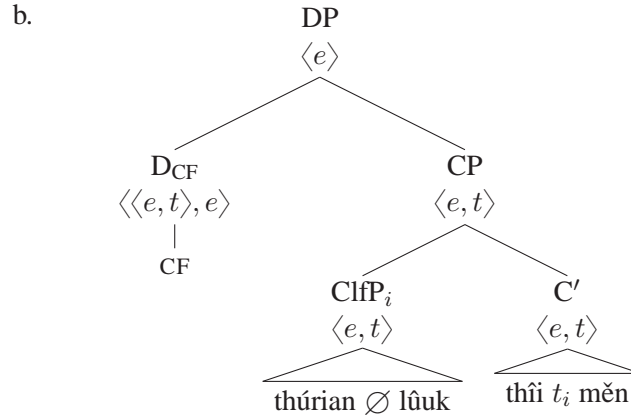
   c.   (i) $[\![C']\!] = \lambda x[\text{smelly}(x)]$
       (ii) $[\![ClfP]\!] = \lambda x[^{\cup}\text{DURIAN}(x) \wedge \mu_{AT}(x) = 1]$
       (iii) $[\![CP]\!] = \lambda x[^{\cup}\text{DURIAN}(x) \wedge \mu_{AT}(x) = 1 \wedge \text{smelly}(x)]$ (by Pred. Mod.)
       (iv) $[\![D]\!] = \lambda P.f_{w,i}[P]$
       (v) $[\![DP]\!] = f_{w,i}[\lambda x[^{\cup}\text{DURIAN}(x) \wedge \mu_{AT}(x) = 1 \wedge \text{smelly}(x)]]$
       (vi)   Paraphrase: A certain durian chosen by the function CF in circumstance $\langle w, i \rangle$ from the set of x such that x is a durian and x is an atom and x is smelly.

In (52) the ClfP is interpreted in [Spec, CP] and then intersected with the C'. In cases of reconstruction, the head noun must be interpreted inside of the CP, and some variable inside of it must be bound by the operator in C, resulting in a property (cf. Hulsey and Sauerland 2006).

Instances of the CMC involving small clauses, such as those instances involving PP modifiers, also are of type $\langle e, t \rangle$ when they function as the complement of D_{CF}. Assuming the simple structure in (50), small clauses in the CMC consist of two components, a predicate, of type $\langle e, t \rangle$, and a ClfP, also of type $\langle e, t \rangle$. Due to the type mismatch, these two constituents are interpreted by set intersection. The small clause as a whole, also of type $\langle e, t \rangle$, is the restriction of the null determiner:

(53)   a.   thúrian lûuk bon tó?
            durian CLF on table
            'the durian on the table'

      b.

DP
$\langle e \rangle$

D$_{\text{CF}}$
$\langle \langle e, t \rangle, e \rangle$
|
CF

SC
$\langle e, t \rangle$

ClfP$_i$
$\langle e, t \rangle$

thúrian $\varnothing$ lûuk

PP
$\langle e, t \rangle$

bon tó?
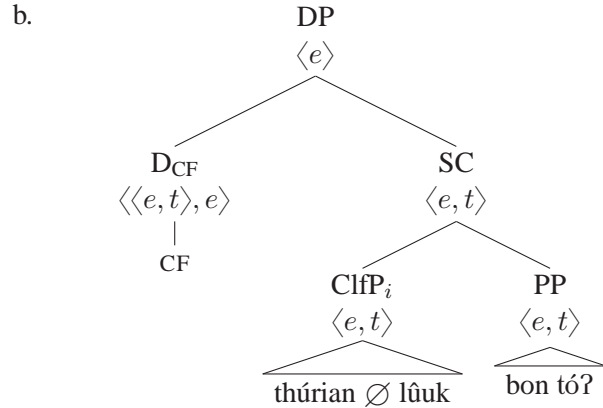
     c.   (i) $[\![\text{PP}]\!] = \lambda x[\text{on.the.table}(x)]$
         (ii) $[\![\text{ClfP}]\!] = \lambda x[^{\cup}\text{DURIAN}(x) \wedge \mu_{\text{AT}}(x) = 1]$
         (iii) $[\![\text{SC}]\!] = \lambda x[^{\cup}\text{DURIAN}(x) \wedge \mu_{\text{AT}}(x) = 1 \wedge \text{on.the.table}(x)]$ (by Pred. Mod.)
         (iv) $[\![D]\!] = \lambda P.f_{w,i}[P]$
         (v) $[\![DP]\!] = f_{w,i}[\lambda x[^{\cup}\text{DURIAN}(x) \wedge \mu_{\text{AT}}(x) = 1 \wedge \text{on.the.table}(x)]]$
         (vi) Paraphrase: The function CF in context $\langle w, i \rangle$ which chooses a member from the set of x such that: x is a durian and x contains 1 atom and x is on the table.

The semantics in (53) can be modified to account for the extra Pred projection in the more articulated structure in (51). There, Pred itself would have the type of a property, and combine with the ClfP head by PM.[11]

    To review, I proposed that the modifier in the CMC is the complement of D$_{\text{CF}}$. The strongest piece of evidence for this claim is the observation that deictic modifiers can be interpreted inside of the CP. I also proposed that other modifiers, such as prepositional phrases, might be predicates of small clauses, entailing that small clauses, too, can function as the complement of D$_{\text{CF}}$. Both of these structures are interpreted as properties, and thus serve as suitable complements to D$_{\text{CF}}$.

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[11]These cases differ from small clause complements of verbs in that the latter have argument-typed subject, and thus are interpreted as propositions. Because DP-internal small clauses have property-typed subjects, they are interpreted instead by PM and can serve as the restriction to a higher argument-forming operator.

5.3.4   Economy and bare classifiers

At this point I have established a structure for the CMC that accounts for several of its key properties. These properties include 1) the referentiality of the CMC, accounted for by D_{CF}, 2) the association of this interpretation with modification, accounted for by the proposal that D_{CF} takes a small clause or CP as its complement, a proposal that also accounted for 3) the observation that modifiers in the CMC must be interpreted predicatively.

However, a central problem posed by the CMC remains a mystery: how does the modifier in the CMC license the classifier? The first step towards my proposed solution is the structural distinction between bare ClfPs that function as the external head of a relative clause or small clause in the CMC (54-b,d), and those that serve as the direct complement of D (54-c), which is the structure we expect for the ungrammatical null ClfP in (54-a):

(54)   a.   *thúrian lûuk
            durian CLF

       b.   thúrian lûuk thîi měn
            durian CLF REL stinky
            'the durian that is smelly'

       c.

       d.
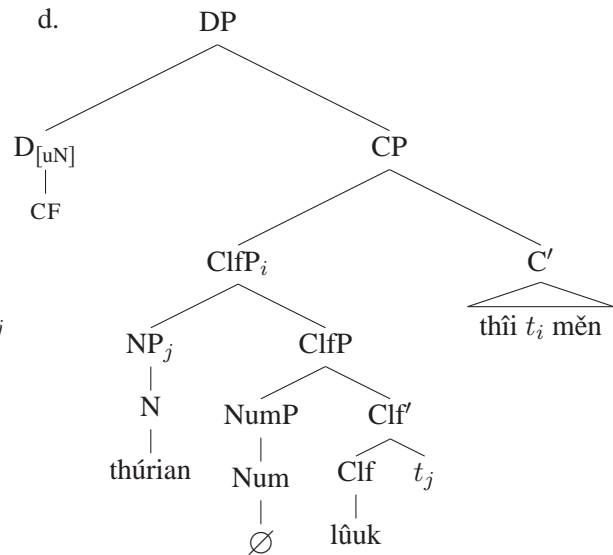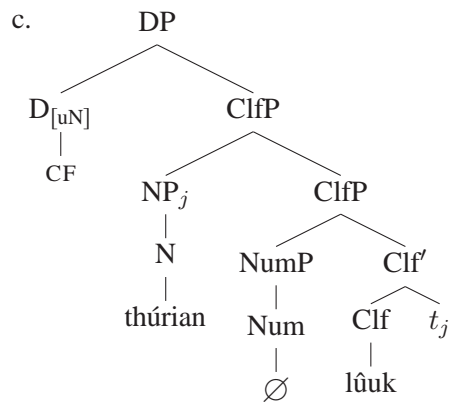
Rather than accounting for the ungrammaticality (54-a) in isolation, we now confront the more specific task of explaining the contrast in grammaticality between (54-c) and (54-d).

Similar problems have been noted elsewhere. **Kayne (1994)** observes that English *one* and the French pronominal clitic series *lui/eux/elle/elles* 'M.SG/M.PL/F.SG/F.PL' have a similar distribution, in that their occurrence after a determiner is licensed only in the presence of a relative clause or other modifier:[12]

(56)   a.   *John remembers the ones.[13]

     b.   John remembers the ones he had last night. ("dreams")

     c.   John remembers the ones of his youth.   (Kayne 1994, p. 103)

(57)   a.   *Jean a   vu   celui.
            Jean has seen *celui*

     b.   celui envoyé à Jean
         celui sent   to Jean
         'the one sent to Jean'

     c.   celui de Jean
         celui of Jean
         'the one of Jean' (='Jean's')

     d.   celui-ci
         celui-here
         'the one here'   (Kayne 1994, p. 100-102)

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[12]Kayne argues for an analysis of the following examples involving a proper noun (from Vergnaud 1974, p. 265) along similar lines:

(55)   a.   *the Paris
     b.   the Paris that I knew
     c.   the Paris of my youth   (Kayne 1994, p. 103)

Unlike the cases in (56), (57), and Thai bare classifiers, the proper noun *Paris* can function as a bare argument without a determiner. A semantic explanation for the contrast in (55) has been proposed which does not require an appeal to the distinction between D-NP and D-CP structures based on the idea that when a proper noun is modified, it has to be type-shifted to combine with the modifier, and as a result of this type-shifting requires a determiner (Gärtner 2004).

[13]Kayne does not observe this point, but *the one(s)* is allowed in certain environments where there seems to be a contextually supplied restrictor, e.g. *You are the ONE(S)*. Such examples must be pronounced with focus on *one*.

While Kayne does not provide an explanation for the ungrammaticality of (56-a) and (57-a), he observes that structures where the relative CP is the complement of D allows a restatement of the ungrammaticality of (56-a) and (57-a) as a prohibition against the noun — *one* or *lui* — occurring as the sister of D.[14]

Returning to Thai, we can account for the contrast in (54) by appealing to a principle that rules out the ability of ClfPs to occur as complements of D_{CF}, resulting in a bare ClfP. One way to think of this principle is in terms of competition. But what are bare ClfPs competing with? If they occurred, bare ClfPs would be interpreted as definite and singular. As we have already seen in chapter 3, definite interpretations are independently available with bare nouns in Thai:

(58)   thúrian (yùu   khâaŋ-nɔ̂ɔk)
        durian COP:LOC side-out
        'The durian(s) is/are outside.'

Thus, perhaps bare classifiers are prohibited because they are in competition with definite bare nouns.

To clarify, the following example places the structure of (58) along with the contrast in (54), giving us the following paradigm for definite DPs in Thai:

(59)   a.   [$_{NP}$ N]

        b.   *[$_{DP}$ D_{CF} [$_{ClfP}$ NP $\varnothing$ Clf]]

        c.   [$_{DP}$ D_{CF} [$_{CP}$ [$_{ClfP}$ NP $\varnothing$ Clf] [$_{C'}$ ...]]]

Some principle is needed that prefers (59-a) to (59-b) but not to (59-c), accounting for definite bare nouns ruling out bare classifiers but not instances of the CMC. This principle of grammar must penalize useless structure. I do not include cases where ClfP might itself occur as an argument, without

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[14]Kayne notes an additional case with a similar distribution, Irish *té*, citing McCloskey (1979, p. 39). In a discussion of Dutch relative clauses, Zwart (2000) likewise notes that the monomorphemic *al* 'all,' in contrast to the inflected *alles*, can only occur as the head of a relative clause.

the null determiner. uch cases are ruled out because the type of the bare ClfP is not compatible with argument positions.[15]

Chierchia (1998, p. 93) proposes that a structural economy condition can determines the choice between bare nouns, taken as bare NPs, and article-noun sequences, which are presumed to correspond to a higher DP projection (see also Boškoviċ 1997; Chomsky 1995; Rizzi 1997; Bresnan 2001 for the general notions of structural economy). Chierchia proposes that this constraint regulates the choice of bare nouns in generic environments in English:

(60)　　a.　　(*The) dogs bark.

　　　　b.　　(*The) dogs are common.　　　　　　　　　　　(Chierchia 1998, p. 393)

Because English bare plurals can have kind meanings, deriving the kind meaning by using the definite article, which allows taxonomic kind-level reference for, e.g. definite singulars, is prohibited. Thus, generic bare plurals block generic plurals with definite markers in English.[16]

Chierchia's version of Avoid Structure simply states that type-shifting operations should be applied as early as possible. That is not quite sufficient for our purposes, as the method of achieving

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[15]Because the bare ClfP is of type $\langle e, t \rangle$, we might wonder why it cannot occur in positions where we expect predicate nominals, given that its type does seem appropriate for such environments. However, as Gennaro Chierchia (p.c.) suggests, predicate nominals generally must have the form of a grammatical argumental noun phrase. Otherwise, there would be no explanation for the inability of English bare singulars to occur in predicate positions, given that bare singular nouns have the appropriate type, i.e., *John is librarian* (cf. Stowell 1991). Therefore, I do not consider the fact that bare ClfPs do not occur in predicate position to be a major problem for my proposal.

[16]For a different approach, see Dayal (2004), who points out that definite singulars might allow kind interpretations based on the taxonomic reading of the noun (i.e. this dog = this kind of dog). Dayal also observes that German differs from English, as German allows generic interpretations for both bare plurals and definite plurals. Dayal, who does not invoke structural economy for these cases, accounts for the optionality of the definite article in German generics by claiming that German definite articles can have either definite or kind (='∩') interpretations.

An important difference between German and Thai, however, is that for Thai the larger structure, the bare classifier, has a subset of the interpretations of the smaller structure, the bare noun. That is, while the bare classifier in Thai could only be interpreted as definite, the bare noun can be interpreted as either definite or generic. In German, on the other hand, it is the larger structure with the definite article that allows either generic or definite interpretations, and as such the smaller structure represents only a subset of the interpretations available to the larger structure. In this case, the economy condition in (61) could be further restricted to cases where not only does the smaller structure allow the interpretation of the larger structure, but also the larger structure is more specific, having a proper subset of the interpretations available to the smaller structure, as is the case in Thai.

definite interpretations from bare nouns — saturation of the world argument of the kind[17] — is different from the method of achieving definite interpretations for the bare classifier, which involves the null, choice functional determiner. Instead, I define the economy condition globally, applying to two structures which have identical interpretations, defined as mutual entailment or biconditionality. Moreover, we want to restrict the condition, for reasons to be made clear, to apply only to two phrases for which one is a projections of the other:

(61)   *Avoid Structure*

      a.   Given some measure of syntactic structure: $\mu_s(\text{XP})$

      b.   If XP is a projection of YP or YP is a projection of XP,

      c.   and $[\![\text{XP}]\!] \longleftrightarrow [\![\text{YP}]\!]$,

      d.   and $\mu_s(\text{XP}) < \mu_s(\text{YP})$,

      e.   then XP blocks YP, and *YP

As defined above, Avoid Structure applies to two maximal projections, one of which must be the extended projection of the other. The condition states that if the two projections have the same interpretation, the smaller interpretation *blocks* the larger interpretation, which is rendered ungrammatical. I leave open the question of how structure should be measured by the μ_s function. One definition which suffices for our purposes is in terms of maximal projections in a projection line. This measuring algorithm may be definable in a way which would subsume the independent projection criterion.

Avoid Structure accounts for the Thai paradigm in (59). Because the NP is structurally smaller than the ClfP in Thai, (59-a) blocks (59-b) in contexts with only one individual, the only ones where the comparison is relevant. In cases of the CMC, however, the ClfP is not the direct

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[17]See chapter 3 for a discussion of the definite interpretation of bare NPs, along with Chierchia (1998); Dayal (2004); Piriyawiboon (2010); and Trinh (2010).

complement of D, thus, the DP is not a projection of the ClfP or the NP. In this case, NPs and DPs with the CMC do not satisfy the conditions for application of Avoid Structure. This proposal also provides an explanation of the English cases in (60).[18]

Avoid Structure also accounts for the more complex paradigm involving modified noun phrases introduced at the beginning of section 5.1.2. It might seem at first that because bare nouns block bare classifiers, modified bare nouns (64-a) must block modified bare classifiers (64-b), effectively blocking the CMC, which would be a problem. Another problem is that if modification is sufficient to alleviate the blocking effect of Avoid Structure, it is unclear why modifiers must follow the classifier in order to license it. That is, an explanation based on Avoid Structure initially seems to predict that (64-c) is grammatical, contrary to fact.

(64)   a.   thúrian [$_{CP}$ thîi měn]
            durian   REL stinky
            'durian(s) that is/are smelly'

        b.   thúrian lûuk [$_{CP}$ thîi měn]
            durian CLF   REL stinky
            'the durian that is smelly'

        c.   *thúrian [$_{CP}$ thîi měn] lûuk
            durian   REL stinky CLF

However, upon closer examination, Avoid Structure does in fact make the correct predictions in

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[18]It does seem that the restriction on definite bare plurals kind terms is alleviated by the presence of relatives and other modifiers in English:

(62)   a.   (?)The pandas are going extinct.
        b.   The pandas of China are going extinct.
        c.   *Pandas of China are going extinct.

(63)   a.   *The gold is getting more expensive.
        b.   The gold that we use to make jewelry is getting more expensive.
        c.   *Gold that we use to make jewelry is getting more expensive.

If such structures are derived from D-complementation, as Kayne suggests, they confirm the predictions of the proposed analysis. Some speakers interestingly found kind reference with definite plurals allowable in (62-a), making English like German for those speakers.

each case, and moreover provides an explanation for the ungrammaticality of (64-c).

A structural analysis of these examples is provided below:

(65)   a.   *Raising structure for (64-a)*   b.   *Adjunction structure for (64-a)*

c.   *Raising structure for (64-b)*   d.   *Adjunction structure for (64-c)*

In (66) I have provided an analysis of (64-a) both in terms of head-raising (65-a) and right adjunction (or reprojection) (65-b). I assume the raising analysis for the CMC as outlined in the previous section (65-c). I do not provide a raising analysis of relative clauses in (64-c), however, because the position of the classifier after the relative clause is not compatible with a structure where the CP is the complement of D. Thus, I only provided an adjunction analysis of the relative clause for this example (65-d).

These structures all receive the same interpretation in a context containing a single smelly durian. Let us see how Avoid Structure accounts for these cases. First, neither (65-a) nor (65-b) blocks (65-c), because the ClfP relative head in [Spec, CP] in (65-c) is interpreted as an atomic

property (cf. (53-c-ii)), while the NP relative head in (65-a) is interpreted as a kind that is shifted to a non-atomic property at the point where it combines with the CP (cf. example (28) of chapter 4). The adjunction structure in (65-b) does not block (65-c) because the NP in (65-b) does not project the determiner in (65-c). On the other hand, (65-b) *does* block the structure in (65-d) where the classifier follows the relative clause, because the DP in (65-d) is a projection of the NP in (65-b). This account provides an analysis for the ungrammaticality of (64-c). Thus, the pattern in (64) follows directly from the requirement that two structures must be projections of each other in order for blocking to apply.

Another interesting consequence of Avoid Structure is that it may provide an account of why deictic modifiers license classifiers (section 3.5 and 5.2.2). Unlike the cases of the CMC above, deictic modifiers are not predicative, and they thus are unlikely candidates for heading clausal complements of D. However, in most contexts classifiers are obligatory with deictic modifiers. The occurrence of classifiers is expected if deictic modifiers are interpreted by applying an index to a particular instance of a kind, an instance which is only accessible by accessing the atomic denotation made available by the classifier. Thus, deictic modifiers license classifiers because they are only interpretable with classifier, and no structurally smaller competitor is available.[19]

Avoid Structure is a transderivational or global economy condition, applying at the interface between syntax and phonology. That is to say, in order for Avoid Structure to apply we must establish some set of projections, a reference set, for comparison. While such global constraints are controversial (e.g. Müller and Sternefeld 1996; Sternefeld 1996; Collins 1997b; Chomsky 1998), they are frequently adopted (e.g. Bobaljik and Wurmbrand 2008; Reinhart 2006), and by Optimality Theoretic approaches to syntax and morphology (e.g. Ackema and Neeleman 2001).

To avoid overgeneration, Avoid Structure must be subject to further constraints, additionally

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[19]As noted in section 3.5, demonstratives do occur without classifiers, though in limited contexts and only with inanimate nouns. It is unclear how to reconcile this fact with the proposal here, or whether demonstratives with or without classifiers are ever available in overlapping contexts.

limiting the computational power necessary for it to apply. For example, Avoid Structure is likely restricted to comparing structures within phase boundaries in the phase-based model of cyclic transfer to the interfaces of Chomsky (2001). This addition could be accomplished without any machinery if Avoid Structure was applied at the transfer of syntax to PF. Another condition on Avoid Structure is that it be restricted to comparing derivations that differ in their functional numeration. This analysis necessitates the claim that the null 'one' licensed by the [+def] D_{CF} is part of the functional numeration, as are classifiers and D heads; these elements may exhaust the available noun-phrase-internal functional heads in Thai.

The analysis of the CMC in Thai can also be extended to the English and French cases discussed at the beginning of the section: French *celui* and English *the one* are ungrammatical in argument positions because, like Thai bare classifiers, they are in competition with syntactically smaller structures. In both languages, these forms are pronouns. Thus, *celui* as an argument, which has the structure in (66-a), is blocked by pronouns or clitics, which project D directly (66-b), following Postal (1969):

(66)   a. *[$_{DP}$ ce [$_{NP}$ lui]]
               this   him

        b. [$_{DP}$ il/lui/le=   ]
               he/him/3.SG.M=

Likewise, English *the one(s)* is blocked by whatever pronoun is appropriate:

(67)   a. *[$_{DP}$ the [$_{NP}$ one]]

        b. [$_{DP}$ he/she/it/*etc.*]

That *celui* and *the one* compete with pronouns follows from their lack of lexical content, like pronouns (pace ellipsis analyses), and satisfy the synonymy condition on the application of Avoid Structure. As with Thai ClfPs, *lui* (and other non-nominative pronouns in French) and English *one*

do not compete with pronouns when they occur as relative heads in [Spec,CP] because they do not occur in the same projection as their selecting definite article in these cases.[20] In conclusion, then, Avoid Structure can account not only for the absence of bare ClfP arguments in Thai, but also similar paradigms in French, and English.[21]

The analysis of Thai I provided in this section relies on the crucial claim that bare ClfPs in Thai are in competition with bare nouns in Thai because bare nouns in Thai can be interpreted as definite. This clearly predicts that if a language allows bare ClfPs (and several do) and also allows bare nominal arguments, that they should not have overlapping uses. In the following section I will try to show that this is correct. Another question raised by this proposal is the extent to which the CMC, or some variant thereof, might be present in classifier languages besides Thai. These issues of variation are the topic of the next section.

