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Natural Selection and the Syntax of Clausal Complementation

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NATURAL SELECTION AND THE SYNTAX OF CLAUSAL
COMPLEMENTATION

A Dissertation Presented

by

KEIR MOULTON

Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

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ABSTRACT

NATURAL SELECTION AND THE SYNTAX OF CLAUSAL COMPLEMENTATION

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This dissertation examines the syntax and semantics of clausal complements. It identifies semantic underpinnings for some syntactic properties of the arguments of propositional attitude verbs. The way clausal arguments compose with their embedding predicates is not uniform and semantic differences emerge from the syntactic context clausal arguments appear in. Three case studies are taken up: clausal arguments of nouns, dislocated clausal arguments (sentential subjects and topics), and infinitival complements with overt subjects (AcI constructions).

Chapter Two assembles evidence to support Stowell's (1981) claim that the clausal complements of nouns are modifiers. It is shown that the clausal complements of nouns behave like adjuncts in their ability to bleed condition C (Kuno 2004 and Jacobson 2003, and explored here further). The compositional strategy used to compose attitude nouns with their arguments, following Kratzer (2006), is shown to account for this behavior and to be commensurate with observations made by Grimshaw (1990). I then show how the modifier status of clausal complements of nouns is determined by the way in which nominals are formed from clause-taking verbs.

Chapter Three examines another complementation strategy, found with fronted clauses. New data from binding is provided in support of Koster's (1978) hypothesis that clauses do not move. Specifically, fronted clauses fail to show the effects of syntactic reconstruction. An analysis, making crucial use of *de re* attitude ascription, is offered to account for 'apparent' binding into fronted clauses.

Chapter Four makes the case for enriching the meanings of clausal complements. By examining some new patterns with *accusative with infinitive* (AcI) constructions (such as *I see him to be a fool*), I argue for decomposing certain doxastic attitude verbs, putting the introduction of alternatives into the complement. Here too the role of *de re* attitude ascription is shown to play a crucial role. It is argued that AcI constructions involve *de re* attitude ascription, with added constraints (determined by the lexical content of the embedding verb) on the nature of the Acquaintance Relation (Kaplan 1968, Lewis 1979). Several predictions about the kinds of verbs that can participate in AcI are borne out.

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CHAPTER I
AN INTRODUCTION TO SELECTION

1. Meaning and form correspondences in clausal complementation

This dissertation is about complement clauses – embedded sentences that serve as arguments to verbs and other predicates. The focus is on the interaction between the syntactic properties of complement clauses and the lexical semantics of propositional attitude predicates.

Work on clausal complementation has always been about the relation between the lexical semantics of embedding verbs and the meanings of various clausal projections (Rosenbaum (1967), Kiparsky and Kiparsky (1970), and Bresnan (1972)). Complement clauses come in a variety of syntactic shapes, which correlate in sometimes very systematic ways with the kinds of meanings they can express and the verbs they complement. Even just looking at English – indeed limiting ourselves to the clausal complements available to one verb – we can see how the syntactic make-up of a complement seems to correspond with different meanings. A well-known paradigm cited in this respect involves perception verbs, like *see*, which take various syntactic complements, each of which delivers different interpretations for the embedding verb:

(1) *Varieties of Perception Reports*

	<i>Syntax</i>	<i>Meaning</i>
a. John saw Fred leave early.	bare infinitive	direct percep.
b. John saw Fred leaving early.	gerundive	direct percep.
c. John saw Fred owning a house.	gerundive	imaginative
d. John saw Fred to be a party-pooper.	infinitive	belief
e. John saw that Fred left early.	finite clause	factive

It is now a clichéd observation about this paradigm that the presence of inflectional material in the complements – like tense, aspect, or the presence of the infinitival particle *to* – corresponds to an interpretation of *see* that reports a belief of the subject – that is, semantic opacity.

When verbs of perception appear with a bare infinitival complement, as in (1)a, they express direct perception reports. These are transparent or epistemically neutral, in that they do not implicate the beliefs of the subject in any way (Barwise 1981, Higginbotham 1983). This is why the following is not a contradiction:

(2) Edina saw Fred leave the house early, but she thought he was just looking out the door.

With syntactically ‘larger’ complements, *see* reports are epistemically non-neutral, meaning that they implicate an attitude on the part of the subject toward the content of the complement. So for instance, with an infinitival complement, (1)d, *see* reports a belief or judgment. Unlike the direct perception report, the complement is epistemically non-

neutral (Jespersen 1940, see also Higginbotham 1983, Kroch et al 1988). This *see* ascribes a belief to the subject, and that's why the following comes out as a contradiction:

(3) Edina saw Fred to be a party-pooper, #but she thought he wasn't.

With finite clause complements, *see* describes an epistemically non-neutral (factive) attitude (1)e, expressing what is often termed indirect perception. These correspondences between meaning and form are tantalizing for those who want to understand the syntax-semantics interface, because they suggest that meaning and form are correlated in a non-arbitrary way, and it gives hope to the idea that complementation patterns simply fall out from the interactions of the meanings of verbs and particular kinds of complements (Pesetsky 1992, Levin 1993, among others). Of course, this calls for a theory of clause meaning that can match up various verb meanings with the right syntactic complements. This dissertation does not provide a theory of complementation that will account for *all* the correspondences in the *see* paradigm. That is a large project – several steps need to be taken before we can get there.

In this work, I take one step toward that goal by examining the kinds of complements available to propositional attitude predicates. The empirical focus is on different syntactic configurations of complements to attitude verbs, and the central result of this dissertation is two-fold. First, once a variety of complementation strategies under attitude verbs is recognized, we have the tools for solving – or at least mitigating – some syntactic puzzles. Second, capturing certain correspondences between the lexical semantics of an embedding predicate and the syntactic shape of its complement requires

us to “reassign” what looks to be lexical meaning into functional projections in the embedded clause. This move – factoring out meanings once thought lexical into meaningful functional projections – has been taken recently by a number of authors. Morzycki (2005) made the case for adverbs. Ramchand (2008) applies the idea to lexical aspect. Borer (2005a,b) takes the most radical step and removes all real linguistic meaning from lexical items. We won’t go that far, but I will try to make the case that at least *some* lexical meaning should be factored out to functional heads. One advantage of this is to get traction on some problems in complement selection, to which I now turn.

1.1. S-selection and C-selection

The form-meaning correspondences we find with *see* are the ideal case. More often than not, the mapping between syntactic and semantic type is not so straightforward. (And, in fact, Chapter Four reveals that even the clean-looking *see* paradigm shows mismatches between the surface syntactic type of a complement and its meaning.) Grimshaw (1979) argued that syntactic and semantic selection were to some extent independent and that predicates must be able to independently encode both semantic and syntactic information about their complements. The former kind of selection came to be known as s(ematic)-selection, the latter c(ategory)-selection (Pesetsky 1982). Grimshaw pointed out that verbs with the same semantic requirements can take complements of different syntactic categories. Both *ask* and *wonder* select, in an intuitive sense, for a question. However, their options for realizing the complement syntactically are different: *ask* allows the question to be realized as a whole *wh*-clause

(4)a, a noun phrase (4)b, or by nothing at all (4)c (a null complement), while *wonder* allows only the clausal option:

- (4) a. John asked me what the time was.
b. John asked me the time.
c. John didn't know the time so he asked me.
- (5) a. John wondered what the time was.
b. *John wondered the time.
c. *John didn't know the time but he wondered.

A predicate's syntactic selectional requirements and its semantic requirements can be on different tracks, so to speak. Grimshaw concluded that syntactic and semantic selection must be independently given in lexical entries.

Once both c-selection and s-selection were posited as part of lexical information, it was noticed by Grimshaw herself (Grimshaw 1979:317n.33) that this over-generated complements patterns, allowing for cross-classification of semantic and syntactic complements types that did not exist. For instance, lexical entries could be written to s-select for questions but c-select for only noun phrases and not sentential complements. It turns out that if a predicate selects for a semantic category it always c-selects for an unmarked, or 'canonical' syntactic expression of that semantic category. So there are no predicates such as *know*₂ that select for embedded questions only in the form of NPs but not *wh*-CPs:

- (6) a. John knew₂ the time. (not an attested pattern)
b. *John knew₂ what time to leave.

Instead there are predicates like English *know* that c-select for both types, and predicates like *wonder* that only select for what Grimshaw called the canonical structural realization (CSR) of questions, which is the syntactic category expressed by *wh*-clauses.

Grimshaw (1981) proposes to solve the over-generation problem by implementing CSRs as part of UG. The CSR of the semantic types question and proposition will be, in current terminology, a CP. A child learning the complement patterns of English will observe that certain verbs select for propositions (or questions, or events) in virtue of some sort of semantic knowledge, and will know that the CSR of propositions is CP. Subcategorization for CP is achieved for free, then. But without any evidence, the subcategorization of NP will not be postulated. If the child has evidence that a predicate that s-selects for a question can c-select a NP, then that can be added to the lexical entry. However, no situation could arise where only a NP expressing a proposition is possible, since if a proposition is what is s-selected, according to the CSR (actually, Grimshaw's *Context Principle*) then it will also select CP.

There is no doubt that something like CSRs need to be accounted for, even if all the facts adduced for them might not play out. The fact is, certain clause meanings more readily map to certain syntactic constructions. And this is what we see with the *see* paradigm. Some linguists addressing clausal complementation have avoided the CSR problem altogether in positing that what look like non-canonical complements really have hidden structure that corresponds to a CSR. So all predicates that select for embedded propositions or embedded questions select for sentential complements, say CPs or IPs.

This view is found in Larson et. al. (1997). Larson and his colleagues have argued that all forms of intensionality (by which they mean predicates that are intensional operators like attitude verbs¹) require sentential complements. This isn't the view taken in this dissertation, although we will see that *some* instances of complementation require a richer syntactic representation than meets the eye.

Pesetsky (1982, 1992, 1993) proposes to solve the over-generation problem by eliminating c-selection. He argues that once we have s-selection, c-selection is superfluous, and its effects can be regulated independently. On this "s-selection only" hypothesis, the syntactic expression of a complement is regulated by abstract case: noun phrases, but not sentential complements, need case. So if a predicate selects for, say, embedded questions it can always have a sentential complement but only a noun phrase complement if the predicate is a case assigner. *Know* and *ask* assign case, so they can take both CPs and DPs. *Wonder* does not assign case² so it only allows complements made available by the CSR of questions. Ruled out is the pattern in (6) since it disallows the sentential complement (which comes for free) but allows the noun phrase complement.

Pesetsky's s-selection only hypothesis, while attractive, has never been carried out extensively. There are also counterexamples to Pesetsky's claim about case being the relevant syntactic factor (see Odjik 1997, Rothstein 1992, Alrenga 2005, among others).

¹ All meanings are intensional, on the approach I take. I believe Larson et al.'s claim is that an intensional operator must always select a whole clause.

² Pesetsky supports this with the fact that *wonder* cannot be passivized, an operation that ought to be available to case assigners. While *wonder* does not assign case to certain DPs, it can clearly assign case to phrases that sit in its internal argument position, as shown by the *wh*-element in free relatives: *what John wondered was whether Fred had the drive to win*.

Moreover, it doesn't always seem possible to predict the shape of a clausal complement purely from the semantics of the embedding verb. Pesetsky resigns that some "syntactic residue" in the form of idiosyncratic syntactic selection is required. Certain predicates simply select for a type of head (in many cases prepositions). This kind of selection cannot be reduced to s-selection or case but requires a form of lexical (L-) selection. According to Pesetsky, the choice between infinitival and finite complements is also a case of L-selection. For instance, *believe* allows a infinitival complement and a finite complement, whereas a verb like *argue* is compatible only with a finite complement:

- (7) a. Edna believed Fred to be innocent.
b. Edna believed that Fred was innocent.
- (8) a. *Edna argued Fred to be innocent.
b. Edna argued that Fred was innocent.

At first glance, there appears to be no meaning difference between the finite and infinitival complement of *believe*. So it would appear that we must stipulate syntactic selection to ensure that *argue* allows only finite clausal complements.

We shouldn't give up on semantic selection so easily, though. Differences between (certain) infinitival and finite clauses are the topic of Chapter Four. There I make the case that we don't *want* to reduce the selection of to an idiosyncratic feature of lexical items. We'll see that for certain verbs, an infinitival complement imbues the embedding predicate with a meaning that other clausal complements can't.

What I hope to provide with this dissertation are ways of capturing Grimshaw's CSRs. I do this by assigning more complex meanings to embedded clauses than is usually recognized. As noted, one of the themes of this dissertation is that elements of meaning once thought to be part of an embedding predicate are factored out to meaningful elements in the complement. I make the case, following Kratzer (2006), that complementizers can introduce propositions of various sorts. And, I argue that certain infinitivals carry a meaning that places meaning restrictions on the predicates that embed them. I focus on complements that are used to report attitude ascriptions, since there is a rich semantic and philosophical literature on propositional attitudes. They offer an ideal place to investigate the mapping between syntactic type and semantic types of complements.

Before turning to the details of the chapters, then, I lay out the basic semantic assumptions of this dissertation, particularly the semantics of attitude reports.

2. The semantics of attitude reports

Belief reports, and other propositional attitude ascriptions, describe a relation between an attitude holder, the subject, and a proposition. I use *proposition* in the usual sense: a set of possible worlds – or the characteristic function of such a set. I assume predicates have world arguments. An adjective like *innocent* denotes a function from individuals to worlds to truth values: it is true of an individual x and a world w if x is innocent in w .

$$(9) \quad \llbracket \textit{innocent} \rrbracket = \lambda x. \lambda w. \textit{innocent}(x)(w)$$

On the simplifying assumption that the copula *be* is semantically vacuous, the tenseless sentence *Fred be innocent* is the proposition below. *Innocent* applies to the constant *Fred* via functional application, returning a function from worlds to truth values:

$$(10) \quad \llbracket \textit{Fred be innocent} \rrbracket = \lambda w. \textit{innocent}(\textit{Fred})(w)$$

With this in mind, we can turn to the analysis of attitude verbs given by Hintikka (1962, 1969). Hintikka proposes that a propositional attitude determines a set of worlds, and this set is dependent on the attitude, the attitude holder, and the world in which the attitude holder resides. Belief, for instance, defines a set of possible worlds which, for all the holder of the belief can determine, are worlds she is in. And to ascribe a belief to someone is to assert that her belief worlds are all worlds where the complement proposition is true. So a report like the one below asserts that all those worlds that are compatible with Edna's belief, are worlds in which Fred is innocent (again ignoring the contribution of tense).

$$(11) \quad \textit{Edna believes that Fred is innocent.}$$

As is apparent from this description, and as is proposed by Hintikka (1969), attitude ascription involves universal quantification over possible worlds. The quantification is restricted by the set of worlds compatible with what the subject believes, and this is often expressed with the notion of doxastic alternatives, which are needed for self-locating

beliefs (Lewis 1979, Chierchia 1989, and others). Doxastic alternatives are defined below.

$$(12) \quad \text{Dox}_{x,w} = \{ w' : \text{it is compatible with what } x \text{ believes in } w \text{ that } w' \text{ is the world } x \text{ lives in } \}$$

The verb *believe*, then, is treated as universal quantifier over possible worlds, restricted by the set of worlds provided by Dox. The clausal complement denotes a proposition, a set of possible worlds, and occupies the nuclear scope of this universal quantifier. I notate the evaluation world as w_0 :

$$(13) \quad \text{a. } \llbracket \textit{believe} \rrbracket = \lambda p. \lambda x. \lambda w. \forall w' (w' \in \text{Dox}(x)(w) \rightarrow p(w'))$$

$$\text{b. } \llbracket \textit{Edna believes that Fred is innocent} \rrbracket = \forall w' (w' \in \text{Dox}(\textit{Edna})(w_0) \rightarrow \textit{innocent}(\textit{Fred})(w'))$$

Enrichments to this basic design will be needed, which I will introduce throughout the dissertation. None of this tells us anything about belief systems, but it is sufficient, it seems, for the purposes of understanding belief ascription, which is the linguist's concern. And, it should be acknowledged, the possible worlds account of attitude ascription has difficulty with things like mathematical beliefs (see Cresswell and von Stechow 1982, although this is an issue I put aside).

Different attitude verbs quantify over different alternatives: the worlds compatible with what Mary hopes are not the same as those worlds compatible with what she

believes or fears or, for that matter, what she might claim. Hence the following kinds of sentences are not contradictory:

- (14) a. Edina believes that Fred is guilty, but she hopes that he is innocent.
b. Edina claimed that Fred was innocent, but (really) believes that he is guilty.
c. Edina hopes that Fred is innocent, but she fears that he is guilty.

My interest here is in the nature of the complement clause: on the formulation above, the complement of *believe* and other attitudes denotes a proposition.

The semantics of attitude verbs, as we will see, often requires more complex objects than these. This formulation ignores the role of tense. In particular, complement clauses are typically taken to denote properties of times (see e.g. Kratzer 1998). What is important at this point is simply the way in which the complement combines with the embedding predicate – as the propositional argument of the verb. This is the standard Hintikka account. In the following chapters of this dissertation, this is the component that comes under scrutiny.

3. The syntax of attitude reports: chapter summaries

The dissertation is at its simplest an exploration of semantic selection in the following four syntactic configurations in which a predicate like *believe* takes a clausal complement.

- (15) a. John believed that Fred was innocent.
b. John's belief that Fred was innocent is unfounded.
c. That Fred was innocent, John didn't believe.
d. John believed Fred to be innocent.

The clausal complement in (15)b is a complement to the nominalization of *believe*. In (15)c, the clausal complement appears dislocated from the embedding verb, a sentential topic construction. And in (15)d, the complement clause appears as an infinitival clause with an overt subject; this is known as an exceptional case marking construction, or ECM (the same complement type in (1)d, where *see* expresses a type of belief). Unlike what we saw with the *see* paradigm, the various shapes and positions of these complements appears at first glance not to affect the meaning of *believe*. Each involves the verb *believe* taking a propositional complement, it would seem, and there are simply some low level syntactic differences among these construction types.

In the following chapters I argue that this impression is wrong, and that these different syntactic configurations actually involve slightly different methods for putting together the attitude verb with its complement. The constructions in (15)b through (15)d are the topics of chapters two through four, respectively. Each of these constructions has played a central role in syntactic theorizing because they exhibit some central syntactic puzzles. I show that the solutions to these puzzles rest on the semantics of complementation.

Chapter Two examines properties of clausal complements to nouns as in (15)b. The interest, for the syntactician, is that these complements appear to behave differently

than arguments of predicates normally do. In fact, as noticed by Stowell (1981) and Higgins (1979), clausal complements to the noun *belief*, and others, appear to identify the content of the belief. This led Stowell to conclude that clausal complements are modifiers of nouns, rather than true arguments. I provide evidence to support Stowell's (1981) claim: clausal complements of nouns *are* modifiers, both semantically and syntactically. In addition to assembling a range of evidence to this effect documented in the literature (Higgins 1979, Grimshaw 1990, Kratzer 2006), I use evidence from binding theory to show that the clausal complements of nouns behave like modifiers, specifically in their ability to bleed condition C violations (Kuno 1997, Jacobson 2003, Lasnik 2003). This provides the crucial *syntactic* evidence that clausal complements to nouns are not arguments. The compositional strategy used to compose attitude nouns with their clausal complements, following Kratzer (2006) and a similar approach in Potts (2002), is shown to account for this behavior. I then discuss the counter-examples, including *proof* (Safir 1985). We end with a strong empirical fact: clausal complements to nouns are *always* modifiers. The source for this restriction is discussed.

Chapter Three examines another kind of complementation strategy, found with fronted clauses—sentential subjects and topics of the sort shown below:

(16) That John was going to win, I don't think anyone expected.

New data from binding is provided in support of Koster's (1978) satellite hypothesis, which is that fronted clauses are not syntactically moved to, but are base-generated in, their surface position. An analysis, making crucial use of *de re attitude* ascription

(Kaplan 1969, Lewis 1979), is then offered to account for what appear to be apparent problems for such an analysis, including the fact that it appears that quantifiers can bind into the fronted clause, as shown in the following case. The pronoun *he* is interpreted as a variable, co-varying as a function of the quantificational expression *any young man*.

(17) That he'll end up acting like his father, I don't think any young man expects.

While it is tempting to interpret these data as showing that clauses must “reconstruct” for the purposes of variable binding – that is, that they must be at some level of syntactic representation in a position structurally below the quantificational binder (see Takahashi 2009) – I show not only that reconstruction is not needed (by making use of the semantics for *de re* and *de se* attitude ascription), but that reconstruction indeed does not happen. Thus, the data offer new support for the claim that clauses do not undergo movements like other arguments (noun phrases for instance). I suggest that this can be traced to a particular property of clauses that, following Embick and Iatridou (1997), prevents them from participating in agreement relations. Again, what is crucial in understanding the behavior of moved complements like these are the semantic tools offered to us. Using those tools avoids unwarranted syntactic assumptions.

Chapter Four examines non-finite complements to attitude verbs, in particular those infinitival complements with overt, accusative subjects, known in the syntactic literature as exceptional case marking constructions (ECM), or – more theory-neutral – as accusative with infinitive constructions (AcI):

- (18) a. John believes her to be upset.
b. I see him to be a selfish, bon vivant.

Several generalizations about the class of verbs that can have AcI complements are made, primary among them the fact that AcI complements are used to report beliefs. This is no trivial observation, I will argue, because with a number of verbs – including *see* – this is the only meaning that AcI allows. Finite clause complements of *see* (and others of its class), however, can only report factive, indirect perception.

Based on data like these, which hold of a wide range of predicates, we'll see that AcI constructions must denote more than mere propositional complements in the narrow sense. That is, in order to capture the belief interpretation of *see* with an AcI complement (but not a finite one), I suggest that AcI complements themselves are responsible for the meaning taken on by *see* in these cases. I do this by factoring into the head of the infinitival modal quantification, in particular, the belief alternatives of the subject. The correspondence between the syntactic shape of the clausal complement and the interpretation of the embedding verb, on this approach, is not the result of selection (syntactic or semantic) at all. The situation is reversed. The complement bears a meaning that only certain verb roots can combine with – hence the moniker 'natural selection'. Sometimes verb roots can be pushed into this syntactic context and this, I argue, helps to explain the "fuzziness" (Pesetsky 1991) in judgments about AcI constructions. In this respect, Grimshaw's notion of canonical structural realization is implemented, in a way presaged by Bresnan (1972), by meaningful heads in the complement clauses.

CHAPTER II

CLAUSAL COMPLEMENTS OF NOUNS

1. Introduction: Stowell's conjecture

Stowell (1981) famously proposed that CPs that appear to complement nouns, as in (1)a and (1)b, are not true arguments of the noun but appositive modifiers.

- (1) a. The theory that pigs fly actually has a lot of support.
- b. The belief/claim/observation that pigs fly is crazy.

The CP complements of nouns exhibit some surprising properties both semantically and syntactically – surprising if they were actually true arguments of the nouns. Higgins (1973) and Stowell (1981) both expressed the intuition that the CP complements in (1) describe the “content” of the theory or belief or claim. They supported this intuition by noting that CPs could appear in post-copular position, where they also identify the content of the subject nouns (2)a and (2)b:

- (2) a. The theory is that pigs fly.
- b. The belief/claim/observation is that pigs fly.

Stowell's claim that the CPs in (1) are appositive modifiers was crucial to his analysis of the syntactic distribution of clausal arguments.³ While there is little evidence that the CPs in (1) are appositives – they haven't the required intonation characteristics of appositives – the intuition that these CPs bear a different relation to the head noun than true complements does find support. It is this support that I wish to detail and expand upon in this survey.

As Stowell (1981) and Grimshaw (1990) detail, the derived nominals in (1) – in particular the derived nominals such as *belief* and *claim* – denote just what their objects do: they are not event nominals but rather are object or result nominals. From this observation, it is often concluded that such nouns do not take CP arguments. This conclusion, however, has been challenged in various places in the literature (most recently, for example, by Pesetsky and Torrego 2004). In this chapter I assemble various pieces of evidence, some old and some new, in support of Stowell's original conclusion that the CP complements in (1) are not true arguments.

Several proposals for how the CPs in (1) *do* compose with the noun have been proposed, and they share the claim that the CPs compose with the nominal via a modification relation. In later parts of this section I will describe two approaches. The two approaches differ substantially in their semantics, and I will devote some discussion to the difficult questions that comparing the two brings up. One approach starts with the

³ Stowell's analysis was motivated in part by his Case Resistance Principle (CRP), which relied on the requirement (Aoun 1979) that an argument has to be case marked to be visible for theta-assignment. Nouns do not case-mark, so the evidence that their complements are not arguments was important to this version of the theory. For unaccusatives, Stowell proposes derivations where the clauses move to subject position and then further vacates that position by extraposition, leaving an expletive. That kind of derivation is not possible in nouns.

idea that propositions can be understood as denoting in the domain of individuals (Cresswell 1973). Chierchia (1984) argues that CPs can denote in the entity domain by a nominalization function. Potts (2002) – a recent implementation of this idea that deals with data we will be looking at below – further suggests that these can be shifted into predicates by other type-shifting mechanisms (Partee 1987). In another approach, Kratzer (2006) has initiated a program that treats CPs as predicates of things, like beliefs and rumors, that have propositional content (a notion that will be clarified as we proceed). The CP composes with the NPs *belief* and *rumor* via predicate modification. On both approaches, the relationship between clauses and their embedding predicate, then, is not one of function application, but one of modification.

My contribution in this chapter is to provide more syntactic evidence that CPs behave as modifiers when they appear in construction with nouns – that is, to support Stowell’s conjecture and use Kratzer’s system in the process. As noted above, one set of evidence comes from considerations of the argument structure of nominals, like those in (1), that take CPs. A modification account in the spirit of Kratzer (2006) is then defended. After that, I will address de-verbal nouns, as in (1)b, and the full set of cases that Higgins and Stowell discuss. These will provide an analogous argument for treating CPs as predicates.

The second argument for the modifier status of CPs will come from certain reconstruction asymmetries between arguments and adjuncts. Modifying adjunct clauses, such as relatives, can obviate certain reconstruction effects (Lebeaux 1988). Early reports in the literature (Lebeaux 1988, Freidin 1986) claimed that, in contrast, clausal complements of nouns behave like arguments in this respect and feed Condition C

violations. I spend some time showing that, to the contrary, clausal complements to nouns behave just like relative clause modifiers in their ability to obviate reconstruction, as several authors have argued (the best cases coming from Kuno 1997). I'll review some of the interesting reasons why the data in this area is disputed, and show that once certain confounds are controlled, the data come out in favor of treating CPs as modifiers.

Another piece of supporting evidence for the view of CPs as modifiers comes from a set of data surrounding predicates in the so-called *prove*-class. The CP complements to nouns like *proof* do not pattern, as pointed out by Safir (1985), like the predicates found in the Higgins-Stowell facts (as in (2)). However, I show that Safir's examples can be understood once we recognize the difference in the kinds of nominals these predicates form. I show that the CP complements of these nouns nonetheless behave like modifiers in their ability to selectively bleed Condition C.