5.4   Classifiers Across Languages

In the previous section I argued that bare classifiers cannot occur as the complement of D_{CF} in Thai is due to an economy principle which prefers definite bare nouns. Yet many classifier languages *do* allow definite bare classifiers in argument positions. This section examines why these

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[20]This analysis of *one* makes the strong prediction that whenever *one* occurs with a relative clause, the relative clause must be analyzed with the raising analysis. The following sentence seems problematic for this claim:

(68)   I saw the one of John$_i$ that he$_i$ didn't want me to. (one=picture)

This may not a problem for the proposed account because the presence of the complement *of John* alleviates the competition with the pronoun, because pronouns cannot take complements (**it of John*). Thus, a matching structure would be allowed in (68), potentially accounting for the absence of a Condition C violation in this case, though this could also follow from the claim that it is the higher copy of the relative head that is interpreted.

[21]The parallel between English/French and Thai raises a further interesting possibility for the analysis of bare nouns which I will not be able to consider here, namely that bare nouns in classifier languages like Thai can themselves contain [+def] features and thus be inserted into the D position, blocking the larger structures in exact parallel with the French and English cases above. Such a proposal is reminiscent of the Danish paradigm discussed in Hankamer and Mikkelsen (2002, 2005) where definite marking on N blocks an overt article, but only in the absence of a modifier. This idea might be able to reconcile some of the more semantically-driven aspects of my proposal with theories in which arguments are universally tied to the D projection, such as Longobardi (2005).

languages might differ from Thai and the general distribution of null D in each language.

In section 5.4.1 I examine several languages which allow definite bare classifiers and try to show that these languages often lack access to definite bare nouns, a fact that follows from Avoid Structure. An explanation for the difference between the availability of definite bare nouns is provided based on differences in whether languages have access to the rule of Semantic Restriction.

In section 5.4.2 I argue that the definite interpretation of bare ClfPs in the languages that allow them are due to the presence of a null D_{CF}. I demonstrate that these languages allow constructions putatively similar to the Thai CMC, as would be expected. I also consider the question of whether languages which do not allow definite bare ClfPs, such as Mandarin, might also have a null D_{CF}. I demonstrate that differences in the specificity of Mandarin noun phrases depend on whether relative clauses precede or follow the classifier. Though the pattern is the opposite of the one in Thai, it can be accounted for by appealing to a null D_{CF}.

5.4.1 Definiteness, bare nouns, and bare classifiers

Unlike Thai, many classifier languages allow bare classifiers to occur in argument positions, where they are interpreted as definite:

(69) **Zek gau** soeng gwo maalou
      CLF dog want cross road
      'The dog wants to cross the road.'   (Cantonese; Cheng and Sybesma 2005, ex. 24a)

(70) **Con cho** thich an thit
      CLF dog like eat meat
      'The dog likes to eat meat.'   (Vietnamese: Mon-Khmer; Trinh 2010, ex. 31b)

(71) Mas **tus tsov** txawm ya ceev-ceev los
      Then CLF tiger then   fly swiftly   come
      'Then the tiger arrived swiftly.'   (White Hmong: Hmong-Mien; Bisang 1993, ex. 43)

(72) **lú ŋgâo-ndoŋ** mà ca⁺w ndáŋ lâu.
CLF boat-wood then really float EMPH.
'The wood ship really did float!' (Green Hmong: Hmong-Mien; Lyman 1979, p. 49)

(73) **tu⁴⁴   ɲɦiu³⁵**
CL.AUG.SG.DEF ox
'the ox'[22] (Weining Ahmao: Hmong-Mien Gerner and Bisang 2010, ex. 13a)

(74) **tua⁴ pya¹** ka⁴   li⁵   . . .
CLF fish   get.stuck fish.dam
'The fish got stuck in the fish dam. . .' (Yay: Kradai; Hudak 1991a, p. 631)

(75) lēo **tú mẹ̀** đạ **tú pộ**
then CLF wife scold CLF husband
'Then the wife scolded her husband.' (Nung: Kradai; Saul and Wilson 1980, p. 26)

(76) **luuŋ⁴ suɯɯ³** sok³   tin³.
CLF   shirt   shrank short.
'The shirt shrank.' (Lungming Tai; Kradai; Hudak 1991b, p. 862)

In the following section I will argue that the bare classifier in all of these languages has a null determiner which can take the ClfP as its complement, the exact structure which was blocked in Thai. Initially, this seems to be a problem for the Avoid Structure-based account of Thai.

While classifiers precede nouns in the languages above, unlike Thai, *classifier-noun* word order is neither a necessary nor sufficient condition for allowing bare ClfPs. Southern Min never allows bare ClfPs despite having classifiers precede nouns:

(77) ***Jia gau** be   lim   zhui.
CLF dog want drink water
'The dog wants to drink water.' (intended) (S. Min: Sino-Tibetan, Cheng and Sybesma

2005, ex. 20b)

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[22]Classifiers in Weining Ahmao are inflectional. See below for discussion of the DEF feature on the classifier.

This demonstrates that having *classifier-noun* word order is not a sufficient condition to allow bare ClfPs.

It is also not the case that every instance of a language with bare ClfPs has the *classifier-noun* word order. For example, Bangla generally has *number-classifier-noun* word order, and allows bare ClfPs. However, when classifiers are bare, NP raising is obligatory,[23] resulting in *noun-classifier* word order and a definite interpretation:

(78) a. du-jon   chele
          two-CLF boy
          'two boys'

      b. **chele-Ta** aSBe
          boy-CLF   come.will
          'The boy will come.'   (Bangla:Indo-European, Bhattacharya 2001, ex. 9a,8a)

Bangla shows that bare ClfPs do not require *classifier-noun* word order.[24] As this is the case, there must be another reason why these languages allow bare classifier phrases and Thai does not.

The economy-based account from section 5.3.4 predicts that a language will allow bare ClfPs as long as they are not blocked by definite NPs. If they did allow definite NPs, Avoid Structure would predict that these NPs would block definite ClfPs. While the available data about possible interpretations of bare nouns for each of the languages allowing bare ClfPs is not complete, there is good evidence that these languages do not allow true definite interpretations for bare nouns.

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[23]Dayal (2010) demonstrates with evidence from adjectives that noun displacement is due to NP movement, rather than head movement, as claimed by Bhattacharya (2001).

[24]There is still a stable generalization, unexceptional in my informal survey of classifier languages, that if a language allows bare classifiers productively with a definite interpretation, then that language has *number-classifier-noun* as the basic order of constituents within the DP. I do not know how much to make of this generalization, however. The languages listed above are by and large spoken in the same general Sprachbund of Northern Vietnam/Southeast China, and while their genetic affiliation is quite diverse, their structure is otherwise similar. I would not be surprised if some of the Tibeto-Burman languages spoken in Yunan province of China and in northeastern Burma/Myanmar, and northern Thailand — languages which generally have *noun-number-classifier* word order like Thai — turned out to allow bare classifiers with definite interpretations. The linguistic diversity in this part of the world is extremely rich and these languages are scarcely described. Relevant is the case of Yi (Jiang and Hu 2010), which has the Thai word order but also seems to have a definite article. Yi is discussed further in section 5.4.2.

The data is clearest in the case of Cantonese. Cheng and Sybesma (2005) survey four dialects of Chinese. Of these four, only Cantonese allows bare classifiers to receive definite interpretations (see (69)).[25] Corresponding to this difference is the observation that "bare NPs cannot be interpreted as definite: they can receive only a generic and an indefinite reading" (p. 269). They provide the following examples:

(79)   a.   Wufei heoi maai syu.
              Wufei go   buy   book
              'Wufei went to buy a book/books.'

         b.   *Wufei jam-jyun   tong la.
              Wufei drink-finish soup SFP
              'Wufei finished drinking the soup.' (intended)   (Cantonese, Cheng and Sybesma

              1999, ex. 22a-b)

In (79-a), the object can be interpreted as indefinite or generic, and that is the only available interpretation of the sentence. Example (79-b) is different in that the verb is marked as perfective, which is more natural with a definite object. However, since the bare noun cannot be interpreted as definite, this sentence is ungrammatical. Thus, the availability of definite bare classifiers in Cantonese can be made to follow directly from the observation that the Cantonese does not allow definite bare nouns.

Dayal (2010) observes that Bangla bare nouns and classifiers have the same interpretive properties as those in Cantonese. While bare classifiers must be interpreted as definite (see (78)), bare nouns must be interpreted as indefinite or generic (80-a), and cannot be used when a noun phrase is making reference to a particular individual (80-b):

(80)   a.   ami ei rastay   kal   rate gare dekhechilam
              I   this road-LOC yesterday night car saw

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[25]Wu Chinese allows bare classifiers to receive definite interpretations if there is a certain tonal mutation on the classifier. I take this mutation to be indicative of the presence of a tonal determiner. See below.

'I saw a car/cars on this road last night.'

b. *chatro oddhapOk-der kOtha bolche
   student professor-CL   talking
   'A/the/some student is/students are talking to the professor.' (intended)   (Bangla,

   Dayal 2010, ex. 20a, 23e)

Again, the availability of the bare classifier is correlated with the unavailability of a definite bare

noun.

Another case where the availability of a bare classifier (see (70)) corresponds to the unavail-

ability of a definite bare noun is Vietnamese, though with Vietnamese the literature is less clear-cut.

According to Trinh (2010), a bare noun in subject position cannot have a definite interpretation.

Thus, (81) can only be interpreted as a generic statement about dogs:

(81)   **Cho** thich an thit.
         dog like eat meat
         'Dogs/*The dog(s) like(s) to eat meat.'   (Vietnamese, Trinh 2010, ex. 31a)

This example indicates that Vietnamese behaves like Cantonese and Bangla with respect to the un-

availability of definite interpretations for bare nouns. However, in his dissertation on Vietnamese

DPs, Nguyen (2004) indicates that bare nouns in Vietnamese can in fact be used in definite environ-

ments: "a bare noun in Vietnamese can refer to one or more than one entity, and to either a definite

or indefinite individual... [sic][26] (p. 1)."[27] I take these definite interpretations of common bare

nouns in Vietnamese to be indexical, similar to proper names. Such uses are generally restricted to

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[26]Definiteness is not a property of individuals, which are simply nuclear entities in a model, but rather noun phrases or DPs.

[27]Nguyen also points out that bare classifiers in Vietnamese must not necessarily be interpreted as definite in object position:

(82)   Toi muon mua **cai ban**.
         I   want buy CLF table
         'I want to buy a/the table.'   (Vietnamese, Nguyen 2004, p. 19)

animate or human nouns. Thus, in a context where 'dog' is maximal, *cho* 'dog' might be used as

the *name* of the dog in general (Tue Trinh, p.c.). To use definite bare nouns in Vietnamese, then,

the context must not only contain a unique and familiar entity to which the noun can refer but the

further condition that a particular noun has been established as the name for a specific individual in

the world. In the absence of such a condition, the bare classifier seems necessary, as the following

examples show:

(83)   a.   Toi co   mot con cho va mot con meo.
              I   have one CLF dog and one CLF cat
              'I have a dog and a cat.'

        b.   Moi khi con cho lai   gan con meo thi con meo lai   quao   no.
              Every time CLF dog come near CLF cat   be CLF cat   then scratch it.
              'Every time the dog comes near the cat then the cat scratches it.'   (Vietnamese,

              Nguyen 2004, p. 19)

While she does not offer a detailed characterization of bare nouns, Löbel (2000) points to several

cases where bare nouns are interpreted as definite which seem to shed light on this issue. Löbel

notes that bare noun phrases which make reference to maximal or unique entities are interpreted as

definite, and that they cannot occur with classifiers when they have this meaning (84):

(84)   a.   vua Tau
              king China
              'the king of China'

        b.   me   toi
              mother I
              'my mother'

        c.   troi xanh
              sky to.be.blue

If the null determiner which selects the classifier is interpreted as a choice function, the alternation between definite and indefinite in certain positions is not entirely surprising, given that the choice function itself can be existentially closed. The restriction of indefinite interpretations of bare classifiers to object position might be due to Existential Closure within the VP, in accordance with the Mapping Hypothesis of Diesing (1992b).

'the sky is blue'   (Vietnamese, Löbel 2000, ex. 6.16)

Thus, I take the restricted availability of definite interpretations for bare nouns in Vietnamese to be a separate phenomenon from the general availability of definite interpretations for bare nouns in Thai and Min. Still, it is unclear whether there are contexts where there is free alternation between definite bare classifiers and definite bare nouns, which would be problematic from the view being proposed.

Hmong languages provide a final case where definite bare nouns and bare classifiers seem to in complementary distribution.[28] Gerner and Bisang (2010) observe that "[Hmong] languages differ from other isolating languages of the area (such as Chinese or Kam-Tai languages) with respect to the use of bare nouns. In (Hmong) languages, bare nouns always have a non-referential reading and cannot be used to refer to an entity in the physical world.... In [Hmong] languages, since bare nouns are non-referential, *they may convey neither a definite nor an indefinite reading.*" (p. 587, emphasis added).[29] The ability of bare classifiers to mark definiteness in Hmong languages (see (71)-(73)) follows from this observation via Avoid Structure.

The particular Hmong language which Gerner and Bisang are concerned with is Weining Ahmao, whose classifiers have a startling property: inflection. Classifiers in Weining Ahmao inflect for definite vs. indefinite, singular vs. plural, and augmentative vs. diminutive. Without dwelling on this system in detail, the inflectional categories on the classifier in this language can be seen as originating from a higher D^0 head, though they are marked on the classifier. I take the alternation in definiteness to be the overt manifestation of the [$\pm$def] features which were proposed for D_{CF} in

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[28]Hmong-Mien and Miao-Yao are interchangeable names for the language family in question, the latter being the Chinese term. I will continue to use Hmong below, because it is the more familiar designation for these people and languages in the west, and despite the fact that Gerner and Bisang (2008, 2010) use the term Miao.

[29](Gerner and Bisang 2010) make the strong claim that in contrast to Hmong languages *all* Chinese and (Tai-)Kradai languages allow definite and indefinite interpretations of bare nouns. Their only citation to support this claim is for Mandarin, based on Li and Thompson (1981). Given that Cheng and Sybesma (1999) have shown that Cantonese is different from Mandarin with regard to the interpretation of bare nouns, it is best to regard this latter claim of Gerner and Bisang with circumspection.

section 5.3.2, though it is not clear if these 'indefinites' are specific or true indefinites.

We have seen that Cantonese, Bangla, Vietnamese, and Hmong languages all freely allow definite bare classifiers but do not (freely) allow definite bare nouns. What is still uncertain is the status of bare nouns in the Kradai languages which allow bare classifiers, including Lungming Tai, Nung, and Yay. Extant descriptions of these languages are sketchy, and the status of bare nouns and classifiers can most reliably be ascertained by examining texts. This is not the place for such an investigation, but a brief survey proved promising. For example, in the Yay stories contained in Hudak (1991a), classifiers are used for definite and possessive DPs, and are consistently used once a particular referent has been introduced, with the notable exception of nouns which denote contextually unique humans, such as kings, chieftains, and parents, which could constitute proper noun uses.

To summarize the findings of this section so far, we have seen that on one hand if a language allows definite bare nouns, it will not allow definite bare classifiers, as is the case in Thai and Min Chinese. Other languages which fall into this group include Mandarin,[30] Japanese, Korean, Burmese, and Indonesian, among many others. On the other hand, the availability of definite bare classifiers is correlated with the unavailability of definite bare nouns, as we saw above for Cantonese, Bangla, Vietnamese, and Hmong. Because the availability of definite ClfPs is contingent on the availability of definite NPs due to Avoid Structure, the difference between these two groups of languages must be phrased as a difference in the availability of definite bare nouns.

In section 3.1.2 I argued that the definite interpretations of bare nouns in classifier languages might simply follow from the application of Situation Restriction, which provides a situation/world-

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[30]Unlike Min and Thai, Mandarin allows bare classifiers in object position, though they always receive an indefinite interpretation there. Cheng and Sybesma (1999) argue that the indefinite interpretation of bare classifiers in object position in Mandarin corresponds to the presence of a null Num^0 head, which Cheng and Sybesma associate with indefiniteness. Cheng and Sybesma argue that the restriction of Mandarin bare classifiers to object position is an effect of the Empty Category Principle (Chomsky 1981), following in spirit the analysis of Italian indefinite bare nouns of Longobardi (1994). Under the analysis proposed above, this fact about Mandarin is surprising, as Avoid Structure should block indefinite bare classifiers in Mandarin in favor of indefinite bare nouns. Perhaps further investigation will reveal subtle differences in meaning between indefinite bare nouns and indefinite bare classifiers in Mandarin.

time variable to the intensional meaning of the bare noun, resulting in its extension at that index. The unavailability of definite interpretations in many classifier languages indicates that Situation Restriction might not be uniformly available in every classifier language. In those languages where Situation Restriction is not available, bare nouns would be interpretable as definite noun phrases, but would be forced to project a classifier which would in turn serve as the restriction to a choice function. Thus, by positing variation in the availability of Situation Restriction in conjunction with Avoid Structure, we can account for the complementarity of definite bare nouns and definite bare classifiers in the two groups of classifier languages.

In addition to these two groups, however, there are classifier languages which apparently allow both overt definiteness above ClfP as well as admitting definite bare nouns. These languages include Wu Chinese (Cheng and Sybesma 2005) and Yi, or Nuosu, a Lolo-Burmese language spoken in southern Sichuan and northern Yunnan (Jiang and Hu 2010). In Wu definite marking is accomplished by a tone-sandhi process on the classifier itself, while in Yi this is accomplished by means of an overt determiner which must occur with a classifier. If it turns out that common nouns in Vietnamese may in fact be interpreted as definite, they too might belong in this category.

The existence of these languages seems to necessitate a further claim about variation, namely that Avoid Structure is not active in every classifier language. However, there is already some evidence that this may be the case, as German, unlike English, allows both definite plurals and bare plurals to refer to kinds, while Avoid Structure would predict that the latter would block the former. Together, these facts indicate that Avoid Structure may be inactive in some languages.

In conclusion, then, the economy-based analysis of the ungrammaticality of bare classifiers in Thai has found support in the crosslinguistic distribution of definite bare nouns and definite bare classifiers. Avoid Structure predicts that definite bare classifiers should only be allowed if definite bare nouns are not. An examination of the languages which allow definite bare classifiers revealed that, for the most part, they do not allow definite bare nouns. This follows directly from

the claim that definite bare nouns are NPs, and due to their small size, block definite noun phrases with more structure. If definite bare nouns are not present, then the projection of a DP, including a classifier, will be necessary. While these languages possess overt classifiers, they do not possess overt determiners. I argued that the availability of definite bare nouns might follow from differences in the availability of Situation Restriction. While the complementarity between definite bare nouns and definite bare classifiers is compelling, the existence of languages which allow both of these definite noun phrases indicates that Avoid Structure itself may be parametrized.

5.4.2 Null determiners with bare classifiers

The previous section established that there are many classifier languages which freely allow definite bare classifiers but do not allow definite bare nouns. I assumed without argument that the definite interpretation observed on these classifiers is actually located at a higher D head which takes the ClfP as its complement, as in the analysis of section 5.3. This is illustrated below for Cantonese:

(85)   a.   Zek gau
            CLF dog
            'the dog'
       b.   DP
               ╱   ╲
             D   ClfP
             | ╱   ╲
            CF   Clf   NP
                    | |
                   zek   N
                           |
                          gau

One could further claim that the classifier in languages like Cantonese head-moves to D^0, as proposed by Simpson (2005) and Wu and Bodomo (2009). The motivation for such movement might be theory-internal, as it would alleviate the ECP effects associated with the empty D head, allowing it to occur freely in positions that are not properly governed, such as subject position in [Spec,TP]. In fact, the movement of NP or ClfP to the specifier of DP in Thai might serve the same role.

In (85) I represented the D^0 as a choice function, following the analysis of Thai above. Like in Thai, this choice function bears a feature marking definiteness. When the feature is [−def], existential closure of the choice function results, while the [+def] feature is realized with an open choice function, as outlined in section 5.3.2 following **Chierchia** (2005). Again illustrated below for Cantonese:

(86)   a.

```
              DP
           /      \
          D        ClfP
          |       /    \
      CF[+def]  Clf    NP
                 |      |
                zek     N
                        |
                       gau
```

b.

```
              DP
           /       \
          D         ClfP
          |        /     \
      CF[−def]  NumP     Clf'
                /\      /    \
              yut    Clf     NP
                      |       |
                     zek      N
                              |
                             gau
```
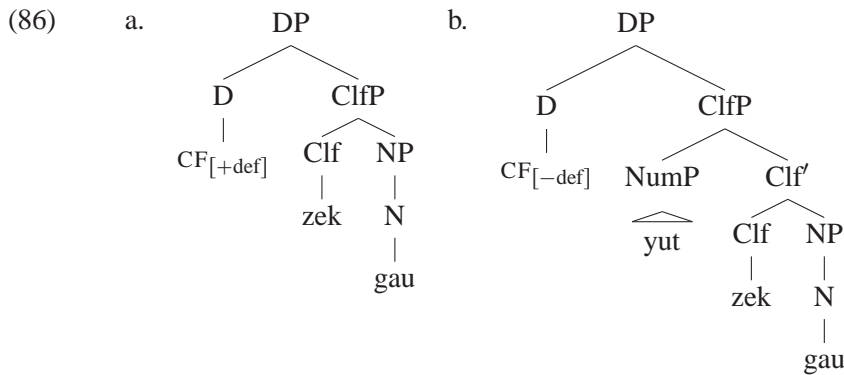
This analysis allows an explanation of observation by **Cheng and Sybesma** (1999, p. 525) that specific indefinite interpretations of bare nouns are allowed in Cantonese only when a numeral is present. Interestingly, Cantonese and other Chinese dialects differ from Thai in that noun phrases of the type *numeral-classifier-noun* cannot be interpreted as definite. This difference could be interpreted as evidence that existential closure of the choice function is obligatory in the presence of a numeral in Chinese. That is, like Thai weak indefinites, overt numerals require that the selecting head be [−def] in Cantonese. Like in Thai, the null allomorph of the numeral 'one' would be licensed only by [+def]. While the determiner is null in (86), **Wu and Bodomo** (2009) claim that the D head can be overtly filled by demonstratives and strong quantifiers, a plausible analysis, but not the only imaginable one (see below).

There are languages, such as some dialects of Wu Chinese (**Cheng and Sybesma** 2005) and Weining Ahmao (**Gerner and Bisang** 2010) where this definiteness feature is realized as tonal or segmental mutations on the classifier itself. This feature can be located at D, but it is realized on

Clf either due to a morphological process following from structural between the classifier and the D head or due to Clf-to-D movement. In addition, the definite determiner in Yi, which must occur with a classifier, can be seen as an overt reflex of the [+def] variant of D_{CF}.

An alternative approach to bare classifiers is taken by Cheng and Sybesma (1999, 2005), who locate definiteness at Clf^0 in Cantonese and Wu. Cheng and Sybesma argue that determiners and classifiers share the property of mediating between "the description provided by the NP and whatever specific entity in the real world the description is applied to." The problem with this analysis, as pointed out by Wu and Bodomo (2009), is that noun phrases with classifiers can be interpreted as indefinite, such as when the classifier is preceded by a numeral. This means that in order to pursue an analysis of Clf^0 as the locus of definiteness, the classifier must be analyzed as ambiguous between a referential and property-type reading, the latter of which is necessary for its position in the restriction of numerals. I take the analysis presented here and argued for by Wu and Bodomo (2009) to be more parsimonious, as definite (or specific) interpretations past the level of the bare noun always correspond to the presence of a null determiner, and the classifier can retain its lexical entry as an atomicity-checking device for languages without number marking.

If bare ClfPs involve null determiners which can take clausal complements, it should be no surprise that languages which allow bare ClfPs allow them to occur with modifiers. Several such cases are reviewed below. While these data do not serve as evidence for the existence of a null D in these languages per se, or even for the null D analysis of bare classifiers in these languages, they do provide circumstantial evidence the CMC in Thai should be seen as part of the same general phenomenon which gives rise to definite bare ClfPs.

In Vietnamese, for example, relative clauses can accompany *classifier-noun* sequences:

(87)   cuon tu-dien   [_{RC} ma toi thich]
         CLF dictionary   that I   like
         'the dictionary that I like'   (Nguyen 2004, p. 59)

This example can be analyzed straightforwardly as an instance of the CMC, with the *classifier-noun* sequence in [Spec,CP]. However, such an analysis is not forced in Vietnamese, as the ClfP could itself be the complement of the null D in (87), and the relative clause could be adjoined to the noun phrase.

In Cantonese, the normal relative clause marker *ge3* occurs in alternation with a *demonstrative-classifier* sequence (88-a-b). The D element and classifier can also co-occur (88-c), though the latter is apparently more formal and less common (Matthews and Yip 2001; Yu 2006):

(88)   a.   ngo5 sik1 ge3 hok6saang1
            1sg   know PRT student
            'the student(s) I know'

       b.   ngo5 sik1 go2 di1   hok6saang1
            1sg   know DEM CL.pl student
            'the students I know'

       c.   ngo5 sik1 go2 di1   ge3 hok6saang1
            1sg   know DEM CL.pl PRT student
            'the students I know'   (Matthews and Yip 2001, p. 280)

The syntax of these examples might be considerably more complex than Thai and Vietnamese because relative clauses in Cantonese are prenominal, as they are in all Chinese languages. A peculiar property of this paradigm is the separation of the putative relative marker from the relative clause by the *demonstrative-classifier* sequence in (88-c). Following the analysis of Mandarin relative clauses in Simpson (2003), in which relative clause markers themselves are instances of D^0, Yu (2006) considers an analysis of (88-a) and (88-b) in which *ge3* and *go2* alternate as an overt D head. In this analysis the TP complement of the relative clause moves to [Spec,DP], following the analysis of prenominal relative clauses in Kayne (1994). Yu proposes that the *classifier-noun* sequence in (88-b) functions as the head of the relative clause in this construction, mirroring my analysis of the CMC in Thai in section 5.3. The fact that the relative marker *ge3* is stranded adjacent to the noun in (88-c) suggests that such an analysis might be on the right track, though it is not clear how the

noun phrase and classifier become separated in this example. I leave the difficult questions raised by these data for future work. Of particular interest is whether these three constructions show any interpretive differences and whether there is evidence that classifiers reconstruct into the relative clause.

In addition to marking relative clauses, the ability of a language to have bare ClfPs has been observed to correlate with the ability of a language to use classifiers to occur in possessive constructions, a property which Bisang (1993, 1999) terms "relationalization." For example, Bisang (1993) observes that in Hmong, classifiers can mark possessive noun phrases:

(89)   nws rab riam ntaj
        he   CLF sword
        'his sword'   (Bisang 1993, p. 29)

Wu and Bodomo (2009) make the same observation about classifiers in Cantonese:

(90)   keoi/Hilary   bun syu
        he/she/Hilary CLF book
        'his/her/Hilary's book   (Wu and Bodomo 2009, p. 500)

These examples, too, can be seen as instances of the CMC, with the *classifier-noun* sequence occurring as the specifier of a stranded PossP (or PP). This PossP/PP can be seen as the complement of a null D, which attracts the possessor to its specifier, as suggested for English possessives by Kayne (1994) (see also Larson and Cho 2003):

(91)   [$_{DP}$ [$_{DP}$ keoi]$_i$ D [$_{PossP/PP}$ [$_{ClfP}$ bun syu] t_i]]

However, as ClfPs can occur as complements of D in these languages, a much simpler analysis of these languages can be found in which the possessors are located in [Spec, DP], following the classical analysis of possessives in Abney (1987, section 3.5):

(92)   [$_{DP}$ [$_{DP}$ keoi] D [$_{ClfP}$ bun syu]]

Wu and Bodomo (2009) suggest that the possessor should be located in D^0, but the possibility of phrasal possessors raises obvious problems for such an analysis.

These data show that languages which allow bare ClfPs also allow modifiers to occur with these classifiers. This finding is certainly compatible with the proposal that these languages possess the same null choice functional determiner which was proposed for the CMC in Thai in section 5.3, though further work is needed to strengthen the connection.

5.4.3 A null determiner in Mandarin Chinese

Putting bare classifier languages aside, a more intriguing question is whether modifiers might also license classifiers in languages which generally prohibit bare classifiers, like Thai. There are two possible scenarios, which might both be correct for different languages. The first is that some languages might lack null D altogether. Such languages would be forced to form relative clauses by adjunction to some nominal projection, and might only allow definite interpretations for cases of bare nouns or with overt definite material such as demonstratives, which would arguably be overt manifestations of D. Alternatively, we might find other languages which do have a null D, like Thai.

Consider Mandarin Chinese. Analyses of Mandarin often assume the existence of a DP projection, whose head has been associated with elements as diverse as demonstratives and strong quantifiers (Tang 1990; Wu and Bodomo 2009), the relative marker *de* (Simpson 2003), and the plural marker *men* (Li 1999). Aoun and Li (2003, ch. 5) argue against a [$_{DP}$ D CP] analysis of Chinese relative clauses. Their arguments focus on why demonstratives cannot be analyzed as a D head when it occurs with relative clauses. But we saw that demonstratives likely are not D heads in Thai. However, there may still be evidence for a different D head in Mandarin which enforces specificity when it occurs with relative clauses, like D_{CF} in Thai.

Because all nominal modifiers in Mandarin precede the noun, relative clauses can occur in different positions relative to other elements in the extended projection of the noun, such as *numeral-classifier* sequences. Thus, both of the following word orders are possible:

(93)   a.   [Num-Clf] - RC - N

          b.   RC - [Num-Clf] - N

Note the order of constituents in Mandarin is the mirror image of Thai, where the noun is followed by the *numeral-classifier* sequence which can either be preceded or followed by a relative clause. In Thai, we saw that when relative clauses followed the *numeral-classifier* sequence, they gave rise to special specific interpretations of the noun phrase as well as licensing the classifier. Both of these properties were attributed to the presence of a null determiner.

Unlike Thai, relative clauses in Mandarin do not license the omission of a numeral in either (93-a) or (93-b), a fact which we will return to shortly. However, there is one intriguing connection to the Thai CMC. When noun phrases precede the classifier in Mandarin, as in (93-b), the noun phrase must be interpreted as specific. Del Gobbo (2003) demonstrates that this is the case by observing that relative clauses cannot precede existential quantifiers in existential environments, which trigger a definiteness effect in Chinese (Huang 1987):

(94)   a.   You yi-ge   [wo renshi de] ren   hen you qian.
                have one-CLF I   know REL person very have money
                'There is a man that I know who is very rich.'

          b.   *You wo renshi de   yi-ge   ren   hen you qian.
                have I   know REL one-CLF person very have money

                                                      (del Gobbo 2003, p. 77)

These sentences are made of three parts. The first is the verb *you*, 'have,' the second is a noun phrase, which must be indefinite, and the third is a predicative coda, *hen you qian* in each of these examples. In this environment, relative clauses cannot precede the *numeral-classifier* sequence *yi-*

ge even though the numeral would be expected to give rise to an indefinite interpretation. So (94-b)

is the Mandarin equivalent of example (16), in which the CMC was shown to be ungrammatical in

existential sentences, even when an indefinite quantifier is present.

When a noun phrase is not in an environment where it must be interpreted existentially,

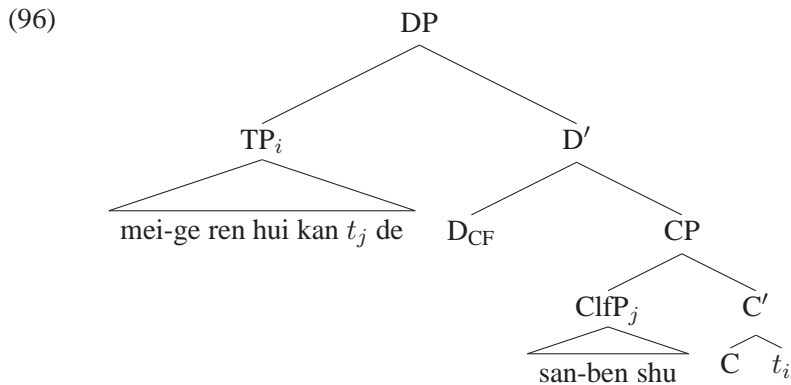relative clauses can precede an indefinite quantifier:

(95) a. Wo hui zhengli [mei-ge   ren   hui kan de] san-ben   shu.
          I   can order   every-CLF person can read REL   three-CLF book
          'I will put in order the three books that every person can read.'

      b. Wo hui zhengli san-ben   [mei-ge   ren   hui kan de] shu.
          I   can order   three-CLF every-CLF person can read REL   book
          'I will put in order three books that every person can read.'   (del Gobbo 2003, p. 70)

Note in particular the difference in the interpretation of the object noun phrases in the two sentences:

when the relative clause precedes the *numeral-classifier* sequence, as in (95-a), the sentence is

interpreted as definite (or perhaps specific), while in (95-b) the sentence allows a 'pure' indefinite

reading. Furthermore, Aoun and Li (2003) demonstrate that in noun phrases such as (95-a), the

numeral *san-ben* 'three' can take scope below the quantifier *mei-ge* 'every' in the subject of the

relative clause. While Aoun and Li demonstrate that such interpretations are restricted in other

cases, it seems that the interpretation of the numeral below the subject quantifier could be analyzed

with reconstruction of the numeral phrase into the relative clause.[31]

The contrasts in both (94) and (95) can be made to follow from an analysis of Mandarin

relative clauses in which the position of the relative clause before the *numeral-classifier* sequence

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[31]Aoun and Li (2003, section 5.1) argue at length against an interpretation of these data based on reconstruction of
the numeral into the relative clause. They argue instead that the subject quantifier *mei-ge* can move out of the relative
clause by Quantifier Raising and hence take scope above the relative head *san-ben shu*. Their argument for this analysis
is that the presence of the adverb *dou* inside of the relative clause forces the subject quantifier to be interpreted within the
relative clause, a fact which they attribute to a locality restriction on the interpretation of *dou* relative to its subject which
blocks QR of *mei-ge*. It seems that their insight could could be preserved in a reconstruction-based analysis by blocking
reconstruction of the numeral when *dou* is present, though Aoun and Li seem skeptical that such an analysis is possible.
However, note that their analysis requires that QR apply across a finite clause boundary, a process which is allowed only
under restricted circumstances (see Reinhart 2006, pp. 61-64).

implicates the presence of the null determiner. This null determiner, which like in Thai is analyzed as a choice function, can be seen as taking a CP complement and triggering movement of the TP to the head position:

(96)

```
                        DP
                 _____/_____
                TP_i            D'
             __/\__          __/\__
   mei-ge ren hui kan t_j de  D_CF    CP
                                  __/\__
                               ClfP_j    C'
                              __/\__    _/\_
                          san-ben shu  C   t_i
```

This analysis accounts for the contrast in (95) by attributing the availability of the relative clause before the *numeral-classifier* sequence to the presence of a null determiner interpreted as a choice function. This accounts in turn for the interpretation of such noun phrases as definite (or specific). This is essentially the analysis proposed by del Gobbo (2003), though her semantics for the determiner differ and she assumes that the relative clause in (96) is base-generated in [Spec, DP]. Another alternative is to identify the D_{CF} in (96) with the relative complementizer *de*, as in Simpson (2003). This would solve the question as to why a putative TP contains the relative marker *de*. The problem with this approach is the fact that *de* occurs in indefinite noun phrases, unlike D_{CF} (recall the discussion in section 4.1.4). The choice between these analyses rests on the answers to difficult questions about the identity of *de*, the absence of complementizers in Mandarin, and the complex reconstruction facts presented in Aoun and Li (2003) which will have to await further study. Yet certain configurations of relative clauses in Mandarin do give rise to specific readings, like in the Thai CMC, and these can be given an analysis in terms of a null determiner interpreted as a choice function.

Unlike Thai, however, the numeral cannot be omitted in Mandarin even when the relative

clause precedes it. We might expect that the numeral would be optional in such cases because the ClfP is not the complement of D_{CF}, and hence is not subject to Avoid Structure. However, the putative bareness of the classifier in Thai was actually due to the availability of the null allomorph of 'one' which is licensed by the [+def] feature on D. It might be that Mandarin lacks such an allomorph, or that the licensing conditions for the null 'one' are different than they are for Thai. An interesting connection in this regard is the observation by Cheng and Sybesma (1999) and Yang (2000), discussed in footnote 30, that Mandarin does allow bare classifiers to occur as arguments, but only in indefinite contexts in lexically governed positions. This indicates that the licensing condition for bare classifiers in Mandarin might involve indefinite rather than definite features.

To summarize these last two subsections, definite null ClfPs in the languages that allow them can be analyzed as the complement of a null determiner, the same D_{CF} which was proposed to account for the CMC in Thai in section 5.3. These same languages allow constructions involving relative clauses and possessors which resemble the CMC in Thai as well. Another analogue to the Thai CMC was found in Mandarin noun phrases where relative clauses precede *numeral-classifier* sequences, which must be interpreted as specific. Unlike Thai, however, Mandarin does not allow these classifiers to occur without numerals.

5.5 Summary

Looking now at the big picture, we have seen that definite noun phrases in classifier languages can be accounted for by appealing to two basic structures: one involving a bare NP, and one involving a null determiner, D_{CF}. The crosslinguistic distribution of these two definite noun phrases is regulated by Avoid Structure, which prohibits the use of larger structures involving D_{CF} when a smaller structure involving a bare NP is synonymous. One of the major effects of this analysis was accounting for the CMC in Thai, where I argued that modifiers function as the complement of D_{CF},

and thus alleviate the blocking effect of Avoid Structure, allowing bare classifiers to surface.

The difference in whether classifier languages allow definite interpretations of bare nouns was attributed to a difference in the availability of the semantic rule, Situation Restriction. Beyond this stipulation, the analysis based on Avoid Structure provided an explanation for a generalization about the complementarity between the availability of definite bare ClfPs and definite bare nouns.

Chapter 6

Quantifier Float and Quantifier Scope

In the last two chapters I have argued that Thai nominal structure sometimes includes higher projections, including a DP projection, while sometimes it does not, such as with bare nouns. Empirically, these chapters have focused on the structure and interpretation of noun phrases containing modifiers, especially relative clauses. In this chapter focus is shifted from modifiers to quantifiers, focusing on a phenomenon in which quantifiers can be discontinuous from their associated noun. While the analysis has implications of its own for Thai grammar and linguistic theory, later in this chapter I present a crosslinguistic generalization about the availability of Q-float that provides evidence that the DP in these languages is a phase despite the absence of overt articles.

The phenomenon I investigate in this chapter is one in which quantifiers, generally quantifier-classifier sequences, do not appear in their argument position following their associated noun, but rather appear at the right edge of the sentence. This phenomenon is illustrated in the following example:

(1)   a.   **nák-rian sǎam-khon** [$_{VP}$ ʔaan nàŋsǔɯ lέɛw   ]
            student   3-CLF   read book   already
            'Three students read a book already.'

b. **nák-rian** [$_{VP}$ ʔaan nàŋsɯ̌ɯ lɛɛ́w] **sǎam-khon**
   student   read book already 3-CLF
   'Three students read a book already.'

Following Wongbiasaj (1979b), I refer to this construction as quantifier float (Q-float), borrowing

the term used to describe a putatively similar phenomenon in English and French (e.g. Baltin 1978;

Dowty and Brodie 1984; Kayne 1975; Sportiche 1988), though the Thai phenomenon is much more

general. I thus refer to the discontinuous quantifier in (1-b) as the floated quantifier (FQ), and to the

NP with which it semantically associated as its host.

    My analysis takes the restriction of Q-float to quantifiers as primary, as the rightward dislo-

cation of nominal modifiers and elements besides quantifiers is prohibited in Thai. This observation

leads naturally to the idea that Thai Q-float is an instance of overt Quantifier Raising (QR, Chomsky

1976; May 1977, 1985). I show that Thai quantifiers always receive surface scope relative to nega-

tion, and thus that Q-float affects quantifier scope. This observation, I argue, provides evidence that

Q-float is DP (or QP)-movement, rather than movement of only the *quantifier-classifier* constituent

or stranding via NP-movement. Evidence for movement more generally comes from the presence

of locality restrictions on quantifiers which are supplemented by traditional semantic considerations

about the interpretation of quantifiers.[1]

    The proposal that Q-float is an instance of overt QR does not entail that all instances of QR

in Thai are realized as Q-float. Indeed, quantifiers can freely appear in object position, where they

must undergo QR in order to be interpreted. Instead, it is claimed that QR becomes visible when

certain interface conditions and constraints are met, in particular, when quantifiers are interpreted

in non-argumental positions (Bobaljik and Wurmbrand 2008).

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[1]My use of the term "Quantifier Raising" throughout the article is arguably misguided. This is because the account for Q-float I suggest has some differences from the traditional analysis of QR as proposed by Chomsky and May; the more general term "scope-shifting operation" may be preferable. Yet given the vagueness of the latter term, and my express desire to tie Thai Q-float to syntactic movement for the purpose of scope-assignment, I have retained the label "Quantifier Raising," with apologies to proponents of onomasiological purism.

If Q-float is really an overt instance of a core grammatical operation, part of Universal Grammar, its widespread nature should be no surprise. Of course, quantifier float is quite common in the world's languages, occurring in most European languages in addition to Arabic (Shlonsky 1991), Japanese (Miyagawa 1989), and Niuean (Steuart 1996), just to name a few examples. While the question of whether my analysis can be extended to these languages remains open, I focus more narrowly on classifier languages. I observe that in classifier languages where quantifiers follow nouns DP-internally, these quantifiers can float to the right. This generalization can be captured by the idea that the DP is a cyclic domain for transfer to the phonological interface, and that ordering restrictions within the DP must be respected even if all of the elements within the DP are not contiguously pronounced.

The paper begins with a basic description of Q-float. In section 6.1 I show that the host of QRs must be arguments, that the operation is restricted to quantifiers, and that FQs are right-adjoined to the clausal spine. Section 6.2 argues that the analyses which have been proposed for other languages, including the stranding and adverbial analyses, cannot be extended to the Thai cases. Section 6.3 lays out the scope facts, focusing on the interpretation of quantifiers relative to negation. Section 6.4 lays out the basic analysis, while section 6.5 details additional aspects of the analysis, including the motivation for, and the restriction on, the discontinuous pronunciation of nouns and quantifiers in Thai.

6.1 Basic Properties of Quantifier Float in Thai

This section examines basic properties of and restrictions on Q-float. It lays out the restrictions on the elements which can host Q-float, which elements can float, and shows that FQs appear between CP and VP. First, I show that only verbal arguments can host Q-float. I then show that while all quantifiers can float, non-quantificational modifiers cannot. As for the location of FQs, evidence

from adverbs demonstrate that floated quantifiers are right-adjoined to the clausal spine, attached approximately to vP projection. This discussion paves the way for the analysis of quantifier float in section 6.4.

6.1.1 Locality constraints on the host

This section introduces syntactic constraints on the noun phrases which can serve as hosts to Q-float. Some of these restrictions were first discovered by Simpson (2004). The basic generalization is that only noun phrases functioning as the argument of a verb can host Q-float.

Example (1) illustrated that the host of Q-float can be the subject of a sentence. The following examples illustrate Q-float from the direct object (2-a) and the indirect object (2-b):

(2)   a.   Tát hâi **năŋsǔu thúk-lêm**   Bill
                Tat give book   every-CLF^{book} Bill
                'Tat gave all of the books to Bill.'

        b.   Tát hâi   **năŋsǔu** Bill **thúk-lêm**
                Tat give book   Bill every-CLF^{book}
                'Tat gave all of the books to Bill.'

(3)   a.   Tát hâi năŋsǔu kaʔ **dèk thúk-khon**   pai.
                Tat give book   to   child every-CLF^{person} PRF
                'Tat gave books away to every child.'[2]

        b.   Tát hâi năŋsǔu kaʔ **dèk**   pai **thúk-khon**
                Tat give book   to   child PRF every-CLF^{person}
                'Tat gave books away to every child.'

In (2-b), Q-float is evinced by the intervention of the indirect object between the host and the FQ. In (3), however, because the direct object is VP-final, an aspectual marker of perfectivity is included to detect the availability of Q-float.