2. Nouns and CPs: clauses are not arguments

In this section I make a very straightforward argument for treating CPs – at least CP complements of nouns – as predicates. This argument is, essentially, a distributional one: non-derived nouns, what I call content nouns like *theory* (1) don't take arguments, so the CPs they appear in construction with cannot be arguments either. The conclusion is that they must stand in a modification relation to the noun.

A content noun describes things that carry information – they seem to define or be associated with propositional content. A story, for instance, might tell us what was happening in imaginary worlds; a theory offers someone's conception of how the world is; a myth is something that describes a counter-factual state of affairs.

The complement CPs of content nouns can appear in construction with the noun (3) or in post-copular position (4).

(3) CPs and non-derived nouns

I don't believe { the idea
the story
the theory
the scoop
the myth
the notion } that Fred didn't report his income.

(4) CPs as post-copular elements

{ the idea
the story
the theory
the scoop
the myth
the notion } is that Fred didn't report his income.

We are used to thinking about the CPs in (3) as complements of the noun because the only other thing a CP that looks like this could be is a relative clause. But, of course, we learn in introductory syntax that these aren't relative clauses: they do not have a gap position that corresponds to the head noun:

- (5) a. The rumor [that Fred didn't report his income] *complement CP*
 b. The rumor [that the tabloids reported]. *relative CP*

In fact, there is an easy way to show that the complement CP is not an argument, at least in the sense that the CP doesn't saturate an argument position of the noun. Nouns like *rumor* and *theory* and other content nouns do not select for the kinds of DPs arguments that generally 'stand in' for clauses (the idea of 'stand in' will be refined below). Nouns can in general take DP arguments, as long as case is made available to those arguments. This is usually English *of*. This can be seen in the de-verbal nouns in (6) and the relational nouns in (7):

- (6) a. John's repetition of his claim.
b. The Romans' destruction of the city.
- (7) a. The niece of my brother's father (is nice).
b. The capital of Wisconsin (is friendly).

Furthermore, verbs that select for CPs can, when nominalized, select what feels like the same argument in the guise of a DP. The usual requirement of case applies (in the case of de-verbal *hope*, the preposition *for* is required). The nominalization of *prove* can take a DP argument that refers to the thing proved, and the nominalization of *hope* takes a DP argument that refers to things *hoped*.⁴

⁴ The nominal *proof* is something of a problem for the approach that clausal complements are modifiers and I devote Section 5 to it.

- (8) a. John proved that he was a citizen. *Verbal complement CP*
 b. Do you have any proof of/for that. *Nominal complement CP*
- (9) a. John hoped that he would win. *Verbal complement CP*
 b. Do you have any hope for that. *Nominal complement CP*

It is not possible, however, to replace the clauses in (3) – the CP ‘complements’ of non-derived nouns – with a DP.

- (10) No DP arguments to non-derived nouns

$$\left. \begin{array}{l} \text{the idea} \\ \text{the story} \\ \text{the theory} \\ \text{the scoop} \\ \text{the myth} \\ \text{the notion} \end{array} \right\} \text{*of that, I don't believe.}$$

Unlike *prove* or *hope* – whose nominals continue to take DP ‘versions’ of their clausal complements – these non-derived nouns cannot take arguments of this sort. The simple conclusion, then, is that the CP is not an argument either. Before turning to what to make of this, let me make a brief digression, for completeness’s sake, on the kinds of DPs these nouns can appear with.

2.1. The *res* argument

It is important to note that non-derived content nouns can take certain of-marked DPs, as shown below:

- (11) a. His story of Mary's birth is frightening.
b. The rumor of John's resignation is spreading.
c. Theories of the crop circles' origins are mostly crap.

These are perhaps better expressed with adjuncts introduced by *about*; in that case we can see that this 'argument' can co-occur with a *that*-clause:

- (12) a. The story about Mary's birth is that it was difficult.
b. The rumor about John's resignation is that it was forced.
c. The theory about the crop circles' origins is that aliens made them.

These expressions represent the *res* argument – what the rumor or story is about (Quine 1956, Cresswell and von Stechow 1982) not the content of the rumor or story. *Res* arguments are more easily seen with attitude verbs. In the examples in (13), John has a belief about some *res*, Ortcutt, and the belief he has about this *res* is that he was a spy.

- (13) a. Bernard's belief of Ortcutt is that he was a spy.
b. Bernard's believed of Ortcutt that he was a spy.

It is generally believed that *de re* attitude ascriptions have a *res* argument and that this *res* argument can be expressed (see Kratzer 1998 for discussion and applications). Many things can be the *res* including things that have content themselves:

(14) John's belief about that idea is that it is wrong.

The semantics of *de re* belief ascription requires more machinery than I wish to go into here (they will be taken up in great detail in the following chapter). The point here, though, is that these arguments are different from the kinds of things that spell out the content of the *rumor* or *story*.

2.2. Kratzer's conjecture

Returning to the main thread of the discussion, the data in (10) showed that content nouns do not take arguments. And I used that fact to argue that the CPs that they appeared in construction with are not arguments. The reason, it would seem, is that non-derived content nouns like *story* or *rumor* are not relational – that is, unlike *capital* or *niece*. Nor are content nouns of this sort derived from verbs, where it is often thought that an argument structure remains available in certain kinds of nominalizations (Grimshaw 1990). If content nouns were either of these types of nouns, we would expect a DP argument to show up as long as it were case licensed. But there don't appear to be internal arguments of content nouns that can be expressed, even with the help of prepositions. It would appear, then, that these are common nouns that describe certain types of individuals, in many cases abstract individuals. We're led to a simple conclusion: If the CP is not an argument, then it must be an adjunct or modifier of some sort. What kind of thing is a *that*-clause that modifies common nouns like *story* or *rumor*? Kratzer (2006) argues that *that*-clauses are, like relative clauses, predicates. They are predicates of the same thing that content nouns are.

Content, propositional content, can be modeled with possible worlds. But what possible worlds? The kinds of individuals described by common nouns like *story*, *myth*, or *rumor*, define accessible worlds. A particular *story* or *rumor* in the actual world can, for any possible world, determine whether that world is compatible with the rumor or story.

That individuals in general have propositional content associated with them has some initial plausibility. Stalnaker (1984) provides a precedent for recovering ‘content’ of this sort from individuals. His example is of a tree trunk with 78 rings on it. This state of this individual indicates the age of the tree (or the proposition that the tree is 78 years old). The mechanisms for this indication relation are complex and relate to the fact that its intrinsic state correlates (via a causal relation) with the environment (Stalnaker 1984, p.13ff). It is very plausible to assume that there exist certain kinds of individuals from which content can be recovered. Quite generally, then, things can provide domains of possibilities. This has been pursued in the area of modality by Hacquard (2005), where events are such things, and Kratzer (2009a).

That content nouns are associated with content is further shown by the fact that they can be the subjects of verbs that take complements that describe content of their subject:

(15) The story says/claims/indicates/shows that Mary is the guilty one.

Assume, then, that content nouns denote sets of individuals that carry information, which we will take to be propositional content. When helpful, I will subscript variables of this

sort of individual as x_c , to distinguish them from other ordinary individuals that do not carry content:

$$(16) \quad \llbracket \textit{story} \rrbracket = \lambda x_c. \lambda w. \textit{story}(x_c)(w) \quad \text{also: } \textit{rumor}, \textit{idea}, \textit{theory}, \textit{myth}, \textit{etc.}$$

If CPs are predicates that modify such nouns, then they must be predicates of contents. Kratzer's (2006) analysis achieves this by turning propositions into predicates of contents. She proposes that complementizers themselves have content arguments, and can be treated as predicates of content if that argument remains unsaturated. The semantic role of the complementizer is to say that the content of the complement proposition identifies the content of the individual *rumor* or *story*. We need to get from the individuals to their content. Suppose that we can recover content in the following way: the content of some individual is a set of possible worlds. I'll treat this as a function, f_{CONT} , that applied to an individual returns a set of possible worlds:

$$(17) \quad f_{\text{CONT}}(x) = \{w: w \text{ is compatible with } x\}$$

Complementizers also have a propositional argument, type $\langle s, t \rangle$ (where s is the type of possible worlds; t is the type for truth values). The role of the complementizer is to say that the content (a set of possible worlds) of some individual is the embedded proposition.

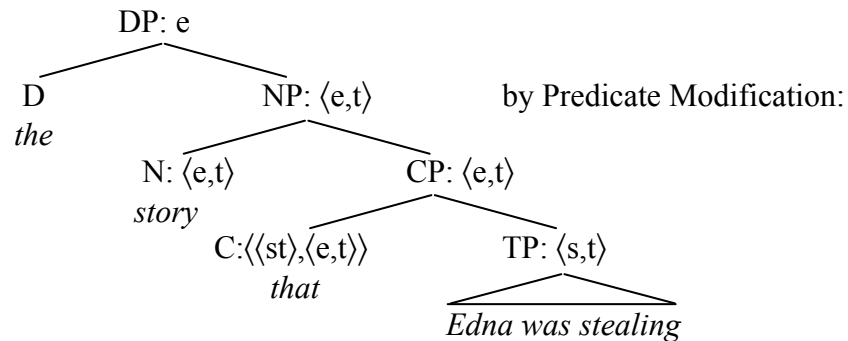
$$(18) \quad \llbracket \text{COMP} \rrbracket = \lambda p. \lambda x_c. f_{\text{CONT}}(x_c) = p \quad (\text{after Kratzer 2006})$$

The complementizer says that the content of an individual *is* the proposition that it embeds. This accords with our intuitions that in (19) the content of the rumor *is* that Patsy is innocent.

(19) The rumor that Patsy is innocent.

What I am interested in here is how Kratzer's complementizer returns a CP that is a predicate of contents. This allows the CP and NP to compose via Predicate Modification (here I don't explicitly represent a world argument of the common noun story):

(20) The story that Edna was stealing.



- [[[TP]]] = $\lambda w.$ stealing(Edna)(w)
- [[[CP]]] = $\lambda x.$ [fCONT(x) = $\lambda w'.$ stealing(Edna)(w')]
- [[[N]]] = $\lambda x.$ rumor(x)
- [[[NP]]] = $\lambda x.$ [rumor(x) \wedge [fCONT(x) = $\lambda w'.$ stealing(Edna)(w')]
- [[[DP]]] = $\iota x.$ [rumor(x) \wedge [fCONT(x) = $\lambda w'.$ stealing(Edna)(w')]

The semantics has treated the complement proposition as being the unique content of the noun. We could have also imagined that the content of the noun merely *implies* the complement proposition. However, we need the propositional complement to specify the

(unique) content of the noun because we want to block multiple modifiers. Unlike relative clause modifiers, which can stack, CPs that spell out the content of the noun can appear just once – even if their content is compatible:⁵

- (21) a. *The rumor that Fred was happy, that he was in Paris, that he could see ghosts.
 b. The rumor that Fred made, that Jill believed, that Bill spread to his friends...

The semantics attributed to the complementizers, however, will in the general case rule this out. Since the complementizer identified the content of the noun with a proposition, stacking them would amount to saying that the propositions are identical.

- (22) a. *The rumor that Fred was happy, that he was in Paris.
 b. $\llbracket (22)a \rrbracket = \lambda x. [\text{rumor}(x) \wedge [\text{fCONT}(x) = \lambda w'. \text{happy}(\text{Fred})(w')]] \wedge [\text{fCONT}(x) = \lambda w'. \text{in-Paris}(\text{Fred})(w')]]$

Since fCONT is a function, if fCONT(x) = p (e.g. the proposition denoted by *that Fred was happy*) and fCONT(x) = q (e.g. the proposition denoted by *that he was in Paris*), then p = q. But these two propositions, p and q, cannot be identical, and so the descriptions given by stacked CPs like this can't be true of any individual.

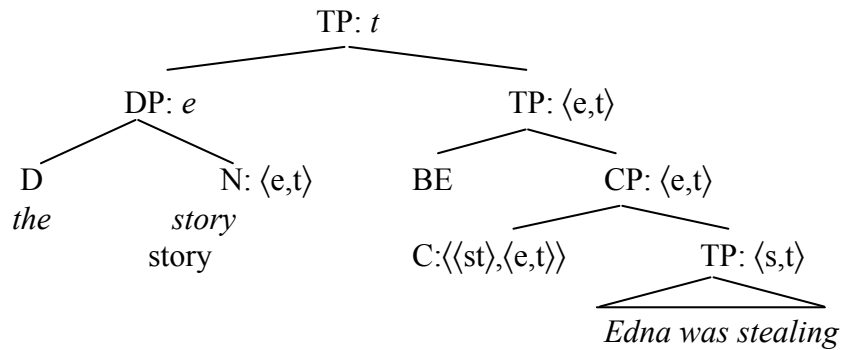
Of course, this does predict that two mathematical statements could be stacked, since they will be true at all the same worlds, namely, all possible worlds. Understanding

⁵ The CPs can of course form a conjunction. The above examples are to be interpreted not as the conjunction of CPs, but iterated intersection. I thank Rajesh Bhatt for pointing this out and Angelika Kratzer for assisting with a remedy.

how mathematical statements conform to a possible world semantics has proved difficult (see e.g. Cresswell and von Stechow 1982), and I merely leave this as an open problem.

An example such as (23), on the other hand, could be treated as a predicational sentence.

(23) The story is that Pasty is innocent.



The copular *be* here will take an argument of type e and a predicate of type $\langle e,t \rangle$ (here the CP) and applies the latter to the former (again, world variables not represented):

- (24) $\llbracket [CP] \rrbracket = \lambda x. [f_{CONT}(x) = \lambda w'.stealing(Edna)(w')]$
 $\llbracket [DP] \rrbracket = \iota x.[story(x)]$
 $\llbracket BE \rrbracket = \lambda X \in D_{\langle e,t \rangle} . \lambda x \in D_e. X(x)$
 $\llbracket [TP] \rrbracket = BE(\iota x.[story(x)])(\lambda x.[f_{CONT}(x)(w') = \lambda w'.stealing(Edna)(w')])$

However, we need to reconsider what kind of copular constructions is involved in these sentences. Potts (2002) shows that these are equative constructions, not predicational, and

he offers an analysis of clausal complements to capture this. It is to Potts' proposal that I turn now.

2.3. Potts (2002)

Potts starts with the observation that small clauses do not allow for the kind of predication that is sometimes called specificational, or equative. For instance, the predication in (25)a cannot be used as small clauses (25)b and (25)c (Heycock and Kroch 1999, from which the following data is taken).

- (25) a. Your attitude towards Jones is my attitude toward Davies.
b. *I consider your attitude toward Jones my attitude toward Davies.
c. *I consider my attitude toward Davies your attitude toward Jones.
(Heycock and Kroch 1999:(29))

In small clauses, at least one of the phrases must be predicative. Potts (2002:67-68) offers evidence that CPs can't be predicates because they cannot occur with content nouns as the predicate.

- (26) a. *I consider the problem that she is bonkers.
b. *I consider that she is bonkers the problem.
c. *I consider it the problem that she is bonkers.
(Potts 2002:68(33))

This would appear to cast doubt on the analysis of CPs as predicative. Potts uses these data to justify an approach whereby propositions can be shifted, into the entity domain

(Cresswell 1973) by a type-shifting operation nominalization (Chierchia 1984, 1985). Nominalization takes a functional type and returns an entity type. Nominalization of a proposition returns an individual of the “proposition sort”. Potts characterizes this shifter as one that takes a property of worlds (propositions) and returns an individual that is the sum of the worlds in the input propositions. So nominalization, represented by \cap , applied to a proposition p returns an individual, notated x^p , which is the unique plural individual composed of just those worlds in which p is true.

$$(27) \quad \text{If } p \in D_{\langle s,t \rangle}, \text{ then } \cap^p(p) = [\iota x^p : \forall w \in p: w \leq x^p] \text{ and } \cap^p(p) \in D_e^6$$

(Potts 2002:4(7))

$$(28) \quad \text{a. } \lambda w[\text{innocent}(\text{Edna})(w)]$$

$$\text{b. } \cap^p[\lambda w[\text{innocent}(\text{Edna})(w)]] = w_1 \oplus w_2 \oplus w_3 \dots$$

A nominalized proposition, then, is of type e , and built into the nominalization function is uniqueness. This is how Potts explains why the CP cannot be a predicate in the small clause construction: a CP is not a predicate. On the other hand, the copular constructions involve equative *be* which (following Partee 1987, Heycock and Kroch 1999) requires its two arguments to be of the same type. Equative *be* is given below, where τ stands for any type, here type e :

⁶ It has been pointed out to me that (27) is too weak. We need to ensure that x^p doesn't include worlds that are not in p .

$$(29) \quad \llbracket \text{be} \rrbracket = \lambda X \in D_{\tau}. \lambda Y \in D_{\tau}. [X = Y]$$

The composition then proceeds by equating the subject *the problem* and the CP *that Edna is innocent* – they are both of the same type – type *e*.

$$(30) \quad \llbracket \text{problem} \rrbracket = \lambda x^p \text{problem}(x^p)$$

$$(31) \quad \llbracket \text{the problem} \rrbracket = \iota x^p \text{problem}(x^p)$$

$$(32) \quad \llbracket \text{the problem is } [^{\cap p} [\text{that Edna is innocent}]] \rrbracket = \\ \iota x^p \text{problem}(x^p) = {}^{\cap p}[\lambda w[\text{innocent}(\text{Edna})(w)]]$$

The advantage in Potts' account is that the CP is of an individual type to start with and this predicts the ungrammaticality of CPs in small clauses (26). Potts needs to do something extra, though, to allow the CPs to compose with nouns. He does so by shifting it into a set-denoting type, a predicate, via the operation IDENT, Partee (1987). IDENT takes the individual propositional correlate, x^p of type *e* (which is the result of nominalizing the clause) and creates a predicate of the form $\lambda y^p. y^p = x^p$. This can then combine successfully with the noun *proposal* by predicate conjunction.

(33) George favors the proposal that we destroy Alaska.

$$\text{a. } \llbracket \text{proposal} \rrbracket = \lambda x^p. \text{proposal}(x^p)$$

$$\text{b. } \llbracket \text{IDENT}(\text{that we destroy Alaska}) \rrbracket = \\ \text{IDENT}({}^{\cap p}(\lambda w[\text{destroy}w(w)(\text{alaska})(\text{we})])) = \lambda y^p[y^p = \\ ({}^{\cap p}(\lambda w[\text{destroy}w(w)(\text{alaska})(\text{we})]))]$$

c. $\llbracket \textit{proposal that we destroy Alaska} \rrbracket =$

$\lambda y^p [\textit{proposal}(y^p) \ \& \ y^p = (\cap^p (\lambda w [\textit{destroy}(w)(\textit{alaska})(\textit{we})])$
 (after Potts 2002)

On Potts' account we need some way to prevent IDENT from creating the needed predicative type in the small clause cases. If IDENT is freely available, why not use it to shift the CP into a predicative type there as well? On the other hand, the approach which takes the CP denotation as predicative from the start will have to find a way of preventing it in the small clauses cases as well.

We might modify Kratzer's account (as in (18)) to ensure that it denotes something of type e to start with (as with Potts analysis). The only thing we would do is revise what (18) does. Instead of returning a property of content individuals as in (34)b, a CP would denote the unique individual whose content is expressed by the complement proposition (34)c.

(34) a. $\llbracket \textit{that we destroy Alaska} \rrbracket =$

b. $\lambda x_c . \textit{fCONT}(x_c) = \lambda w . \textit{destroy}(\textit{Alaska})(\textit{we})(w)$ *type e,t*

c. $\iota x_c . \textit{fCONT}(x_c) = \lambda w . \textit{destroy}(\textit{Alaska})(\textit{we})(w)$ *type e*

We then will need to use IDENT to compose the CP with the noun as in Potts (2002). So IDENT applied to a CP of the form in (34)c will give the following:

(35) a. $\textit{IDENT}(\iota x_c . \textit{fCONT}(x_c) = \lambda w . \textit{destroy}(\textit{Alaska})(\textit{we})(w)) =$

b. $\lambda y_c . [\textit{y}_c = \iota x_c . \textit{fCONT}(x_c) = \lambda w . \textit{destroy}(\textit{Alaska})(\textit{we})(w)]$

The CP, after IDENT has applied, will denote the property of being the thing that is identical to the unique thing whose content is the proposition that we destroy Alaska.

This is intersected with the noun *proposal*:

- (36) a. $\llbracket \textit{the proposal that we destroy Alaska} \rrbracket =$
 b. $\iota y. [\textit{proposal}(y) \ \& \ [y = \iota x. \textit{fCONT}(x_c) = \lambda w. \textit{destroy}(\textit{Alaska})(\textit{we})(w))]]$

This move, however, suffers from just the same problem as Potts' does: what prevents us from applying IDENT to give a CP the right type to serve as the predicate in a small clause? We want to create predicate-types for the purposes of intersection with the noun, but that gets us into trouble in preventing the small clause cases. This is a genuine problem. On either approach we have yet to derive the small clause restriction, and this remains an open question.

2.3.1 Contents or nominalized propositions?

The semantics of the two proposals is crucially different, however. Here are the formulas assigned to *the proposal the we destroy Alaska* in the two approaches:

- (37) a. $\iota y^p [\textit{proposal}(y^p) \ \& \ [y^p = (\cap^p)(\lambda w [\textit{destroy}w(w)(\textit{alaska})(\textit{we}))]]]$ (Potts 2002)
 b. $\iota y [\textit{proposal}(y) \ \& \ [\textit{fCONT}(y) = \lambda w. \textit{destroy}(\textit{Alaska})(\textit{we})(w)]]]$

Under the nominalization approach as in (37)a, the proposal is identified with a proposition. That is, what *proposal* describes is something (a nominalized proposition)

that is identical to the (nominalized proposition) expressed by *that we destroy Alaska*. In (37)b, no such identification is made. The noun *proposal* describes something that has propositional content. The CP then describes a thing whose content is expressed by the proposition *that we destroy Alaska*.

There are reasons to avoid saying that a proposal *is* a proposition, as (37)a does. Proposals – and rumors, stories, theories, ideas, and others – come into existence at particular times (*the proposal that... was made last year*); they may be reported or spread and they may have qualities like being mean or nasty (*they spread a nasty rumor that...*), and they may cease to exist (*that proposal that... is dead*). Propositions don't have these properties: they can't, for instance, be mean.

We can talk of rumors and proposals being false, too, but when we do so, they nonetheless remain actual proposals and rumors. If we identify a rumor with its propositional content, and if the propositional content is the sum of non-actual worlds (and this sum was identified with the proposal), then the rumor would be non-actual. In (37)b, no such identification is made. Since the proposition describes the content of the rumor (it isn't the rumor itself), the *content* of the rumor can be false but the rumor can truly be a rumor.⁷

On the other hand, talking about the content of things like rumors and proposals, as in (37)b, has difficulties. CPs, on this approach, express properties that are true of a thing just in case its content is the proposition expressed by the embedded clause. So *that life is beautiful* expresses a property of things just in case the content of that thing is the

⁷ It would be necessary now to spell out what predicates like *is false* (as in *the rumor that Edna is innocent is false*) are true of. They must be properties of the *content* of the rumor, not the rumor itself.

proposition that life is beautiful. The content of the French expression *la vie est belle* is the same, and so we should be able to say:

(38) *The French sentence that life is beautiful is *La vie est belle*.

On the approach in (37)b this should mean ‘The French sentence whose content is the proposition that life is beautiful is *La vie est belle*.’⁸ I leave these difficult questions for future study. I will assume the Kratzer-style account since it avoids the most immediate problems of literally identifying things like proposals and rumors with propositional content.

On either approach, though, the important result is that the complement to the noun intersects with the noun’s denotation. There is no predicate-argument relation. That’s the take-home message – and it’s one I’ll provide more evidence for throughout the rest of the chapter. I’ll turn next to the nominalizations of verbs, where the very same thing happens.

3. The Higgins-Stowell facts

The kind of paradigm found with non-derived nouns – showing that their CP complements are modifiers – extends to nouns derived from attitude verbs. As Higgins (1973) and Stowell (1981) showed, CPs that combine with many de-verbal nouns show

⁸ We would need to say: *The French sentence that expresses that life is beautiful is “La vie est belle”*. The noun *sentence* cannot take CPs that describe their content. Much like *picture* and *book*. Both have content but we cannot say **The picture that Washington is crossing the Delaware* and **The book that Jesus was actually married*.

the same predicate-like properties as clauses that combine with non-derived nouns: they act as predicates in post-copular position.

- (39) a. The belief that Edna was stealing (is false)
b. The belief is that Edna was stealing.
- (40) a. Andrea's guess that Bill was lying.
b. Andrea's guess was that Bill was lying.
- (41) a. John's claim that he would go.
b. John's claim was that he would go.
- (42) a. Paul's explanation that he was temporarily insane.
b. Paul's explanation was that he was temporarily insane.
(Stowell 1981: 199(154a-c))

This behavior obtains for some infinitives as well – those that characterize the content of the nominal (Higgins 1973, Stowell 1981):

- (43) a. Jack's desire was to finish on time.
 b. Jack's desire to finish on time (is a good sign).
- (44) a. Jack's hope was to be my friend.
 b. Jack's hope to be my friend (is crazy).
- (45) a. Jim's promise was to go swimming.
 b. Jim's promise to go swimming (was renegeed).
- (46) a. John's decision was to swim.
 b. John's decision to swim (was reckless)

In contrast, certain non-finite clauses behave differently in this respect (Higgins (1973), Stowell (1981)): they can appear as clausal complements to the noun, but they cannot appear in the copular construction, which suggests they are not predicates:

- (47) a. Jack's attempt to finish on time.
 b. *Jack's attempt was to finish on time. (Stowell 1981: 201(156/9a))
- (48) a. Jack's pretense to be my friend.
 b. *Jack's pretense was to be my friend. (Stowell 1981: 201(156/9b))
- (49) a. Jim's refusal to go swimming.
 b. *Jim's refusal was to go swimming. (Stowell 1981: 201(156/9c))

The proposition that he go swimming is not the content of Jim's refusal; it's the thing he refused to do. It's an argument.

So how do CP predicates compose with the deverbal nouns *claim* and *belief* and *hope* and so on? These verb roots take as an internal argument something that bears content:

- (50) a. John believed the rumor.
b. Mary claimed something that other people object to.
c. John decided that.
d. John told Mary his sad story.