If a noun phrase is contained within another noun phrase serving as a verbal argument, how-

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[2]The verb 'go' following the DP is a serial verb which signals semi-perfective aspect.

ever, it cannot serve as the host. Thus, the following example illustrates that genitive noun phrases

cannot host Q-float:

(4) a. Pong cà hây [$_{NP}$ năŋsɨ̌ɨ **khɔ̌ɔŋ dèk sɔ̌ɔŋ-khon**] kàp nammon phrung.níi
         Pong will give   book   belong child 2-CLF^{person} to Nammon tomorrow
         'Pong will give the two childrens book to Nammon tomorrow.'

     b. *Pong cà hây [$_{NP}$ năŋsɨ̌ɨ **khɔ̌ɔŋ dèk**] kàp nammon phrung.níi **sɔ̌ɔŋ-khon**
         Pong will give   book   belong child   to Nammon tomorrow 2-CLF^{person}

Likewise, FQs cannot be hosted by the complements of nouns:

(5) a. Jôo wâat [$_{NP}$ phâap **măa săam-tua**] lɛ́ɛw
         Joe draw   picture dog 3-CLF^{animal} already
         'Joe drew three pictures of dogs already.'

     b. *Jôo wâat [$_{NP}$ phâap **măa**] lɛ́ɛw **săam-tua**
         Joe draw   picture dog already 3-CLF^{animal}

In addition, Q-float cannot be hosted by a noun phrase contained within a relative clauses (based on

Simpson 2004, ex. 43):

(6) a. phǒm khɔ̌ɔj cəə [$_{NP}$ phûu-chaaj [$_{CP}$ thîi mii **rót kwaa-sìp-khan**   ]] maa
         I   PRF   meet   man   REL have car exceed-10-CLF^{handle} ASP
         lɛ́ɛw.
         already
         'I have met men who have owned more than 10 cars.'

     b. *phǒm khɔ̌ɔj cəə [$_{NP}$ phûu-chaaj [$_{CP}$ thîi mii **rót**]] maa lɛ́ɛw
         I   PRF   meet   man   REL have car ASP already
         kwaa-sìp-khan.
         exceed-10-CLF^{handle}

Together, these examples demonstrate that FQs cannot be hosted by noun phrases if they are con-

tained within other noun phrases.

In summary, while quantifiers float freely from verbal arguments, the configuration below is

prohibited.

(7) *[$_{XP}$ [$_{NP}$ . . . N. . . [$_{NP}$ . . . N$_1$ . . .]] . . . FQ$_1$]

This generalization could be stated as a locality restriction on the host, putatively as a case of the A-over-A Principle of Ross (1967): the NP which is merged with the verbal projection can host Q-float, but not an NP contained within another NP. Alternatively, this restriction could be stated in terms of argument structure: only NPs which are theta-marked by the verb can host Q-float.

6.1.2   The quantifiers that float

This section illustrates that only quantifiers can undergo Q-float. I show that this extends both to quantifiers which do contain a classifier and those which do not. The restriction of Q-float to quantifiers means that it is not an instance of a more general extraposition phenomenon, as suggested by Simpson (2004). Thus, I show that the extraposition of relative clauses, prepositions, and demonstratives is not allowed in Thai.

Almost all quantifiers can undergo Q-float in Thai. These include the majority of quantifiers which select for classifiers, including numerals **??**introex), strong quantifiers such as *thúk* 'each, every' ((2)-(3)), and weak quantifiers such as *lǎaj* 'several' and *baaŋ* 'some':

(8)   a.   **nák-rian lǎaj-khon** [kin khâaw lɛ́ɛw   ]
           student   some-CLF eat rice   already
           'Several students have already eaten.'

      b.   **nák-rian** [kin khâaw lɛ́ɛw   ] **lǎaj-khon**
           student   eat rice   already several-CLF
           'Several students have already eaten.

(9)   a.   **nák-rian baaŋ-khon** [kin khâaw lɛ́ɛw   ]
           student   some-CLF   eat rice   already
           'Some students have already eaten.'

      b.   **nák-rian** [kin khâaw lɛ́ɛw   ] **baaŋ-khon**
           student   eat rice   already some-CLF
           'Some students have already eaten.'

Numerals can be appended with modifiers such as *khɛ̂ɛ* 'just' and *kwaa* 'exceed, more than'

(Deephuengton 1992), which does not impact their ability to float. In some cases, the modifier

makes Q-float more natural:

(10) **nák-rian** aan năŋsǔɯ **khêɛ-săam-khon**
      student   read book   just-three-CLF^{person}
      'Just three students read (a book).'

(11) **nák-rian** aan năŋsǔɯ **săam-khon-kwaa**
      student   read book   three-CLF^{person}-exceed
      'More than three students read (a book).'

Not all quantifiers that can float occur with classifiers. Thus, the exhaustive quantifier *tháŋ-*

mòt 'all' can also float (see section 3.4.3 for more on this quantifier):

(12) a. **nák-rian tháŋ-mòt** [kin khâaw lɛ́ɛw   ]
          student   all   eat rice   already
          'All the students have already eaten.'

      b. **nák-rian** [kin khâaw lɛ́ɛw   ] **tháŋ-mòt**
          student   eat rice   already all
          'The students have all already eaten.'

Some putative quantifiers cannot undergo Q-float. The quantifier *tɛ̀ɛláʔ* 'each' seems to be

unique among distributive, classifier-selecting quantifiers in not occurring as an FQ:

(13) a. **nák-rian tɛ̀ɛláʔ-khon** [kin khâaw lɛ́ɛw   ]
          student   each-CLF   eat rice   already
          'Each student read a book.'

      b. ***nák-rian** [kin khâaw lɛ́ɛw   ] **tɛ̀ɛláʔ-khon**
          student   eat rice   already each-CLF

Likewise, the quantifier *sùan-mâak* 'majority' cannot float.

(14) a. **nák-rian sùan-mâak** [kin khâaw lɛ́ɛw   ]
          student   part-many   eat rice   already
          'Most students read a book.'

b. *__nák-rian__ [kin khâaw lέεw] __sùan-mâak__
  student eat rice already part-many

I propose that both of these elements cannot float because they are not quantifiers.

Beginning with the second case, *sùan-mâak* is morphologically complex, formed by the noun/classifier *sùan* 'part' and the adjective *mâak* 'a lot' (section 3.4.3). Recall that *mâak* can alternate with *jàj* 'big,' to form *sùan-jàj*, which also means 'majority.' Thus, *sùan-mâak* should be analyzed as a (potentially deictic) modifier meaning 'large part,' rather than as a quantifier. Therefore, its inability to undergo Q-float is reducible to the inability of adjectives to undergo Q-float in general.

The other putative quantifier which cannot undergo Q-float, *tὲε-láʔ* 'each', has more opaque semantics. Its first element is a coordinating conjunction *tὲε* 'but.' The second element, *láʔ*, is a determiner-like element meaning 'per,' which otherwise generally occurs with a classifier, and always has a distributive interpretation. Thus, the inability of *tὲε-láʔ* to undergo Q-float may be because of it is the reflex of a distributive operator in VP which introduces quantification over verbal arguments rather than being interpreted as a quantifier itself. No studies have been conducted on this element to my knowledge, but it is unique among putative quantifiers which select for classifiers in not allowing Q-float.

Besides quantifiers, adnominal modifiers in Thai must remain adjacent to the noun that they modify. Thus, as was observed in chapter 4, footnote (34), Thai lacks relative clause extraposition. Since some instances of Q-float involve classifiers, it is important to note that relative clauses cannot be extraposed even in instances of the classifier-modifier construction of Chapter 5:

(15) a. chăn hen [$_{NP}$ dek (khon) [$_{CP}$ **thîi khruu khɯɯy tii __**]] mɯɯə-chaaw-níi
    1SG see   child CLF THÎI teacher PRF hit *ec* time-morning-this
    'I saw [the child that the teacher hit] this morning.'

  b. *chăn hen [$_{NP}$ dek t_i] mɯɯə-chaaw-níi (khon) [$_{CP}$ **thîi khruu khɯɯy tii __**]$_i$
    1SG see   child time-morning-this CLF THÎI teacher PRF hit *ec*

Thai also does not allow adjectives (16) or prepositional phrases (17) to be extraposed:

(16)   a.   chăn hen [$_{NP}$ dek (khon) [$_{AP}$ **son**   ]] mɨɨə-chaaw-níi
           1SG see   child CLF   naughty time-morning-this
           'I saw the naughty child this morning.'

        b.   *chăn hen [$_{NP}$ dek t_i] mɨɨə-chaaw-níi   (khon) [$_{AP}$ **son**   ]
           1SG see   child   time-morning-this CLF   naughty

(17)   a.   chăn ʔàan [$_{NP}$ nàŋsɨ̌ɨ (lêm) [$_{PP}$ **bon tóʔ**]] mɨɨə-chaaw-níi
           1SG read   book   CLF   on table time-morning-this
           'I read the book on the table this morning.'

        b.   *chăn ʔàan [$_{NP}$ nàŋsɨ̌ɨ t_i] mɨɨə-chaaw-níi   (lêm) [$_{PP}$ **bon tóʔ**]
           1SG read   book   time-morning-this CLF   on table
           'I read the book on the table this morning.'

Finally, demonstratives also cannot be extraposed, but must appear adjacent to the noun they modify, despite the fact that they are like quantifiers in selecting quantifiers:

(18)   a.   **nák-rian khon-níi** [kin khâaw lέεw   ]
           student   CLF-this   eat rice   already
           'This student read a book.'

        b.   ***nák-rian** [kin khâaw lέεw   ] **khon-níi**
           student   eat rice   already CLF-this

The observation that modifiers cannot be extraposed in Thai rules out a number of imaginable analyses of Q-float which would take it to be part of a more general rightward movement process. The fact that Q-float is restricted to quantifiers calls for an analysis of Q-float which relies on special properties of quantifiers. This same observation seems to be able to account for those putative quantifiers which cannot appears as FQs: only true quantificational determiners can drive Q-float.

6.1.3 The position of floated quantifiers

This section introduces evidence from the distribution of Q-float relative to adverbs that suggests that FQs are right-adjoined to the clausal spine. These data show that Thai FQs are located in what could be called the Thai 'middlefield,' the projections between CP and VP.

FQs must occur outside of low adverbs, including some aspect markers (19-a) and manner adverbials (19-b):

(19) a. **nák-rian** [klàb   bâan] paj-lɛ́ɛw   **sɔ̌ɔŋ-khon**
          student   return home ASP-already 2-CLF
          'Two students already went back home.'

    b. ??**nák-rian** [klàb   bâan] **sɔ̌ɔŋ-khon** paj-lɛ́ɛw
          student   return home   2-CLF   ASP-already

(20) a. **nák-rian** [kin thúrian] kàp mɯɯ **sɔ̌ɔŋ-khon**
          student   eat durian   with hand 2-CLF
          'Two students ate the durian with their hands.'

    b. *****nák-rian** [kin thúrian] **sɔ̌ɔŋ-khon** kàp   mɯɯ
          student   eat durian   2-CLF   with hand

The inability of FQs to appear before manner adverbials indicates that they are outside of the VP.

On the other hand, FQs can reorder with higher adverbs, such as temporal adverbs. However, when the quantifier is rightmost, it must be set off by a prosodic break, indicated by horizontal lines: ||. This is the same kind of pause which was observed to occur when adverbs themselves reordered in section 2.6.1:

(21) a. **nák-rian** [ʔaan nàŋsɯ̌ɯ lêm-níi   ] **sɔ̌ɔŋ-khon** mɯ̂awaanníi
          student   read book CLF-this 2-CLF   yesterday

    b. **nák-rian** [ʔaan nàŋsɯ̌ɯ lêm-níi   ] mɯ̂awaanníi || **sɔ̌ɔŋ-khon**
          student   read book CLF-this yesterday   2-CLF
          'Two students read this book yesterday.'

(22) a. lăŋcàak-nán **măa** [kàt nák-rian] **sɔ̌ɔŋ-tua** dooj-thanthii
          after-that   dog   bite student   2-CLF   ADV-immediate

   b. lăŋcàak-nán **măa** [kàt nák-rian] dooj-thanthii || **sɔ̌ɔŋ-tua**
          after-that   dog   bite student   ADV-immediate   2-CLF
          'After that, two dogs immediately bit the students.'

(23) a. **nák-rian** [ʔaan nàŋsɯ̌ɯ lêm-níi   ] **sɔ̌ɔŋ-khon** rew-rew
          student   read book   CLF-this   2-CLF   quickly

   b. **nák-rian** [ʔaan nàŋsɯ̌ɯ lêm-níi   ] rew-rew || **sɔ̌ɔŋ-khon**
          student   read book   CLF-this   quickly   2-CLF
          'Two students read this book quickly.'

Because these adverbs are associated with the TP and aspectual projections, the ability of FQs to reorder with them indicate that they can occur within these projections. However, the fact that FQs preferentially precede these adverbs indicate that the FQs do have a basic position between the VP and higher tense/aspect projections, roughly at vP.

Last, the FQ must occur inside of sentence-final particles such as interrogative markers, or affirmative markers, or politeness particles:

(24) a. **nák-rian** [ʔaan nàŋsɯ̌ɯ lêm-níi   ] **thúk-khon** máj
          student   read book   CLF-this   every-CLF YNQ
          'Has every student read this book?'

   b. ***nák-rian** [ʔaan nàŋsɯ̌ɯ lêm-níi   ] máj **thúk-khon**
          student   read book   CLF-this   YNQ every-CLF

(25) a. **nák-rian** [ʔaan nàŋsɯ̌ɯ lêm-níi   ] **thúk-khon** náʔ
          student   read book   CLF-this   every-CLF SFP
          'Every student read this book, right?'

   b. ***nák-rian** [ʔaan nàŋsɯ̌ɯ lêm-níi   ] náʔ **thúk-khon**
          student   read book   CLF-this   SFP every-CLF

(26) a. **nák-rian** [ʔaan nàŋsɯ̌ɯ lêm-níi   ] **thúk-khon** kháp
          student   read book   CLF-this   every-CLF POLITE.MSP
          'Every student read this book.' [*polite*]

    b. ***nák-rian** [ʔaan nàŋsɯ̌ɯ lêm-níi] kháp   **thúk-khon**
        student   read book CLF-this POLITE.MSP every-CLF

As these discourse-oriented elements are generally associated with the CP-field, the inability of FQs to occur outside of them indicate that FQs must occur inside the CP.

Together, the distribution of FQs relative to adverbs indicate that the base position of FQs is at the vP projection, immediately above the VP, though it can scramble with elements are located somewhere in the Thai middlefield, between CP and VP:

(27)   [$_{CP}$ [$_{TP}$ [$_{v}$P [$_{VP}$ . . .] FQ] (FQ)]]

The rightward position of FQs in Thai is thus generally adverbial, though it is not free. This is unsurprising, as in many documented cases of Q-float, quantifiers appear in positions generally occupied by adverbs (cf. Bobaljik 2003).

In summary, the data in section 6.1.1 illustrates that while subjects, direct objects, and indirect objects can all host Q-float, NPs located inside of these arguments cannot. Section 6.1.2 showed that any 'true' quantifier can appear as an FQ, but non-quantificational modifiers such as relative clauses cannot. Thus, there is no Thai phenomenon comparable to extraposition in English. The conclusion is that Q-float is not an instance of a more general phenomenon. In section 6.1.3, data relating to the position of FQs relative to adverbs suggested that FQs are located at vP, though they can scramble with adverbs between vP and CP.

6.2   Against Stranding and Adverbial Approaches

In the literature, the closest equivalent to Q-float in Thai are instances of Q-float in Japanese and Korean, a construction which has undergone extensive investigation in both languages.[3] Below

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[3]For Japanese, the standard references are Haig 1980; Kuroda 1980; Miyagawa 1989. Additional works of note include Fitzpatrick 2006; Fukushima 1991; Hasegawa 1993; Kobuchi-Philip 2006; Nakanishi 2007. Nakanishi 2008 provides a literature review. For Korean, see Fitzpatrick 2006; Kang 2002; Ko 2007; Lee 1989; Park and Sohn 1993.

I briefly review the analyses of the Japanese phenomenon, which echo the two analyses which have been argued for Q-float in general, and show that neither analysis is able to satisfactorily account for the facts in Thai.

6.2.1 The stranding analysis

The stranding analysis of Q-float was proposed independently for Japanese by Miyagawa (1989) and for French and English by Sportiche (1988). In this analysis, more recently defended by Fitzpatrick (2006); Miyagawa and Arikawa (2007) and Watanabe (2006), the NP host of the FQ moves is subextracted out of a larger QP projection containing the FQ into its surface position. The example in (28-a) is for a simple intransitive verb (based on Nakanishi 2008):

(28)   [NP$_i$ [$_{IP}$ PP/Adv [$_{IP}$ [$_{QP}$ t$_i$ Q-CLF] V]]]

The strongest arguments for this analysis, presented initially by Miyagawa (1989), have come from locality facts about the relationship between the host and the FQ and a contrast in the ability of passive (29-a) and unaccusative (29-b) subjects to host FQs across VP internal adverbs, while unergative subjects (29-c) are unable to do so:

(29)   a.   **Kuruma**-ga doroboo-ni **ni-dai**   nusum-are-ta.
             car-NOM   thief-by   two-CLF steal-PASS-PST
             'Two cars were stolen by a thief.'   (Miyagawa 1989, p. 38)

         b.   **Gakusei**-ga ofisu-ni **huta-ri**   ki-ta.
             student-NOM office-to two-CLF come-PST
             'Two students came to the office.'   (Miyagawa 1989, p. 43)

         c.   ***Kodomo**-ga   geragerato **huta-ri**   warat-ta.
             children-NOM loudly   two-CLF laugh-PST
             (*intended*)'Two children laughed loudly.'   (Miyagawa 1989, p. 44)

While passive and unaccusative subjects are assumed to originate within the VP, unergative subjects are not. Thus, the ability of FQs to occur inside the VP only in the former cases corresponds to the existence of an NP trace inside of the VP in those cases.

While compelling, many have challenged the empirical basis of this generalization. Thus, subjects of unergative verbs can host FQs in many cases:

(30)   **Kodoma**-ga butai-de **zyuu-nin** odot-ta.
        child-NOM   stage-at ten-CLF   dance-PST
        'Ten children danced on stage.'   (Takami 2001, p. 129)

Nakanishi (2008) provides additional examples from the literature which have illustrated the same point. More recent analyses which have attempted to rescue the stranding analysis, including Miyagawa and Arikawa (2007) and Ko (2007), have relied on the idea that the adverb or other intervening element itself can scramble to the left, allowing an analysis by stranding by relying on further movement. Generally, this movement is usually perceived as A-bar scrambling (see also Fitzpatrick 2006).[4]

For the Thai data, the stranding analysis is problematic because Q-float in Thai is not obviously dependent on NP-movement of any kind. In particular, objects hosting Q-float occur in their regular argument position in Thai, while the quantifier can occur to its right. The only way that the stranding analysis could account for these data would be by postulating head independent head movement of the verb and NP movement out of the DP, stranding the quantifier but reinstating the original order of verb and object. Yet section 6.1.3 provided evidence from adverbs that FQs appear higher in the clause than objects, right-adjoined to the clause. This observation essentially makes an analysis where the FQ is stranded deep within VP by NP movement impossible. Further support for

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[4]Fitzpatrick (2006) actually proposes that Q-float is derived by either stranding or base-generated adverbs based on the semantics of the FQ: while numerals and weak quantifiers are derived by stranding, he argues, strong quantifiers are adverbs. Though no syntactic differences have been detected distinguishing the two classes in Thai in the properties listed above, for example, such differences may still be awaiting detection by more sensitive tests for movement.

this conclusion is presented in section 6.3.1, where it is shown that the scope of floated quantifiers

follows from an analysis where they are right-adjoined to the clause.

6.2.2 The adverb analysis

The alternative to the stranding analysis is the adverb analysis, which has been proposed both

for English and other European languages (Bobaljik 1995; Doetjes 1997; Dowty and Brodie 1984)

and for Japanese (Fukushima 1991; Nakanishi 2007). The basic idea is that floating quantifiers are

not actually quantificational determiners in the traditional sense: they do not take their associated

host as their restrictor, and they do not have the traditional tripartite quantificational structure.[5]

The strongest argument for the adverbial analysis of Q-float comes from systematic differ-

ences in the interpretation of predicates when FQs are present. Namely, sentences with FQs have

been argued to be associated with both a distributive and a plurality-of-events reading. Consider the

following contrast :

(31)   a. **Gakusei**   **san-nin**-ga kinoo   Peter-o   tatai-ta.
            student-NOM yesterday   three-CL Peter-ACC hit-PAST
            'Three students hit Peter yesterday.'

        b. **Gakusei**-ga kinoo   **san-nin** Peter-o   tatai-ta.
            student-NOM yesterday three-CL Peter-ACC hit-PAST
            'Three students hit Peter yesterday.'

(32)   a. **Gakusei**   **san-nin**-ga kinoo   Peter-o   korosi-ta.
            student-NOM yesterday   three-CL Peter-ACC kill-PAST
            'Three students killed Peter yesterday.'

        b. ??**Gakusei**-ga kinoo   **san-nin** Peter-o   korosi-ta.
            student-NOM yesterday three-CL Peter-ACC kill-PAST
            'Three students killed Peter yesterday.'   (Nakanishi 2007, pp. 133-134)

While multiple hitting events within a particular day are possible, explaining why FQs are available

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[5]This is not the only alternative, however. Hoji and Ishii (2004) argue that FQs do take NPs as their restrictor, but undergo LF-movement to c-command the NP which functions as their restrictor.

in (31-b), multiple killing events are not possible, hence the unacceptability of (32-b).

If Thai had these same effects, it would constitute strong evidence for the adverbial approach. But Thai speakers do not detect a contrast in the following pair:

(33)   a.   **nák.riian** tii Peter mûɯə.waan.níi **sǎam-/thúk-khon**
             student   hit Peter yesterday   3-/every-CL^{person}
             'Three students hit Peter yesterday.'

        b.   **nák.riian** khâa Peter mûɯə.waan.níi **sǎam-/thúk-khon**
             student   kill Peter yesterday   3-/every-CL^{person}
             'Three students killed Peter yesterday.'

Thus, it does not seem that Thai floated quantifiers necessarily quantify over events as Nakanishi proposes.

Nakanishi's proposal is also somewhat surprising because FQs in Japanese and Thai so often include classifiers. Classifiers occur with numerals because the nouns that they are associated with are uncountable on their own (chapter 3). Nakanishi's proposal would entail that classifiers would also occur in order to allow quantifiers to combine with events, and in so doing would serve a secondary semantic function, as homomorphisms between event and individual structure. While the Japanese data regarding predicate interpretations is quite compelling, it remains difficult for me to believe that the quantifiers occurring with classifiers in these examples do not simply take their hosts, which agree with these classifiers semantically, as their quantificational restrictors.

6.3   Quantifier Float and Scope

Section 6.1 laid out several properties of Q-float in Thai including the existence of locality constraints, the observation that FQs occupy adverbial positions, and the restriction of Q-float to quantifiers. These properties are typical of Q-float in any language. However, we saw that despite sharing these properties with Q-float in Japanese, Thai FQs cannot be analyzed either as stranded

nominal constituents or as adverbs. This section introduces an additional fact about Q-float in Thai which suggest a novel analysis: Q-float affects the scope of quantifiers. In fact, Q-float allows interpretations of quantifiers that are not available when they occur adjacent to their host.

This section focuses solely on sentences with a single quantifiers and its scope relative to negation. This is because the interpretations of sentences involving multiple quantifiers do not seem subject to similar effects. For these contexts, the effects of Q-float on quantifier scope differ depending on the position of the host. The basic generalization seems to be the following:

(34)   a.   Q-float can lower the scope of subject quantifiers.

        b.   Q-float can raise the scope of object quantifiers.

This observation delimits the potential analyses of Q-float in Thai. In the following section I take these facts as evidence for applying a particular analysis of Quantifier Raising to the Thai facts.

6.3.1   Quantifiers and negation

We begin with subject quantifiers. The effects of Q-float can be seen most clearly with the element *sák* 'even one,' which must be interpreted as a negative polarity item. The following example illustrates the basic distribution of *sák* relative to negation:

(35)   a.   *ʔaacaan **sák-khon**   yaŋ **mâj** [$_{VP}$ tii nák-rian]
            teacher even.one-CLF still NEG   hit student
            'Not even one teacher has hit a student.' (intended)

        b.   ʔaacaan yaŋ **mâj** [$_{VP}$ tii [$_{DP}$ nák-rian **sák-khon**   ]]
            teacher still NEG   hit   student even.one-CLF
            'Teachers haven't hit even one student'

In (35-a), *sák* appears in subject position where it c-commands negation. It is ungrammatical there. In (35-b), however, *sák* occurs with the object inside of the negated VP, where it is allowed.

The status of *sák* as an NPI is useful as a diagnostic for the structural position of FQs relative to negation. Thus, while *sák* cannot occur in subject position, it can appear as an FQ:

(36) a. *nák-rian **sák-khon**   yaŋ **mâj** [$_{VP}$ kin khâaw]
          student even.one-CL^{person} still NEG   eat rice
          'Not even one student has eaten.' (Intended)

      b. nák-rian yaŋ **mâj** [$_{VP}$ kin khâaw] **sák-khon**
          student still NEG   eat rice   even.one-CL^{person}
          'Not even one student has eaten.'

Example (36-b) demonstrates that FQs associated with subjects are c-commanded by negation, and that FQs associated with subjects can be structurally lower than their host.

Corroborating evidence comes from the scope of universal quantifiers relative to negation. Unlike in English (see below), subject quantifiers in Thai cannot be interpreted below negation, as seen in (37-a). When the quantifier is floated, however, the low-scope reading of the subject quantifier is available in (37-b):

(37) a. nák-rian **thúk-khon**   (yaŋ) **mâj** [$_{VP}$ kin khâaw]
          student every-CL^{person} still NEG   eat rice
          'Every student still hasn't eaten.' $\forall > \neg, *\neg > \forall$

      b. nák-rian (yaŋ) **mâj** [$_{VP}$ kin khâaw] **thúk-khon**
          student still NEG   eat rice   every-CL^{person}
          'Every student still hasn't eaten.' $\forall > \neg, \neg > \forall$

The ability of FQs to receive scope below negation corroborates the finding based on the availability of NPIs in floated positions. The available interpretations of (37-b) illustrate an additional scopal property of FQs which the NPI example did not reveal: subject FQs are scopally ambiguous relative to negation.

While Q-float can lower the scope of subject quantifiers, it can raise the scope of object quantifiers. Unlike quantifiers in subject position, quantifiers in object position must scope below

negation. Yet ambiguity arises when object quantifiers are floated, as is shown in (38-b):

(38)   a.   Joe **mâj** [$_{VP}$ phóp nákrian **thúk-khon**   ] mûawaanníi
            Joe NEG   meet student every-CL^{person} yesterday
            'Joe didn't meet all of the students yesterday' $\forall > \neg, *\neg > \forall$

        b.   Joe **mâj** [$_{VP}$ phóp nákrian] mûawaanníi **thúk-khon**
            Joe NEG   meet student   yesterday   every-CL^{person}
            'Joe didn't meet all of the students yesterday' $\forall > \neg, \neg > \forall$

Like subject FQs, object FQs are scopally ambiguous relative to negation.

To summarize, Q-float affects the scope of FQs relative to negation by permitting a narrower interpretation for subject Qs and a wider interpretation for object Qs.

(39)

	Structure	$\forall > \neg$	$\neg > \forall$
Subject-Q	NP-$\forall \ldots \neg \ldots$		*
Subject-FQ	NP $\ldots \neg \ldots \forall$		
Object-Q	$\neg \ldots$ NP-$\forall \ldots$	*	
Object-FQ	$\neg \ldots$ NP $\ldots \forall$		

Thus, the scopal effects of Q-float are dependent on the position of the host. It is not surprising that FQs in Thai receive surface scope, similar effects are attested in Q-float in English and French (Bobaljik 2003; Déprez 1994; Dowty and Brodie 1984; Williams 1982). Thai is different because FQs allow interpretations that are unavailable for quantifiers in their argument positions.

6.3.2   Scope ambiguity and multiple attachments sites for negation

In this section I analyze that the scopal ambiguity of floated quantifiers in Thai as arising not from the variable position of quantifiers, but rather from various positions available to negation (see also section 2.3). I this regard, I follow Visonyanggoon (2000, p. 164-174), who argues that negation can be freely generated in the specifier of verbal auxiliaries in Thai, as it can recur, as shown below:

(40)   khǎw **mâj** nâa-càʔ **mâj** tôŋ **mâj** tham ŋaan
        3P   NEG should NEG must NEG do   work
        'It is unlikely that he does not have to not work.'   (Visonyanggoon 2000, p. 166)

Each occurrence of negation in Thai is interpreted. In other words, Thai is not a negative concord language.

Visonyangoon also points out that negation cannot serve as a predicator on its own (that is, it cannot license VP-ellipsis, see section 2.3):

(41)   a.   khǎw dùu   thiiwii tὲὲ chǎn **mâj** duu
               3P   watch T.V.   but 1P.SG NEG watch
               'He watches T.V. but I don't.'

        b. *khǎw dùu   thiiwii tὲὲ chǎn **mâj**
             3P   watch T.V.   but 1P.SG NEG

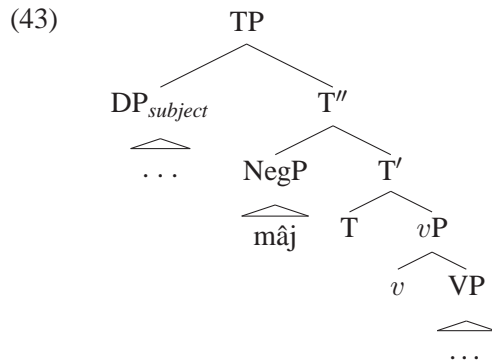   (Visonyanggoon 2000, p. 132)

As any verbal head can serve as a predicator, negation does not seem to be a verbal head in Thai. If negation is a NegP in the specifier of verbal categories, however, the contrast in (41-a-b) is accounted for because specifier cannot license ellipsis.[6]

I follow Visonyangoon in locating negation in the specifier of any verbal projection including both VP and TP:

(42)   a.

    b.

---
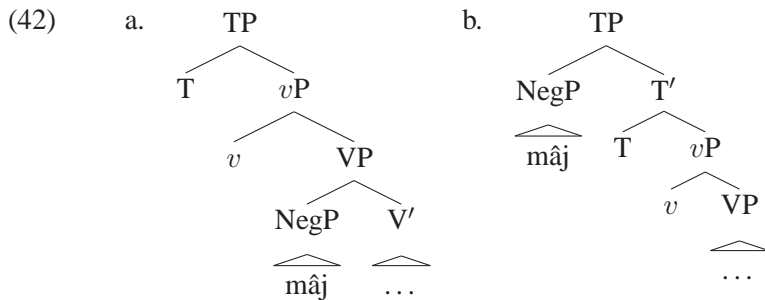
[6]Visonyangoon provides another argument from coordination (p. 171) I do not repeat here.

Assuming multiple specifiers are allowed (e.g. Ura 1996), the subject would occupy the outer specifier of TP when negation was also present there. For now, I distinguish multiple specifiers from adjuncts by allowing multiple X-bar levels. While specifiers increase the bar-level of their sister, adjuncts do not:

(43)

```
                    TP
                  /    \
          DP_subject     T″
             /\         /  \
            …         NegP    T′
                      /\     /  \
                    mâj    T    vP
                               /  \
                              v    VP
                                   /\
                                  …
```
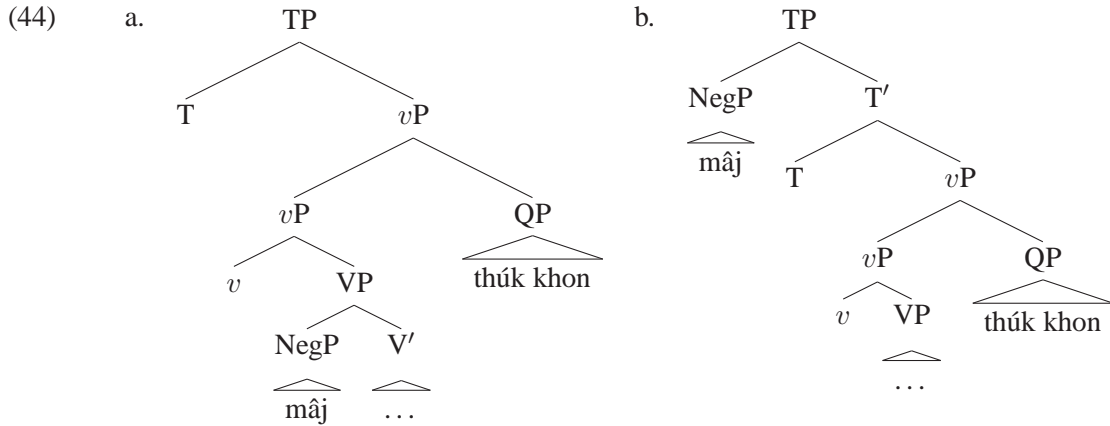
Alternatively, negation might be prohibited in [Spec, TP] because of the presence of the subject there. I leave this issue open.

As subjects always occur above negation, the observation that subjects quantifiers must scope above negation ((37-a)) can be restated as a requirement that Thai quantifiers receive surface scope.[7] While subjects may originate in a lower position, such as [Spec, vP] (e.g. Chomsky 1995; Kratzer 1996), reconstruction of the subject to its vP internal position must not be allowed. Likewise, because objects occur inside of the VP while negation is generated above the VP, object quantifiers must receive surface scope (38-a).

We are now in a position to assess the fact that both subject and object FQs can be interpreted with scope both above and below negation ((37-b),(38-b)). Recall from section 6.1.3 that the position of FQs relative to adverbs suggests that FQs are located between VP and CP. If FQs are adjoined to an intermediate projection such as vP, as suggested by the adverb analysis, the different positions which are available for negation can account for the scopal ambiguity of FQs:

---

[7]This is distinct from the claim that Thai quantifiers are interpreted in their surface position. There is reason to think that quantifiers objects are not interpreted *in situ*. See section 6.4.2 for discussion.

(44)   a.

```
              TP
           /      \
          T        vP
                 /    \
               vP      QP
              /  \    /    \
             v    VP  thúk khon
                 /  \
              NegP    V′
              /\      /\
            mâj      …
```

b.

```
              TP
           /      \
        NegP       T′
         /\      /    \
       mâj      T       vP
                      /    \
                    vP      QP
                   /  \    /    \
                  v    VP  thúk khon
                      /\
                      …
```

Thus, like subject and object quantifiers, subject and object FQs receive surface scope. The different available interpretations for these quantifiers relative to negation can be reduced to instances of structural ambiguity. The availability for subject FQs to structurally occur below negation also can account for the fact that an NPI subject quantifier must appear as an FQ (35). Note that this structure for object quantifiers in particular is compatible with our finding in section 6.2.1 that object FQs occur outside of the VP.
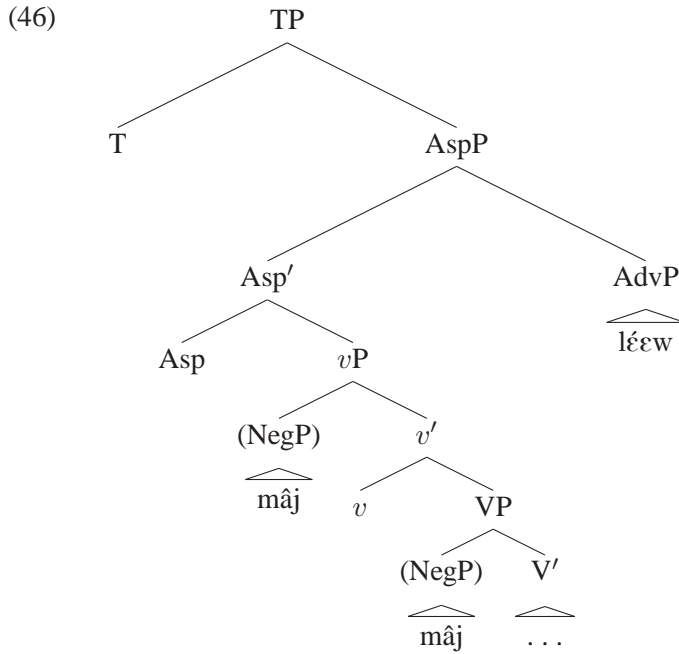
There is further evidence from the adverb *lɛ́ɛw* 'already' that FQs are indeed rigidly scoped relative to negation and other adverbs. Like in English, in Thai *lɛ́ɛw* 'already' prefers to scope above negation. That is, it seems to be a positive polarity item (PPI):

(45)   a.   nák-rian **mây** hǐw   khâaw **lɛ́ɛw**
            student NEG hungry rice   already
            'The students are already not hungry.'   already $> \neg$, *$\neg >$ already

       b.   nák-rian **mây** pìt   fài   **lɛ́ɛw**
            student NEG close light already
            'The students have already not turned the light off.'   already $> \neg$, *$\neg >$ already

The differences between these readings can be somewhat difficult to detect because 'already' is replaced by 'yet' when it scopes below negation in English. When already occurs above negation, the reading is that the listed state or action does not hold at the time of speaking. In the latter case, there is an implication that the students will not turn off the light, i.e. that they have failed to do so.

The available interpretations of these sentences indicate that negation must attach to a projection below *lɛ́ɛw*, as shown:

(46)

```
                          TP
                       ╱      ╲
                      T        AspP
                            ╱        ╲
                          Asp'        AdvP
                        ╱     ╲        ╱‾╲
                      Asp      vP     lɛ́ɛw
                            ╱     ╲
                        (NegP)    v'
                         ╱‾╲     ╱   ╲
                        mâj    v     VP
                                   ╱    ╲
                               (NegP)    V'
                                ╱‾╲     ╱‾╲
                               mâj     . . .
```

Each of these positions for *mâj* are possible for (46), given that it is c-commanded by *lɛ́ɛw* in each of them.

Because *lɛ́ɛw* must be attached above negation, we can use it to force the high reading of the adverb, as shown below:

(47) a. nák-rian **mâj** [hǐw   khâaw] **lɛ́ɛw**   **thúk-khon**
          student NEG hungry rice   already every-CL^{person}
          'Every student already isn't hungry.' $\forall > \neg, *\neg > \forall$

     b. ?nák-rian **mâj** [hǐw   khâaw] **thúk-khon**   **lɛ́ɛw**
          student NEG hungry rice   every-CL^{person} already
          'Every student already isn't hungry.' $\forall > \neg, \neg > \forall$

While marginal, when the FQ is placed to the left of *lɛ́ɛw*, both readings are available.

Given that *léɛw* must attach above negation, the fact that (47-a) must have the FQ scoping above negation follows directly from an analysis where linear order on the right is due to right adjunction. On the other hand, the FQ in (47-b) can occur below negation because it is structurally lower than *léɛw*:

(48)   a.
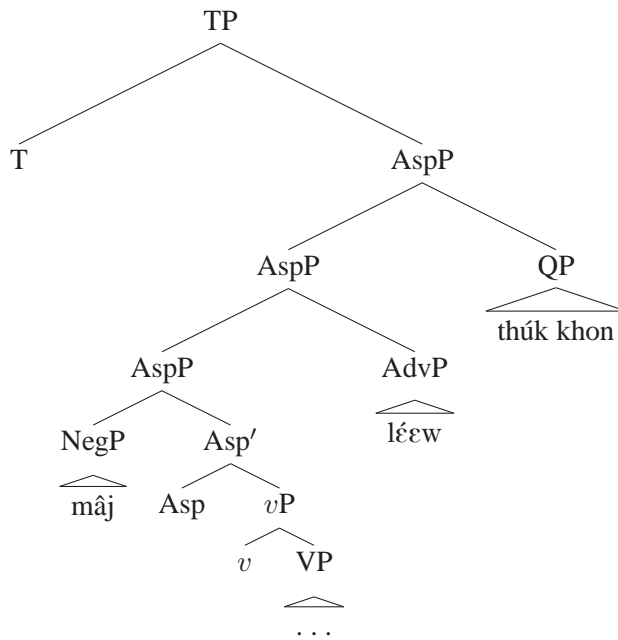
b.
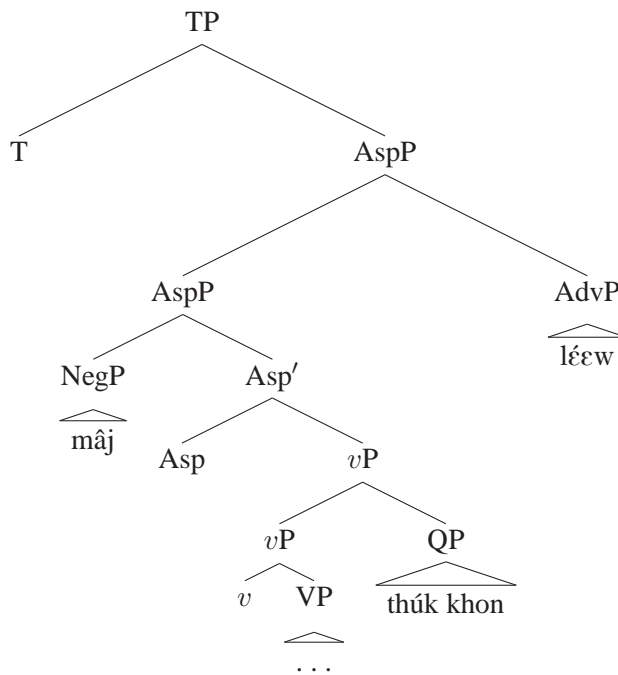
Other imaginable structures are also compatible with these assumptions, but the idea that rightward-attachment in Thai is a form of right-adjunction is able to account for the restriction on the interpretation of FQs without difficulty.

This analysis predicts straightforwardly that the interpretation of FQs relative to negation should be free for adverbs which are not PPIs. The following examples shows that this is the case:

(49)   a.   Mǎa **mâj** [kàt dèk] **mûawaannii thúk-tua**
            dog NEG bite child yesterday   every-CL^{body}
            'Every dog didn't bite children yesterday.' $\forall > \neg, \neg > \forall$

        b.   Mǎa **mâj** [kàt dèk] **thúk-tua**   **mûawaannii**
            dog NEG bite child every-CL^{body} yesterday
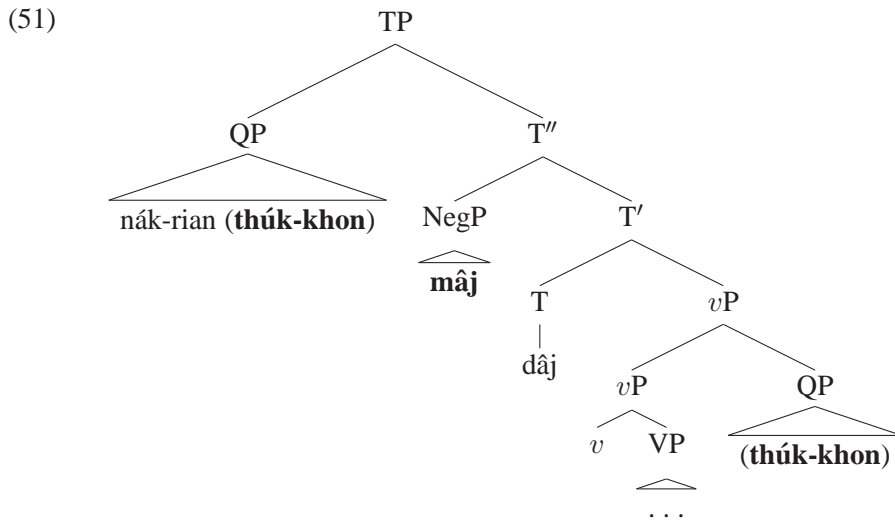   'Every dog didn't bite children yesterday.' $\forall > \neg, \neg > \forall$

As before, the particular scope effects observed in these sentences can be derived from a number of different structures. Crucially, though, the availability for negation to scope above the FQ in both examples in (49) is because there are no restrictions on the height of negation due to the non-PPI status of the adverb.

There is some direct evidence for the claim that the height of negation leads to the ambiguity of FQs rather than the height of the FQ itself. This evidence comes from the interpretation of FQs in sentences where negation precedes some auxiliary which is structurally high in the clause. Consider the examples in (50-a-b):

(50)   a.   nák-rian **thúk-khon mâj** dâj chɔ̂ɔp kin ʔahǎan-faràŋ
            student every-CLF NEG PST like eat food-Western
            'Every student didn't like to eat Western food.' $\forall > \neg, \neg > \forall$

        b.   nák-rian **mâj** dâj chɔ̂ɔp kin ʔahǎan-faràŋ **thúk-khon**
            student NEG PST like eat food-Western every-CLF
            'Every student didn't like to eat Western food.' *$\forall > \neg, \neg > \forall$

In these examples, negation occurs before the verbal auxiliary *dâj* 'get', which has many uses, but generally seems to mark past tense when it occurs preverbally. Interestingly, in examples where negation precedes *dâj*, we see a different pattern of scopal behavior than when negation directly precedes the verb. While subject quantifiers are ambiguous, FQs can only scope below negation.