As Kratzer (2006) argues, these verb roots are to be decomposed, like other verbs, by factoring out the external argument – the Agent or Holder of the eventuality (which is either a state or an event proper) (Kratzer 1996). The verb root then has an event argument and a content argument.⁹

$$(51) \quad \llbracket_{\text{verb}} \textit{claim} \rrbracket = \lambda x_c. \lambda e. \textit{claim}(x_c)(e)$$

We can now examine how de-verbal nouns are formed from these verbs. The conclusion of the next section will be that the derived noun involves the existential closure of the verb's eventuality argument, leaving the internal argument open for composition; hence the noun *claim* has the same type structure as the non-derived content nouns:

⁹ I am leaving out a world argument for these verbs to make the following exposition about the composition clearer. Ultimately, these verbs will have to be intensional.

$$(52) \quad \llbracket_{\text{noun}} \textit{claim} \rrbracket = \lambda x_c. \exists e. \textit{claim}(x_c)(e)$$

The composition of the CP with the derived noun will proceed just as with the noun: via predicate conjunction.

$$(53) \quad \llbracket \textit{claim that Edna was stealing} \rrbracket \\ = \lambda x_c. \exists e [\textit{claim}(x_c)(e) \ \& \ [\textit{fCONT}(x_c) = \lambda w'. \exists e [\textit{stealing}(\textit{Edna})(e)(w')]]]]$$

This analysis of nominalization needs justification, which I turn to next.

3.1. The importance of object nominals

Here I describe the formation of the de-verbal nouns from attitude verbs. In the process, we will find yet another syntactic argument for treating clausal complements of nouns (derived or otherwise) not as true arguments but as modifiers. The argument is basically that of Grimshaw (1990), and here I hope to add additional data and provide a formal implementation. The argument is simple and analogous to that made for non-derived nouns: object nominals do not allow their internal arguments to be saturated, and yet object nominals still allow *that*-clause complements. If these complements were true arguments that saturated the object position, we couldn't explain why they can appear where other object-saturating arguments can't. If they are modifiers, we can explain their ability to appear in these cases. Crucially, the argument presented doesn't rely on abstract case. We'll see that the nouns are "defective" in more than just their ability to assign case. They are defective in their argument-taking abilities.

To be able to make this argument, I need to first introduce how object nominals are formed in the easy cases. With that in place, it will become easier to see how object

nominals are formed from attitude verbs, which will in turn provide the background for showing why the CPs that complement derived nouns are predicate modifiers.

The kinds of nominalizations that attitude verbs like *believe* form are of the sort classified by Grimshaw (1990) as *result* or *object nominalizations*. Object nouns appear to denote the thing that the internal argument does. *Belief* refers to a thing believed. The (non-attitude) verb *love* can likewise denote a thing loved.

- (54) a. John's belief is crazy.
b. The love of John's life is very nice.

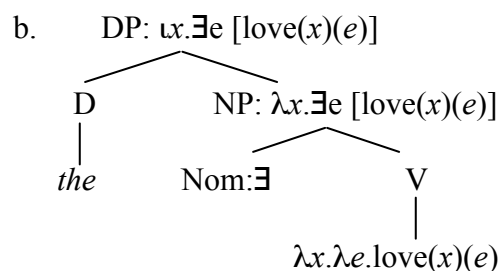
The relevant fact about object nominals is that the object argument cannot be saturated (Grimshaw 1990). To see this, we need to compare object nominals to event (or eventuality) nominals¹⁰, whose internal argument DPs can be expressed (with the help of *of*). Take the verb *love*, which can form both types of nominals. The eventuality nominal in (55)b denotes a state – hence the predicate *last forever* can be true of that state. In this case, the internal argument must be present (with *of*-case). The object nominal, in (55)c, does not allow the internal argument to be expressed:

¹⁰ From hereon, I will use the cover term eventuality for both states and events proper (Bach 1986). I use *l* as the semantic type for eventualities. As for the variables, I will use *s* for states and *e* for events proper.

- (55) a. John loved Mary. *Verbal*
 b. John's love of Mary lasted forever. *Eventuality nominal*
 c. John's love (*of Mary) was a nice woman *Object nominal*

I take the formation of an object nominal to involve existential closure of the eventuality argument of the verb root. I will house the existential quantifier that performs this operation in Nom, a nominalizing head. Furthermore, external arguments are not arguments of the verb root (Kratzer 1996). Thus a 'transitive' verb root has an internal argument and an eventuality argument; external arguments are added by Voice heads (Kratzer 1996), giving agents (for events proper) and perhaps holders (for states). Nominalizing a verb root then will either close off existentially the eventuality argument or the internal argument. If the former, nominalizing the root of *love* returns a predicate of individuals, a predicate of *loved things*, which can then be selected by a determiner, for instance:

- (56) Object nominal
 a. The love (of John's life was Mary)

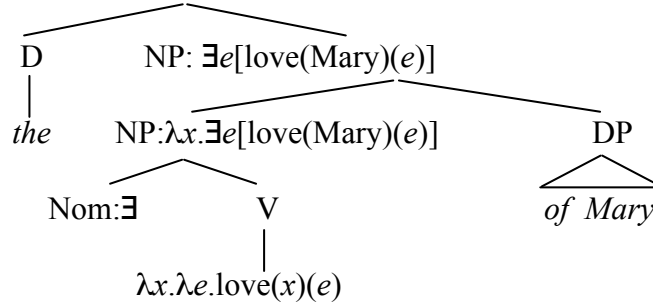


On the other hand, if the internal argument is saturated, as in the case below, then an object nominal cannot be derived. The NP will be of the wrong type – since the internal argument/object position is saturated, the NP cannot denote a property of loved individuals. The article *the* needs to operate over a property; the denotation of the NP is a formula. The semantic computation crashes because no property is available for the determiner.

(57) No internal arguments for object nominals

a. *The love of Mary. (*on object nominal structure/interpretation)

b. DP: $*\lambda x.\exists e [\text{love}(\text{Mary})(e)]$ ← *computation crashes*



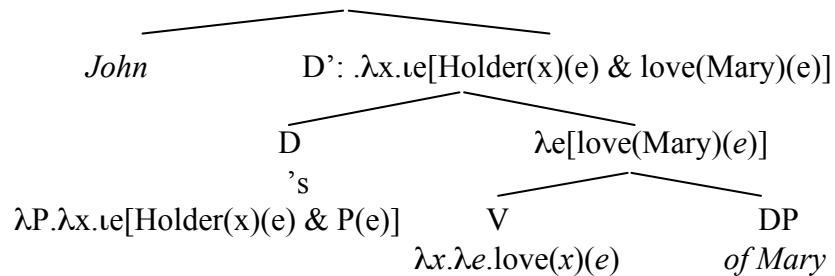
Instead, only an event nominal can be formed if the internal argument is saturated. Eventuality nominals denote the eventuality described by the verb – so in (55)b, the predicate *last forever* is something that is true of John’s love state, not of the object of John’s love. Hence, eventuality nominals have something like the structure below. The role that the possessor plays is complex; I will treat, for the purposes of the composition, the genitive as an all-purpose argument-introducing head. Here, the likely candidate has

the meaning of a state holder.¹¹ The possessor takes a property of eventualities and returns the unique event whose holder is the possessor.

(58) Eventuality nominal

a. John's love of Mary (lasted forever).

b. DP: $\iota e[\text{Holder}(\text{John})(e) \ \& \ \text{love}(\text{Mary})(e)]$



This DP denotes the unique state (held by John) which is a state of loving Mary – which can be temporally situated.

Now to object nominals formed from attitude verbs. The important data point here is that, as with other object nominals, the internal argument cannot be saturated. We've seen that verbs like *believe* have a content argument, which appears as their internal

¹¹ This doesn't, of course, do justice to the argument-taking properties of eventuality nominals. We are going to have to understand the passive nominals, as in *John's murder*. Recovering the argument via a general relation encoded in the possessive might be a possibility, but it can't be limited to Agents or Holders. But perhaps it can be limited to event participants. It will quite generally prevent us from being able to get non-arguments to be in the possessor position. This would work to eliminate the possibility of raising nominals (Kayne 1984):

(i) *John's semblance/promise/belief to be a lawyer.

A semantic account of the lack of raising nominals is an avenue I leave for future work. In particular, it would require also understanding expressions like *Yesterday's meeting*, which would require talking about time arguments for event-denoting nouns like *meeting*.

argument in the verbal cases. (the (b) cases below). When a nominal is formed, this argument cannot be expressed (the (a) cases).^{12,13}

- (59) a. *John's belief of that idea. *object nominal*
b. John believed that idea. *verb*
- (60) a. *John's claim of something. *object nominal*
b. John claimed something. *verb*
- (61) a. *Her thought of that. *object nominal*
b. She thought that. *verb*

This restriction is the result of the way object nominals are built from the corresponding verbal roots just as with *love*. If the internal argument position of *believe* is what *that idea* saturates, forming an object nominal isn't possible if the object argument has been saturated. The failure of these derived nominals to take DP complements helps to settle an important confound in examining the complementation properties of nouns: licensing considerations, such as case. The fact that these are ungrammatical gives us a way of

¹² These verbs can take *of-marked* DPs, but again as noted in the text, those express the *res* argument of *believe* (and can appear as *about*-adjuncts too). Lots of things can be the *res*, including content nouns themselves (see (ib)):

- (i) a. John's belief of Ortcutt is that he is driving too fast.
b. John's belief about that idea is that it is wrong.

We know this is a different argument from the content argument because they can co-occur in verbal structures with the clausal complement:

- (ii) a. John believed of Ortcutt that he was driving too fast.
b. John believed about that idea that it is wrong.

¹³ I have seen this observation made, in a slightly different context, by Zucchi (1989). I was made aware of it in conversations with Kyle Johnson.

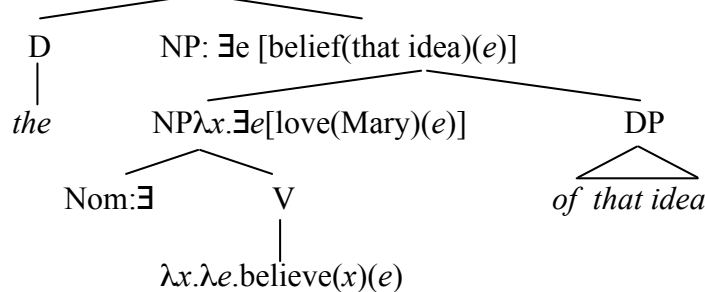
factoring out any consideration of case, or whatever mechanism is responsible for DP licensing. Any time a CP can appear but a DP can't, we could always appeal to case as the regulating factor. On that view, a DP is not available because case is not available, but a CP is because it doesn't "need" case (as in various approaches taken by Pesetsky (1982) and others). However, the nominal case-marking *of*, whatever its source may ultimately be, ought to be available if indeed these were true arguments of the noun.

The answer, then, does not lie in the case-marking properties of nouns, but in semantic structures assigned to object nominals. Object nominalization renders the predicate unable to compose with the internal argument. This is what happens in the case of *belief*: If we saturate the internal argument, we get a formula, something which a determiner like *the* cannot compose with and the semantic computation crashes.

(62) Object nominal

a. *The belief of that idea. (* on object nominal structure)

b. DP: $*\iota x.\exists e$ [belief(that idea)(e)] ← computation crashes

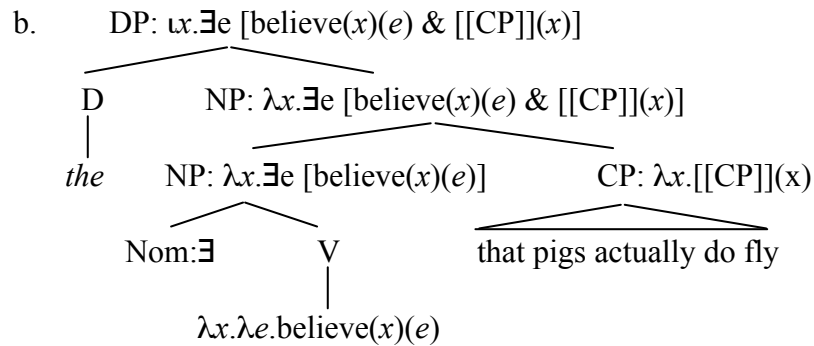


Now we are in a position to see what happens when a CP is in construction with an object nominal derived from *believe*. Since CPs do not saturate the internal argument of the predicate, but modify it by intersection, the object nominal can be intersected with the

predicate of contents furnished by the CP. For space I do not spell out the content of the CP, but the reader can verify that the types work out if CPs are predicates of contents.

(63) Object nominal intersected with CP modifier

a. The belief that pigs actually do fly (is widespread).



Treating CPs as predicates captures the fact that while the nominal *belief* does not take a content argument (in virtue of being an object nominal), the CP can nevertheless compose (being a predicate).

This section has made the case for treating clausal complements (to derived nouns) as modifiers by providing a negative argument: since true object arguments do not appear with this class of derived nouns (being object nominals), and since clausal ‘complements’ do, then they must not be arguments that saturate an argument position. Given the discussion above, the idea that CPs modify (that is, compose by intersection with a predicate of the same type) is the most natural conclusion. In the next section, I wish to provide positive evidence that the CP complements to nouns do not saturate an argument position but rather stand in a modification relation. The evidence comes from reconstruction.

4. Further syntactic evidence for the modifier analysis of CP complements

If CPs are really modifiers we expect them to behave as such in other respects. In particular, we expect there to be some syntactic evidence that they are modifiers. In the next sections, I use diagnostics for the modifier/argument distinction that involves the selective bleeding of Condition C that holds for adjuncts but not complements (van Riemsdijk and Williams 1981, Freidin 1986, Lebeaux 1988, 1990 among others). I will confirm that – after reviewing some conflicting reports in the literature – clausal ‘complements’ can late merge to nouns (and hence, in line with observations in Jacobson 2004, Kuno 2004, Lasnik 1998, 1999, and McCarthy 2003). I will spend some time reviewing the data marshaled for and against this position in the literature. The conclusion is that when we control for certain confounds in the data, we discover that clausal complements to nouns act like modifiers for the purposes of late merge, thus providing positive, syntactic evidence for the proposals above.

4.1. Argument / modifier asymmetries and Condition C

In certain respects, *Wh*-moved material acts as though it is present in the gap position for the purposes of binding conditions, like Condition C. A referring expression, for instance the proper name *Nixon*, cannot be co-valued with the pronoun *he* it moves over.

- (64) a. *Which investigation of Nixon₁ did he₁ resent?
b. *Which book about John’s₁ library did he₁ read?

The result is ungrammatical in the same way that the following examples without movement are:

- (65) a. *He₁ resented which investigations of Nixon₁?
b. *He₁ read which book about John's₁ library?

Here the referring expression is c-commanded by the co-valued pronoun, a structural configuration thought to be ungrammatical. Since in (64), *Nixon* cannot be co-valued with *he*, it is often thought that the moved phrase is subject to binding conditions as if it were in its base position. That is, the binding theory assesses a syntactic representation for (64) that looks like (65).

It has long been suggested that there is an asymmetry, however, between arguments and modifiers when it comes to their sensitivity to these connectivity or 'reconstruction' effects with Condition C (van Riemsdijk and Williams 1981, Freidin 1986, Lebeaux 1988). When a proper name is an argument within the moved expression, a disjoint reference effect is generally thought to hold (as we saw above, and repeated below). If the referring expression is contained in a modifier, however, the disjoint reference effect is lifted.

- (66) a. *Which investigation of Nixon₁ did he₁ resent? *argument*
 b. Which investigation near Nixon's₁ house did he₁ resent? *modifier*
 (Safir 1999: ft1 589)
- (67) a. *Which book about John's₁ library did he₁ read? *argument*
 b. Which book from John's₁ library did he₁ read? *modifier*
 (Fox and Nissenbaum 1999:6(6))

Lebeaux (1988) proposed that this difference would follow if the representation that the binding theory assessed did not require that modifiers be in the base position. We'll see in a moment the techniques currently used to capture this difference.

Many speakers, though, often do not find a strong contrast between arguments and modifiers. Part of the problem, is that the modifier/argument status is unclear for many nominals. We have already seen, in the discussion about object versus eventuality nominals, that nouns are often ambiguous in their argument-taking properties (Grimshaw 1990). Following a strategy pointed out to me by Kyle Johnson (p.c.; see Johnson 2009), one way to force argument status on a referring expression is to make sure we have an eventuality nominal. And one way to do that is to choose a verbal gerund, especially one with a small clause complement. This will ensure that the relevant name is not part of a modifier. In the cases below, the referring expression is syntactically case-marked as the object of the verbal gerund. And, indeed, the disjoint reference effect is clear:

- (68) a. *Whose painting John₁ nude does he₁ resent most?
 b. Whose painting him₁ nude does John₁ resent most?
- (69) a. *Whose finding Hector₁ insufferable at the meeting was he₁ unaware of?
 b. Whose finding him₁ insufferable at the meeting was Hector₁ unaware of?

In fact, these induce a disjoint reference effect in the way that cases where the modification status is clear don't:

- (70) a. Whose painting Mary nude in John₁'s backyard does he₁ resent most?
 b. Whose browsing the web during Hector₁'s speech was he₁ unaware of?

I conclude, then, that there *is* a modifier/argument distinction in the selective bleeding of condition C. This is important to establish, since we need to be sure the test we run concerning clausal complements is legitimate. Let me briefly describe the standard approach to the adjunct/argument asymmetry in the literature.

4.2. The Late Merge account

The most recent understanding of connectivity and other reconstruction effects is the copy theory of movement (Chomsky 1995). Under the copy theory of movement, movement involves the creation of a copy of some phrase and the merge of that copy in a higher position. In a sense, then, phrases leave copies of themselves, and those copies are subject to the same requirements that overt phrases are (further spell-out principles determine which copy is pronounced, see Fox 1999). So the gap of the moved *wh*-phrase

is occupied not by a mere trace but by a copy of the moved expression. (64)a, repeated below, has the representation below, where a condition C effect is induced by the lower copy of the *wh*-phrase:

(71) **[Which investigation of Nixon₁] did he₁ resent [Which investigation of Nixon₁]?*

Lebeaux's proposal – updated in the copy theory of movement framework (Chomsky 1995, Fox 1999, Fox and Nissenbaum 1999) – is that modifiers can be present in some copies but not others – a process now dubbed late-merge. So the *wh*-phrase in (66)b can merge without its adjunct; the higher copy, however, contains the adjunct. No Condition C violation is induced.

(72) a. Modifier – late-merged to higher copy

[Which investigation near Nixon's₁ house] did he₁ resent [Which investigation]?

b. *Argument – merged in base position*

**[Which investigation of Nixon₁] did he₁ resent [Which investigation of Nixon]?*

The late merge option is not available for arguments, Lebeaux argued, because of the Projection Principle. The Projection Principle states that a predicate's thematic or argument-structure requirements must be satisfied at all levels of representation. As a consequence, complements cannot be present at one point in the derivation but not another. Fox (1999) argues that once the move is made to the copy theory of movement, the argument/adjunction asymmetry falls out naturally from compositional mechanisms. Take for example the noun *investigation*. If its argument is merged only in the higher

copy, then that means the lower copy of *investigation* has an unsaturated argument position. This would render it the wrong type and it wouldn't compose with the element that selects it.^{14,15}

4.3. Complement clauses and Late Merge

In addition to the PP adjunct/complement asymmetries above, Freidin (1986) and Lebeaux (1988) claimed that there was an argument/modifier asymmetry in the case of clausal elements. An example of this purported contrast is shown below. In the (a) case a referring pronoun is in a 'complement' clause; in (b) it is in a relative clause:

- (73) a. *Which claim that Mary had offended John₁ did he₁ repeat?
b. Which claim that offended John₁ did he₁ repeat?
(Safir 1999: 589(1))

The relative clause in (b), being an adjunct, can late merge and thereby bleed Condition C. The clausal complement in (a), on the other hand, must be merged in the base position. This forces the referring expression below its co-valued pronoun. These two representations are shown below:

¹⁴ Spelling this out fully actually requires recourse to Fox's trace conversion mechanism (Fox 1999, see also Sauerland 1998). Not only is this mechanism troublesome (see Johnson 2009), it will take us too far afield. The simple message about modifier/argument distinctions is sufficient presently.

¹⁵ Optional arguments, as in *the picture (of John)*, might act like modifiers for the purposes of late merge. It is hard to see how the semantics would rule this out. And this comports with the lack of clarity of the data in these cases.

- (74) Relative Clause – late-merger
- a. Which claim that offended John₁ did he₁ repeat?
 - b. [Which claim that offended John₁] did he₁ repeat [which claim]
- (75) Complement Clause – no late-merger
- a. *Which claim that Mary had offended John₁ did he₁ repeat?
 - b. *[Which claim that Mary had offended John₁] did he₁ repeat [Which claim that Mary had offended John₁]?

Based on the contrast in (73) alone it would seem that clausal ‘complements’ to nouns are indeed complements, since they cannot late-merge. A number of linguists in a variety of frameworks, however, have suggested that the contrast between argument and adjunct CPs (in contrast to argument and adjunct PPs) is not robust. This is the topic of the next section.

4.4. The facts: controlling for the confounds

Perfectly grammatical examples of ‘complement’ clauses of nouns obviating Condition C effects have been cited in the literature. A sample is shown below from various sources. (See Postal 1997, Kuno 2004, Safir 1999, Lasnik 1998, 1999, McCarthy 2004, Landau 2007.)

- (76) a. The fact that John₁ has been arrested he₁ generally fails to mention.
b. Whose allegation that Lee₁ was less than truthful did he₁ refute vehemently?
(Kuno 2004)
c. How many arguments that John's₁ theory was correct did he₁ publish?
(Safir 1999: ft1, modified from Barss)

While the contrast in (73) is clear, it's surprising that Condition C violations do not appear in the examples above. What gives? Before rushing to any conclusions about what we know, it is helpful to pause to ask why the data should be so inconclusive, and to examine what factors and possible confounds contribute to the judgments. After that, I will offer examples that systematically control for those confounds. I will make the case that clausal complements to nouns behave as modifiers (they can 'late merge'), providing syntactic evidence for the analysis of CPs.

4.4.1 The perspective confound

There are several reasons why the data is not stable and why certain examples tend to be degraded. The first, noted by Kuno (1997) and Kuno (2004), is that perspective is a crucial factor in the acceptability of these types of sentences. Clausal 'complements' that specify the content of some noun tend to be degraded when a referring expression in the CP is co-valued with the agent or author to whom the content of the CP is ascribed. For instance, in (73) John is likely the perspectival centre – or 'author' – of the claim repeated, but a referring expression is used in the CP that reports the content of his utterance. Kuno (1997) suggests that changing the perspectival center of a report can

alleviate the confound. Safir (1999) offers a pair where this factor is potentially controlled for:

- (77) a. ?Which claim that Al₁ had defeated Lea was he₁ unaware of?
b. *Which claim that Al₁ had defeated Mary did he₁ later admit he₁ made?
(Safir 1999(63))

In (a), Safir suggests that content of the claim is not something Al would himself utter – he was unaware of it. In (b), the claim is something that Al would say: “I defeated Mary”. The judgments are, as Safir points out, not too robust. The issue here involves *de se* attitudes, and how *de se* counterparts are expressed in the complements of attitude ascriptions. In the (b) case, we are reporting a claim that Al is making about himself and the content of the claim involves the person he knowingly identifies as himself, hence the first person paraphrase. *De se* counterparts involve more than just co-indexing two referring-expressions, and a great deal of work goes into characterizing *de se* belief and *de se* pronouns (Kaplan 1977, Lewis 1979, Chierchia 1989, Schlenker 1999, Anand 2006; and see Chapter Three where the issue is taken up more fully). The upshot is that even if no Condition C violation holds, proper names will still be the wrong thing to use in a *de se* ascription.¹⁶ Controlling for this confound is difficult, and even the (a) example does not quite alleviate this problem – to say that Al is *unaware* of a claim about himself simply negates that he is aware that he (really, his *de se* counterpart) has had a claim made about him.

¹⁶ For instance, I know of no case where a proper name is used to express a *de se* counterpart. This is of course hard to see because such cases will generally also involve a Condition C violation.

Kuno (2004) provides a better example. The predicate in the example below, *expunge*, is not one (like *aware* or *repeat*) that implies an attitude on the part of its subject. The object position of *expunge* is extensional. This greatly helps alleviate the perspectival confound and the condition C violation is absent.

- (78) Which psychiatrist's view that John₁ was schizophrenic did he₁ try to get expunged from the trial records?
(Kuno 2004: 335(72))

We can actually make these better, as there is another confound in the data that needs to be controlled for.

4.4.2 The individuation confound

There is a second confound, pointed out by Jacobson (2004:27-28ft10), that many of the examples that purport to show a contrast between modifier and argument CPs. The confound concerns how we individuate things with content. Many of the sentences reported in the literature involve questions headed by *which*, and this carries its own requirements that interact with content nouns. Take one of the pairs reported in the original literature:

- (79) a. *Which claim that John₁ had helped develop new technologies did he₁ make at last year's national convention? ('complement clause')
b. Which claim that John₁ made did he₁ later deny? ('relative clause')
(Lebeaux 1992)

The sentence in (79)a is somewhat degraded even without a Condition C violation:

- (80) ??Which claim that he₁ had helped develop new technologies did John₁ make at last year's national convention?

To that end, Jacobson (2004) has pointed out that a contrast persists between relative and non-relative CPs where no Condition C issues arise:

- (81) a. Which claim (that he made) did John write down in his report?
b. ?Which claim that Mary was guilty did John write down in his report?
- (82) a. Which argument (that she made) did he refute?
b. ?Which argument that guns should be banned did he refute?

The problem traces back to the fact that these question words – *which x* – require the individuation of x's, such as individual *claims* or *arguments*. Now, while it is not difficult to individuate claims and arguments in general (even with relative clauses added to them), it requires a richer context to individuate claims that have the same content.

When a context is set-up that makes it more plausible for there to be different claims with the same content, the examples improve dramatically. Providing different authors or originators of the *claim* or *argument* help. In this case, bleeding of Condition C is natural even for clausal 'complements':

- (83) a. Which witness's claim that Mary₁ was at the scene of the crime did she₁ try to have stricken from the record?
- b. Which justice's argument that Mr. B₁ was within his right to protest the cutbacks did he₁ refer to in his₁ speech?

Or consider the following scenario, where the content of the arguments can differ slightly according to their originator:

- (84) Professor C. is well-known for being resistant to reviewers' suggestions and criticisms. One proposal in Professor C.'s most recent submission was uniformly rejected by the reviewers, although they each had very different arguments against it. Professor C, surprisingly, changed his proposal.

The journal editor wondered which reviewer's argument that Professor C's₁ proposal was flawed he₁ ended up accepting.

Here, there are a number of different arguments that Professor C's proposal is flawed, and so it is natural to ask whose argument Professor C ended up accepting. What makes Kuno's (2004) examples from above particularly good is that they control for this confound as well as the perspective confound. Kuno's sentences involve cases where different claims, opinions, or views can be individuated (on the basis of their authors) even if they have the same content.