This observation can be made to follow directly if *dâj* is seen as occupying a position high in the clause, perhaps T, for expository purposes. If so, the ability of negation to scope above the subject in these examples might be because of their position in the same projection. On the other hand, the fact that *dâj* must scope above the FQ indicates that the FQ must occur lower in the structure than the subject:

(51)

```
                            TP
                  ┌─────────┴──────────┐
                 QP                    T″
            ┌────┴────┐          ┌─────┴─────┐
    nák-rian (thúk-khon)      NegP          T′
                              ┌─┐      ┌─────┴─────┐
                             mâj        T          vP
                                        │      ┌───┴───┐
                                       dâj    vP      QP
                                           ┌──┴──┐  ┌──┴──┐
                                           v    VP  (thúk-khon)
                                               ┌─┐
                                               ...
```

Again, the conclusion that Thai quantifiers receive surface scope relative to negation seems to be borne out in this example. The one complication is the ambiguity of the subject quantifier. It could be that because both NegP and QP are specifiers of the same projection, they are in a mutual c-command relationship, allowing them to be interpreted in either order (cf. May 1985, p. 33). I put this issue aside for now, and move on to more general issues related to movement and scope.

6.4 Quantifier Float as Quantifier Raising

In this section I introduce basic principles of Quantifier Raising (QR), a covert movement operation which has been proposed to account for the kind of quantifier scope differences we saw for Thai in the previous section. I show that some more recent conceptions of QR characterize it as movement or reconstruction to a position in the middle of the clause, similar to where FQs have been shown to be adjoined in Thai. I propose that these adjoined positions for FQs are generated by movement of an entire QP, including the noun, and that the discontinuity between these two elements occurs at the interface of syntax with phonology.

6.4.1 The position of raised quantifiers

Quantifier Raising (QR, Chomsky 1976; May 1977, 1985) is an syntactic movement operation which provides a structural explanation for the ambiguity of English sentences such as the following:

(52)   A girl kissed every boy.

Depending on the scope of the object quantifier, the situation either involves a single girl who kissed every boy (narrow scope) or the weaker claim that for every boy, there is some girl kissed that boy (wide scope). These two reading correspond to the following predicate-logical interpretations:

(53)   a. $\exists x[\text{girl}(x) \wedge \forall y[\text{boy}(y) \rightarrow \text{kiss}(x, y)]]$

   b. $\forall y[\text{boy}(y) \rightarrow \exists x[\text{girl}(x) \wedge \text{kiss}(x, y)]]$

The purpose of QR is to generate syntactic representations that can be directly mapped onto the semantic representations in (53).

May (1985) proposes that QR involves adjunction of quantificational noun phrases (or QPs) to the S node (the modern TP). The order in which the two QPs are adjoined determines their scope:

(54)   a.   [$_{TP}$ [$_{QP}$ ∃ girl$_x$] [$_{TP}$ [$_{QP}$ ∀ boy$_y$] [$_{TP}$ x T [$_{VP}$ kissed y]]]]

    b.   [$_{TP}$ [$_{QP}$ ∀ boy$_y$] [$_{TP}$ [$_{QP}$ ∃ girl$_x$] [$_{TP}$ x T [$_{VP}$ kissed y]]]]

Obviously (54) does not occur on the surface, but applies in a later syntactic cycle, logical form (LF), which is ordered after syntactic structures have been transferred to the phonological form:

(55)   Deep Structure
                              |
                    Surface Structure

        Logical Form   Phonological Form
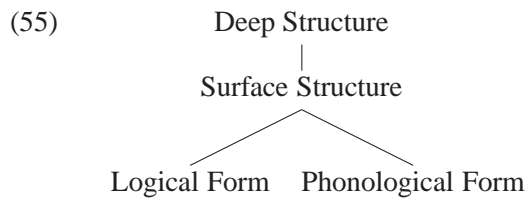
Thus, the need for QR as a syntactic operation is one of the traditional arguments for the existence of LF.

One of the more cumbersome pieces of May's analysis of quantifier scope was his proposal that quantifiers must also be able to undergo a Quantifier Lowering operation (QL, p. 97-105), motivated by examples where quantifiers serve as subjects of raising predicates such as the following:

(56)   A democrat$_i$ is likely t_i to win the next election.

(56) can be read as either making specific reference to a particular democrat who the speaker has in mind (say, Barack Obama) or it could be read as making a general statement about the likelihood of any democrat winning due to, say, the status of the economy or recent poll numbers. These two readings can be construed as wide versus narrow scope readings for the subject existential quantifier relative to the matrix raising verb *likely*. The narrow scope reading, according to May, follows from a process whereby *a democrat* lowers to the subject of the infinitive clause at LF.

QL is theoretically problematic because the lowered quantifier neither c-commands its trace nor satisfies the extension condition. The copy theory of movement proposed in Chomsky (1993) provided a more natural solution for this problem, whereby movement is construed as an operation which merges identical copies of the subject in two positions, allowing either to be interpreted:

(57)   A democrat$_i$ is likely ~~a democrat$_i$~~ to win the next election.

Under this analysis, the scope of the quantifier relative to the raising predicate is simply dependent on which copy of the subject quantifier is interpreted.

Another apparent case of quantifier lowering in English occurs is the ability of universal quantifiers in subject position to scope below negation:

(58)   Everybody isn't mad at me.

The relevant interpretation is most salient when a rise-fall stress is placed on *everybody* and secondary focus is placed on the verb *mad* (Büring 1997). McCloskey (1997) and Sauerland (2003) provide arguments that the possibility of the universal quantifier scoping below negation in (58) is due to the availability of a lower position for the subject, internal to the predicate. Of course, the idea that subjects move up into their surface position has been around for some time before (Huang 1993; Koopman and Sportiche 1992; Kuroda 1988; Sportiche 1988). Under the copy theory of movement, we can provide the following representation for (58):

(59)   Everybody$_i$ isn't ~~everybody$_i$~~ mad at me.

Here, the low scope reading of *everybody* arises when the lower copy of the subject is interpreted.

Hornstein (1995) argues that given the availability of subject reconstruction to its VP-internal position, cases of inverse scope can be analyzed by positing A-movement to a case position above the predicate-internal position of the subject. Likewise, Johnson and Tomioka (1997) argue that

subject quantifiers reconstruct to vP, where object quantifiers can scope above them by undergoing QR to a projection above the subject trace.[8]

(60)

[Tree diagram: TP branches into DP (A boy) and an intermediate node with T and vP. The vP branches into DP (every girl) and vP. This vP branches into DP (some boy) and vP. That vP branches into v and VP. VP branches into V (kissed) and DP (every girl). Dashed movement lines connect "A boy" down to a lower position, "every girl" to a lower position, and "some boy" to a lower position; "every girl" (object) connects up to the higher "every girl".]

Johnson and Tomioka's argument for an analysis of QR which involves subject reconstruction to vP involves examples with subject quantifiers, object quantifiers, and negation. They demonstrate that when object quantifiers scope over subject quantifiers, only readings where the subject quantifier scopes below negation are available. They account for this generalization by assuming that negation must be merged above vP.

The structure proposed by Johnson and Tomioka to represent the LF of sentences with inverse scope in (60) resembles the positions proposed for FQs which were observed in the previous section. In particular, the DPs in (60) are attached to positions in the mid-clausal spine, roughly around vP. The main difference between Thai and the English structure in (60) is that the latter involve left-adjunction and the Thai examples involve right-adjunction.

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[8]The difference between these two proposals is the question of whether QR is A-movement or A-bar movement. The main argument for QR being a case of A-movement is that it is famously clause-bound (e.g. Reinhart 1997). The main argument for QR being an instance of A-bar movement is inverse linking, cases of inverse scope within a DP, which May (1985) relies on heavily in making his argument for QR more generally. See also Kennedy (1997) for discussion.

6.4.2   QP movement

In this section I argue that the most straightforward conception of Q-float in Thai is as movement of an entire QP. However, if Q-float is QP-movement, it is not clear how it moves to and from a position which appears to be right-adjoined to the clause, nor how the QP itself comes to be pronounced in different positions. These difficult questions will be addressed in the sections following this one. Here, instead, I focus on the motivation for considering Q-float to be an instance of QP movement.

In addition to accounting for inverse scope, movement-based analyses of QR have been maintained because they solve a basic problem precipitated by the semantics of quantifiers, particularly in object position. This problem is made particularly clear by Barwise and Cooper (1981)'s analysis of quantificational determiners as two-place relations between sets, of type $\langle\langle e, t\rangle, \langle\langle e, t\rangle, t\rangle\rangle$. In a simple example such as (61-a), the first argument of the quantifier, the restrictor, is the NP associate of the quantifier, while the second argument, the scope, is the clause or proposition with which the quantifier is associated (61-b). An obvious benefit of QR is that it allows any proposition to be interpreted as a set, i.e. a property, by virtue of the vacated argument position, under the assumption that the trace of movement is interpreted as a variable (61-c), and movement is interpreted as predicate abstraction. The semantic interpretation of this structure is given in (61-d):

(61)   a.   John laughed at every joke.

   b. $\forall$ [$_{restrictor}$ joke] [$_{scope}$ John laughed at x]

   c.   [$_{TP}$ [$_{QP}$ every joke$_i$] [$_{TP}$ John laughed at ~~every joke$_i$~~]]

   d. $\forall x[\text{joke(x)} \rightarrow \text{laughed.at(j,x)}]$

Thus, QR solves the problem of quantifiers in object position. The question relevant for our purposes is whether Q-float can be characterized as part of the same process.

Indeed, a basic instance of Q-float, such as the Thai case in (62-a) (glossed to English), has the same problems with respect to quantifier interpretation as quantifiers in object position. Regardless of whether (62-a) is an instance of subject or object Q-float, it is unclear how the appropriate NP is associated with the FQ as its restrictor, and how the clause can function as the scopal argument of the quantifier, given that its arguments are saturated:

(62)   a.   [$_{TP}$ student [$_{vP}$ [$_{vP}$ ~~student~~ read book] [$_{QP}$ every-CLF]]]

        b.   ∀ [$_{restrictor}$?] [$_{scope}$ student read book]

A movement analysis that makes use of stranding is impossible for Thai, because the object NP never moves (section 6.2.1). Suppose instead that both subject and object Q-float involve movement of the entire QP. The problem of interpretation then would not arise, as the restrictor NP and the FQ would occur together at every level of syntax.

In addition to avoiding both problems of interpretation, positing QP-movement also provides a way of accounting for the locality restrictions noted in section 6.1.1, as QR is generally seen as more limited than regular A-bar movement in its ability to cross bounding nodes for movement. Under an analysis involving QP-movement, subject Q-float would involve movement from the floated position to the subject position, while object Q-float involves movement from the object position to the floated position:

(63)   a.   *Subject Q-float as QP-movement*

              [$_{TP}$ [$_{QP_i}$ student every-CLF] [$_{vP}$ [$_{vP}$ v read book] t_i]]

        b.   *Object Q-float as QP-movement*

              [$_{TP}$ student [$_{vP}$ [$_{vP}$ ~~student~~ read t_i] [$_{QP_i}$ book every-CLF]]]

In conjunction with the evidence from adverbials and scope that FQs occupy a position around vP,

Thai Q-float can be transparently viewed as a subcase of QR, under the analysis of QR of Johnson and Tomioka (1997). This can account for the restriction of Q-float to quantifiers as well as providing at least a partial explanation for the scope of FQs. The first point needs little elaboration. QR is restricted to quantifiers because of their type. Ergo, the restriction of Q-float to quantificational NPs can be attributed to their type.

The scope of FQs relative to negation have been shown in section 6.3.2 to follow from the idea that negation can occur in different positions. If we take those FQs to include their nominal restriction, as argued above, then the ability of FQs to be interpreted in their floated position follows directly.

However, the QP-movement analysis leaves several questions unanswered, which are dealt with in the following sections. First, section 6.4.3 outlines a theory for rightward direction of Q-float in Thai. Then, section 6.5 makes a proposal about how the QPs in the derivations above become separated at the interface with PF, a proposal which is argued to permit a partial explanation for a generalization about the availability of FQs in different classifier languages.

6.4.3 A toy theory of specifier directionality

Thai seems to exhibit a clear distinction between adjuncts, which are on the right, and specifiers, which are on the left. Suppose that the traditional distinction between adjuncts and specifiers were dissolved, as has been suggested for example by Kayne (1994). Suppose, too, that the decision as to whether a specifier is spelled out on the left or the right in a given language is regulated by specific syntactic features of the specifier.[9]
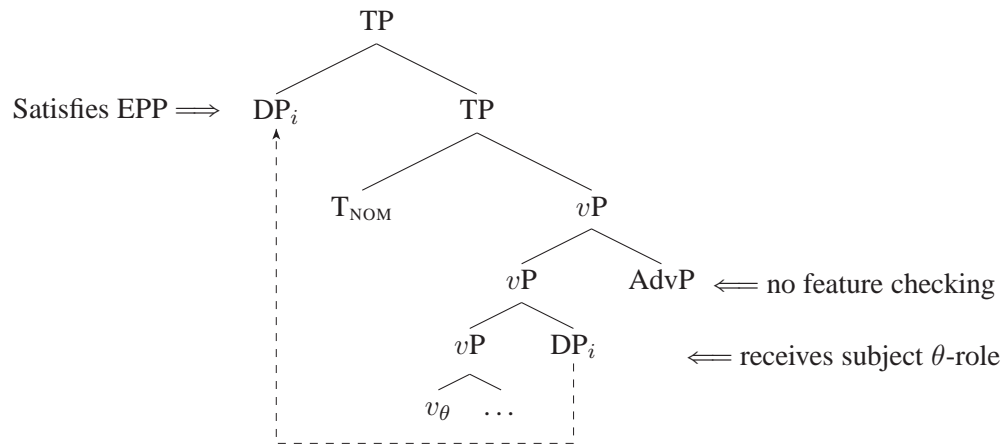
If we assume that subjects move to their surface position in Thai, driven by the presence of

---

[9]This general idea was borrowed in part from a course taught by David Pesetsky and Danny Fox at MIT during the fall of 2009. They proposed that a distinction exists between inner specifiers, which are ordered on the right, and outer specifiers, which are ordered on the left. The formal basis of this distinction is not clear. A different approach to derive directionality of specifiers based on morphological properties of the moved constituent can be found in Johnson (2011). Both of these ideas are ultimately attempting to account for the rightward direction of QR, motivated by the analysis of extraposition of Fox and Nissenbaum (1999) and the analysis of Antecedent-Contained Deletion in Fox (2002).

an EPP feature, we can exploit this feature to account for the specifier/adjunct distinction. In other cases of non-EPP driven merge, such as adjunction, or merger for reasons of theta-assignment, the 'specifier' is spelled out on the right, as a putative adjunct:
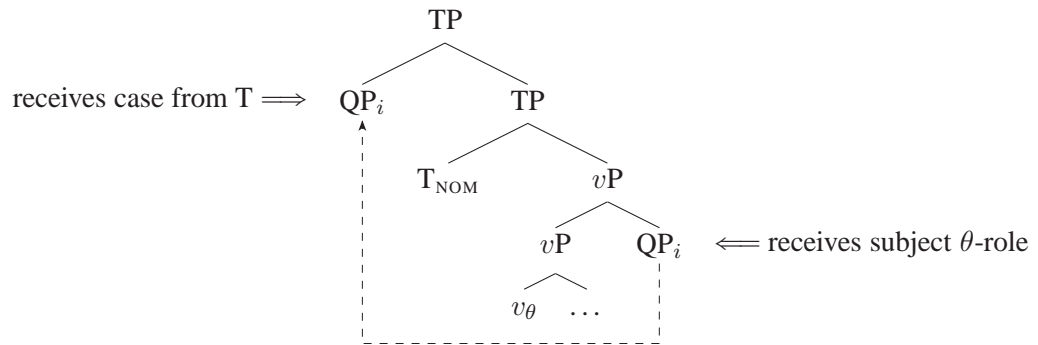
(64)

$$
\begin{array}{c}
\text{TP} \\
\end{array}
$$

Satisfies EPP $\Longrightarrow$ DP$_i$ TP

T$_{\text{NOM}}$ vP

vP   AdvP $\Longleftarrow$ no feature checking

vP   DP$_i$ $\Longleftarrow$ receives subject θ-role

v_θ ...

The idea that the EPP, as a feature, bears directly on the mapping between syntactic structures and pronunciation was also used by Nunes (2004) to account for the preference for pronouncing structurally higher copies. Nunes proposes (pp. 31-32) that this is so because the highest copy has the most checked formal features, and derivations can only converge once formal features have been checked. If feature checking is relevant to the PF interface for determining which copy is pronounced, the idea that these same features might be relevant for determining the directionality of specifiers is not too far-fetched.

    Consider briefly the other cases of leftward specifiers in Thai: topics occur on the left, motivated by a Topic head, which presumably must have a filled specifier (Rizzi 1997), NPs occur on the left within noun phrases, likely due to an EPP feature on the D head, and instances of VP-movement discussed in chapter 2 are pronounced on the left as well. Other cases are more difficult, including negation, which I just argued is a verbal specifier, and numerals, which I argued occur in [Spec,ClfP] in chapter 3. Solutions are imaginable, however. Perhaps negation occurs as the

specifier of a separate Neg projection, as proposed by Cinque (1999, p. 120-126), which has an

EPP feature which must be filled by an overt negative specifier, *mâj* in Thai. For numerals, the idea

that classifiers contain an EPP feature is also quite natural, especially given the arguments for that

position in section 3.2.2. Based on these considerations, the idea that only certain specifiers are
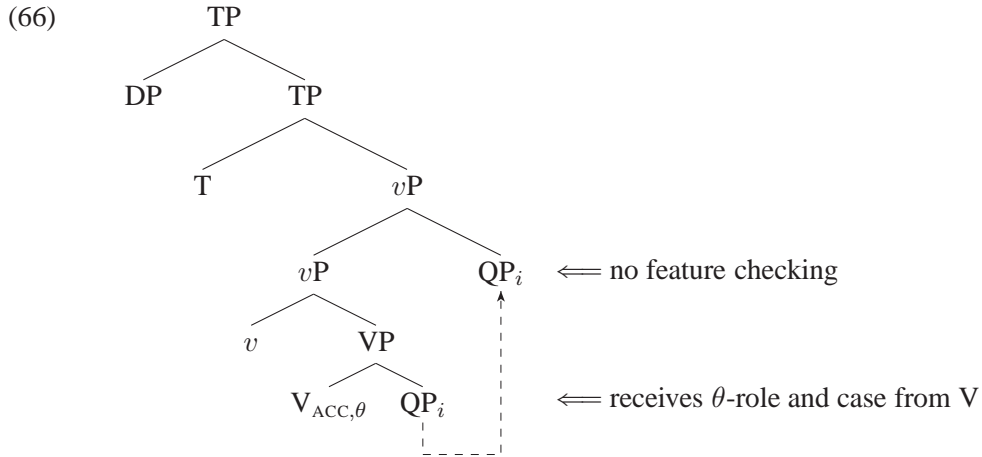
spelled out on the left seems plausible.

Given the distinction in subject positions in (64), the fact that FQs emerge on the right can be

derived from the observation that predicate-internal subjects also appear on the right:

(65)

receives case from T $\Longrightarrow$ QP$_i$

$$
\begin{array}{c}
\text{TP} \\
\diagup \quad \diagdown \\
\text{QP}_i \qquad \text{TP} \\
\qquad \diagup \quad \diagdown \\
\qquad \text{T}_{\text{NOM}} \qquad v\text{P} \\
\qquad\qquad \diagup \quad \diagdown \\
\qquad\qquad v\text{P} \qquad \text{QP}_i \quad \Longleftarrow \text{receives subject } \theta\text{-role} \\
\qquad\qquad \diagup \diagdown \\
\qquad\qquad v_\theta \quad \ldots
\end{array}
$$

In addition to these two positions, the subject QP could in principle move through additional mid-

clausal projections on the way to its surface position, potentially leading to different scopal interpre-

tations. For our purposes, though, the two positions in (65) are sufficient. In the following section I

propose a mechanism which regulates where the different QP-internal elements are spelled out and

what their scope is in these different elements, deriving Q-float.

For objects, the derivation is different in that the case position and the theta position are the

same, as the complement of the verb. Q-float is caused by the type-driven movement of the QP to

the vP level. Because it does not move to check any criterial features, it is spelled out on the right:

(66)

```
                    TP
                 ┌───┴────┐
               DP          TP
                        ┌───┴────┐
                       T          vP
                              ┌────┴─────┐
                            vP          QP_i   ⟸ no feature checking
                         ┌──┴───┐        ↑
                        v       VP       ┊
                             ┌──┴───┐    ┊
                          V_ACC,θ  QP_i  ┊   ⟸ receives θ-role and case from V
                                   └─────┘
```

The actual projection which the QP moves to is, in principle, free, though we saw in section 6.1.3 that they cannot move into the upper CP domain.

It is unclear why object quantifiers move to the vP or other mid-clausal levels rather than to some higher projection, such as above the surface position of the subject. This may be an instance of derivational economy: the vP level is the first one where the quantifier *can* be interpreted, due to the position of the subject there.

In summary, I am proposing that Q-float in Thai is related to Quantifier Raising, a scope-driven movement operation which is restricted to quantifiers. This leads to the claim, independently necessary for semantic reasons, that Q-float involves movement of the whole QP. A movement-based analysis is made more plausible by the stipulation that specifiers on the left and right in Thai are structurally identical except for the requirement that specifiers on the left satisfy some EPP feature in the clausal spine. This proposal allows Thai Q-float to be seen as an instance of QR as movement and reconstruction to a mid-clausal level, but leaves open the questions of how FQs and hosts become separated, and why quantifiers receive surface scope relative to negation in Thai.

6.5 Interpreting and Pronouncing Quantifier Float

This section addresses the question of how a single QP comes to be spelled out in different positions within the clause. It is argued that this restriction arises after 'narrow syntax' is complete, at the PF interface Chomsky (2004, 2005). In particular, I argue in section 6.5.1 that the spell-out of copies and show that Thai Q-float can be seen as a case of scattered deletion (Fanselow and Ćavar 2002; Nunes 2004). In section 6.5.2 I introduce the constraints which lead to the particular deletion pattern that is found in Thai, which I also argue account for the locality restrictions on QR. Finally, I present a generalization about the availability of classifier float in different languages in section 6.5.3. I argue that this generalization can be captured by the claim that the QP or DP constitutes a cyclic domain for transfer of syntactic information to the interface with phonology. I show how this constraint can account for the observed generalization, and consider alternatives.

The analysis I present has a clear inadequacy, however. It seems to predict, incorrectly, that Q-float should only be possible in those cases where it takes scope in a different position relative to some other scope bearing element than it would in argument position. I argue that this shortcoming can be resolved by introducing focus into the analysis. While I do not offer a full integration of focus into my analysis, I suggest directions for such an integration.

6.5.1 Linearization and Copy Pronunciation

There is a line of work stemming from Kayne (1994) in which the interface between syntax and phonology is characterized as a procedure which translates hierarchical structure into a set of precedence statements which serve as instructions for pronunciation. To give a primitive example, Kayne takes a structure such as (67-a) to be translated into the precedence statements in (67-b), where precedence, $<$, is determined by c-command, and only terminal nodes are translated into precedence statements:

(67)   a.

```
                  IP
                 /  \
               NP    VP
               |    /  \
               N   V    NP
               |   |    |
             John likes  N
                         |
                        Mary
```

   b.   {John ≺ likes, John ≺ Mary, likes ≺ Mary}
        or {John ≺ likes ≺ Mary}.

Unlike **Kayne** (1994), I do not tie the precedence relation directly to c-command, as I take direc-

tionality to be determined by other factors, such as feature checking, as detailed in section 6.4.2.

Linearization theory is particularly interesting in its intersection with the copy theory of

movement, as movement in this theory leads to contradictory linearization requirements, as shown

in (68):

(68)   a.

```
                  CP
                 /  \
              NP_i   CP
               |    /  \
               N   C    IP
               |   |   /  \
              Who does NP   VP
                      |    /  \
                      N   V    NP_i
                      |   |    |
                   John like   N
                               |
                              Who
```

   b.   {who ≺ does ≺ John ≺ like ≺ who}

Here, *who* must both precede the other members of the clause as well as follow them. In order for

this string to be pronounced, one of these copies must be deleted.

Nunes (2004) demonstrates that deletion occurs in three different ways depending on various

morphological and semantic considerations in different languages (see also **Bobaljik** 2002; **Boškovič**

2001). The most common way of pronouncing (68), as in English, involves deletion of all but the

highest copy. Some authors have stipulated the pronunciation of the highest copy as a general preference (Bobaljik 1995; Pesetsky 1997), Nunes (2004) attempts to derive this preference from more general principles, arguing that copies with more unchecked features are preferentially deleted.

In addition to cases above where only one copy is pronounced, Nunes (2004) presents examples from various languages where multiple copies within a movement chain are pronounced. For example, in German multiple copies of a *wh*-moved element can occur overtly:

(69) **Wen** denkst Du **wen** sie meint   **wen** Harald liebt?
      Who think you who she believes who Harald loves
      'Who do you think that she believes that Harald loves?'   (Fanselow and Mahajan 1995)

Such examples provide evidence for the copy theory of movement, as well as the idea that the conditions leading to the pronunciation of the different members of chains are subject to crosslinguistic variation. In the case of German, Nunes proposes that the moved *wh*-phrase in (69) is actually a head which is morphologically fused with the probing C-head, leading to distinctness among members of the *wh*-chain, allowing multiple copies to be pronounced. The ability of German to morphologically fuse heads leads to the ability to pronounce multiple copies.

The final way that copies can be pronounced is by scattered deletion, which combines aspects of both strategies above. Like in the single-copy cases, each element is only realized once, but these elements are realized in different positions, as in the multiple-copy cases in (69). Consider the following examples, the first from Croatian and the second from German:

(70) a. **Na kakav**   je Ivan **krov** bacio loptu?
          On what-kind-of be Ivan roof throw ball
          'One what kind of roof did Ivan throw the ball?

      b. **Wieviel**   hat er **Schweine** gekauft?
          how many has he pigs   bought
          'How many pigs has he bought?'   (Fanselow and Ćavar 2002, p. 68)

Fanselow and Ćavar (2002) proposes that the motivation for scattered deletion in the cases above is that the moved constituent simultaneously checks two different discourse-oriented features in the two positions. In (70), the setence-initial *wh*-component checks a *wh*-feature on C, while the lower noun phrase checks a focus feature on some lower projection. Nunes (2004, p. 25-30) discusses a number of other cases of scattered deletion (see also Boškovìc and Nunes 2007).

In the framework of Nunes (2004), scattered deletion is a costly operation because it violates a preference to pronounce a single copy in a chain. Economy conditions prefer to pronounce a single copy because the deletion process by which chains are reduced targets the smallest number of constituents to allow that chain to be linearized. Deleting the highest node which dominates the chain is more economical than deleting different sub-nodes in different positions (p. 27). This means that scattered deletion occurs only if required by some overriding system of constraints.

The following section examines how other constraints interact with the preference to spell out a single constituent, defined below:

(71)   *DELETE: Delete the smallest number of constituents to satisfy linearization requirements.

The constraint above is not responsible for deciding which copy is deleted, an effect which Nunes attributes to the feature system, but only the preference for the kind of deletion we see in English *wh*-movement, rather than scattered deletion.

6.5.2   Transparent Interfaces in Argument Tracking and Scope

In order for *DELETE to be violated, there must be constraints which prefer both nouns to occur in their case positions, as they always do in Thai, and for quantifiers to occur in their floated position. These constraints would together favor the discontinuous pronunciation of QPs. I propose that both constraints are based in the idea that PF must transparently reflect semantic relations between syntactic items when possible. In this regard I follow the proposal of Bobaljik

and Wurmbrand (2008) (BW) in proposing that such constraints reflect an asymmetry between LF (meaning) and PF (form): PF is faithful to LF.

The first principle regulating the mapping from syntax to PF requires transparency in *argument tracking*, that is, the ability to determine which noun phrase serves which syntactic function in a clause:[10]

(72)   *Argument Transparency* (ArT) Syntactic relations (e.g. subject, object, etc.) must be transparently reflected at PF.

In principle, ArT could be satisfied by one of three ways: with word order, agreement, or case marking. As is well known, languages which allow free word order tend to be those which use rich morphology to mark the syntactic functions of noun phrases (e.g Markman 2005). This state of affairs is expected under ArT because word order, agreement, and case are all ways of ensuring Argument Transparency. Because Thai lacks case and agreement, the effect of ArT in Thai is to require that *nouns* be spelled out in their argument (case) positions. Thus, subject NPs are always spelled out in subject position, and object NPs are always spelled out in object position, etc. We might call this subcase of ArT the *Analytic NP Principle*, which states, roughly, that noun phrases in analytic languages lacking case and agreement must be pronounced in their case positions.[11]

The other principle which requires that PF transparently reflect LF is Scope Transparency, or

---

[10]In the framework of Williams (2003), a similar idea is encoded as two different requirements, one regulating mapping between semantic relations (or argument structure) and case, and another regulating mapping between case and surface structure. The constraint I have in mind is closer to the latter.

[11]In addition to their rigid word order, the Analytic NP Principle seems directly tied to two otherwise mysterious properties of isolating languages. These include the absence of overt *wh*-movement, which is extremely uniform across these languages, and somewhat paradoxically, the status of nearly all of these languages as 'radical'-pro-drop languages (cf. Huang 1984). It is well-known that languages which allow arguments to be omitted freely fall into two categories: those with extremely rich morphology and those with extremely poor morphology. The latter case has always been puzzling, as it has often been claimed that agreement itself is the mechanism which gives rise to argument omission (e.g. Alexiadou and Anagnostopoulou 1998). Due to the Analytic NP Principle, however, null noun phrases are allowed in languages with isolating morphology precisely because in such languages arguments predictably occur in a fixed position. Due to this, they can be omitted because their surface position is invariant.

ScoT. This constraint is used by BW (p. 3) to account for a number of cases where word order and scope interact. BW's definition of the constraint is provided below:[12]

(73)   *Scope Transparency* (ScoT) (1st version):

     If the order of two elements at LF is A $\gg$ B, then the order at PF is A $\gg$ B.

BW propose that the $\gg$ relation "represents the canonical manifestation of hierarchical order at the relevant level, roughly scope at LF ... and linear precedence at PF" (p. 3).

     This does not suffice for Thai, since the mapping between c-command and linear order is not direct, but is subject to an ordering condition among specifiers. Thus, I adopt a slightly different version of ScoT, shown below:

(74)   *Scope Transparency* (ScoT) (2nd version):

     If the order of two elements at LF is A $\gg$ B, then pronounce syntactic objects which transparently reflect that order.

Here, the syntax transparently reflects scope at PF by selecting copies which have the appropriate height relative to each other. If there are multiple copies, this does not necessarily have the effect of spelling out a copy which is interpreted. Instead, ScoT only penalizes cases where two scope-bearing elements are spelled out in positions with a structural relationship which is different than the one which is reflected in the semantics.

     Consider how these constraints together derive subject Q-float, from section 6.3:

(75)   nák-rian (yaŋ) **mâj** [$_{\text{VP}}$ kin khâaw] **thúk-khon**
      student still NEG   eat rice   every-CL^{person}
      'Every student still hasn't eaten.' $\forall > \neg, \neg > \forall$

---

[12]The idea that grammar favors isomorphism between scope and word order is not unique to BW; they cite a number of additional variations of the idea in earlier work to which the reader is referred.

The fact that the host is pronounced in subject position can be seen as an effect of ArT, while the fact that the quantifier is pronounced in the position where it is interpreted can be attributed to ScoT. Together, these constraints overcome the preference of *DELETE to delete a single QP.

The same considerations apply for object Q-float, as ScoT requires that they be interpreted in their floated position at the expense of *DELETE:

(76)   Joe **mâj** [$_{VP}$ phóp nákrian] mûawaanníi **thúk-khon**
      Joe NEG   meet student yesterday   every-CL^{person}
      'Joe didn't meet all of the students yesterday' $\forall > \neg, \neg > \forall$

Again, the ambiguity of quantifiers in these cases has been shown to follow from the variable position of negation.

Now recall that quantificational subjects receive obligatory high scope above negation. This can be made to follow from the proposal above in that the surface position of quantifiers is proposed to be the position in which they are interpreted. Reconstruction in (77) is prohibited by ScoT, and both ArT and *DELETE is satisfied as well.

(77)   nák-rian **thúk-khon**   (yaŋ) **mâj** [$_{VP}$ kin khâaw]
      student every-CL^{person} still NEG   eat rice
      'Every student still hasn't eaten.' $\forall > \neg, *\neg > \forall$

The analysis of Bobaljik and Wurmbrand (2008) actually predicts that reconstruction should be available in such cases because ScoT can be violated in case some other interface constraint, such as *DELETE, is satisfied. Yet Q-float is freely available for arguments in Thai, which indicates that violations of *DELETE may be relatively inconsequential in this regard. Thus, the more important constraint for the Thai subject facts is ScoT, which requires that subjects receive their surface scope.

Object quantifiers constitute a special case because they are never interpreted in situ, but always must undergo QR. Nevertheless, ScoT predicts that when quantifiers surface in object position, they should always have low scope, as objects are always hierarchically below negation:

(78)   Joe **mâj** [$_{VP}$ phóp nákrian **thúk-khon**   ] mûawaannîi
       Joe NEG   meet student every-CL^{person} yesterday
       'Joe didn't meet all of the students yesterday' $*\forall > \neg, \neg > \forall$

Thus, ScoT is satisfied despite the fact that objects are not actually interpreted in object position.

The observation that Thai quantifiers always receive surface scope follows from Scopal Transparency, which requires that the surface position of quantifiers transparently reflect their scope. On the other hand, the requirement that noun always appear in their argument positions follows from what I term Argument Transparency, which requires that the syntactic role of arguments be transparently reflected in the phonological form of the sentence. Together, these constraints lead to a violation of *DELETE, which prefers that a contiguous copy generated by movement be spelled out.

The Thai facts are somewhat puzzling from the perspective of BW, who argue that if ScoT can be satisfied without making recourse to 'costly' PF operations, the application of such an operation in order to satisfy ScoT is generally prohibited. Thus, we would expect that Q-float would be prohibited from, say, object position whenever the quantifier scoped below negation. This is because ScoT, ArT, and *DELETE are all satisfied when the QP occurs there. Thus, the surprising thing about Thai Q-float is how freely it applies. I return to this issue after considering the distribution of Q-float in classifier languages.

6.5.3   Quantifier float in classifier languages

In the previous section, attention was restricted to a relatively small number of constraints and their effect on copy deletion. We might wonder if there are other constraints at work in constraining the linearization of QPs. In this section I present a crosslinguistic generalization about the basic order within a noun phrase which suggests that Q-float linearization is constrained by *consistency* (Fox and Pesetsky 2005; Ko 2007).[13] Consistency is the requirement that once linear order estab-

---

[13]Note that this is a different kind of *consistency* than the semantic test for definite articles discussed in chapter 3 and chapter 5.

lished in one spell-out domain, it must observed in later stages of linearization. The generalization below provides evidence both for the analysis of Thai Q-float as an instance of scattered deletion as well as providing evidence that the DP/QP constitute phases for transfer to linearization in Thai and other classifier languages (cf. Heck et al. 2008; Kramer 2009; Svenonius 2004).

The generalization below is the result of a survey of Southeast Asian languages for which speakers or grammars were available. This survey revealed that while rightward Q-float of *quantifier-classifier* constituents is common in classifier languages, it seems to be constrained by the word order within the noun phrase:

(79)   *Quantifier Float Generalization*

   Rightward quantifier float (of the *Q/Num-Clf*) is only attested in classifier languages which allow the DP-internal order *N-Q/Num-Clf* (N-Q).

Most of these languages only allow rightward Q-float, an independent tendency. However, Japanese and Korean also allow FQs to scramble to the left across their associated hosts.[14]

The generalization in (79) covers Thai, which has the appropriate word order, as well as Japanese and Korean, which allow *Q-Clf* constituents to either precede or follow nouns QP-internally. In addition, Q-float is attested in the following classifier languages, with examples provided:

(80)   a.   dii-nee Yangoun-ko **caun-thaa thoun-yauq** laa-ke-te
             this-day Rangoon-to student   3-CL   came

        b.   dii-nee **caun-thaa** Yangoun-ko **thoun-yauq** laa-ke-te)
             this-day student   Rangoon-to 3-CL   came
             (both) 'Today three students came to Rangoon.'   (Burmese; Simpson 2004, ex. 3)

(81)   a. a^{44}-z_i^{33} **thuɯ^{31}ʐɪ^{33}** **ñi^{31}-po^{31}** i^{31}-ñi^{31} pɪ^{31} o^{44}
             child   book   2-CLF   today   read SFP

---

[14]Of course, leftwards quantifier float is attested in, for example French 'Quantification at a distance' (Kayne 1975).

    b.   a^{44}-ʑi^{33} **thɯɯ^{31}ʐɪ^{33}** i^{31}-ñi^{31} **ñi^{31}-po^{31}** pɪ^{31} o^{44}
        child   book   today 2-CLF   read SFP
        (both) 'Children read two books today.'   (Nuosu/Yi; Suhua Hu, p.c.)

(82)   a.   **khruu bəy-niet** ɛːn sipʰəl
        teacher 3-CLF   read book

    b.   **khruu** ɛːn siphəl **bəy-niet**
        teacher read book 3-CLF
        (both) 'Three teachers read a book.'   (Khmer)

(83)   a.   **phúcè sí-sō**   cwá dɤ́ hóhó
        child   3-CLF go   to school

    b.   **phúcè** cwá dɤ́ hóhó   **sí-sō**
        child   go   to school 3-CLF
        (both) 'Three children went to school'   (Kayah Li; Solnit 1997, p. 161)

(84)   a.   **manok a-bulat** adɛʔ
        chicken 1-CLF   big

    b.   **manok** adɛʔ **a-bulat**
        chicken big   1-CLF
        (both) 'One chicken is big.'   (Moken)

Like Korean and Japanese, Burmese and Yi are both SOV languages and thus allow relatively free word order within the sentence. As such, the presence of quantifier float in these languages is not too surprising. More striking is the ability of quantifiers to float in Khmer, Kayah Li, and Moken, all of which are SVO. While all of these languages are spoken in the same general linguistic area, in western Southeast Asia, they represent several different language families. The one property that all of these languages share is that they allow the *N-Q* word order, either as the only word order, as in Thai, Burmese, Khmer, Yi, Kayah Li and Moken, or as one of the available word orders, as in Korean and Japanese. In fact, I have not found a classifier language with the N-Q word order that does not allow rightwards Q-float.

On the other hand, despite a rich literature on the syntax and semantics of Mandarin Chinese,

a similar construction to Q-float has never been reported.[15] Any discussion of the same phenomenon is similarly absent in the literature on Vietnamese, and grammars of Hmong languages likewise do not mention the ability of quantifiers to float. Yet all of these languages have as a default the *Q-N* word order, and thus would not be expected to exhibit Q-float under the generalization above.

The generalization in (79) follows from the proposed analysis along with the additional condition that the QP or DP serves as a cyclic domain for linearization. What this means is that once word order is established at the QP level, the relative word order cannot be changed. Because Thai noun phrases have the order *N-Q*, and QR moves quantifiers to the right, Thai nouns and quantifiers can be pronounced in their argument and scope position, respectively, while this order is respected. This entails in turn that while linearization statements are fixed once the spell-out of a phase is determined, those elements do not have to appear contiguously in later phases. This property of linearization is called *consistency* by Fox and Pesetsky (2005) and Ko (2007).

Consider again the Thai example. When the QP is computed, the linear order is as in (85-a). at a later phase, say, the vP, the additional statements are added in (85-b), which involve contradictions regarding the position of the elements in Q due to movement. Scattered deletion can only apply in a way which is consistent with the QP-internal order. Thus, (85-c) is allowed, as we have seen, but (85-d) would not be.

(85)   *Consistency in rightwards Q-float from object position with N-Q order*

     a.   QP = { NP $\prec$ Q $\prec$ Clf }

     b. vP = { V $\prec$ QP$_i$ $\prec$ Adv $\prec$ QP$_i$ }

     c.   { V $\prec$ NP $\prec$ Adv $\prec$ Q $\prec$ Clf }

     d.   *{ V $\prec$ Q $\prec$ Clf $\prec$ Adv $\prec$ NP }

---

[15] An interesting connection in this regard is that Mandarin Chinese does have a way of universally quantifying over subjects adverbial, through the preverbal operator *dou*, which has been given significant attention in the literature on Mandarin (e.g. Xiang 2008).

This proposal would account for the absence of Q-float in classifier languages with the order Q-N, but only if adverbs in these languages occurred sentence-finally, as in Thai, which would predict that like Thai some specifiers in those languages are spelled out on the right. However, most adverbs precede the VP in both Vietnamese (e.g. **Duffield** 1999) and Chinese (e.g. **Ernst** 1999, 2002). This means that Q-float from subject position violates consistency, as it occurs to the right (86), but Q-float from object position does not, as it would be predicted to occur to the left (87):

(86)   *Inconsistency in rightward Q-float from subject position with Q-N order*

     a.   QP = { Q ≺ Clf ≺ NP }

     b.   CP = { QP_i ≺ Adv ≺ QP_i ≺ VP }

     c.   { Q ≺ Clf ≺ Adv ≺ NP ≺ VP }

     d. *{ NP ≺ Adv ≺ Q ≺ Clf ≺ VP }

(87)   *Consistency in leftward Q-float from object position with Q-N order*

     a.   QP = { Q ≺ Clf ≺ NP }

     b. vP = { Adv ≺ QP_i ≺ V ≺ QP_i }

     c.   { Adv ≺ Q ≺ Clf ≺ V ≺ NP }

     d. *{ Adv ≺ NP ≺ V ≺ Q ≺ Clf }

I do not know of any evidence that this prediction is correct, and even if leftwards Q-float from object position is not allowed in these languages, this could be due to other factors. I return to this puzzle in the following section.

Before concluding, it is worth mentioning some alternative explanations for the generalization in (79), and the types of analyses of Q-float that those explanations would favor. For example, one could claim, as I do, that the N-Q order is generated by NP-movement, and that every instance of Q-float is actually generated by stranding. Thus, the availability of Q-float qua stranding would

be predicated on the prior existence of NP-movement within the QP. The problem with this analysis for Thai, at least, is that object quantifiers are clearly structurally higher than their associated noun phrases, as I showed in section 6.2.1, so it does not seem to be sufficient to handle all of the cases of Q-float which the generalization covers.

An alternative mode of explanation would be to claim, as I do in Jenks (2010), that Q-N and N-Q languages have different structures within the QP: while quantifiers were functional projections above the noun in Q-N languages, they were adjuncts in N-Q languages. Because quantifiers are adjuncts in N-Q languages, they could adjoin either to the noun or another constituent. This analysis has a precedent in Doetjes (1997) and Benmamoun (1999), who observe that generally quantifiers which can attach both to VPs and nouns have the syntax of adjuncts. However, it is not clear under this view how to derive the correct interpretations of floated quantifiers. We have already seen that there is no evidence for interpreting FQs in Thai as 'pure' adverbials, and the explanation for the generalization in (79) must account for the existence of Q-float in all of those languages.

Another way of capitalizing on a structural difference would be to say that because quantifiers are adjuncts in N-Q languages, they can be adjoined to the noun in the floated position, after the noun moves there covertly. This analysis would follow the analysis of extraposition in Fox and Nissenbaum (1999), and would follow Sportiche (2005), among others, in claiming that quantifiers and their semantic restrictors are not necessarily constituents at every stage of the syntax. The explanation for the generalization under this view originates in the idea that late adjunction is restricted to adjuncts (Fox and Nissenbaum 1999; Lebeaux 1988, 1990). Such an analysis would still have to explain why NPs moved to or from the right side of the clause, however, and would have no explanation for why extraposition was impossible for non-quantificational adjuncts in Thai.

6.6   Further directions: The role of focus

Let us review what we have learned about Thai Q-float: it is restricted to arguments 6.1.1, only quantifiers can float 6.1.2, and they float to a position between VP and CP 6.1.3. The data regarding the position of FQs from section 6.1.3 was further corroborated by data from VP-ellipsis 6.2.1, which showed that FQs lie outside of the VP, and data from scope 6.3, which additionally demonstrated that Thai FQs seem to be interpreted in their surface position at least respect to negation, which quantifiers in subject and object position lacked quantificational variability with regard to negation. This latter fact led to the analysis of Q-float as Quantifier Raising in section 6.4.