- (85) a. Whose allegation that John₁ was less than truthful did he₁ refute vehemently?
 b. Whose opinion that Weld₁ was unfit for the ambassadorial appointment did he₁ try to refute vehemently?
 c. Whose claim that the Senator₁ had violated the campaign finance regulation did he₁ dismiss as politically motivated?
 d. Which psychiatrist's view that John₁ was schizophrenic did he₁ try to get expunged from the trial records?
 (Kuno 2004: 335(72a-d))

These examples also do well to alleviate the perspectival confound noted above. The last example is particularly natural. Here, the predicate that selects the moved complex DP is not a typical attitude verb: as noted, *expunge* doesn't necessarily implicate any belief on the part of the embedded subject. In fact, just by varying the nature of the most embedded verb we get a contrast. Compare the variation on Kuno's example with *believe* (and other belief-implicating verbs) instead of *expunge* (and others):

- (86) a. ??Which psychiatrist's view that John₁ was schizophrenic did he₁ not believe (...understand/agree with/want to hear/...)?
 b. Which psychiatrist's view that John₁ was schizophrenic did he₁ try to get expunged from the trial records?

This example alleviates the difficulties of individuating things with the same content as well as the perspectival/*de se* confound.

Taking into consideration the various confounds pointed out in the literature, we can now conclusively see that the clausal complements of nouns can bleed condition C. If the late-merger account of these bleeding effects is right, then we have powerful

confirmation that not only are the clausal complements of nouns *semantically* modifiers, but at the level of syntactic representation they are treated as such. Of course, one thing we need to do is to return to cases which are reliably arguments of the embedding predicate to make sure that we indeed have a contrast.

4.5. Comparison to clausal arguments

The clausal complements of verbs, in contrast to nouns, behave as expected: moving their complements does not render them impervious to disjoint reference effects. To test this I use verbal gerunds, as above, to ensure that we indeed have verbal complementation. To make sure we have a verbal gerund I add in an adverb (which is ungrammatical with nominal gerunds – e.g. **Whose loudly singing of the national anthem* vs. *Whose loudly singing the national anthem*). The sentences below are the result of crossing two manipulations: the presence of a possible Condition C violation (a,c) or not (b,d), and whether the CP is the complement of a noun (c,d) or a verbal gerund (a,b). The judgments reported here are compatible with the claim that only the CP complements of nominals bleed Condition C.

- (87) a. *Whose loudly claiming that Bob₁ is the murderer did he₁ not hear?
b. Whose loudly claiming that he₁ is the murderer did Bob₁ not hear?
c. Whose loud claim that Bob₁ is the murderer did he₁ not hear?
d. Whose loud claim that he₁ is the murderer did Bob₁ not hear?
- (88) a. *Whose falsely alleging that John₁ was less than truthful did he₁ not witness?
b. Whose falsely alleging that he₁ was less than truthful did Bob₁ not witness?
c. Whose false allegation that John₁ was less than truthful did he₁ refute vehemently?
d. Whose false allegation that he₁ was less than truthful did John₁ refute vehemently?

The lengths that need to be taken to ensure that the complements are arguments of a verb and not a noun degrade the acceptability. And we should be worried that the contrasts are not as glaringly bad as we might expect. Nonetheless, if these data hold up, we are safe in concluding that verbs still can take clauses as arguments. It is true, however, that these data require confirmation experimentally.

Another strategy is to use raising-to-object infinitival complements, whose subjects are case marked by the embedding predicate (see Chapter Four for a thorough discussion of these constructions). Nouns (and nominal gerunds) do not allow these kinds of complements, unlike verbs and verbal gerunds:

- (89) a. John believed her to be upset.
 b. John strongly believing her to be upset (is a mistake on his part).
 c. *John's strong believing of her to be upset (is mistaken).
 d. *John's strong belief of her to be upset (is mistaken).

We can be sure that the embedded subject – which on many accounts raises to become the matrix object syntactically – is not a modifier. The contrasts between these complements and complements to nouns is clearest:

- (90) a. *Whose believing John₁ to be a fool do you think he₁ would be most upset by?
 b. Whose believing him₁ to be a fool do you think John₁ would be most upset by?
 c. Whose belief that John₁ is a fool do you think he₁ would be most upset by?
 d. Whose belief that he₁ is a fool do you think John₁ would be most upset by?
- (91) a. *Whose desiring John₁ to be hanged do you think he₁ would be most upset by?
 b. Whose desiring him₁ to be hanged do you think John₁ would be most upset by?
 c. Whose desire for John₁ to be hanged do you think he₁ would be most upset by?
 d. Whose desire for him₁ to be hanged do you think John₁ would be most upset by?

I haven't controlled for the perspectival confound in these cases (the embedding predicate, *upset*, has a perspectival component in that it requires belief on the part of the subject about the content of what he was upset by). Nonetheless, this feature is held constant across the items and a contrast emerges. Once again, experimental testing would be needed to verify these intuitions.

4.5.3 Relation to Higgins-Stowell facts

Important to note here is the correlation between the Stowell-Higgins facts and the reconstruction effects (see Landau 2007 for remarks in this direction). Those predicates whose complements do not appear in the post-copular position (see (47)) also show stronger condition C effects than CPs that behave as modifiers in other respects.

- (92) a. *Whose attempt to discredit Nixon₁ did he₁ resent?
(Safir 1999: ft 1)
- b. *Which professor's refusal to accept Bob₁'s paper did he₁ challenge?
- c. *Whose anger that Bill₁ was responsible did he₁ try to diffuse?

We need to be just as careful, however, with these examples as we were with the original cases that purported to show an asymmetry. Below, are some minimal pairs contrasting “true” arguments with modifiers of nouns:

- (93) a. Whose desire to discredit Nixon₁ was he₁ not told about.
b. *Whose attempt to discredit Nixon₁ was he₁ not told about.
- (94) a. Which professor's choice not to accept Bob's paper did he₁ challenge?
b. *Which professor's refusal to accept Bob's paper did he₁ challenge?
- (95) a. Whose claim that Bill₁ was responsible did he₁ try to cover up?
b. *Whose anger that Bill₁ was responsible did he₁ try to cover up?

The true argument clauses, then, behave as expected with respect to their inability to bleed condition C.

5. Apparent problem: *proof*

There is an old objection to treating clausal ‘complements’ to nouns as modifiers that has cropped up in the literature. These data were marshaled by Safir (1985) against Stowell’s arguments that clausal complements to nouns are (always) appositive modifiers. The arguments of this class of verbs – the *prove*-class, also known as *bisentential* verbs (Emonds 1976, Koster 1978) – can be either CPs or DPs. The internal argument refers to the content of what is proved by some fact instantiated by the subject argument. (Some speakers prefer *the fact that* rather than a bare CP as the subject argument.)

- (96) a. The mess in the kitchen proves that Smith was the culprit.
b. (The fact) That there is a mess in the kitchen proves that Smith was the culprit.
- (97) a. The mess in the kitchen proves your theory.
b. (The fact) That there is a mess in the kitchen proves your theory.

Safir pointed out that while the nominal *proof* can take as its internal argument a CP, that same argument position cannot be predicated of by a CP in the post copular position, unlike predicates like *believe* and other content nouns. *Evidence* behaves similarly:

- (98) a. The proof that Smith was the culprit (disappeared). *Nominal complement*
 b. *The proof was that Smith was the culprit. *Post copular CP*
only means: Smith's being the culprit proved some other thing.
- (99) a. The evidence that Smith was the culprit. *Nominal complement*
 b. The evidence was that Smith was the culprit. *Post copular CP*
only means: Smith's being the culprit was evidence for something.
- (100) a. The belief/claim/rumor that Smith was the culprit. *Nominal complement*
 b. The belief/claim/rumor was that Smith was the culprit. *Nominal complement*

Instead, it is the subject argument that is identified by the post-copular element (as evidenced by the paraphrase above), and can be either a CP or DP. The internal argument CP can remain in complement position in these cases.¹⁷

- (101) a. The proof (that Smith was the culprit) was that he was late.
 b. The proof (that Smith was the culprit) is the mess in the kitchen.
 c. The evidence (that Smith was the culprit) was that he was late.

First, it should be pointed out that a number of predicates, which appear to have a similar meaning to *prove*, do not work this way. Verbs such as *indicate*, *suggest*, *demonstration*, and *reveal*:

¹⁷ Angelika Kratzer has pointed out that *proof* may have two uses. One describes something that has content (as in *the wording of the proof*) and another use describes some fact that proves something (*this fingerprint is the proof that John was here*). It is the latter *proof* I am interested in.

- (102) a. The evidence indicated that no witchcraft was involved.
b. The indication was that no witchcraft was involved.¹⁸
- (103) a. The evidence suggested that no witchcraft was involved.
b. The suggestion was that no witchcraft was involved.
- (104) a. The evidence revealed that no witchcraft was involved.
b. The revelation was that no witchcraft was involved.
- (105) a. The evidence demonstrated that no witchcraft was involved.
b. The demonstration was that no witchcraft was involved.

So there is something particular about *proof* and *evidence*. Safir's (1985) point is that the clausal complement of *proof* (which describes what was proved) does not behave like the clausal complements of *belief* and others in being something that can describe the noun *proof*. This provided evidence against Stowell's claim that CPs were only ever modifiers of nouns, not true complements. (This was a problem for Stowell who tied the fact that CP could remain *in situ* after nouns to the fact that they weren't true arguments.) The problem posed by *proof* appears to carry over to the analysis here: if CP 'complements' to nouns are predicates, then why can't they appear in the predication construction with this class of verbs?

¹⁸ *Indication* appears to be ambiguous. It can, but needn't, behave like *proof*.

- (i) a. (The fact) that there were no broomsticks around was the only indication that no witchcraft was involved.
b. The only indication that no witchcraft was involved was (the fact) that there were no broomsticks around.

I should point out first of all that the claim in this chapter is not necessarily that *all* complements to nouns are modifiers. Clearly, we have seen this is not the case for nouns like *attempt*. But it is worth looking at *proof* since the objection has been raised in a number of places.

The difference between *proof* and *belief* is that the nominal formed from *prove* is not an object nominal. If anything, it's a subject nominal. As (106) above shows, the nominal *proof* denotes the entity that supports the conclusion – it can be the facts that prove something, for instance (a); as noted, the internal argument CP can co-occur with the post-copular element – which isn't true of *belief-class* nominals (c).

- (106) a. The proof was a fact/the mess/that Fred was missing.
b. The proof that Fred was the culprit was a fact/the mess/that Fred was missing.
c. *The belief that Fred was the culprit was that he was missing.

Proof simply denotes entities, like facts for instance, that prove things. It's a property of the nominal itself. This doesn't tell us *anything* about the status of the complement of *proof*.

The internal argument of *prove* behaves differently from the internal arguments of *believe* and *claim* in just the expected way too. Unlike the object nominals such as *belief* and *claim*, the noun *proof* permits its internal argument to be expressed as a DP with *of*-case (sometimes *for* is more appropriate):

- (107) a. The proof of that/his guilt.
b. The indication of this.
c. The evidence for this.

It's the subject argument that cannot be expressed this way:

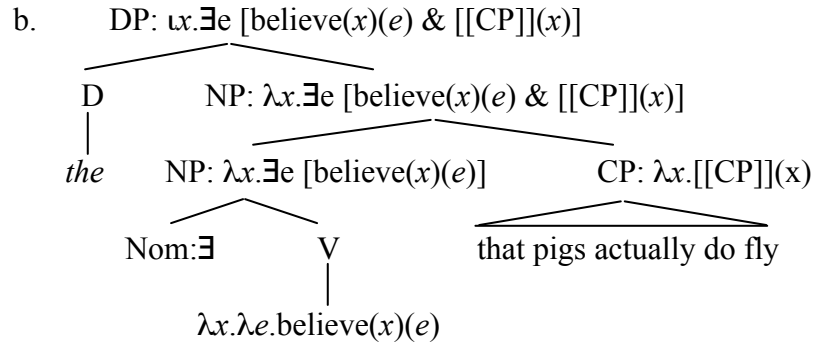
- (108) *The evidence for his guilt of that fact (is here).
Cannot mean: That fact proves his guilt and that fact is here.

It appears, then, that a verb such as *prove* takes two arguments: the internal argument is a proposition (type $\langle s,t \rangle$), the 'subject' is an individual-type argument, often picking out some fact or particular situation, which forms the basis of some conclusion expressed by the propositional argument.

This implies, then, that the external argument of *prove* is not severed. Recall, that in deriving the object nominals for verbs like *claim* and *belief* we severed the external argument (à la Kratzer 1996) and nominalization applied to the verb root, which had only an internal argument (and an eventuality argument). That move allowed us to existentially close the eventuality argument, returning a predicate of things believed or claimed. The parse tree is given below again for *belief*:

(109) Object Nominalization of *believe*

a. The belief that pigs actually do fly (is widespread).



This treatment of nominalization assumes that it is the verb root that is nominalized. If the same is true of the nominalization of *prove* into *proof*, then the root of *prove* must have an external argument.

Let me put on the table a temporary meaning for *prove*. It requires talking about evidence made available by individual things – like messes and other situations. Assume the following informal meaning for *prove* (I suppress the eventuality argument). Further things would need to be said about how to define the worlds accessible from situations and other individuals that can be the subject argument of *prove*—these individuals provide evidence, perhaps the circumstances of x entail the conclusion. What I am interested in here are the semantic types involved. Let's just translate *prove* and give it an informal meaning below that:

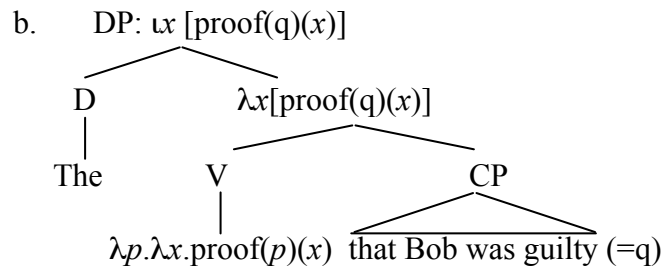
(110) a. $\llbracket \text{prove} \rrbracket = \lambda p. \lambda x. \lambda w. \text{prove}(p)(x)(w)$

b. x proves p in w iff $\forall w' (\text{compatible}(x)(w)(w') \rightarrow p(w'))$

Now, let's derive the (non-event) nominal from this entry for *prove*: the subject argument will be targeted as the referent of the nominal (I suppress world arguments for the predicate *prove*; the internal argument can be existentially closed or simply saturated by a proposition).

(111) “subject nominal” of *prove*

a. The proof (that Bob was guilty).



The reason that the clausal complement of the noun does not behave like a predicate is because the nominal is not an object nominal, it's a subject nominal. What the noun *proof* denotes is not the thing which follows from the facts described by the subject, but the subject itself. There's really no mystery here about the status of (98)b – given the nature of the noun *proof*, the only thing the post-copular CP can do is identify the thing doing the proving, not that which is proved. It tells us nothing about the status of the complement CP. We've looked at two ways of finding this out. There *is* a mystery, however, since given the formula above, the CP complement of *proof* saturates, rather than modifies, the noun. And this is precisely what does not happen with the nouns we looked at, like *belief*. Two options arise. Either *some* CPs are true arguments of nouns or we just haven't found the right evidence to determine the status of *proof*'s complements.

In the next section I will give evidence from reconstruction that indeed the complement of *proof* acts like the complement of *belief*-type nouns in their ability to ‘late merge’.

5.1. *Proof* complements and Condition C

We now have an independent test to see whether a clausal complement to a noun is a modifier or not, which comes from Condition C. Here indeed even the object argument of *prove* allows for selective bleeding of Condition C:

- (112) a. What/whose proof that John₁ was at the scene of the crime did he₁ have expunged from the record.
b. Whose evidence that John₁ was at the scene of the crime did he₁ have expunged from the record.

This is to be compared to the verbal complement (again, as above, I used verbal gerunds to ensure we have a verbal complement):

- (113) *Whose proving yesterday that John₁ was at the scene of the crime did he₁ not want his lawyer to hear?

The controls show that (a) this is a reliable sentence and (b) that it is indeed that presence of the name that causes the trouble in (113).

- (114) a. John did not want his lawyer to hear Mary proving yesterday he was at the scene of the crime.
- b. Whose proving yesterday that he₁ was at the scene of the crime did John₁/he₁ not want his lawyer to hear?

If these data can be maintained – and I think they can – we learn that bleeding of condition C does not travel entirely with the Higgins-Stowell facts. That is, the complement of *prove* does not act like a modifier for the purposes of the post-copular constituents, but it does act like a modifier for the purposes of whatever distinguishes arguments of object/subject nominals from event nominals.

This can perhaps be seen even by looking at the DP arguments nominal *proof* takes: they are often introduced by a lexically specific preposition (*Johns proof for/of his innocence*). These too can bleed condition C:

- (115) a. Whose proof of John₁'s innocence did he₁ try to have entered into the court record?
- b. What kind of proof for John₁'s claim does he₁ think the judge wants to be given?

Proof still denotes a noun that describes the subject of the proving – the evidence not the conclusion – but even its thematic objects (DP or CP) can bleed condition C. If the bleeding of condition C diagnoses non-argument status (and all nominal arguments are optional with result/argument nominals) then we need to find a way to let even the CP objects of nominal *proof* to compose as a modifier.

6. Summary

Following up on the program of giving complementizers the meanings in Kratzer (2006), we have seen a number of arguments that CPs are not arguments of nouns – whether those nouns are deverbal or not – but are predicates of contents that modify the nouns (which are themselves descriptions of individuals with content). The evidence came from several inter-related data points. The first consideration was that non-derived nouns like *idea* and *story* don't take (syntactic) arguments at all. But they do take what *appear* to be CP arguments; treating the CPs like modifiers captured this state of affairs. Furthermore, the Higgins-Stowell facts showed that we want to treat the CPs that follow certain de-verbal nouns in the same way. Whether the CP denoted a predicate of contents that modified this noun depended on a number of factors, such as whether the predicate was itself something that had content and, in the case of the *prove*-class, what type of nominal is formed from the verb.

A mystery remains, however: why *are* the nominalizations of clause taking verbs always argument (subject or object) nominals? Why can't nouns take clauses in the way nouns take arguments of other categories? It isn't a property of clauses (cf. Stowell 1981). We can see this best when we look to verbs that have different kinds of nominalizations: event versus object.

As pointed out by Vendler (1967), Dowty (1979) and Grimshaw (1990), event nominalizations can preserve aktionsart distinctions found with the verb. The verb

(phrase) *observe+NP* is naturally interpreted atelically, while *destroy* is as telic.¹⁹ Their corresponding nominalizations preserve these distinctions.

- (116) a. The doctor observed the patient {for/*in} three hours. *atelic*
b. Only observation of the patient {for/*in} several weeks can determine the most likely [course of action].

- (117) a. The Roman's destroyed the city {in/*for} three hours *telic*
b. The total destruction of the city {in/*for} only two days appalled everyone.
(Grimshaw 1990:58(28b/29b))

However, an aspectual contrast is *not* preserved in the nominalization of clause-taking *observe*. *Observe that p for several weeks* is possible – requiring a repeated events interpretation (a). But the nominalization doesn't allow this.

- (118) a. Bob [[observed that Mary was sick] for several weeks].
b. *Bob's [[observation [that Mary was sick]] for several weeks] was needed.
c. Bob's [[observation of Mary] for several weeks] was needed.

This is true of clause-taking *observe* whether there's a complement or not. The meaning of clause-taking *observe* just seems to be incapable of forming an event denoting nominal. Is that a property of all clause-taking verbs? And if so, why?

¹⁹ When *destruction* is interpreted as a result noun it does not show aktionsart distinctions (Grimshaw 1990). The point is, however, that clause-taking verbs appear *only* to allow “Result” or “object” nominals.

CHAPTER III

CPS DON'T MOVE

1. Introduction

The status of sentential subjects was at one time a topic of much debate, and many of the questions posed then remain unresolved today. One of the central questions – whether sentential subjects exist – is still often answered in different ways, as witnessed by recent work on the topic (Alrenga 2005, Davies and Dubinsky 1998, 1999, 2001, 2008). The present chapter addresses a related, but no less unsettled, question about CPs that appear in a left-dislocated position: do they move there or are they base generated there? I bring reconstruction data to bear on this question, and conclude that CPs do not move. I implement an analysis using the tools of *de re* attitude ascription that derives this, and discuss its implications for the representation of sentential subjects.

1.1. What derives the Topic Analysis of sentential subjects?

The distribution of sentential subjects is not like that of DP subjects, and this has prompted many to puy left-dislocated clauses, even those that *appear* to be subjects, in a topic position (Emonds 1976, Koster 1978, Stowell 1981). Alrenga (2005) has recently provided corroborating evidence for this analysis for English, along with support for a derivation in which a null DP operator abstracts over the gap position in the clause, as schematized for the sentential subject below:

- (1) a. That predatory lenders are responsible for the crisis is not widely accepted.
 b. [_{CP} [_{CP} That predatory lenders are responsible for the crisis] [_{CP} Op₁ t₁ is not widely accepted t₁.]]

The “Topic Approach” is designed to capture not only the non-subject properties of left dislocated CPs, but also the well-known requirement on the category of the gap in these constructions. Dislocated CPs – whether topics or subjects – are only licensed if their gap position is one that otherwise admits DPs, what I will call the DP Requirement (Williams 1981, Grimshaw 1982, Postal 1986, Webelhuth 1992, Alrenga 2005).

But this long-standing issue about sentential subjects is profitably separated from another question: what kind of dependency holds between the fronted CP and the gap position? That is, does a null operator move or does the CP move? This constitutes a mostly independent choice-point from the subject/topic question. As noted, whether sentential subjects exist or not remains one of the central empirical debates about dislocated CPs. Some claim that sentential subjects, contra Koster (1978), *do* exist but are degraded for extra-grammatical reasons (Delahunty 1983, Davies and Dubinsky 2008). However this issue is resolved, the question of whether the CP moves to its dislocated position or is base-generated there also remains unsettled. I will use reconstruction as a way of asking this question. Since left-dislocated CPs – I use the phrase to remain neutral on where they sit and whether they are moved there – are semantically opaque domains, the landscape of binding changes quite a bit. The logophoric and perspectival properties of the embedding verbs affects the tests in profound ways, although I hope to control for these effects. Here is a preview of the facts.

The base-generated topic analysis faces an immediate challenge from cases which appear to show that CPs reconstruct for the purposes of variable binding. This is true for topic CPs, (2)a, and CP subjects (2)b.²⁰

- (2) a. That he₁'ll end up just like his father, I don't think any man₁ expects.
- b. That he₁'ll end up just like his father isn't generally expected by any man₁.

Both (2)a,b can be understood so that the pronoun *he* co-varies with the choice of men, which on a naïve view of binding would suggest reconstruction.

At the same time, it is possible to find cases where reconstruction is not forced, as demonstrated by the absence of Condition C effects. Below, referring expressions in a sentential subject (3)b and sentential topic (3)a/(4) are naturally co-valued with a pronoun in the matrix clause.

- (3) a. That the faculty would be so NICE to Mary₁, I don't think she₁ ever expected.
 - b. That the faculty were so NICE to Mary₁ seemed to her₁ to bode well for her graduate career.
- (4) That John₁ would grow up to be so handsome and successful, I don't think anyone ever expected of him₁.

²⁰ It appears as though indexicals can be bound in dislocated CPs, although I have been unable to find convincing examples. A bound indexical is no worse in the dislocated CP, however, than the *in situ* one.

- (i) That my paper would be accepted, only I expected.
- (ii) Only I expected that my paper would be accepted.

In both cases, this can convey that no one else expected their own paper to be accepted.

These dislocated CPs clearly ameliorate what is otherwise an (albeit somewhat weak) Condition C violation when the clause is in situ:²¹

- (5) a. *?I don't think she₁ ever expected that the faculty would be so NICE to Mary₁.
b. *?It seemed to her₁ to bode well for her graduate career that the faculty were so NICE to Mary₁.
- (6) a. *I don't think anyone ever expected of him₁ that John₁ would grow up to be so handsome and successful.
b. I don't think anyone ever expected of John₁ that he₁ would grow up to be so handsome and successful.

This appears to be a point in favor of the base-generation account.

I wish to argue that the reconstruction effects in (2) are only apparent and that there is no movement dependency between the dislocated CP and the gap at all. The central piece of evidence is that sentential subjects and overtly topicalized CPs fail to exhibit evidence for *syntactic* reconstruction. As will be detailed in Section 3, moved constituents are sensitive to interactions between various binding requirements (Romero 1998, Fox 1999). In particular, reconstruction for variable binding can feed Condition C violations (Fox 1999). In the case of fronted CPs (both subjects and topics), such an interaction is not found. The argument is centered on the following examples. In both

²¹ In these examples I have de-accented the referring expression (by focusing the predicate *nice* in the embedded CP). This helps some speakers avoid a Condition C violation, as does the great distance between the pronoun and referring expression. However, I will try to show that a contrast still exists between dislocated CPs and CPs in situ.

cases, we would expect a Condition C violation if the dislocated CP had to reconstruct to the underlined gap position for variable binding purposes.

- (7) a. That he₁ might be too old to WORK for Mrs. Brown₂, I don't think she₂ would want any man₁ to believe ___.
- b. That he₁ might actually be too OLD for Mrs. Brown₂ seemed to her₂ not to enter any man₁'s mind ___.

In both cases, however, the pronoun *he* can co-vary with the choice of *men* while at the same time the referring expression *Mrs. Brown* need not induce a Condition C violation.

Movement theories (in particular the copy theory of movement, Chomsky 1995, Fox 1999) are *designed* to ensure that reconstruction for variable binding and Condition C travel together. Since they don't in the case of fronted CPs, it must be the case that fronted CPs have not moved to the position in which they surface.

We then have to understand why pronouns appear to co-vary as a function of quantifiers that do not c-command them. In this chapter I focus on a way of doing this – achieving co-variation without syntactic reconstruction – in the case of complements to attitude verbs. An explanation for these cases becomes available once it is recognized that pronouns – especially those in opaque contexts like the complements of attitude verbs – don't need to be directly bound by their apparent binders. I provide an analysis of how this can be carried out by using the mechanisms of *de se* and *de re* attitude ascription. I will also point toward similar ways to extend this proposal to fronted CPs that aren't complements to attitude verbs.

I then provide a base-generation analysis along the lines of Koster (1978) and Alrenga (2005), with an eye toward understanding *why* CPs are forced to be base-generated in, rather than move to, that position. I argue that the null operator that connects dislocated CPs with their gaps ranges over centered propositions (Lewis 1979, Chierchia 1989), variables of type $\langle s \langle e, t \rangle \rangle$. I then show how this approach also offers a simple explanation for DP Requirement, once augmented with natural assumptions about the role that agreement plays in movement and composition (Adger and Ramchand 2005). I follow Iatridou and Embick (1997) and attribute the rigidity of clauses to their inability to participate in agreement.

1.2. Outline of chapter

Section 2 offers a review of the issues involved in dislocated CPs, including a comparison between the Topic Analysis and accounts that put CPs in subject position. The goal of this section is to provide the historical background as well as to make clear that the issue of movement is something that both accounts need to contend with. In Section 3 I turn to reconstruction effects, and conclude that neither CP subjects nor CP topics reconstruct for the purposes of variable binding. Within section 3, the reliability of Condition C diagnostics is addressed. In section 4 I provide an account of apparent variable binding using the tools of *de se* and *de re* attitude ascription. Section 5 puts the pieces together and provides an account of the DP Requirement based on the way index features regulate movement (Adger and Ramchand 2005, Kratzer 2004, 2009b). I end with an open question about another movement derivation that is not possible for CPs, but that the account does not rule out.

2. Fronted CPs: The Issues

2.1. The DP Requirement

Clauses that appear dislocated from their argument positions – sentential subjects and sentential topics – impose a constraint on the category of the argument position: the gap must be one that can otherwise be occupied by a DP (Williams 1981, Grimshaw 1982, Postal 1986, Webelhuth 1992, Alrenga 2005). The generalization is summarized as the DP Requirement:

(8) DP Requirement on dislocated CPs

A verb allows a CP argument to front only if a DP is licensed in the gap position.²²

This famous generalization is takes root in contrasts of the sort found below. Adjectives like *afraid* and unaccusative verbs like *seems* do not select DPs, but do take CP arguments. Concomitantly, *seems* does not allow its CP to appear dislocated; *afraid* allows this only with a preposition:

²² There are CP and DP taking predicates that do not allow dislocated CPs, even when the DP is of the appropriate semantic type. As Postal (1986) points out, taking a DP is only a necessary condition for allowing a sentential subject or topic.

- | | | |
|------|--|----------------|
| (9) | a. *John's losing seems/turns out/appears. | *DP |
| | b. It seems/turns out/appears that John lost | ✓CP complement |
| | c. *That John lost seems/turns out/appears. | *CP Subject |
| (10) | a. I am afraid *(of) that. | DP |
| | b. I am afraid (*of) that Fred will leave me. | CP complement |
| | c. That Fred will leave me, (that) I am afraid of. | CP Topic |

A similar contrast appears for verbs: those that select DPs (like *expect*) license a dislocated CP:

- | | |
|------|--|
| (11) | a. People didn't expect/believe/predict that. |
| | b. That Wisconsin would go Democrat wasn't widely expected/believed/predicted. |

Verbs like *boast* and *complain*, which license CPs but not DPs, prohibit a dislocated CP (Postal 1994):

- | | | |
|------|---|----------|
| (12) | a. *John complained/boasted that. | DP |
| | b. John complained/boasted that he could lift 100 pounds.
complement | CP |
| | c. *That he could lift 100 pounds, John complained/boasted. | CP Topic |

Further evidence for the requirement in (8) is provided by a class of verbs, which includes *capture*, *reflect*, *contemplate*, that select for DPs but not CPs (13)a,b.

Surprisingly, these verbs allow CPs that are CP subjects (13)c and CP topics (13)d (Kuno 1973a, Grimshaw 1982, Jacobson 1992, Alrenga 2005).

- (13) a. This formulation of the rule {expresses/captures/reflects/brings out} the fact that these nouns behave differently. ✓DP
- b. *This formulation of the rule {expresses/captures/reflects/brings out} that these nouns behave differently. *CP
- c. That these nouns behave differently is {expressed/ captured/reflected/ brought out} by this formulation of the rule. ✓CP Subj.
(Alrenga 2005 (30-32))
- d. That these nouns behave differently, this rule simply can't capture. ✓CP Topic

The source of the DP Requirement has often been attributed to the non-“nouniness” of clauses, in contrast to traces. Stowell (1981) famously proposed that CPs are subject to a Case Resistance Principle. Coupled with views of argument association at the time (Aoun 1979), this forced CPs to move to, but then to vacate, case assigning positions. Webelhuth (1992) stipulates a general constraint that traces must be DPs. A CP, according to that constraint, can only move from a position that licenses DPs. Of course, that constraint is a description of the generalization.

2.2. The Topic Analysis

As noted in the introduction, one particularly influential analysis of dislocated CPs is the proposal of Koster (1978), recently defended and expanded upon in detail by Alrenga (2005). This proposal holds that sentential subjects are not subjects in the first place, but are base-generated topics. A null operator abstracts over the argument position in the complement clause.

- (14) a. That he would win the election was widely predicted.
- b. [_{CP1} [_{CP2} That he would win the election] [_{C2'} Op_i [_{TP} t_i was widely predicted t_i]]]

Koster (1978) and Alrenga (2005) suggest that sentential subjects have a more restricted distribution than DP subjects (Ross 1967, Hooper and Thompson 1973, Kuno 1973a, Emonds 1976, Koster 1978, Alrenga 2005). They can't appear in Subject-Aux inversion structures (15); after other topicalized phrases (16); or in a case-marked ECM position (17). In each case below, I compare a dislocated CP – a sentential subject – in (a) with a DP (or expletive) in the (b) examples, and a complex DP embedding a CP in the (c) examples (to demonstrate that weight is not the issue). In the (d) examples a topicalized phrase is given, showing that sentential subjects pattern in the same way as topics.

- (15) a. *Does [that Hillary will win] seem unlikely? *CP subject*
 b. Does it seem unlikely that Hilary will win? *expl/extraposed CP*
 c. Does the possibility that Hilary will win seem unlikely? *complex DP*
 d. *Did to Ms. Brown the win seem unlikely? *topicalized XP*
- (16) a. *...but Rupert, [that Ms. Brown won Texas] really bothered. *CP subject*
 b. ...but Rupert, the result really bothered. *DP*
 c. ...but Rupert, the fact that Ms. Brown won really bothered. *complex DP*
 d. *John, the book I gave to. (Alrenga 2005:179(14a)) *topicalized DP*
- (17) a. *I planned for [that the cult members cloned a human] to be discovered (Alrenga 2005:178(11b)) *CP subject*
 b. I planned for that (fact) to be discovered. *DP*
 c. I planned for the fact that the cult cloned a human to be discovered. *complex DP*
 d. *I planned for our cloning attempts, you to discover. (Alrenga 2005:179(17b)) *topic DP*

Alrenga (2005) also notes that the availability of dislocated CPs in embedded clauses correlates with the availability of topicalized DPs in the same position. Both are uncomfortable in adjunct clauses (18), NP complement clauses (19), but not under certain bridge verbs (20):

- (18) a. *The Dems are upset because [for Ms. Brown to win] is very unlikely.
 b. *The Dems are upset because [the Florida primary] they have canceled.
- (19) a. *John raised the possibility that [for you to do that] would be nice.
 b. *John raised the possibility that Mary, your antics would upset.
 (Alrenga 2005:179(15c))
- (20) a. I think that [for us to smoke] would really bother her.
 b. Mary thinks that John, the article really bothered.
 (Alrenga 2005:178-9(10a/16a))

The Topic Analysis locates the burden for explaining the DP Requirement on the nature of the null operator: the language must only supply null operators whose category is DP.

2.3. The Subject Analysis

Indeed clauses are difficult to put in positions that test whether they are subjects or not, but many authors think that the grammaticality judgments are the result of extra grammatical factors (Delahunty 1983, Davies and Dubinsky 2008). These critics point out, quite rightly, that clause-internal CPs are difficult from both a processing perspective and are quite rare cross-linguistically (Kuno 1973a, Dryer 1980). Furthermore, the weight of the CP is such that it is often much heavier than the material that precedes and follows it, making extraposition a more natural alternative (Delahunty 1983, Padgett xxxx). Davies and Dubinsky (1998, 2008) suggest that CPs can only sit in subject position if they are embedded in a DP (for Davies and Dubinsky, all subjects in English are DPs).

(21) [DP/NP [CP that Fred left]] seems unlikely.

This DP shell directly captures why the gap must be a DP – if only DPs can be subjects, their traces will only be of DP too. They argue that this silent structure poses problems for the processor and this is what makes subject-aux inversion degraded. I will return to the idea that dislocated CPs are embedded in a covert nominal structure at the end of the paper. But it should be clear that the Subject Approaches of this sort converge with the Topic Approaches in one respect: CPs cannot be subjects, only DPs can. The point of divergence is whether CPs can be embedded as part of DPs.²³

Even if the Subject Approach is right, though, we still require some way of deriving the DP requirement on sentential topics. Recall that these too require their gaps to be DPs:

- (22) a. *That John lost, it only seems/turns out/appears.
b. That Fred will leave me, (that) I am afraid *(of).
c. *That he could lift 100 pounds, John complained/boasted.

²³ The subject analysis comes close to a semantic analysis of sentential subjects, of a sort related to proposals in Chierchia (1984) (see also Potts 2002). Chierchia proposes that non-entity type expressions, like properties and propositions, can be shifted into entity-type expressions by a nominalizing function. Chierchia (1984:48) locates the nominalizer in C (suggested by the obligatory appearance of C in sentential subjects and topics). He then has to require that only terms that denote in the individual domain can be subjects. This is too strong, however. Forcing the term in subject position to denote individuals, of whatever sort, will prevent quantifiers from reconstructing (independently of whether reconstruction is syntactic or semantic). Expletives make a similar case. We simply don't want to force things to be interpreted in subject position, *a fortiori* we don't want to place restrictions on their semantic type. This is why I only consider the covert D analysis from hereon.

That null operators must be DPs may rest on something quite general of overt operators: various types of abstractions over clausal complements in English require their gaps to be DPs, showing just the same asymmetries that sentential subject/topics do.²⁴

- (23) a. What every boy said/believed/was afraid *(of) was that he would win.
b. What every boy boasted/complained/commented *(about) was that he would win.
c. *What seems/appears/turns out is that he would win.

Where the Topic Analysis and Subject analysis differ significantly, however, is how the dislocated CP gets where it is. The Topic analysis is usually²⁵ coupled with the assumption that the clause is base-generated. The subject analysis admits of movement – both in the case of subjects and overtly topicalized CPs.

²⁴ Potts (2002, 2003), Postal (1994) show that *as*-parentheticals involve a CP (proposition-type) gap. These constructions do indeed pattern differently from fronted CPs (and as Potts shows, *which*-appositives) in requiring CP gaps and disallowing DP gaps:

- (i) a. Albert {boasted/commented/complained} that the results were fantastic.
b. The results were fantastic, as Albert {boasted/commented/complained}
(ii) a. *Albert {boasted/commented/complained} {that/it/a belief that the results were fantastic}.
b. *The results were fantastic, which Albert {boasted/commented/complained}.

(Potts 2002:64(22-23))

If the *as*-parentheticals involve some sort of null operator, then we are in trouble since that would admit of CP null operators. Potts' system makes the distinction between the two in terms of the semantic types, which involves nominalization of propositions (Cresswell 1972, Chierchia 1984). Chapter Two offers some discussion of taking CPs as denoting in the individual domain, and some difficulties that arise for that approach in the context of nominal CP complements.

²⁵ I have of course collapsed the Topic Analysis with a non-movement analysis. There is of course the possibility that CPs can't be in subject position but nonetheless move to topic position (e.g. Stowell 1981 and others). The real question I am concerned with comes down to movement.

In the next few sections I detail more fully the reconstruction data that bear on this issue, outlined in the beginning of the chapter. The evidence from reconstruction is not straightforward, however, since the opaque nature of the CP calls into question the very utility of standard tests for reconstruction. The take home point is that complement CPs – as opposed to relative CPs – fail to show the kind of sensitivity to syntax famously argued for by Fox (1999) for reconstruction. Accounting for this fact will lead us to the Topic Analysis.

3. Apparent binding into fronted CPs

As with certain other moved constituents, including DP topics, dislocated CPs can contain pronouns bound by quantifiers they move past. (In all the cases I test below, I use an NPI as the binding quantifier. If NPIs must remain low, this rules out a possible representation where the quantifier moves to out-scope the sentential subject entirely.) At least on simple inspection, a bound variable reading is available to pronouns in CP subjects and CP topics:

(24) That he₁'ll end up looking like his father doesn't seem to any young man₁ to be very likely.

(25) That he₁'ll end up looking like his father, every young man₁ expects.

At the same time dislocated CPs can bleed condition C. Below is a (contrastive) CP topic:

- (26) That Texas would be a surprise was always possible, but...
- a. That Ms. Brown₁ would lose Ohio, she₁ never expected.
 - b. That she₁ would lose Ohio, Ms. Brown₁ never expected.
 - c. *She₁ never expected that Ms. Brown₁ would lose Ohio.

Sentential subjects show the same bleeding of condition C:²⁶

- (27) a. That she actually kissed John₁ on the LIPS struck him as a real surprise.
- b. *It struck him₁ as a real surprise that she actually kissed John₁ on the LIPS.

What needs to be established is whether the CP undergoes movement in the first place: that is, whether there is syntactic reconstruction.

To test if dislocated CPs syntactically reconstruct, we follow Romero (1988) and Fox (1999) in creating a conflict between various kinds of binding requirements. We implement a method from Fox (1999). Fox (1999) tests configurations like those in (28)a,b. Some moved XP contains a *pronoun*₁, whose intended binder is a lower quantifier; the XP also contains a *referring expression*₂ that is co-valued with a pronoun in the sentence. Following standard assumptions, bound variables must be in the scope of the quantifiers that bind them; referring expressions in the scope of co-valued pronouns induce Condition C violations.

²⁶ If sentential subjects are really subjects, then we expect bleeding of Condition C, since A-movement in general appears to leave a contentless trace (Lasnik 1998, Fox 1999, among many others). The fact that sentential topics bleed Condition C is the more important data, since A-bar movement generally (aside from selective bleeding by adjuncts) shows obligatory reconstruction.

(28) *Fox's (1999) design*

- a. [XP ... pronoun₁ ... r-expression₂ ...] ... pronoun₂ ... ✗ ... QP₁ ... ✗
b. [XP ... pronoun₁ ... r-expression₂ ...] ... QP₁ ... ✓ ... pronoun₂ ... ✗

In (28)a, the XP must reconstruct to the lowest position (identified by an underscore) for variable binding. But that puts the referring expression below a co-valued pronoun. This induces a Condition C violation. The higher reconstruction site in that same sentence fares even worse: the pronoun₁ fails to be bound by the QP and the referring expression falls in the domain of a co-valued pronoun. In the configuration in (28)b on the other hand, the XP can reconstruct to the higher position, which allows for variable binding but doesn't induce a Principle C violation.

The prediction for *wh*-movement, as below, is that (28)a is grammatical but (28)b is ungrammatical. The data and judgments reported are Fox's.

- (29) a. *Which of the papers that he₁ gave to Ms. Brown₂ did she₂ hope ✗ that every student₁ will revise ✗?
b. Which (of the) paper(s) that he₁ gave to Ms. Brown₂ did every student₁ hope ✓ that she₂ will read ✗?
(Fox 1999: 173 (37))

The same effect carries over to other A-bar movements, including topicalized DPs:

- (30) a. *The papers that he₁ gave to Ms. Brown₂, she₂ hoped that every student₂ will revise.
- b. The papers that he₁ gave to Ms. Brown₂, every student₁ hoped that she₂ will read.
(Anagnostopolou and Fox 2007)

As reviewed in Chapter One, what allows the food examples is the ability for the relative clause to counter-cyclically merge to a position where the pronoun is bound but the referring expression doesn't induce a disjoint reference effect. Updated in the copy theory of movement, counter-cyclic movement (late merger) permits adjuncts to appear in some copies and not others. In (29)a and (30)a, the relative clause can merge to the intermediate copy and thus allow for binding but prevent a Condition C violation. In (29)b and (30)b, the relative clause is forced to merge to the lowest copy for variable binding purposes, where it incurs a Condition C violation.

Similarly, A-movement shows that reconstruction feeds Condition C violations. The example below involves reconstruction for scope purposes. If *a student* or *someone* scopes under *seems* a Condition C violation is reported.

- (31) a. A student of David₁'s seems to him₁ to be at the party.
- b. Someone from David₁'s city seems to him₁ to be likely to win the lottery.
**seems* > *someone*
(Fox 1999(197))

Scope reconstruction is possible, however, if a Condition C violation isn't incurred:

- (32) a. A student of his₁ seems to David₁ to be at the party.
 b. Someone from his₁ city seems to David₁ to be likely to win the lottery.
 (Fox 1999(197))

That subject positions exhibit just this kind of interaction will be important, since it allows us to apply the test to sentential subjects without having to make a decision about whether they are topics or subjects.

3.1. Testing fronted CPs for syntactic reconstruction

Turning to dislocated CPs, we expect that if the bound variable interpretations of pronouns they contain are achieved via syntactic reconstruction, then reconstruction for variable binding will feed Condition C. The following sentences are structurally identical to the scheme laid out by Fox in (28). The results, however, turn out quite differently. In (33)a, the quantificational binder is below a pronoun co-valued with the name, *Mrs. Brown*. If the bound variable interpretation for the pronoun in the Sentential Topic required reconstruction, then that reconstruction would induce a Condition C violation. In (33)b, the effect is expected to be absent whether or not bound pronouns require binding. Contrary to the expectations of reconstruction, (33)a is grammatical. I introduce the sentence with *but*, since fronted CPs are often most naturally understood as contrastive.

- (33) a. ...but that he₁ might be too old to WORK for Mrs. Brown₂, I don't think she₂ would want any man₁ to believe __.
 b. ...but that he₁ might be too old to WORK for Mrs. Brown₂, I don't think any man₁ would want her₂ to believe __.

Two points of note, however. First, I have de-accented the referring expression, as that appears to help alleviate a possible Condition C violation. While this in general may help alleviate a Condition C violation even when the CP is in the argument position (as in (34)b), there is still a difference between this and the dislocated CP ((34)a):

- (34) a. That he₁ might be too old to WORK for Mrs. Brown₂, I don't think she₂ would want any man₁ to accept.
b. *I don't think she₂ would want any man₁ to accept that he₁ might be too old to WORK for Mrs. Brown₂.

Second, these examples involve a referring expression that is deeply embedded inside a clause that has a logophoric center different from the referring expression. The clause that contains *Mrs. Brown* could be reported from the perspective of *any man*, in which case the use of a name would be a plausible way to refer to her. If the complement clause reports an attitude of Mrs. Brown, an analogous Condition C violation is incurred (*cf. She didn't expect that any man would work for Mrs. Brown*), perhaps because names are bad ways to express *de se* counterparts. (See below and Chapter Two.) (35) and (36) counteract this confound. Note that (36) does not allow when the CP is in situ the referring expression to ever escape a Condition C violation (the referring expression *John* is in the complement of an attitude ascribed to *John*):

- (35) *He₁ didn't expect of any woman₂ that she₂ would actually ask John₁ out on a date.

However, a sentential topic helps alleviate the Condition C violation, even when the pronoun is construed as bound:

- (36) a. ...But that she₂ would actually ask John₁ out on a date, I don't think he₁ ever expected of any girl in his class₂.
- b. ...But that she₂ would actually ask him₁ out on a date, I don't think John₁ ever expected of any girl in his class₂.

It's true that these two sentences are not equally good. But the difference is not related to reconstruction. While this speculation awaits further testing, part of the problem seems to be that the pronouns prefer to be in the same clause, and the quantifier and the name in another. For instance, there appears to be a weak contrast below – where nothing about reconstruction is at issue, assuming that the fronted CP does not reconstruct.

- (37) a. ?But that she would actually ask John out on a date, I don't think he ever expected of Mary.
- b. But that she would actually ask him out on a date, I don't think John ever expected of Mary.
- c. But that Mary would actually ask John out on a date, I don't think he ever expected of her.

Given that acceptability of these cases is subject to such subtle re-organization as that above, it's unlikely that whatever small contrast is found in (36) is due to reconstruction. The amelioration, then, has to be the result of the position of the fronted CP/sentential subject. A pronoun is nonetheless bound. Dislocated CPs, then, do alleviate Condition C, in just the way we would expect if the CP did not reconstruct.

Sentential subjects show the same insensitivity to syntactic reconstruction:

- (38) a. ...But that he₁ might actually be too OLD for Mary₂ seemed to her₂ not to enter any man₁'s mind.
b. But that he₁ might actually be too OLD for her₂ seemed to Mary₂ not to enter any man₁'s mind.

Notice that the crucial case, (38)a, is on a par with cases where no reconstruction is forced for variable binding. That is, compare the two sentences below:

- (39) a. ...But that he₁ might actually be too OLD for Mary₂ seemed to her₂ not to enter any man₁'s mind.
b. ...But that he₁ might actually be too OLD for Mary₂ seemed to her₂ not to enter Bobby₁'s mind.

Reconstruction of dislocated CPs, then, is not necessary for variable binding. Before moving on, I would like to return to cases that argue for the interaction between variable binding and Condition C in the first place.²⁷

3.2. Re-evaluating syntactic reconstruction of DPs

In this section I return to some of the original cases that motivated syntactic reconstruction, like Fox's (29). Since there were a number of factors that made co-variation for a pronoun in a fronted CP possible (without incurring a Condition C

²⁷ There are, of course, other arguments for syntactic reconstruction than ones based on Condition C effects (Romero 1998, Fox 1999).

violation), we ought to control for those factors in all cases, to ensure that we indeed have a contrast between fronted CPs and DPs. I reach no firm conclusions about these cases, since some of the factors that help in the case of fronted CPs might be available in DP cases as well. Ultimately, what I will provide in this chapter is a way of achieving co-variation without syntactic reconstruction from certain fronted CPs, and it will remain somewhat of an open question about whether (a) fronted DPs can behave similarly (i.e. allow variable binding while bleeding condition C) and (b) if so, how this is achieved.

One of the strategies that appeared to improve the Condition C violation in the case of fronted clauses was de-accenting the referring expression. Let's make the same alterations to the Fox-style sentences – i.e. DPs with a relative clause. I'll focus here on non *wh*-DPs (i.e. the topics and subjects), since these are directly comparable to fronted CPs. Consider first the pair of sentences below in (40). I have suggested de-accenting of the referring expression by putting contrastive focus on a clause-final adverbial in the fronted CP.

- (40) a. ...But the papers that he₁ submitted to Mrs. Brown₂ in his FIRST YEAR, she₂ didn't want any student₁ to publish.
b. ...But the papers that he₁ submitted to her₂ in his FIRST YEAR, Mrs. Brown₂ didn't want any student₁ to publish.

The question is whether variable binding in (40)a is harder than in (41)a, a fronted CP:

- (41) a. That he₁ submitted to Mrs. Brown₂ in his FIRST YEAR, she₂ didn't want any student₁ to publicize.
- b. That he₁ submitted to her₂ in his FRIST YEAR, she₂ didn't want any student₁ to publicize.

If there is a contrast between (40)a and (41)a, it isn't as robust as one would like. Further work needs to be done to make sure that there remain cases where we are sure that reconstruction for variable binding feeds Condition C.

However, there is one illuminating contrast that I wish to point out. It involves comparing relative clauses to complement clauses. To do so we choose a head noun, like *idea*, and compare *idea* with a relative clause versus a complement clause (actually, a modifier that characterizes the content of the idea, see Chapter Two).

- (42) a. ?...but the idea that he₁ told Mrs. Brown₂ about YESTERDAY, I don't think she₂ would want any student₁ to believe.
- b. ...but the idea that he₁ presented his work to Mrs. Brown₂ SUCCESSFULLY, I don't think she₂ would want any student₁ to believe.

In this case, it is not clear whether the relative clause example allows for co-variation and binding as successfully as the complement clause case (this indeterminacy is merely what “?” represents). DPs in subject position might provide a similar contrast:

- (43) a. ?The idea that he₁ presented in his draft for Mrs. Brown₂ didn't seem to her₂ to be understood by any student₁.
- b. The idea that he₁ should present his draft to Mrs. Brown₂, didn't seem to her₂ to be understood by any student₁.

These may be the kind of cases we are after to ensure that Fox's original sentences (and the judgments) can be maintained in certain cases – at least, that there is a contrast between the complements as compared to the relatives of nouns. The crucial difference between (43)a and (43)b is that the complement in (43)b reports the content of the attitude holder. I'll return to this contrast below, once I present an analysis of the fronted CP cases.

3.3. Interim summary

Fronted CPs do not need to syntactically reconstruct for the purposes of variable binding. I then returned to some of the original kinds of sentences that motivated syntactic reconstruction for DPs. There the results here were less clear, and I explored some of the subtleties involved in determining whether fronted DPs exhibit the kind of effects predicted by syntactic reconstruction theories.

Since fronted CPs *don't* show the effects of syntactic reconstruction, I conclude that they don't move. They are base-generated in their surface position (leaving open whether that surface position can be the subject position). We then need to find another way to achieve co-variation. In the next section I will offer an analysis of fronted CPs that allows for variable binding with syntactic reconstruction.

4. An analysis: binding from the *res*

We've seen that we need a way to allow for a bound variable interpretation in (44) without putting the CP in a position that will induce a disjoint reference effect.

(44) ...but that he_1 is too old for Mrs. Brown₂ I don't think she_2 wanted any man_1 to know.

The solution I offer is to base-generate the CP in its surface position, following Koster's (1978) analysis. To achieve co-variation for the pronoun in such cases, we will exploit the nature of certain ingredients of belief ascription.

It is a general property of intensional contexts, like the complement of attitude verbs, that pronouns do not need to be bound directly by binders outside the complement. This is perhaps most easily seen in the case of *de se*. The most natural interpretation of (45)a,b is one where every man has the *de se* belief that he is too old to work for Mrs. Brown:

- (45) a. Every man_i believes that he_i is too old to work for Mrs. Brown.
b. That he_i is too old to work for Mrs. Brown, every man_i believes.

On this reading, *he* is not bound by the quantifier; rather, *he* picks, for each of the men, the individual that he identifies as himself in his belief worlds – his *de se* counterparts (Lewis 1979). On any formulation of *de se* meanings, some other mechanism for binding is implemented, often by an operator at the edge of the complement clause (Chierchia

1989). Even when the pronoun is not interpreted *de se*, as in (46), other mechanisms can be at work to achieve co-varying interpretations for the pronoun:

- (46) a. Every boy_i's mother believes that he_i is too young to work.
b. That he_i is too young to work, every boy_i's mother believes.

This is most naturally understood as meaning that each boy's mother has the belief *about her son* – that he is too young to work. This interpretation can be signaled overtly by specifying what the belief is about with an adjunct phrase. These easily allow co-variation of the pronoun without feeding condition C.

- (47) ...but that he₁ might be too old to work for Mrs. Brown₂, I don't think she₂ would want any man₁'s wife to believe that of/about him.

I am going to argue that the apparent binding into fronted CPs is actually rather indirect. What co-varies, I will argue, is this (sometimes) hidden phrase, overt above, that represents what the belief is about. This extra phrase describes the *res* of an attitude. The *res* is an argument of the attitude verb.

- (48) a. Ralph believed *of Orcutt* that he was a spy.
b. John believed *about that situation* that it was a card game.
c. The rumor *about Mary* is that she's dating Fred.
d. Every boy's mother hopes *for her son* that he'll grow up happy.

My solution to the co-variation in fronted CPs implicates the mechanism of *de re* belief ascription. In the next section, I will introduce this and a means for allowing pronouns in the fronted CP to co-vary without syntactic reconstruction. The upshot will be that the pronouns are bound from *within* the fronted CP and needn't fall under the scope of the quantificational binder. I turn to *de re* belief ascription now.