The proposed analysis successfully accounted for why FQs occur in the position that they do, why they are interpreted there, why Q-float is restricted to quantifiers, and why languages must have *N-Q* word order in order to allow Q-float. However, several aspects of the analysis are somewhat troubling. For one, is not clear *why* QR should be overt in these languages. In addition, the role of ScoT in Q-float is somewhat different than in the cases observed by Bobaljik and Wurmbrand (2008), as Q-float is allowed in even when it does not affect scope. Furthermore, while our analysis was able to account for the Q-float generalization above, it still is not clear why *leftward* Q-float is not allowed in languages with *Q-N* word order. I would add to these problems the additional complaint that the rightward nature of QR was essentially derived by a stipulation.

These problems may all be due to an oversight in the proposed analysis, namely, the importance of focus in deriving Q-float in the first place. There is little work on focus in Thai, though, and working out an articulated analysis of Q-float along these lines would require a number of fundamental issues to be addressed in this domain.

The basic analysis would go as follows. QR derives various positions for quantifiers, as described above. Quantifiers can be focused in any of these positions. Focus is realized as rightward displacement of the quantifier, to the clause final position. Such focus-driven movement to the right

is actually quite common crosslinguistically (cf. Büring 2009). The quantifier and noun are spelled out discontinuously due to conflicting requirements on their pronunciation, as before, only now the requirement that the quantifier be spelled out on the right arises due to its need to take focus. The fact that only quantifiers can be focused in this position could be derived from the unique ability of quantifiers to be interpreted in non-argumental positions.

Such an analysis avoids the problems of a pure ScoT-based analysis because the rightward position of the quantifier is no longer motivated by scope considerations, but by information structural ones as well. Furthermore, it does not require a stipulated distinction between rightward and leftward specifiers, which could be reclassified as a pure contrast between specifiers and adjuncts. Such a view also provides a clear explanation for why QR is sometimes overt — because raised quantifiers are sometimes focused. Finally, an analysis couched in terms of focus may allow an explanation for why leftward Q-float does not occur, as leftward positions are clause-internal, and thus would not aid in the realization of focus on the quantifier. In contrast, rightward positions are peripheral, allowing the quantifiers to be prominent, as is required by focus more generally.

In addition to its theoretical merits, there are empirical motivations for adopting a focus-driven approach to Q-float. For one, the intonational breaks observed in section 6.1.3 show that the FQ is preferentially associated with the boundary of an intonational phrase, as would be expected of a focused constituent (see again Büring 2009). Likewise, floated quantifiers trigger intervention effects with lower wh-expressions, though the exact generalization is unclear. Intervention effects are identified with focus in existing literature (Beck 2006). One challenge in analyzing Q-float in terms of focus is working out how focus on quantifiers affects their available scopal interpretations.

A number of other facts are still unknown or poorly understood about Q-float. In particular, it is not clear what the effect of Q-float is in sentences containing quantifiers in both subject and object position, paradigms which are particularly difficult for reasons outlined in section 6.5.2. These types of sentences are also fertile ground for further work.

Chapter 7

Conclusion

As I conclude, I briefly summarize major properties of Thai syntax covered above and discuss three larger issues that they raise about syntax, the syntax-semantics interface, and the architecture of grammar. I first address the implications of the claim that clausal arguments can be either DPs or NPs, in particular the extent to which this view is compatible with different conceptions of linguistic variation. The second issue, going back to Chomsky (1970), is the extent to which nominal structure and clausal structure resemble one another. The final issue how the deterministic structure-building operations of syntax are constrained by interface conditions and economy constraints, and whether there is any principled way to distinguish the two.

7.1   Summary of the Dissertation

To begin, in chapters 2 and 3 I outlined a number of properties of Thai clause structure and Thai noun phrase structure. The discussion of clause structure focused on functional levels between VP and CP that serve to introduce external arguments and to specify the aspectual and modal properties of the verb. This discussion highlighted the extent to which Thai clause structure is highly isolating and rigidly ordered, and I argued, following the work of Simpson (2001) and Vi-

sonyanggoon (2000), that apparent exceptions to the right-branching structure of the clause should be analyzed as instances of VP movement.

While my discussion of noun phrase structure also focused on functional elements above the noun, the semantics of bare nouns and their ability to function as bare arguments was seen to provide evidence for an analysis of Thai nouns in terms of kinds. Additionally, some novel arguments for the status of classifiers as functional projections of the noun were provided, which argued for a similar conclusion from that found in earlier work. My proposals about plural marking, quantifiers, and deixis comprised a novel analysis of the Thai DP which relies on the idea that strong quantifiers are overt instantiations of the D position in Thai, while deictic elements, such as demonstratives, are adjuncts attaching to ClfP.

Chapter 4 took up a problem related to the Thai complementizer system, in particular why the same complementizer, *thîi*, introduces both relative clauses and noun-complement clauses, but does not appear in sentential complements of verbs. The paradigm is complicated by the observation that these latter cases involve a distinct complementizer, *wâa*, which appears only in verb-complement clauses and noun-complement clauses, but not in relative clauses. I proposed that *thîi* is actually a relative operator-cum-complementizer, and that it occurs in just those positions where embedded clauses are interpreted as predicates rather than arguments. I argued that when these predicative clauses occur noun-phrase-internally, they combine with the noun by predicate modification. This analysis of *thîi* necessitated a view of noun-complement clauses as nominal modifiers, which was justified on empirical grounds.

In chapter 5, I examined a phenomenon I dubbed the *classifier-modifier construction*, in which classifiers are licensed by nominal modifiers. I argued that the CMC involved a null D head, following earlier work, but proposed that in the CMC it is the modifier rather than the classifier that is the complement of the null determiner. I showed that this proposal in conjunction with *Avoid Structure*, an articulated structural economy constraint, could account for the absence of 'bare'

classifier phrases in Thai, that is, *noun-classifier* sequences receiving a definite interpretation. I also demonstrated that this structural economy constraint correctly predicts an attested correlation between the unavailability of definite bare nouns in a language and the ability of that language to use definite bare classifiers.

Finally, chapter 6 branched out from noun phrase internal structure, examining quantifier float in Thai, which I argued was an overt manifestation of Quantifier Raising. Evidence for my analysis came from new facts about the height of floated quantifiers, which demonstrated that floating quantifiers were able to take scope lower than subjects, but higher than objects. I argued that quantifier float is generated by movement of the entire quantified noun phrase, and that the dissociation of the quantifier from the noun in Thai occurs in the mapping from syntactic structure to PF.

7.2 To D or Not to D?

In the preceding chapters, a view of Thai noun phrases is articulated where both NP and DP function as arguments, but the choice between them is principled. Noun phrases containing bare nouns and modifiers project only NP, which accounts for their relative freedom of interpretations as kinds, generics, definites, and existentials. Noun phrases containing classifiers project DP (cf. Wu and Bodomo 2009), and this D can be filled either by quantifiers or by a choice-functional determiner. While perspective in itself is compatible with a framework where bare nouns denote kinds, as in Chierchia (1998), or properties, as in Dayal (2004), the kind analysis provides a principled explanation for the existence of classifiers as well as for the distribution of those determiners we do find in classifier languages (see below).

In chapter 5 the claim that arguments only sometimes project DP also had empirical benefits specific to Thai, framing an account of how modifiers license classifiers in terms of competition: all things being equal, definite NPs are preferred to definite DPs because they are more economical.

When modifiers occur as the complement of D, this competition is alleviated. The idea that definite NPs compete with DPs is supported by the observation that the unavailability of definite bare nouns in many classifier languages correlates with the availability of definite bare classifiers. Admittedly, this does not constitute a direct argument for definite NPs — such arguments are hard to establish based on a single language — but abandoning this aspect of the analysis would leave the licensing effect of modifiers in the CMC an outstanding problem.

The alternative view, advocated by many (Longobardi 1994, 2005; Stowell 1991; Szabolcsi 1994), is one where "reference to individuals" (Longobardi 2005), whether kinds or definites, always correlates with the existence of a DP projection. The benefits of this perspective are largely theory-internal, as it provides a transparent mapping from structure to meaning. If this stance is correct, however, the absence of overt definite articles in the vast majority of classifier languages is puzzling. It is also unclear why there should be any difference between generalized classifier languages that require classifiers for definite reference, such as Cantonese, and those that do not, such as Thai (as discussed in section 5.4.1). It is important to note that there is an identical distinction between number-marking languages that allow bare nouns to be definite, like Hindi and Russian, and those that do not, like English and German:

(1)   DISTRIBUTION OF BARE NOUN INTERPRETATIONS IN DIFFERENT LANGUAGES

	Generalized classifiers	*Number-marking*
Indefinite and definite	Mandarin, Thai	Russian, Hindi
Indefinite only	Cantonese, Hmong	English, German
Restricted	none attested	Italian, Spanish

In the table above *indefinite* is taken to range over kind, generic, and existential readings while *restricted* means that bare nouns in these languages only occur in certain syntactic positions. The availability of definite readings of bare nouns in number-marking languages generally is predictable from the absence of articles. Chierchia (1998) and Dayal (2004) attribute this observation to the *Blocking Principle*, which disallows covert definite type-shifts if an overt article is available. Yet

articles are rarely overt in any classifier language, making it less clear why there might be any distinction in the available interpretation of bare nouns. Of course, Cheng and Sybesma (1999, p. 522) attribute this distinction to the Blocking Principle on the basis that definite bare nouns are in complementary distribution with definite bare classifiers, arguing that definite classifiers act like overt determiners to block definiteness on the bare noun. Yet there are problems with adopting a view of classifiers as definite markers (section 5.4.2), so the distinction must be framed as between languages that allow a null D with classifiers and those which allow a null D without classifiers, essentially back where we started.

In order to maintain that definites are always DPs while maintaining the kind-based view of bare nouns in classifier languages, one would be forced to posit in the functional lexicon of classifier languages allowing definite bare nouns a null D head, interpreted as Situation Restriction (SR). Recall that SR was the semantic rule that derived definite readings from kind-based ones (section 3.1.2). Generalized classifier languages without this D head would be forced to utilize classifiers to derive predicates from kinds, then a choice functional D such as ι to select individuals from this predicate. However, when D is overt in classifier languages, as in Yi (Jiang and Hu 2010) and Weining Ahmao (Gerner and Bisang 2010), it always occurs with a classifier, putting the classifier-free SR version of D tenuous empirical ground. In addition, the mapping between intensional meanings, such as kinds, and extensional ones, such as definites, is usually not overt in natural language (cf. Dayal 2004). Thus, the analysis that SR is a 'free' semantic rule seems more natural than claiming it is a (null) D head, though the unavailability of SR in many classifier languages is puzzling.

In summary, if a language allows definite bare nouns, it also allows kind-based, generic, and existential uses of bare nouns. In other words, no language only allows definite bare nouns. This generalization follows from Carlson's conjecture that bare nouns have kind-based meanings, and that the alternation between kind and generic/indefinite readings arises due to properties of

the clause. In addition, the availability of definite readings of bare nouns in classifier languages seem more plausibly associated with a semantic rule than with a covert determiner, because such determiner are never overt.

Up to this point only crosslinguistic differences in the general distribution of argumental bare noun have been considered. Yet some languages allow bare nouns as arguments only in particular grammatical constructions. Italian, for example, allows bare nouns in lexically governed positions (Longobardi 1994), but this fact merely implicates the existence of a null determiner in such cases. Another construction where argumental NPs are attested is pseudo noun incorporation (PNI), a term which arose in Massam (2001)'s study of Niuean. Niuean sentences generally have a V-Part-S-O word order, in which noun phrases are realized as fully articulated DPs, with numerals, articles, and case (2-a). Transitive subjects are marked as ergative, while objects are absolutive. IN PNI constructions, though, objects surface immediately following the verb without the functional markers (2-b). In PNI constructions, the object is no longer case-marked, and the subject is marked absolutive, as if it were the subject of an intransitive verb:

(2) a. Takafaga tūmau ní   e   ia e   tau ika.
       hunt   always EMPH ERG he ABS PL fish
       'He is always fishing.'

    b. Takafaga ika tūmau ní   e   ia.
       hunt   fish always EMPH ERG he
       'He is always fishing.'   (Massam 2001, p. 157)

Massam argues that (2-b) does not involve true noun-incorporation into the verb by head movement (cf. Baker 1988a). Instead, she argues that the distinction between (2-a) and (2-b) arises because in (2-a) the noun projects functional structure and shifts out of the VP to check case, followed by VP-movement. In (2-b), on the other hand, NP remains internal to the VP and moves with the VP. The NP does not vacate the VP in those cases because it does not project DP. Unsurprisingly, instances of PNI always have non-specific, non-referential interpretations for the NPs (see

also Dayal 2011b).

What is particularly striking about the Niuean data is the correlation between the absence of functional structure on NP and the syntactic inertness of the NP with respect to higher functional projections in the clause. It is striking that the availability of bare NPs in classifier languages corresponds to the availability of bare verbs. This absence raises the possibility that differences among languages in whether DP is required might be tied to whether higher functional categories are required by the clause. In other words, classifier languages freely allow bare NPs because they never need to project DPs for purposes of agreement. Though many classifier languages do have case, these languages are almost always SOV languages with free word order, like Japanese, Korean, and Burmese. Thus, the motility of NPs may be related to the presence of case projections. This generalization resembles the Niuean facts, where the presence of case on the NP forces it to evacuate from the VP.

A final connection here is with the proposal of Sportiche (2005) and the work of Beghelli and Stowell (1997), who posit that bare NPs are merged directly into their argument positions and they move to higher clausal positions to combine with their functional projections, such as quantifiers. If it is true that all languages initially merge noun phrases into their argument positions as bare NPs, it is less surprising that these bare NPs can surface in certain languages.

In conclusion, while the notion that bare nouns might only project NP is undesirable from the perspective of frameworks where the mapping between syntax and semantics is crosslinguistically uniform (e.g. Longobardi 2005), there does seem to be a real connection between bare nouns and indefinitene and kind-based readings which would be unexpected if bare nouns always contained covert functional heads. The availability of definite bare nouns remains a more challenging problem, and is clearly 'marked' crosslingusitically, though I have presented several arguments that definite bare nouns lack silent articles.

7.3 Structural Parallels Between Noun Phrases and Clauses

The original motivation for the DP projection is the putative structural similarity between clauses and gerundive noun phrases, going back to Abney (1987), Chomsky (1970), and Jackendoff (1977). Abney focuses on the similarities between subjects and possessors in triggering agreement, and argues that the D level is analogous to the Infl projection in the clause. Szabolcsi (1994) takes issue with this claim, arguing instead that D is parallel to C in the clause, a view which has arguably become the dominant view in linguistic theory both for theory internal reasons and because of striking connections between extraction from DP and CP in Hungarian and Greek (see, e.g., Alexiadou et al. 2007, pp.130-151). A third view is provided by Larson (1991), who argues that the correct parallel for DPs is with VP rather than CP or IP, based on the relational character of quantificational determiners.

Visonyanggoon (2000) focuses specifically on the question of how Thai clauses and noun phrases are parallel. She argues that there are parallels in the sense that both are right branching, and both involve instances of phrasal movement – NP and VP movement — which obfuscate this structural similarity. The fact that VP parallels NP in this sense provides evidence against Larson's claim that DP is equivalent to VP.

I argued in chapter 6 that the DP/QP in classifier languages is a phase based on the crosslinguistic distribution of rightward quantifier float in classifier languages. The notion that DP/QP is a phase clearly favors the parallel with CP, as both are phases. This connection raises the possibility that just as the CP is composed of an 'inner' phase, vP, so too might the DP contain an 'inner' phase, call it nP, which would be the domain of theta assignment by the noun and valence-affecting morphology on the noun. In Thai, what I have called NP is structurally rich, as is hinted at by its rich set of productive derivational noun prefixes. Just as subjects merge at or above vP, so too would external arguments, i.e. possessors, merge at or above nP.

However, there are problematic aspects of the DP/CP parallel arising from asymmetries in the determiner and complementizer system in Thai. In her seminal work proposing that CP is parallel to DP, Szabolcsi (1994) observes that D and C serve two distinct roles that are conflated in many languages. The first role is to indicate clause/phrase type: either definite or indefinite for DPs and either finite or infinitive (say) for CPs. The second role is to act as subordinators, allowing the DP or CP to function as a theta-marked argument of a predicate. Szabolsci then conjectures that the nature and realization of D and C are correlated across languages.

The Thai data is problematic for this proposal, however. In chapter 4 I showed that Thai does have an overt complementizer, *wâa*, which conflates the two functions as both a finite clause-marker and a subordinator. Furthermore, *wâa* is obligatory in finite embedded clauses. Thus, Thai lacks an overt D, but does have an overt C. So while D and C are correlated in many languages, Thai seems to disconfirm Szabolsci's conjecture, at least in its strongest form. The obvious conclusion is that D and C, while structurally parallel, are not always correlated.[1] It may also be that the status of nouns as kinds in classifier languages obviates the need for a D, thus distinguishing noun phrases from clauses.

In light of these difficulties, one aspect of Thai clauses does favor the parallel between IP (now TP) and DP: just as bare nouns can occur as arguments in Thai, so too can bare verbs occur as matrix predicates. Perhaps this parallel between matrix predicates and DPs is irrelevant in light of Szabolsci's work arguing that DPs and CPs are only parallel when they function as arguments. Nevertheless, the absence of agreement or tense in Thai, Chinese, and other isolating classifier languages clearly parallels to the absence of articles under Abney (1987)'s proposal that D is an instance of Infl (cf. Fukui 1986; Kuroda 1988, ch. 4). Thus, Lin (2005, 2010) argues that Chinese lacks a TP projection, explaining the lack of agreement and tense markers in Chinese. However,

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[1]Mandarin Chinese, on the other hand, lacks overt complementizers as well as overt articles, thus providing support for the DP/CP parallel.

Sybesma (2007) argues against this conclusion based on semantic parallels between Mandarin and Dutch. Similarly, Matthewson (2005, 2006) examines the apparent tenselessness of the Salish language St'át'imcets and concludes that the truth conditions on tenseless sentences are not so vague so as to suggest that tense is absent in the semantics.

This controversy parallels the debate on the presence and status of D in languages that allow bare nouns. On one hand, the analytic nature of classifier languages makes the absence of certain functional projections unsurprising. On the other hand, classifier languages do contain functional words marking number distinctions (i.e. classifiers) and overt aspectual heads. As such, there is no *a priori* reason that tense and definiteness heads should be absent, especially given their structural importance. Even more, T and D are semantically similar: both are indexical, providing a referential interpretation for a variable introduced by the lexical head, an event variable for T and an individual variable for D (cf. Partee 1973).

As we have discussed, Krifka (1995) and Chierchia (1998) make sense of the absence of articles in classifier languages by claiming that nouns in these languages denote kinds. Unlike property-denoting nouns, kind-denoting nouns have the semantic type of arguments. It remains to be seen whether a similar claim can be made about verbs to make sense of the absence of tense. The obvious idea is that event arguments are simply not present in the meaning of verbs in classifier languages, but are introduced by higher functional projections, such as aspect, just as classifiers derive property meanings from kind-based ones. Because verbs would lack event arguments, no tense head would be necessary to existentially close or to index the time of this tense argument.

In summary, then, while the notion that DP is a phase clearly favors a parallel with the CP, the absence of articles in Thai fails to find a correlate in the CP domain, where Thai does have overt complementizers. On the other hand, the fact that tense, like D, is the position where events receive their referential indices seems to favor the parallel between DP and TP, potentially explaining the frequent absence of both tense and articles in the isolating classifier languages of East and Southeast

Asia.

7.4   Economy, Interface Constraints, and Variation

A leading idea about syntactic variation, generally attributed to Borer (1984), is that it should be reduced to variation in the featural properties of functional heads, i.e., differences in the functional lexicon of different languages. Such distinctions seem necessary, for example, to derive differences in DP word order in classifier languages. From this perspective, the different instances of movement deriving various word-order permutations proposed by Simpson (2005) originate in the different featural make-ups of functional heads above the NP.

Fukui (1986) articulates a different conception of variation, the idea some languages might lack certain functional categories altogether. Thus, Fukui claims, many differences between Japanese and English can be explained by the proposal that Det, Comp, and Infl are absence in Japanese. Interestingly, Chierchia (1998)'s proposal that nouns should be interpreted as kinds dovetails with Fukui's proposal in that it explains why some languages might not project DP without requiring the stronger claim that such languages never project DP.

If Fukui is correct in claiming that functional heads can be absent, yet I and others are correct in maintaining that functional structure is still optionally projected, there must be a way of determining whether that structure should be projected. One obvious criterion is whether the structure is required by the semantics. Thus, because numerals cannot combine with kind-denoting nouns in classifier languages, classifiers must be merged into the structure. Additionally, I argued earlier that structural economy regulates the presence versus absence higher nominal projections in classifiers languages.

My articulation of *Avoid Structure* requires constructing a *reference set* consisting of (at least) two synonymous structures. It has been argued based on considerations of computational com-

plexity that global economy conditions relying on reference sets do not play a role in grammar (e.g. Collins 1997b, 2001; Sternefeld 1996). We then might wonder whether there is some way of rephrasing the effect of Avoid Structure in a purely derivational manner. However, if Avoid Structure applies at the end of the computation of every phase, and only to elements within the same extended projection, the computational load is already reduced.

I propose in chapter 6 that Thai quantifier float occurs in part because of constraints which prefer that overt structure transparently reflects scope and argument structural. These interface conditions, Scopal Transparency and Argument Transparency, apply to determine how chains created by movement are linearized. The existence of a linearization procedure for movement provides a way of analyzing crosslinguistic differences that do not rely solely on differences in a language's functional inventory. This approach is akin to the recent work of Richards (2010) that attempts to derive differences between overt and covert *wh*-movement from the phonological characteristics of different languages. These approaches reduce what Chomsky (2006) calls the "tension between descriptive and explanatory adequacy" by accounting for cross-linguistic differences at the PF interface, thus avoiding complicated differences between languages in syntax itself.

In conclusion, syntactic variation may arise from many sources. While differences can be attributed to the featural makeup of functional heads, others may arise because of semantic differences between languages. Further differences may arise due to the way that movement is linearized, including constraints placed on linearization by syntax itself. Such a conclusion makes the job of linguists more difficult: it is no longer certain whether a particular difference between languages is solely due to their functional lexicon. Yet this conclusion potentially reduces featural differences between languages while providing an additional way to understand linguistic diversity.

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