4.1. Review: De Re belief ascription

Consider the following famous scenario from Quine (1956). It's the usual double vision scenario:

- (49) There is a certain man in a brown hat whom Ralph has glimpsed several times under questionable circumstances on which we need not enter here; suffice it to say that Ralph suspects he is a spy. Also there is a grey-haired man, vaguely known to Ralph as rather a pillar of the community, whom Ralph is not aware of having seen except once at the beach. Now Ralph does not know it but the men are one and the same [Bernard Ortcutt]. (Quine 1956 (56))
- a. Ralph believes that Ortcutt is a spy.
 - b. Ralph believes that Ortcutt is not a spy.

So that Ralph does not have contradictory beliefs, it's standard to assume that Ralph's beliefs are differentiated by the way he is acquainted with Ortcutt on these two occasions. This is modeled by Acquaintance Relations (Lewis 1979). An Acquaintance Relation is a way that an attitude holder is perceptually or causally related to the particular person, entity, or situation that he has a *de re* belief about—i.e. the *res* (see chapter 4 for discussion about what kinds of Acquaintance Relations count). Crudely put, in one

report, we say that Ralph believes the man wearing a brown hat is a spy; in the second case Ralph believes the grey-haired man is not a spy.

In *de re* belief ascriptions, the attitude verb has a property type complement, a *res* argument (y_{res}) and the attitude holder argument (x_{att}). The acquaintance relation is asserted to hold between the attitude holder and the *res* in the evaluation world and that relation in turn provides a description for a *de dicto* attitude.

(50) *de re belief*

- a. $\llbracket \text{believe} \rrbracket = \lambda P_{\langle e, \langle s, t \rangle \rangle} . \lambda y_{res} . \lambda x_{att} . \lambda w . \exists R . [\text{Acqaint}(R) \ \& \ R(x)(y)(w) \ \& \ \forall \langle x', w' \rangle (\langle x', w' \rangle \in \text{DOX}(\langle x, w \rangle) : P(\iota z . R(x')(z)(w'))(w'))]$
- b. $\llbracket \text{believe}(P)(res)(att)(w) \rrbracket$ is true iff, given any pair $\langle x', w' \rangle$,
- i. **there is an Acquaintance Relation R s.t. x bears R uniquely to y in w**
 - ii. $\langle x', w' \rangle$ is a member of the doxastic alternatives of x in w
 - iii. the unique individual z that x' bears R to in w' has the property P

We need the notion of centered worlds in order to define doxastic alternatives appropriate for *de re* belief (Lewis 1979). DOX is defined below:

(51) $\text{DOX}\langle x, w \rangle = \{ \langle x', w' \rangle \mid \text{it is compatible with what } x \text{ believes in } w \text{ that } x \text{ is } x' \text{ in } w' \}$

In the one case, the guise under which Ralph sees Ortcutt provides a suitable description – the man in the brown hat. On the other ascription, the man with grey hair provides a suitable description. A rough translation for each attitude is as follows:

(52) Ralph believes that Ortcutt is a spy.

$$\lambda w. \exists R. [\text{Acqaint}(R) \wedge R(\text{Ralph})(\text{Ortcutt})(w) \wedge \forall \langle x', w' \rangle \in \text{Dox}(\langle \text{Ralph}, w \rangle): \\ \text{Be-a-spy}(\iota z. R(x')(z)(w'))(w')]$$

$R = \lambda x. \lambda y. \lambda w. x$ sees y wearing a brown hat in w

(53) Ralph believes that Ortcutt is not a spy.

$$\lambda w. \exists R. [\text{Acqaint}(R) \wedge R(\text{Ralph})(\text{Ortcutt})(w) \wedge \forall \langle x', w' \rangle \in \text{Dox}(\langle \text{Ralph}, w \rangle): \\ \neg \text{Be-a-spy}(\iota z. R(x')(z)(w'))(w')]$$

$R = \lambda x. \lambda y. \lambda w. x$ sees the y with grey hair in w

We are almost in a position to tackle the fronted CP cases, but we need two more ingredients, which I will introduce in the following section.

4.2. Proposal: binding from within the fronted CP

Let me demonstrate with cases where the *res* argument is overt first. That sentence is repeated below. Recall that the pronoun *he* co-varies as a function of *any man* but this must not be achieved by syntactic reconstruction, as that would predict a disjoint reference effect.

(54) ...but that he_1 might be too old to work for Mrs. Brown $_2$, I don't think she_2 would want any man_1 's wife to believe that about him.

The first ingredient we need is a way to create a property out of the fronted CP. Following Chierchia (1989) and ideas in Percus and Sauerland (2003) we form such a

property by abstracting over the pronoun. We might imagine that the complementizer houses a lambda that will bind the variable. The fronted CP is thus a property:

$$(55) \quad \llbracket \text{that}_{\lambda x} \text{he}_x \text{ is too old for Mrs. Brown} \rrbracket = \lambda x. \lambda w. \text{Too-old-for-Mrs.B}(x)(w)$$

Co-variation of the pronoun, then, will be determined by the value of the individual to which this fronted property is applied. And the individual to which this property is applied is the *res* argument – and *it* can be bound. (An important issue I sidestep is how the pronouns morphological features are determined, on which there is a large and vibrant literature, with special attention to bound indexicals (Heim 2004, von Stechow 2003, Rullman 2003, 2005).

The second ingredient we need is a way to interpret the fronted CP as the property-level argument of *de re* belief. Here I follow Koster (1978) and Alrenga (2005) in postulating a null operator. In this case, the null operator will range over properties.

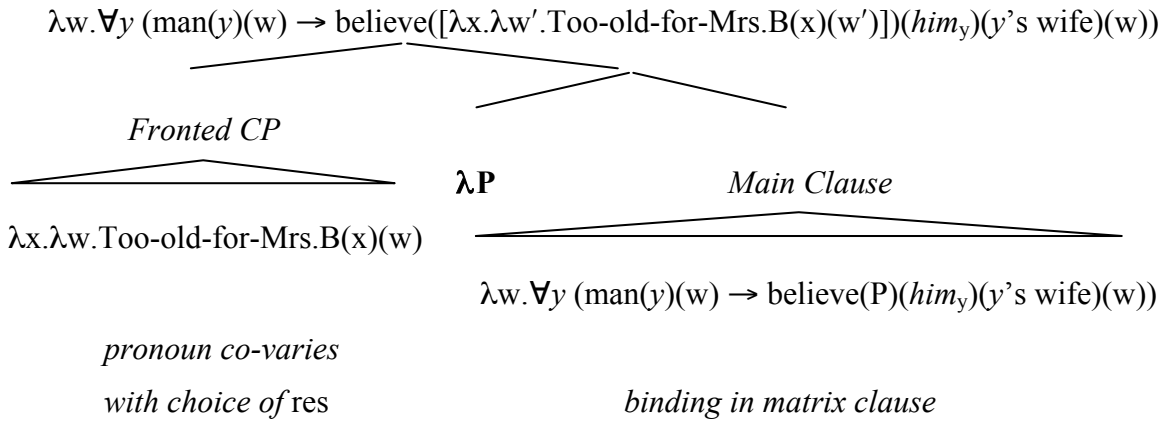
A null operator abstracts over the gap position of the main clause, which is semantically a variable of property type (I will return below to a more precise view of what the null operator is).

- (56) a. That he was too old for Mrs. Brown, Op_i I don't think any man's wife believed t_i about him. \rightarrow
- b. That he was too old for Mrs. Brown, $\lambda P_{\langle e, t \rangle}$ I don't think any man's wife believed P about him.

The composition of all these pieces is shown below:

(57) The Composition of a Fronted CP

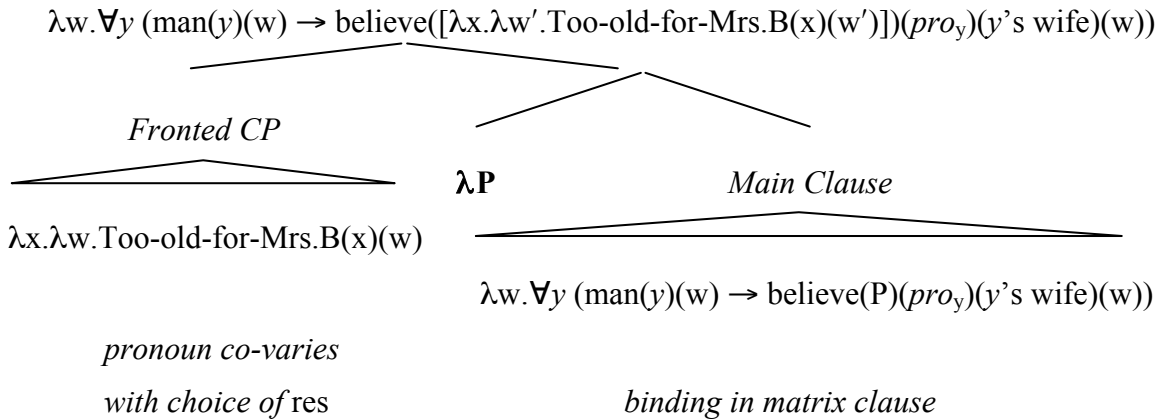
...but that he_1 might be too old for Mrs. Brown₂, every man_1 's wife believed of him_1 .



Cases where the *res* argument is not overtly indicated, as in (70), require that the *res* argument be saturated by a null pronoun, which is then bound by the quantifier, just in the fashion shown above.

(58) ...but that he₁ might be too old for Mrs. Brown₂, every man₁'s wife believed *pro*₁.

(59) The Composition of a Fronted CP



(70) denotes, then, the proposition that is true if for every man there is a possibly different Acquaintance Relation that his wife bears to him, and in all the doxastic alternatives of each of his wives, the person each wife bears that relation to is too old for Mrs. Brown. (The acquaintance relation here could vary from wife to wife.) The binding, then, is very indirect. Co-variation is of the *res*, which indirectly lets the *de re* pronoun co-vary. It is the *res* argument that is bound by the quantifier. This should then become a general strategy for allowing pronouns to co-vary in the topic CP. We also predict that binding in dislocated CPs is going to be degraded if it cannot be interpreted as a *res*. This is difficult to show, since the nature of the *res* is quite flexible, but there may be ways of making a particular element a “degraded” *res*. In the example below I try to manipulate what the topic of the most embedded attitude (the wife’s expectation) is. In case (a), the format of the dislocated CP suggests that the *res* is the children; in (b) the *res* could more likely be each man’s parents.

- (60) a. That the children will be taken care of by his₁ parents, I don't think any man₁ wants his wife to expect.
- b. That his₁ parents will take care of the children, I don't think any man₁ wants his wife to expect.

My judgments detect a weak degradation in the coherence of the sentence in (60)a, one that is replicated if we try to make the *res* overt:

- (61) a. That the children will be taken care of by [his₁ parents]₂, I don't think any man₁ wants his wife to expect of them₂.
- b. That [his₁ parents]₂ will take care of the children, I don't think any man₁ wants his wife to expect of [them]₂.

As mentioned, the quantifier can be the attitude holder herself. Such cases we identified above as *de se*. The most natural interpretation of (45)a,b is one where every man has the *de se* belief that he is too old to work for Mrs. Brown:

- (62) a. Every man_i believes that he_i is too old to work for Mrs. Brown.
- b. That he_i is too old to work for Mrs. Brown, every man_i believes.

On this reading, *he* is not bound by the quantifier; rather, *he* picks, for each of the men, the individual that he identifies as himself in his belief worlds – his *de se* counterparts (Lewis 1979). *De se* beliefs are particular kinds of beliefs about the self. Philosophers have discovered that *de se* attitudes are not strictly propositional (Perry 1979, Lewis 1979). Imagine a scenario, as Kaplan (1977) does, in which John runs by a mirror in a

smoky room and sees the outline of a man whose pants are on fire. Because of the smoke, John does not recognize himself and because he's running he doesn't feel any evidence of his pants being on fire. His belief is that John's pants are on fire, and if you asked him what he thought he would say "Some guy's pants are on fire". Very soon, however, once he begins to feel the heat, John's belief will change. Once that happens, John will tell you, "My pants are on fire". In both cases John's pants are on fire, and the propositional content of these two beliefs is the same. But his beliefs have changed in a fundamental way, in a way that cannot be captured by treating belief as merely propositional. Lewis (1979) called John's belief about himself once he discovers his predicament a *de se* belief, one that appears to be irreducibly from his perspective. It's a belief only he can have.

The difference between *de se* and non-*de se*, quite remarkably, is found to play a role in attitude ascriptions, the linguistic means by which we report attitudes. This was discovered by Morgan (1970) and Chierchia (1989). Chierchia shows that controlled PRO can only report *de se* beliefs. Before coming to hold the *de se* belief that his pants are on fire, John will want the object of his belief (John) to be doused with water, but will not want his *de se* self to be doused with water. The control construction cannot report this desire of John's (while the non-control construction can).

- (63) a. #John wants PRO to be doused with water. *non de se
 b. John wants himself to be doused with water. ^{ok}non de se

The control construction is only possible when John holds the *de se* belief that his pants are on fire and, assuming he doesn't like this situation, has the *de se* desire that someone douse him. Lewis (1979) argues that *de se* beliefs are a type of *de re* belief, where the acquaintance relation is one of identity. Thus we can accommodate the cases in (45)a,b by assuming a *de re* account, and let the acquaintance relation be set to one of identity.

4.3. The nature of the null operator

The analysis follows Koster (1978) in that a null operator abstracts over the argument position in which the fronted CP is construed. We have construed the fronted CP as the property-level argument of *believe*. That a null operator pronoun can range over such types is corroborated by the fact that the overt pronominal *that* can allow for “sloppy” *de se* readings (Chierchia 1989):

- (64) A: He expects his paper will be accepted.
B: Yeah, she expects that too.
- (65) A: I often think I am being followed. Am I paranoid?
B: No, every one believes *that*, at one point or another.

Both of the responses above can report *de se* ascriptions. In (64), she expects *de se* that her paper will be accepted. In (65), I am asserting that everyone believes *de se* that they are being followed. Pronouns, then, can stand in for properties. *That* can also stand in for the property in quantified *de re* belief ascriptions:

- (66) A: People say most kids end up resenting their parents.
B: I don't think any boy's mother would want to believe *that* about her own son.

The same *that* can serve as a resumptive pronoun in sentential subject/topic constructions, and binding is still possible. This pronoun can appear left-dislocated as well.

- (67) a. That he₁ might be too old to WORK for Mrs. Brown₂, I don't think she₂ would want any man₁ to believe *that*.
b. That he₁ might be too old to WORK for Mrs. Brown₂, *that* I don't think she₂ would want any man₁ to believe.

It's not a difficult move, then, to assume that since overt pronouns can stand in for the property complements of attitudes, a null pronoun (which undergoes A-bar movement as an operator—see below for a refinement) can range over such things too. (In fact, whatever analysis one gives to *that* should immediately carry over to the null operator, which means that even if the present implementation is wrong, the correlation between the null operator's semantics and *that* will have to deliver us co-variation.)

4.4. Summary

This tour of pronouns in the complements of attitude reports does not exhaust all the technical possibilities for capturing the apparent binding (more on this, below). The point, at the very least, is that there are ways of letting pronouns in the dislocated CP co-vary in just the right way but without proposing reconstruction. I have suggested that

some the mechanics of *de re* ascription (which, following Lewis 1979, subsume *de se*) provide such a way. The upshot is that we need to find a way for the co-variation exhibited by pronouns in the matrix clause to be a function not of the apparent quantificational binder but of something else. *Res* arguments seem particularly well suited to make this connection in many cases.

4.5. Looking beyond *de re* attitudes

The semantics of *de re* ascription provides one way of achieving co-variation in the fronted CP without performing syntactic reconstruction. If this is the only way for a pronoun in a fronted clause to achieve co-variation then we predict that only fronted complements of *de re* attitude ascriptions will behave this way. There are a number of cases which suggest that this conclusion is too strong. I will take them in turn, and suggest how the project I have begun might find ways of being extended beyond *de re* attitudes.

We've already seen examples where the clausal complements of nouns allow for co-variation of a pronoun and yet no disjoin reference effect.

- (68) ...but the idea that he₁ presented his work to Mrs. Brown₂ SUCCESSFULLY, I don't think she₂ would want any student₁ to believe.

It seems likely that these nouns can report *de re* attitudes as much as the verbs can and we could exploit the strategy given to verbs here as well. The following examples confirm this:

- (69) a. ...but the idea (about himself) that he₁ presented his work to Mrs. Brown₂ SUCCESSFULLY, I don't think she₂ would want any student₁ to believe.
- b. ...but the claim (about himself) that he₁ was too YOUNG for Mrs. Brown₂, I don't think she₂ would want any man₁ to believe.
- c. ...but the belief (about him) that he₁ was too YOUNG for Mrs. Brown₂, I don't think she₂ would want any man₁'s wife to hold.
- d. ...but the rumor (about her son) that he₁ was too YOUNG for Mrs. Brown₂'s class, I don't think she₂ would want any boy₁'s mother to believe.

So if nouns like *claim*, *belief* and *rumor* can have *res* arguments, we might expect that it is these arguments that co-vary and the pronoun in the complement is bound indirectly by the embedded C, as suggested for the clausal arguments of verbs. However, applying the semantics of *de re* belief to nominal complements is not trivial, especially in light of the results of Chapter One. There it was shown that CP complements of nouns are modifiers – predicates of things with content. We have a new task now: how to formulate *de re* belief ascription for nominal complements while taking into account their status as modifiers. I leave this for future research.

There is, however, a greater challenge to the account provided here for apparent binding. There are clear examples – examples that do not report the content of an attitude let alone a *de re* attitude – where a bound variable interpretation is available to a pronoun in a sentential subject. It seems that it is generally quite easy to construct examples where a pronoun in a sentential subject allows co-variation.

- (70) a. That he₁ was not chosen for the team made every short boy₁ scream.
b. That he₁ was sick didn't prevent any boy₁ from attending school.
c. That she₁ also had a job made most working mothers₁ during wartime very busy.

Angelika Kratzer (p.c.) suggests cases that show that there may be interesting perspectival conditions that make a bound variable interpretation more easily available. While the first example easily allows a bound variable interpretation, such an interpretation is not as easily available in the second.

(71) That he₁ was barefoot wouldn't have prevented any one₁ of those boys from walking on the hot sand.

(72) That he₁ was barefoot wouldn't remove any one₁ of those boys from the list of suspects.
(Angelika Kratzer, p.c.)

The difference may relate to the kind of perspective taken on the clause. We might imagine that the fact of being barefoot in (71) is reported from the perspective of the boys – perhaps their goals to walk across the sand. In (72), however, that fact is not reported from the boys' perspective. Below I take sentences in (70) and manipulate the perspective. These are paired with the original examples from above.

- (73) a. That he₁ was not chosen for the team made every short boy₁ scream.
 b. That he₁ was not chosen for the team made every short boy₁ a reject.
- (74) a. That he₁ was sick didn't prevent every boy₁ from attending school.
 b. That he₁ was sick didn't mean that every boy₁ had the deadly flu.
- (75) a. That she₁ also had a job made most women₁ during wartime very busy.
 b. That she₁ also had a job made most women₁ during wartime the first working mothers.

We might imagine that clauses that do not report the contents of an attitude could indirectly be presented from the perspective of certain agents.

In this vein, the presence of a psych-predicate improves bound variables in sentential subjects. Larson and Cheung (2008) provide nice pairs that show this (although they offer a structural solution).

- (76) That he₁ was praised by his₁ teacher made no boy₁ angry/happy/suspicious/
 anxious/proud.
 (Larson and Cheung 2008(7c))
- (77) *That he₁ was praised by his₁ teacher made no boy₁ responsible/culpable.
 (Larson and Cheung 2008(8c))

The presence of the psych verb suggests the content of the fronted CP is reported from the perspective of the psych-subject. Of course, in order for this to work, perspective shifting needs to allow variable binding effects without recourse to reconstruction. This requires appeal to notions of logophoricity, for instance (see Sells 1987, Kuno 2004, Culy

1997). It is possible, however, that even these pronouns can receive their co-varying interpretation within the fronted clause. In fact, such factors may help to make a D-type strategy available for the pronoun, which is itself another possibility for achieving co-variation.

5. Why clauses don't move

We have arrived at the conclusion that clauses *can* be base-generated in a non-argument position. But this doesn't answer two important questions. As noted in the introduction, this does not settle whether clauses can be in subject position or whether they are in a peripheral position in the spirit of Koster (1978). Nor does it conclusively settle whether clauses *can* move from their argument positions: it could be the case, of course, that CPs have two options for appearing left-dislocated, by movement or base-generation.

If both of those options are available to clauses, though, we would need to understand why the DP requirement holds of all left-dislocated CPs. On the assumption that null operators are syntactically always DPs, the Koster-style approach captures this immediately. If we were to countenance CPs moving, we would have to then find another reason why their gaps were subject to the DP requirement.

If CPs cannot move, though, we are still left with an open question: why can't CPs move? In the concluding part of this chapter I would like to indicate one direction for understanding this restriction on CPs which relates their inability to move with their inability to bear agreement.

5.1. Iatridou and Embick (1997): clauses don't agree

Iatridou and Embick (hereafter IE) make the compelling case that clauses, CPs and TPs, do not have phi-features. They do so by looking at *pro*-drop languages. They show that while overt pronouns can take clauses as linguistic antecedents, null *pro* cannot. Their solution rests on the assumption that null *pro* requires licensing by phi-features, and that *pro*'s referent must bear phi-features. Clauses simply don't have phi-features. This is a very helpful fact about clauses, because it allows us to make a stronger claim than Stowell: clauses will not be able to participate in agreement. I will offer a way of extending this in such a way that clauses can never participate in syntactic Agreement relations (in the sense of Chomsky 1999, Chomsky 2000, among others). This prevents them from becoming subjects *and* from topicalizing.

IE show that null *pro* cannot take a clause as its antecedent. For instance while English *it* and *that* take a clause as an antecedent, the Modern Greek *pro* can't:

- (78) A: John is always late.
B: I know...that/it convinced his father to get him a car.
- (79) A: o Kostas ine panda aryporimenos
The Kosatas is always delayed
- B: Praymatika. *ke *pro* epise ton patera tu na tu
Indeed. And *pro* convinced the father his MOD
- ayorasi aftokinito.
Buy a car
(IE 1997:58(2))

IE are careful to rule out possible reasons for this – that *pro* can't refer to inanimates (it can) or that there is some “ontological” reason that *pro* cannot refer to propositions or the things propositions describe (they can).²⁸

Catalan too prevents *pro* from finding a clausal antecedent. (The following examples use conditionals, as do most of IE's examples).

- (80) *Si [arribem tardi]_i *pro*_i convencerà la Maria de comprar-nos un cotxe
 If arrive-1PLlate *pro* convince-FUT the Maria to buy-us a car.
 (IE 1997:61(11b))

Overt pronouns, though, are possible:

- (81) Si [arribem tardi]_i *axiò*_i convencerà la Maria de comprar-nos un cotxe
 If arrive-1PLlate *that* convince-FUT the Maria to buy-us a car.
 ‘If we arrive late, that will convince Maria to buy us a car’
 (IE 1997:62(15b))

IE show further that the generalization that holds here is a linguistic one. *Pro* can't deictically refer in general, so there is something that prevents *pro* from finding CPs/TPs as linguistic antecedents. Their proposal for this generalization is that *pro*, when it takes a linguistic antecedent, must share all the person/number/gender (φ -features) of the antecedent. Their claim is that clauses simply don't have these features.

²⁸ IE also discuss that in certain cases it looks like *pro* can pick up clause meanings, but it turns out to be *expletive pro*. They show that this is just a different mechanism altogether.

(82) *Iatridou and Embick's Generalization*

CPs and TP do not possess φ -features.

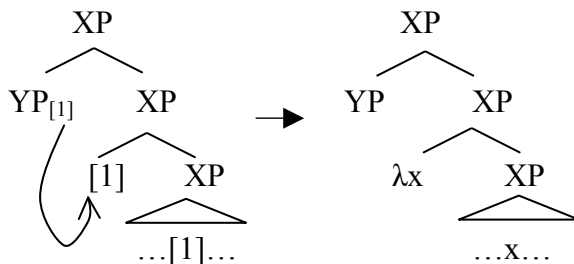
Now, IE note that this conclusion may lend support to the idea (actually, implementation) that CPs do not bear case, given the connection between agreement and case assignment in general. But it could actually rule out more than just the clauses participating in case-relations. If we extend IE's observations to the syntactic operation of Agreement (in the sense of Chomsky 2000) we can get a handle on why they don't move around at all.

5.2. Topicalization Requires Agreement (and maybe agreement)

We are now in a position to ask why the DP requirement holds of sentential topics and subjects. The analysis I propose here rests on a recent view of the role that agreement and indices play in the syntax of movement and pronominalization.

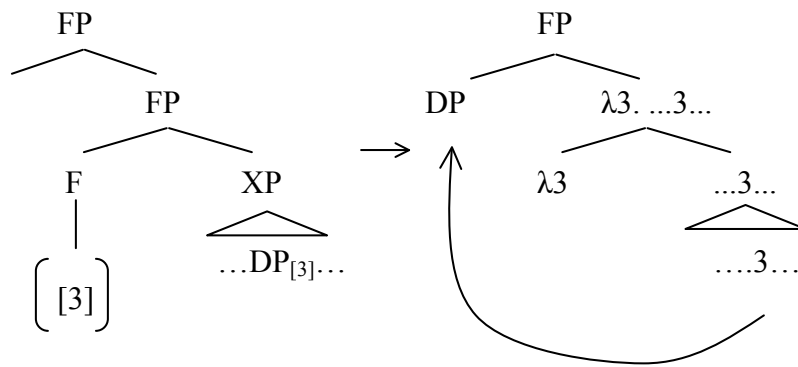
A traditional view of the semantics of movement holds that moved phrases generate a lambda abstract (Heim and Kratzer 1998).

(83)



There is another view of the role that lambdas play in the syntax of movement (Adger and Ramchand 2005, Kratzer 2004, 2009b). This view holds that both binders and the variables they bind are features, numerical indices, bundled with heads. The binders are not created by movement, but are borne on functional heads (like F below). The indices that are borne on DPs are the variables (i.e. traces).

(84)



In the tree above, the index [3] on some functional head F is interpreted as heading its own projection, creating a lambda abstract.

The range of verbal functional heads that host binder indices includes, at least, complementizers and perhaps *v*. Indices on determiners, or pronouns, are interpreted as variables. But how is the connection between binder-bindee made? Suppose indices in general aren't able to enter a relationship without being dependent on some form of agreement.

This kind of system can be most easily appreciated by looking at relative clauses, as a number of authors have suggested (see e.g. Kratzer 2009b for a recent discussion). Relative clause C, much like the C that heads *de se* complements, binds a variable in the

clause. This variable is simply the relative pronoun, with phi-features (which C and then, via predications, the head noun must agree with). The CP is then interpreted as a predicate:

(85) a. The man [_{CP} [_C C_[n] [_{TP} John saw D_[n]]

b. That man [_{CP} λn John saw n]

The spell-out of D_[n] is then subject to principles of morphological insertion, and additional parameters that determine whether the pronoun appears in the specifier of C. (Further additional questions arise if the Determiner itself has an NP complement, as in raising analyses of relative clauses (Bhatt 2003)).

Let us assume, as is usually done for topicalization (Chomsky 1977), that topicalization resembles relative clause formation in these respects. Topicalization C, like relative clause C, bears a binder index which probes a matching index. The difference between relativization and topicalization, however, is that the goal DP must move and compose with the CP by function application. The idea for CPs would be the following. The index feature on matrix topicalizing C will probe for a matching feature on some functional head. But if we limit this operation to features like agreement (i.e. matching indices don't count in probe-goal relations) then we can never establish an Agree relation with a CP because there are no agreement features (valued or otherwise) on CPs. The binding can't even get started.

5.3. Open questions

There is a type of movement that I have not considered here, and that is what might be called semantically vacuous movement. Note that what we have prevented CPs from doing is topicalizing – which amounts to saying CPs can never undergo movement that is triggered by a binder index (such as a Topicalization C or a relative clause C). But there are movements that do not implicate such mechanisms.

Various types of predicate frontings, including predicate topicalization and predicate wh-movement, are thought to be semantically vacuous movements.

- (86) a. [Criticize John], I think Mary did.
b. [Proud of John,] I think Mary is.
- (87) a. [How proud of John] does Sue believe Mary to be?
b. [How angry at John] did Sue say Mary was?

One reason for the conclusion that these are semantically vacuous movement is that they show frozen scope, or only *total* reconstruction effects. (Barss (1986), Huang (1993), Takano (1995), Heycock (1995), Sauerland and Elbourne 2003). These are the kinds of movements demonstrated below:

- (88) a. *[Criticize John₁], I think he₁ said Mary did.
b. *[Proud of John₁], I think he₁ said Mary is.
(Takano 1995:331)

Furthermore, if a referring expression is within an adjunct of a moved predicate, and the matrix clause contains a co-valued pronoun, a violation of Condition C is not circumvented (Fox 1999, Freidin 1986, Lebeaux 1988, and van Riemsdijk and Williams 1981, among others).

- (89) a. *[Criticize a student that John₁ taught], he₁ said Mary did.
b. *[Proud of a student that John₁ taught], he₁ said Mary is.
c. *[How proud of a student [that John₁ taught]] did he₁ say Mary is?
(Takano 1995:332)

This is to be compared to topicalized DPs and CPs. In the case of topicalized DPs, the usual story is that adjuncts can late merge to these because the higher copy is interpreted, and so something can late-merge to it:

- (90) a. [The students [that John₁ taught]], he₁ said Mary criticized.
b. [The pictures of the girl [that John₁ loves]], he₁ said Mary likes.
(Takano 1995:331)

The point here is that the kind of fronting involved in dislocated CPs cannot be of the predicate fronting sort, since as we have seen, both sentential subjects and sentential topics allow for bleeding of Condition C. This is thus another kind of movement derivation that we need to find a way of blocking for CPs. I am more encouraged in ruling out this movement for CPs, since the kinds of phrases that can undergo semantically vacuous movement in English are limited. Nonetheless, we need a theory that prevents CPs from drifting away leftwards, even if only phonologically.

6. Conclusion

This chapter has argued that fronted CPs – subjects and topics – do not move to those positions but can be base-generated there. Bound variable interpretations for pronouns in fronted CPs do not involve syntactic reconstruction, as evidenced by the fact that these interpretations were available when a syntactic reconstruction account would predict a condition C violation. Since the theory of movement most commonly adopted (the copy theory and its attendant interpretative mechanisms (Fox 1999)) is designed to ensure that movement would produce a conflict in such cases, we concluded that CPs don't move. I followed Koster's account – that fronted CPs are base-generated – thus explaining the absence of Condition C effects. I then suggested ways of accounting for co-variation of pronouns in the fronted clause. I worked through cases where front CPs were interpreted as the arguments of *de se* and *de re* attitude verbs, and showed how to achieve co-variation without syntactic reconstruction. We then saw that bound variable interpretations may be available in a wider range of fronted CPs, and this might ultimately be related to perspectival properties.

The message, then, is that clausal arguments do not participate in the kinds of movement dependencies that other arguments do, such as DPs. I suggested this is the result of the fact that CPs don't participate in agreement relations. Whatever the source of this restriction, we must now ask why DPs can't admit of the same mechanisms. In fact, given the difficulty in verifying data about whether moved noun phrases always show syntactic reconstruction effects, it may be worth re-examining those cases too.

CHAPTER IV

INFINITIVES AND BELIEF

1. Where's the attitude?

A standard formulation of attitude verbs, following Hintikka (1962, 1969), treats them as quantifiers over alternatives. This standard approach gives to a verb like *think*, for instance, the following denotation. (DOX delivers alternatives compatible with what the subject believes.)

$$(1) \quad \llbracket \textit{think} \rrbracket = \lambda p. \lambda x. \lambda w. \forall w' (w' \in \text{Dox}(x, w) \rightarrow p(w'))$$

On this formulation, attitude verbs take complement propositions *directly*, with the modal quantification ‘built into’ the embedding verb. We’ve already seen some reasons why this might not be true for all cases of attitude ascription. In Chapter Two we looked at clausal complements of nouns, which included the nominalizations of attitude verbs. We saw that one way of capturing the modifier status of these clauses involved decomposing attitude verbs. We followed Kratzer, who factored out to the complementizer the job of introducing propositional content. This means that the complementizer, not the embedding noun, can select for a proposition. This decompositional approach to attitudes has been applied elsewhere. Anand and Hacquard (2008) offer a variation of the idea for a class of attitude verbs they call ‘proffering verbs’ (like *claim* and *wager*). Kratzer (2009a) looks at modals interpreted under attitudes and concludes that the quantification (over the alternatives provided by the embedding verb) is in the embedded clause. On this

decompositional approach, the semantics once attributed to attitude verbs themselves in the Hintikka approach is instead contributed by other parts of the constructions in which attitude verbs appear.

In this chapter, I will make another case for this kind of decompositional approach. It involves the selection of infinitival complements under attitude verbs, in particular, the accusative with infinitive construction (AcI). Getting a handle on the selectional properties of AcI-taking verbs, I will argue, requires that the ‘attitude’ of an attitude ascription be factored out to the embedded clause.

1.1. The *See* Paradigm

Perception verbs, like *see* and *hear*, among others, are famous for having different meanings depending on their complement. When *see* takes a bare infinitival complement (one without *to*) it reports direct perception and it is epistemically neutral (2)a. The subject needn’t believe what she saw was an event that has the description given by the verb phrase complement (Barwise 1981). The finite complement of *see*, in addition to being factive, requires that the subject believe the content of the complement clause and hence the continuation in (2)b is a contradiction:

- (2) a. Martha saw Fred driving too fast, but she believed he wasn’t.
b. Martha saw that Fred was driving too fast, #but she believed he wasn’t.

Another complement option for *see* is an infinitival with an overt accusative subject, the *Accusativus Cum Infinitivo* or AcI construction.²⁹ Like the finite clause, *see* with an AcI complement is epistemically non-neutral (3), but unlike the finite-taking version (4)a, it is not factive (4)b (Jespersen 1940, Higginbotham 1983, Safir 1993):

- (3) Martha saw Fred to be driving too fast, #but she believed he wasn't.
- (4) a. Martha saw Fred to be driving too fast, but he actually wasn't.
b. Martha saw that Fred was driving too fast, #but he actually wasn't.

As I will detail more fully below, AcI constructions report a belief, of a sort that has the flavor of a judgment or opinion, a dimension that we'll tackle later. Let's abstract, for now, from this particular flavor of belief that *see* takes on here.

The *See* Paradigm, as I will call it, presents a number of challenges for the project that seeks to regulate the syntactic complementation options of a predicate from its semantics (the “s-selection only” hypothesis, Pesetsky (1982, 1991)). There are several correspondences between complement type and meaning that a theory of complementation would need to capture in order to derive the *See* Paradigm. One ‘correspondence’ – the focus of this chapter – involves the infinitival complements in (2)

²⁹ The construction is usually called exceptional case marking (ECM) or Raising to Object. I use the more traditional, and theory neutral, term *Accusativus Cum Infinitivo* (AcI) because, while not exactly the best description, it makes clear that the focus is on infinitival constructions, those with *to*+bare infinitive, in English. There are a number of other constructions that involve AcI in the general sense: non-finite clauses of various sorts with overt accusative subject (complements to causative and perception verbs, for instance) that do not have the same semantic effects. Indeed, all case marking (via Agree (Chomsky 2000)) is a kind of AcI. Section 4.1 reviews the syntax.

and (3). Here, we must ensure that *see*+AcI reports are epistemically non-neutral, unlike the bare infinitives, and that they are not factive, unlike the finite clause (Hegarty 1992, Kiparsky and Kiparsky 1970). The second ‘correspondence’ involves the meaning of finite clauses: these must deliver factive complements only, but only with certain verbs. That is, not only is *see* with an AcI complement not factive, *see* with a finite complement *must* be factive. (Note that the factivity here cannot be attributed to finite clauses alone, since there are plenty of finite clause taking predicates that can express what (4)a does, and none are of course factive.) In sum, the presence of the AcI construction forces a non-factive, epistemically non-neutral reading of *see*. The semantics of finite clauses is not the focus of this chapter – rather AcI complements are – but their distribution and interpretation under *see* indicates the depth of the puzzle posed by the *See* Paradigm.

We can’t pin all this down on polysemy, at least not *just* on polysemy. Even if we resorted to several different lexical items all pronounced *see*, we would still need to account for the correlation between the meaning of *see* with its complement type. As I will detail when I review the syntax of AcI constructions in Section 4, the syntactic status of AcI complements alone won’t deliver us an answer as to why they must report non-factive beliefs, nor will standard assumptions about the semantic type of bare infinitives prevent them from reporting what AcI complements do. Something more drastic needs to be done.

That there is grammar in this is further confirmed by the fact that *see* is not alone in its behavior. The bulk of this chapter is devoted to showing that a whole class of predicates – *see* type verbs – presents the same pattern. Simply explaining the complement options of these verbs by recourse to syntactic selection won’t capture a

general fact about English complement types. With AcI complements, but not bare infinitival or finite complements, verbs like *hear*, *perceive*, *consider*, *understand*, *remember* report (non-factive) beliefs, some sharing with *see-AcI* the particular flavor of a judgment.

1.2. The attitude is in the complement

We are not in a position to explain the whole of the *See* Paradigm. This chapter tackles the meanings delivered by *see*-type verbs with AcI complements (with an eye toward a larger inventory of complement options). Although it will take a few more steps to make my case – which I develop over the course of this chapter – complement patterns like that found with *see* and others will force us to draw the following conclusion: the meaning available to *see* in (4)a is delivered, in part, by something inside the AcI construction itself, not necessarily the verb *see*. Simply put, *see*+AcI means what it does because that meaning is in the AcI complement.

After ruling out a number of possibilities for what underlies the distinction between bare infinitival, finite and AcI complements, I will explore one option for building into the AcI complement the semantics of belief. Not just any kind of belief, however, but a belief *about* something that the embedding verb describes a relation to – that is, a *de re* belief. This can be best appreciated by looking at some other verbs of the *see*-type, such as *perceive* and *hear*. When these take AcI complements, they report a belief, and in particular a belief about what was heard or perceived.

- (5) John hears Mary to be out of tune.
 ≈ John believes of what he hears that it is Mary out of tune.
- (6) John perceives there to be a spider on his leg.
 ≈ John believes of what he perceives that it is a spider on his leg.

I will argue that what AcI does is describe a *de re belief* and that certain embedding verbs in this construction describe the way in which the believer is acquainted – causally connected – with the object of the belief, the *res*. In particular, I will propose that there is a meaningful functional head in the AcI complement that ascribes a *de re belief*. The semantics of *de re belief*, following Kaplan (1969) and Lewis (1979), already incorporates constraints on how an attitude holder is connected with the *res*. Following Lewis (1979), these are modeled as Acquaintance Relations. It will be argued that in AcI, a perception verb can provide the Acquaintance Relation. So not only will I suggest that the ‘belief’ component is in the complement, I will make a proposal for the role the embedded verb plays.

A word is in order about the scope of the issue here. First, it is not the case that a verb like *see* can have a non-factive, opaque complement *only* in the AcI construction. There are uses of *see* (and some other perception verbs) which take opaque nominal objects, as in *John sees a moose, but it's really a bear*. (See, among others, Zimmermann 1993.) Intensional transitive verbs are beyond the scope of this chapter (but see Section 3.4.5 for some discussion). The question we are asking is why – when we look at clausal complements – this sense of *see* must take an AcI and not a bare infinitival or finite complement.

Second, my focus is on AcI taking verbs that alternate like *see*. There is another class of predicates, which includes verbs of evidence and showing, whose finite and AcI complements are identical.

- (7) a. The evidence revealed/proved/showed/ there to be a real problem.
b. The evidence revealed/proved/showed that there is a real problem.

The existence of these verbs shows that AcI constructions are more varied than the subset discussed in this chapter. But it doesn't take away from the major puzzle presented by the *see*-type verbs.

1.3. Outline of chapter

In section 2, I turn to a fuller discussion of the meanings that AcI constructions deliver in comparison to other complements – in particular, bare infinitival complements. I will show that *see-AcI* constructions report *de re* beliefs, and that the embedding verb provides the way in which the attitude holder is acquainted with the object of belief. In Section 3, I argue that the *de re* belief component of this meaning is in the complement. I then provide a formal implementation of this, including a proposal for how the meaning of the embedding verb composes with a meaningful functional head in the complement. The surprising result is that the embedding verb is interpreted *inside* the complement. I then discuss the generality of the proposal for other AcI-taking verbs, including the verb *believe* itself. In section 3.2, I then turn to show that several predictions of the analysis are borne out. One prediction is about which verbs embed AcI complements, and another

is about the lexical variation – and variability of judgments – we find concerning the range of verbs that take AcI complements.

In section 4 I turn to the syntax-semantics interface and ask why AcI carries the meaning it does. I conclude with speculative discussion about how the project of putting meaning in complement clauses might be extended to the finite cases.

2. Semantic varieties of complements

Before turning to a full documentation of the properties of AcI constructions, we need some basic background in diagnosing whether complements are opaque or not. These tests are crucial to establish several of the basic generalizations about AcI predicates.

2.1. Epistemically neutral and non-neutral reports

It's a well-rehearsed observation that the bare infinitival complement of a verb like *see*, which is used to report 'direct perception' is epistemically neutral. When *see* takes a finite complement, often described as an 'indirect perception' report, it is epistemically non-neutral (Barwise 1981, Higginbotham 1983). I'll run through some familiar scenarios to show this.

Suppose Mary is holding a can of soda with a straw in it, but she's not drinking from the straw. Rather, the straw is resting against her cheek. John is watching all of this, but the straw and the cheek are indistinguishable from his distance. So as far as John is concerned, the event he thinks he is seeing is one of Mary drinking a soda. But the event that John is actually seeing is an event of Mary holding a straw up to her cheek. We can

report his perception of this particular event as an epistemically neutral direct perception, without implying that John believes the verb phrase we use to be the correct description of what he saw or found.

- (8) a. John saw Mary hold the straw up to her cheek. *true*
b. John found Mary holding a straw up to her cheek. *true*
- (9) a. John saw Mary drink a soda. *false*
b. John found Mary drinking a soda. *false*

Following Barwise (1981), epistemically neutral reports are automatically delivered if the matrix predicate selects for an individual situation or event (debate ensues about whether we need situations or Davidsonian (1967) events for this (Higginbotham 1983)). To ensure transparency on the event description, the verb must not be looking for a property of events but an individual event. And this, in turn, ensures that the description of the seen event is epistemically neutral. Following Higginbotham (1983), we might treat the bare infinitive like an existential quantifier over events, which, like other quantifier phrases, will raise, leaving a variable that ranges over events. This gives the verb *see* the right type of complement and, most importantly, it ensures that the event description of the thing seen can vary, independent of the seer's mental state – hence it's epistemically neutral. The ingredients of this analysis are shown below:

(10) $\llbracket \textit{see} \rrbracket = \lambda s'. \lambda x. \lambda s. \textit{see}(s')(x)(s)$

(11) a. John saw Mary hold a straw.

b. $\exists s \exists s' [\textit{hold}(\textit{straw})(\textit{Mary})(s') \ \& \ \textit{saw}(s')(\textit{John})(s)]$

There is some event s' , which is an event of Mary holding a straw, and there is an event s which is an event of John seeing s' .

Of course, the same is not true of an indirect perception report. In the scenario described above, the following are false:

(12) *Epistemically non-neutral Reports*

a. John saw that Mary was holding the straw up to her cheek. *false*

b. John found that Mary was holding a straw up to her cheek. *false*

John didn't see or find that Mary was holding a straw up to her cheek, because he didn't believe of what he saw or found that it was (or was evidence that) Mary was holding a straw up to her cheek. (Nor, of course, is it true to say that *he saw/found that Mary was drinking a soda*, because that betrays the factivity of *see-that*.)

AcI constructions, on the other hand, are like finite complements, and unlike bare infinitivals, in that they are always used to report epistemically non-neutral *see*. This is the first of several properties of AcI constructions that I detail in the following sections.

2.2. AcI constructions are epistemically non-neutral

Below are some naturally occurring examples of *see* with AcI complements.³⁰ As noted, in some cases the AcI complements have the flavor of a judgment. This is especially clear in the following examples:

- (13) a. The fact that Bill Clinton is Hillary[’s] top advisor, and she has miserably mismanaged her campaign shows that Bill Clinton is not after all that economic wizard that Americans saw him to be in the 90’s.
(<http://women.barackobama.com/page/community/post/bloju/gGCN8J>)
- b. I see him to be an indolent, selfish *bon vivant*. (Jane Austin, *Mansfield Park*)
- c. He went over to him and saw him to be in great stomach pain and seemingly very ill. (<http://www.geocities.com/craigavonhs/rev/mccorryloughsiders.html>)

The sentences above report a judgment or opinion about what might be best described as subjective qualities. What seems to make a judgment different, intuitively speaking, from a garden-variety belief report is that predicates that are otherwise matters-of-fact – say a person’s citizenship – are interpreted as being subject to personal opinion, along the lines of predicates of personal taste as investigated by Lasersohn (2005) and Stephenson (2007). Borkin (1984) discovered many such contrasts. The AcI example in (14) does not report the discovery of someone’s citizenship, but an opinion about how to characterize the way someone appears or behaves:

³⁰ The first involves a relative clause, with the predicate of the infinitival serving as the head. Moving the embedded predicate improves the acceptability, I have found, and the majority of Google hits I get involve such constructions, for reasons not yet clear to me. The second two examples keep the predicate in situ.

- (14) a. When I looked into the files, I found that she was Canadian
b. #When I looked into the files, I found her to be Canadian. (Borkin 1984)

Aside from ‘coercing’ predicates that otherwise describe matter-of-fact properties, AcI complements of these verbs can contain gradable predicates (*tall*) and familiar predicates of personal taste, such as *rude* or *pretty* (Lasersohn (2005) and Stephenson (2007)):

- (15) a. I found/felt/saw her to be very Canadian (even though she’s technically American).
b. I found/felt/saw him to be rude/pretty/a good doctor/tall.

In fact, just about any kind of embedded predicate is possible, as long as we admit that people could have different opinions about whether it applies. Higginbotham (1983) notes that AcI constructions that contain verb phrases that describe states or events that are typically matters-of-fact come out as judgments in AcI.

- (16) From the perspective of those who house the homeless, the building was seen to have collapsed, but in view of the Housing Authority, the building was merely classified as substandard. (Higginbotham 1983)

I will devote Section 3.4 to a discussion of the judgment effect with these verbs. What is important at this point is that unlike epistemically neutral bare infinitival complements, AcI constructions are always semantically non-neutral. Of course, this is intuitively clear, since they express judgments. The following tests confirm this intuition. While it is a contradiction to deny the content of an epistemically neutral perception complement, it

isn't in the case of AcI (since *see* AcI constructions impose judgments on their complements, more matter-of-fact predicates like *drinking a soda* are slightly odder in these sentences.)

(17) Direct Perception

John saw Mary hold(ing) a straw up to her cheek.
...#but she was not holding a straw up to her cheek; she was drinking a soda.
...^{ok}but he thought she was drinking a soda.

(18) AcI Complements

John saw Mary to be holding a straw up to her cheek.
...^{ok}but she was not holding a straw up to her cheek; she was drinking a soda.
...#but he thought she was not holding up the straw; he thought she was drinking a soda.

Of course, it is possible that Mary *was* just holding the straw up to her cheek, and we can report John's true belief about this event. The point is that in AcI (a) the complement needn't be a true description of the event and (b) the description of the event must be true for the subject, hence epistemically non-neutral.

Hear AcI is likewise epistemically non-neutral, as demonstrated by the contrast between AcI in (20) and the bare infinitival complement in (19):

- (19) Mary heard the teacher drop a book, *bare infinitive*
a. ...#but he actually slammed a door.
b.^{ok}but she believed that he was slamming a door.

- (20) Mary heard the teacher to be dropping a book, *AcI*
a.^{ok}but he actually was slamming a door.
b. ...#but she believed that he was slamming a door.

Feel acts similarly, although the set-up requires a context that involves feelable stimuli in the bare infinitival case:

- (21) Lewis felt Bruce lick his face, *bare infinitive*
a. ...#but Bruce was actually rubbing sandpaper across his face.
b.^{ok}but Lewis believed that Bruce was rubbing sandpaper across his face.

- (22) Lewis felt Bruce to be licking his face. *AcI*
a.^{ok}but he actually was rubbing sandpaper across his face.
b. ...#but Lewis believed that he was rubbing sandpaper across his face.

Predicates like *find* and *perceive* take gerundive complements, in which case they are epistemically neutral. With *AcI*, they are epistemically non-neutral.

- (23) John perceived Mary holding a straw up to her cheek. *Gerund*
 a. ...#But she was really drinking a soda.
 b.^{ok}But he thought she was drinking a soda.
- (24) John perceived Mary to be holding a straw up to her cheek. *AcI*
 a. ...^{ok}But she was really drinking a soda.
 b.#But he thought she was drinking a soda.
- (25) John found Mary holding a straw up to her cheek. *Gerund*
 a. ...#But she was really drinking a soda.
 b. ...^{ok}But he thought she was drinking a soda.
- (26) John found Mary to be holding a straw up to her cheek. *AcI*
 a. ...^{ok}But she was really drinking a soda.
 b. ...#But he thought she was drinking a soda.

In sum, AcI complements are epistemically non-neutral. Let me add one more corroborating piece of evidence for this.

2.2.1 A clarifying note on passive *see*

Direct perception *see* cannot passivize (**Mary was seen eat a bagel*) and instead requires the infinitival marker *to*. The question is whether the presence of *to* is merely a (mysterious) syntactic reflex of passivization or whether *to* always implicates belief when it appears with *see*. The latter is the case, as Kroch, Santorini, and Heycock (1988)

already concluded. To see this better, there needs to be an attitude holder; a *by*-phrase is therefore helpful.

- (27) a. Fred was seen to be driving too fast by the police, #but they thought he wasn't.
b. Mary was seen to be drinking a soda by her father, #but he thought she was holding a can of grease in front of her face, not drinking a soda.

These are contradictions. If the passive of *see* with a *to*-infinitive complement could report epistemically neutral direct perception, these would not be contradictions. Note they are not with bare infinitival complements:

- (28) a. Mary saw Fred driving too fast, but she thought he was riding a spaceship and so was fine with the speed.
b. Mary saw Fred drinking a soda, but she thought he was holding a can of grease in front of his face.

And passive in general – which is possible with a *-ing* complement – can be used with epistemically neutral direct perception:

- (29) Fred was seen by Mary drinking a soda, but she thought he was just holding a can of grease in front of his face.

The other perception verbs behave similarly:

- (30) a. Mary was heard by her friends to be singing out of tune, #but they thought she was in tune.
 b. Mary's friends heard her sing out of tune, but they thought she was in tune.
- (31) a. Bruce was felt by Lewis to be rubbing sandpaper across his face, #but Lewis thought the cat was just licking him.
 b. Lewis felt Bruce rub sandpaper across his face, but Lewis thought the cat was just licking him.

(The attitude holders can be correct in their belief, of course, so it doesn't rule out the event described having occurred.) So *to* does correlate with a meaning difference here. Of course, this still means we must find some reason why the subject of bare infinitivals cannot be passivized, as **Fred was seen drink a soda*. But *to* is no mere syntactic reflex of this in the case of perception verbs.³¹ This much is clear: AcI constructions are always epistemically non-neutral. This distinguishes them, first of all, from their bare infinitival counterparts.

2.3. AcI complements report belief

Of course, being epistemically non-neutral does not tell us what *kind* of attitude AcI constructions must report. AcI constructions always report what Stalnaker (1984) terms *attitudes of acceptance*, those attitudes which can be said to be correct if the content of their complement is true, and false if they are not (Stalnaker 1984, p.79). This

³¹ This is not to say that sometimes *to* may be merely a syntactic reflex of passivization, as in causatives (**Mary was made *(to) leave*). I don't know if there is a meaning difference here.

typically distinguishes belief attitudes (or *doxastics*) from desiderative (or *bouletics*) embedding verbs. This is what is behind Pesetsky's (1991) tests that distinguish among these. The test predicates truth or falsity of the embedded complement. In the following sentences, the appositive relative is to be read as commenting on the embedded rather than matrix clause.

- (32) a. John believed that Mary went to Paris, *which was true/false*
b. John wanted/ordered/desired/ that Mary go to Paris, *#which was true/false*

As Pesetsky notes, all the verbs that participate in the AcI construction – not just the perception verbs we are concentrating on here – are compatible with these kinds of *truth/falsity* modifications.³²

- (33) *AcI constructions report attitudes of acceptance/belief*

John {believed /considered /fancied/held/judged/suspected/presumed/
recognized/remembered/understood/figured/fiound/imagined/reckoned/

regarded/felt/knew/took} Mary to be Canadian, which was false.

These AcI constructions, then, are not only epistemically non-neutral, they report belief, as opposed to any number of other attitudes we might imagine. Moreover, these interpretations are absent when these verbs take other types of clausal complements. The

³² In this way, they are distinguished from the *Want*-class constructions with infinitival complements discussed in Section 4.

bare infinitives report epistemically neutral perception. The finite clauses, in turn, do a third thing – many come out as factive, indirect perception reports. Put simply, it is a property of these verbs with AcI complements that allows them to have the semantics of *believe*. As I will argue more below, simply positing a verb *see* (*hear*, *perceive*) with the lexical semantics of an attitude verb – taking a proposition – won't help in determining why that version of *hear* can't take a bare infinitival clause. I will argue that the meaning *see* verbs take on in AcI constructions – belief ascription – is delivered by the AcI construction itself.

But *See AcI* verbs clearly aren't synonymous with the verb *believe*. The embedding verb makes a contribution. It is to that question I turn next.

2.4. AcI complements report *de re* belief

Take the verb *hear*. It is not perfect in the AcI construction, but it is possible. What *hear+AcI* requires is some amount of auditory perception, and, importantly, this auditory perception is of the thing the belief reported is about. This contrasts with the finite clause complements:

- (34) a. I hear that she is playing out of tune (some one told me)
b. I hear her to be playing out of tune.

The AcI example commits me to having heard something I took to be her playing out of tune. *Hear-that* merely requires that I heard or read some report (or utterance, perhaps)

whose content was that she is playing out of tune. With *hear-that* I needn't believe the content of the complement – not so with *hear+AcI*:

- (35) a. I heard from my friends that she was out of tune ...but I don't think she was.
b. I heard her to be out of tune ...#but I don't think she was.

The AcI construction reports a belief in contrast to both the finite and bare infinitival complement. We are seeing here that if we want to maintain some connection between different uses of *hear*, the belief component must be contributed by AcI and AcI alone.

The kind of belief reported with *hear+AcI* is a belief about something heard. That kind of belief is a *de re* belief. Informally, *I heard Mary to be out of tune* reports a *de re* belief about some particular thing I heard, and the belief is that some thing is a state of Mary being out of tune. It appears, then, that the difference between the interpretation of AcI and bare infinitival complements boils down to a difference about whether the complement describes what was heard or what the attitude holder thought he heard. (I'll treat Mary's being out of tune as a state of her being out of tune.)

- (36) John hears Mary to be out of tune.
 ≈ John believes *de re* of a state *s* he hears that *s* is a state of Mary being out of tune.
- (37) John hears Mary being out of tune.
 ≈ John hears a state *s* and *s* is a state of Mary being out of tune.

Hear+AcI is quite literally *hear* plus an ascription of a belief about what was heard. And this is exactly the analysis I will give. There are of course some immediate questions that arise once we take this route, particularly whether all perception verbs when with AcI complements require the same perceptual relation to hold between the subject and the *res* as they do when they report direct perception (the verb *see*, for instance). But this route also offers several advantages. It requires us to decompose attitude verbs – at least for *see* type verbs like *hear* so that the belief component will be in the complement. This will help us explain why *hear* implies belief only when it takes AcI. Ultimately, then, controlling the form-meaning correspondences of the *See* paradigm requires that we abandon the Hintikka-style approach to attitude ascription, and factor out the modal quantification to the embedded clause. I turn now to a proposal for exactly how to do this for *see AcI* constructions.

3. The attitude is in the complement

The starting hypothesis of the proposal is that there is no verb *perceive* or *hear* or *see* that attributes belief – i.e. these verbs are not proportional attitude verbs of the Hintikka sort. These verbs can take as internal arguments things *heard* and *seen*. That much lexical semantics we *must* give them. Assume, then, that *hear*, for instance, describes an eventuality of hearing something. I sever the external argument throughout (Kratzer 1996). A Voice head introduces the external argument, either a holder or agent. I will remain neutral on whether direct perception verbs like *hear* describe states or events. I'll identify the external argument as a holder, although I don't see that anything hinges

on this. (Crucially, we'll see that it does matter that the external argument of *hear* + *AcI* is a holder.) The denotations of *hear* and *Holder* are given below.

$$(38) \quad \llbracket \textit{hear} \rrbracket = \lambda s'. \lambda s. \lambda w. \textit{hear}(s')(s)(w)$$

$$(39) \quad \llbracket \textit{Holder} \rrbracket = \lambda s'. \lambda s. \lambda w. \textit{hear}(s')(s)(w)$$

The interpretation of direct perception proceeds in the way outlined in (11)b. Assuming the bare infinitival complement can QR as an existential quantifier of eventualities (following Higginbotham 1983), the internal argument is saturated by a variable bound by the existential. In the case at hand, *John heard Mary play(ing) out of tune*, we claim there is an event of Mary playing out of tune, and John heard that event.

- (40) a. John heard Mary play out of tune.
 b. $\exists s \exists s' [\textit{Holder}(\textit{John})(s)(w_0) \ \& \ \textit{heard}(s')(s)(w_0) \ \& \ \textit{play-out-of-tune}(s')(w_0) \ \& \ \textit{Agent}(\textit{Mary})(s')(w)]$

There is some event s' , which is an event of Mary playing out of tune, and there is an eventuality s that is a hearing of s' and John is the holder of s .

There is simply no belief in sight in direct perception report, because *hear* selects for an individual-level argument.

In order to handle the epistemically non-neutral AcI sentence *John heard Mary to be out of tune* one option is to posit a different verb *hear* which ascribes belief. That verb

would have to (a) quantify over the belief alternatives of its subject and (b) take a propositional complement. There are some pretty solid reasons that there does not exist such a verb.

If there were a verb *hear* that had the semantics of a (non-factive) attitude verb, then we would be at a loss as to why such a verb does not allow a finite clause. Moreover, we really wouldn't be able to explain why bare infinitives couldn't complement such a verb either. Preventing a bare infinitive from being a suitable 'propositional' complement is not easy. While I have treated bare infinitives as properties of events (or existentially quantified events), we could imagine that the eventuality argument is closed off, returning a proposition. That is *Mary play out of tune* could describe the proposition that is true if there is an event of Mary playing out of tune.

(41) $\llbracket \llbracket \text{VP Mary play out of tune} \rrbracket \rrbracket = \lambda w. \exists s. \text{Play-out-of-tune}(\text{Mary})(s)(w)$

Surely this would be a suitable complement for *hear* if *hear* were an attitude verb that took propositional complements.^{33,34,35} And bare infinitival complements are perfectly

³³ And in a system that only has one intensional argument – like the situation semantics of Kratzer, to take an example, see Kratzer (2007) – a VP could simply be of type $\langle s, t \rangle$.

³⁴ Moreover, intensional transitive verbs are often thought of as taking property-type complements (see Zimmermann 1994). Why couldn't there be an intensional transitive *hear* that took properties of events as its complement? (See Section 3.4.5 for more discussion of the intensional transitive uses of *See*-type verbs.)

³⁵ And lastly, direct perception complements may actually have (viewpoint) aspect in them (Felser 1999). On most standard assumptions, viewpoint aspect maps a property of events into properties of times. Properties of times are perfect semantic types for the complements of attitude verbs. The point here is that the 'size' of the bare infinitive – and the fact that it may denote a property of events – won't necessarily ensure that it must be a complement to a direct perception verb. What ensures direct perception is that the internal argument of the embedding verb is an individual. Complement clauses just need to find a way to

good complements to other intensional operators, such as modals (*John can/must play out of tune*). In sum, there is nothing particular about bare infinitives, it seems, that would prevent them from being complements to a hypothetical verb root *hear* that had the semantics of an attitude verb.

On the other hand, we have an immediate answer as to why *hear* with a bare infinitive reports only direct perception on the hypothesis that *hear* simply never does anything more than take a individual-level internal argument. The question then becomes why *hear* with an AcI complement reports a belief. And here we can see why we want to put the attitude ascription component of *hear* + *AcI* in the complement. Within the infinitival AcI complement there is a meaningful functional head. That head has the meaning of *de re* belief. (In Section 4 I will address the syntactic status of this functional head, which will of course have to determine the difference between bare and *to*-infinitives.) The strategy, then, is to keep constant the meaning of *hear* and derive the difference between direct perception and AcI from within the complement. We can decompose *hear+AcI* then in the following way:

saturate that position. Nothing says bare infinitives couldn't also saturate argument positions of intensional operators – which could be selecting for properties of events.

(42) John hears Mary to be out of tune.

Informally:

- a. John hears some state *s*
(provided by the matrix clause)
- b. John believes *de re* of that state *s* that *s* is a state of Mary being out of tune.
(provided by the embedded clause)

In order to put the belief component in the complement, we have two tasks. One task is to determine how the embedding verb makes the contribution it does. My answer is that the role of the embedding verb is to specify how the attitude holder is connected or causally related to the object of their belief, the *res*. Following Lewis (1979), the relation between the attitude holder and the *res* is an Acquaintance Relation. The role of the embedding verb, I suggest, is to provide the Acquaintance Relation.

The second ingredient of the proposal involves getting the doxastic alternatives of the matrix subject. By putting the attitude in the embedded clause, we've lost the subject argument – from which we typically recover doxastic alternatives. We'll incorporate a solution to this in the proposal as well.

In the next section I will show how to implement both of these aspects of the meaning of AcI complements formally. After that, I will turn to other verbs (like *believe* itself) and show, with a slight modification, how they can be accommodated on this approach. Then I turn to some of the predictions of the analysis.

3.1. De Re belief and Acquaintance Relations

Beliefs about things, which will include states and events and other individuals, are usually *de re* beliefs. To review from Chapter Three, double vision scenarios show that an attitude holder, like Ralph, can have apparently contradictory beliefs about one and the same *res*, Ortcutt. Ralph sees Ortcutt in a brown hat and believes him to be a spy. On another occasion, Ralph sees Ortcutt at the beach, and maintains the belief that this particular individual is not a spy. What Ralph doesn't know, of course, is that these two individuals are one and the same:

(43) *Double Vision sentences*

- a. Ralph believes that Ortcutt is a spy.
- b. Ralph believes that Ortcutt is not a spy.

But Ralph wouldn't assent to the proposition that one person both is and isn't a spy. We need to make sure Ralph has consistent beliefs. The solution to this, following Kaplan (1969), is to treat these belief reports as ascriptions of properties under certain descriptions. In Chapter Three, we settled on a representation in which *believe* has three arguments: the subject/attitude holder, a *res*, and a property (plus the usual world argument). Following Lewis (1979), an Acquaintance Relation R is said to hold between the attitude holder and the *res*. The Acquaintance Relation is further used as the "description" of the *res*'s counterpart in all the attitude holder's doxastic alternatives. A denotation for *de re belief* along these lines is given below:

$$(44) \quad \llbracket believe \rrbracket = \lambda P_{\langle e, \langle s, t \rangle \rangle} . \lambda y_{res} . \lambda x_{att} . \lambda w . \exists R . [\text{Acqaint}(R) \ \& \ R(y)(x)(w) \ \& \ \forall \langle x', w' \rangle (\langle x', w' \rangle \in \text{Dox}(\langle x, w \rangle) : P(\iota z . R(z)(x')(w'))(w'))]$$

The individual z here is the counterpart of the *res* y . Here are the truth conditions again for *de re* belief:

- (45) $\llbracket believe \rrbracket(P)(y_{res})(x_{att})(w)$ is true iff, given any pair $\langle x', w' \rangle$
- i. $\langle x', w' \rangle$ is a member of doxastic alternatives of x in w
 - ii. there is an Acquaintance Relation R s.t. x bears R uniquely to y in w
 - iii. the unique individual z that x' bears R to in w' has the property P in w'

The two beliefs attributed to Ortcutt come out true in the scenario as long as we choose different acquaintance relations. In each sentence, these different modes of acquaintance will pick out different individuals as far as Ralph's beliefs are concerned.

(46) *Different Acquaintance Relations*

a. Ralph believes that Ortcutt is a spy.

$$\exists R . [\text{Acqaint}(R) \ \& \ R(\text{Ortcutt})(\text{Ralph})(w_0) \ \& \ \forall \langle x', w' \rangle (\langle x', w' \rangle \in \text{Dox}(\langle \text{Ralph}, w_0 \rangle) : \text{Be-a-spy}(\iota z . R(z)(x')(w'))(w'))]$$

$R = \lambda x . \lambda y . \lambda w . x$ sees y wearing a brown hat in w

b. Ralph believes that Ortcutt is not a spy.

$$\exists R . [\text{Acqaint}(R) \ \& \ R(\text{Ortcutt})(\text{Ralph})(w_0) \ \& \ \forall \langle x', w' \rangle (\langle x', w' \rangle \in \text{Dox}(\langle \text{Ralph}, w_0 \rangle) : \neg \text{Be-a-spy}(\iota z . R(z)(x')(w'))(w'))]$$

$R = \lambda x . \lambda y . \lambda w . x$ sees y on the beach in w

As pointed out by Kaplan (1969) and Lewis (1979), what counts as an Acquaintance Relation is constrained in certain ways. There must be a causal connection between the attitude holder and the *res*. One puzzle that motivates such a constraint is Kaplan's (1969) *shortest spy* case. Ralph has the belief that there is a shortest spy, a reasonable enough belief to have if you think no two spies are ever of exactly the same height. Ralph has no contact with Orcutt, but it turns out Orcutt is the shortest spy. Ralph cannot believe Orcutt is a spy qua *the shortest spy*. The report of this belief is odd too.

(47) Ralph believes that Orcutt is a spy.

Kaplan (1969) thus requires that the attitude holder “vividly associate” a particular name or description with the *res*.³⁶ There is no vivid association for Ralph for Orcutt. Lewis' Acquaintance Relations (1979) capture the causal connection between attitude holder and *res* simply because that causal connection is “built into” what it means to be a relation of acquaintance. Lewis suggests a few kinds of Acquaintance Relations:

³⁶ See Anand (2006, Chapter One) for some interesting discussion about whether we need to impose such a strong constraint of causal rapport (Kaplan 1969) between subject and *res*. The issue has to do with whether, once we control for the fact that the description in the shortest spy case gives rise to a tautological belief (possibly ruled out on Gricean principles), the non-causal cases are better. See Aloni (2001).

“It will be helpful to have a collection of examples, uncontroversial or so I hope, of the relationships in which belief *de re* is possible. I can have beliefs *de re* (1) about my acquaintances, present or absent; (2) about contemporary public figures prominent in the news; (3) about the famous dead who feature prominently in history; (4) about authors whose works I have read; (5) about strangers now face to face with me; (6) about strangers I am somehow tracing, such as the driver of the car ahead of me, or the spy I am about to catch because he has left so many legible traces; and (7) about myself”.

... “in each case, I and the one of whom I have beliefs *de re* are so related that there is **an extensive causal dependence** of my states upon his; and this causal dependence is of a sort apt for the reliable transmission of information” (Lewis 1979:541-2).

What is crucial is that the range of Acquaintance Relations includes relations that describe the “transmission” of information. Direct perception is an ideal candidate.

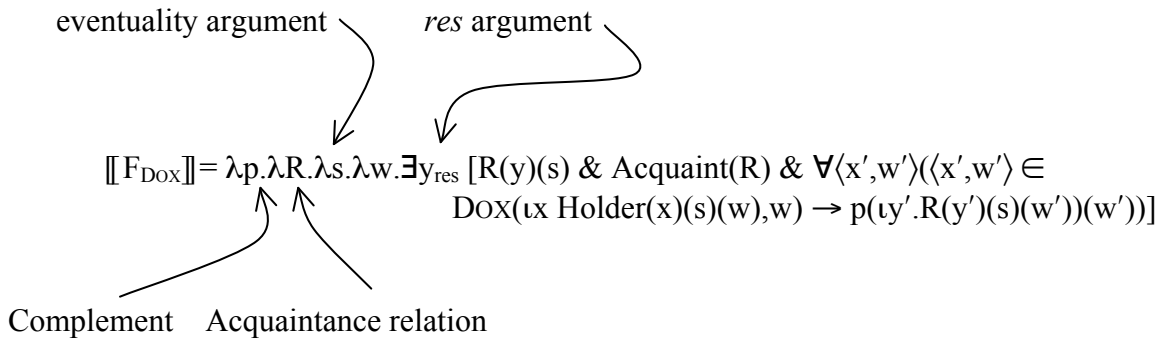
3.2. AcI: Constraining the Acquaintance Relation

In the formulation of *de re* belief in (44), the type of Acquaintance Relation is left unspecified. Exactly how the attitude holder is acquainted with the *res* is resolved contextually.³⁷ My proposal is that in AcI constructions, at least those involving perception verbs, the matrix verb actually determines the Acquaintance Relation. In the *hear* case from (34)b – *I heard her to be out of tune* – this will require that the attitude holder be put in some auditory contact with something he believes to be Mary playing out of tune.

³⁷ Questions arise as to whether the Acquaintance Relation is existentially quantified or remains a free variable (as in Abusch 1997). Existentially quantifying the Acquaintance Relation accounts for cases where the subject of attitude is quantified. Zimmerman (1991) and Heim (1993) consider cases where several attitude holders may each have *de re* beliefs about Orcutt, but they are acquainted with him in different ways.

Our strategy is to put the meaning of (*de re*) belief into the AcI complement. To that end, I propose that there is a meaningful functional head – which I will call F_{Dox} – in AcI complements which has the semantics of *de re believe* from (44). But there are two crucial changes. Here is the denotation of F_{Dox} :

(48) The Proposal for AcI



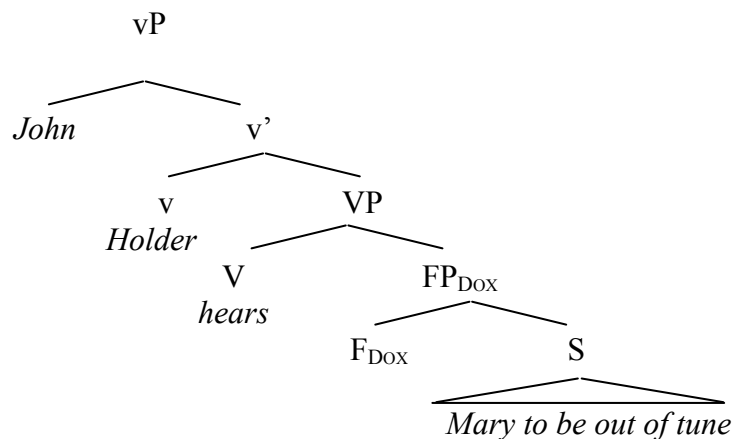
Let's walk through this. F_{Dox} has the familiar ingredients of *de re* belief but there are some differences in how those ingredients are put together. One difference between F_{Dox} and *de re believe* is motivated by the fact that the subject whose doxastic alternatives we are quantifying over in *see*-AcI constructions is the subject of the matrix verb. But the doxastic alternatives are introduced in the embedded clause with F_{Dox} . To get at the attitude holder, I follow a strategy (pursued, for instance, in Anand and Hacquard 2008) for recovering an attitude holder and hence doxastic alternatives via an eventuality argument. That is, F_{Dox} takes an eventuality argument s and finds the (unique) holder of this eventuality s (in the evaluation world), and quantifies over that individual's doxastic alternatives (in the evaluation world). As will be shown below, the eventuality argument of F_{Dox} is identified with that of the embedding verb and the head that introduces the

external argument, and this is how we will ensure – assuming states have unique holders – that it is the subject’s doxastic alternatives that are at issue.

The second – and most important – feature of F_{DOX} has to do with the Acquaintance Relation. In the formulation of *de re believe* in (44), the Acquaintance Relation was existentially closed. In F_{DOX} it is opened up. The idea is that perception verbs like *hear* ‘lambda in’ as the acquaintance relation. The result of this is that what is heard, seen, or perceived (in the actual world) is the *res*, which is what is existentially bound.

Finally, we need to make sure the complement of F_{DOX} is the right type. To do so, the clausal complement will be a property that is applied to the *res* argument. In most cases at hand, I will treat the complement clause as a property of eventualities since the *res* is an eventuality. In the attitude holder’s doxastic alternatives this property of eventualities is applied to a (counterpart by acquaintance of) the *res*. Let’s consider, then, what this does for a sentence like the following:

(49) John hears Mary to be out of tune.



The complement of F_{Dox} I simply identify as S. In this case, it will be a property of states of Mary being out of tune.

$$(50) \quad \llbracket [s \text{ Mary be out of tune }] \rrbracket = \lambda s. \lambda w. \text{Out-of-tune}(\text{Mary})(s)(w)$$

In the computations below, I'll write P for this property for ease of demonstration. F_{Dox} takes S as its first argument, forming FP_{Dox} :

$$(51) \quad \llbracket \text{FP}_{\text{Dox}} \rrbracket = \lambda R. \lambda s. \lambda w. \exists y_{\text{res}} [\text{R}(y)(s)(w) \ \& \ \text{Acquaint}(\text{R}) \ \& \ \forall \langle x', w' \rangle (\langle x', w' \rangle \in \text{Dox}(\iota x \text{ Holder}(x)(s)(w), w) \rightarrow \text{P}(\iota y'. \text{R}(y')(s)(w'))(w'))]$$

FP_{Dox} now calls for some R. That R must be a suitable Acquaintance Relation (i.e. Acquaint must be true of R). *Hear* is such a relation.

$$(52) \quad \llbracket [_{\text{VP}} \text{FP}_{\text{Dox}}(\text{hear})] \rrbracket = \lambda s. \lambda w. \exists y_{\text{res}} [\text{hear}(y)(s)(w) \ \& \ \text{Acquaint}(\lambda x. \lambda s. \lambda w. \text{hear}(x)(s)(w)) \ \& \ \forall \langle x', w' \rangle (\langle x', w' \rangle \in \text{Dox}(\iota x \text{ Holder}(x)(s)(w), w) \rightarrow \text{P}(\iota y'. \text{hear}(y')(s)(w'))(w'))]$$

The external argument is then added. Since the denotation of FP_{Dox} requires that the eventuality argument s have a holder, s must be a state with a holder. So we add Voice, Holder and the external argument:

(53) $\llbracket [\text{VP John } [\text{v}, \text{Voice [VP]]}] \rrbracket =$

$$\lambda s. \lambda w. \exists y_{\text{res}} [\text{Holder}(\text{John})(s)(w) \ \& \ \text{hear}(y)(s)(w) \ \& \ \text{Acquaint}(\text{hear}^{38}) \ \& \\ \forall \langle x', w' \rangle (\langle x', w' \rangle \in \text{Dox}(\text{tx Holder}(x)(s)(w), w) \rightarrow \text{P}(\text{ty}' . \text{hear}(y')(s)(w'))(w'))]$$

After existential closure of the eventuality argument and evaluation of the proposition at w_0 we get the following:

(54) $\exists y_{\text{res}} [\text{Holder}(\text{John})(s)(w_0) \ \& \ \text{hear}(y)(s)(w_0) \ \& \ \text{Acquaint}(\text{hear}) \ \& \\ \forall \langle x', w' \rangle (\langle x', w' \rangle \in \text{Dox}(\text{tx Holder}(x)(s)(w_0), w_0) \rightarrow \text{P}(\text{ty}' . \text{hear}(y')(s)(w'))(w'))]$

‘John bears the Acquaintance relation of hearing to some res y in w_0 and believes in w_0 of y that it is a state of Mary out of tune’

What this requires, informally, is that John hear some res y and believe of y that it is a state of Mary being out of tune. If John merely believes Mary is out of tune (and is nonetheless in a *hearing* state), then the AcI construction will be false. Thus we connect the role of the matrix verb to the attitude ascribed by allowing the embedding verb to describe the acquaintance relation.

Moreover, if John merely hears about Mary’s being out of tune – say by hearsay – then *hear-AcI* will be false, since John has not heard a state which he believes to be Mary out of tune. Recall, that this is exactly what the data shows. *Hear-AcI* doesn’t allow ‘indirect’ perception:

³⁸ This should really be the denotation of *hear*, as above, but I just write the verb name for brevity.

(55) John heard Mary to be out of tune (*from his friends)

One amendment to the formulation of F_{DOX} is necessary. Now that we have treated Acquaintance Relations like verbs, i.e. by severing the external argument, we need to add their external arguments by a separate head. This creates some technical problems for how we treat the occurrence of the Acquaintance Relation in the doxastic alternatives. Notice our F_{DOX} , repeated below, we have as usual quantified over individual-world pairs. But the consequent of the conditional in F_{DOX} doesn't contain an occurrence of the attitude holder's *de se* counterpart (i.e. x').

$$(56) \quad \llbracket F_{\text{DOX}} \rrbracket = \lambda p. \lambda R. \lambda s. \lambda w. \exists y_{\text{res}} [R(y)(s)(w) \ \& \ \text{Acquaint}(R) \ \& \ \forall \langle x', w' \rangle (\langle x', w' \rangle \in \text{DOX}(\iota x \text{ Holder}(x)(s)(w), w) \rightarrow p(\iota y'. R(y')(s)(w'))(w'))]$$

We need to fix this. The denotation of F_{DOX} should read:

$$(57) \quad \llbracket F_{\text{DOX}} \rrbracket = \lambda p. \lambda R. \lambda s. \lambda w. \exists y_{\text{res}} [R(y)(s) \ \& \ \text{Acquaint}(R) \ \& \ \forall \langle x', w' \rangle (\langle x', w' \rangle \in \text{DOX}(\iota x \text{ Holder}(x)(s)(w), w) \rightarrow p(\iota y'. R(y')(s)(w') \ \& \ \underline{\text{Holder}(x')(s)(w')}(w')))]$$

The *de se* counterpart is thus the holder of the Acquaintance Relation in the doxastic alternatives, which is crucial to make the complement a centered proposition (Lewis 1979).

Questions now arise as to whether this strategy is true for all the verbs we have looked at. There are two questions here. First, we predict that whether a verb can appear

in this kind of AcI construction is determined by whether it can describe a suitable Acquaintance Relation. And second, we seem to be making the strong prediction that the embedding verb in AcI is that very same verb that appears in, say, direct perception reports. In the latter case, this appears to be true for verbs like *perceive* and *hear*. However, there are non-perceptual uses of *see*, for instance, that can be used in the AcI construction.

- (58) a. John sees a new syntactician to be needed.
b. John sees there to be fewer problems with the piece now.

It is unavoidable, I conclude, that we admit that *see* with an AcI complement can describe a different kind of seeing than *see* with a bare infinitival complement. It is difficult to tell whether this *see* describes a suitable Acquaintance Relation, because there could just as well be a bleached use of *see* that does not require literal visual acquaintance, but rather some cognitive contact with a state of affairs. (The case above, say, involves a belief about the needs of a department).

Of course, for the skeptic, this just means that the project of deriving the differences in meaning from the complement alone is on the wrong track. One could say that there are more *sees* than I have suggested, each with different complement-taking options. But that approach *still* wouldn't capture why belief-ascribing *see* went with AcI complements but not bare infinitival complements. (Recall, there is nothing inherent in bare infinitives that prevent them from serving as complements to intensional operators, such as modals.) The *see* that appears with AcI is semantically bleached, then: the kind of

Acquaintance Relation it describes doesn't just have to be visual. But the major claim of this chapter remains: the quantification over doxastic alternatives is in the complement clause. That's how we ensure that *see* only means believe when it combines with clausal complements.

However the lexicalization properties of *see* are accounted for, there are probably clearer cases where we don't want to say that the embedding verb describes the Acquaintance Relation. The verb *believe* itself is troublesome on this account because we've given the AcI complement the semantics of *de re believe*. So what would the actual embedding verb do? In the next section, I will offer suggestions for *believe*.

3.2.1 *Believe and AcI*

We have several options for treating *believe* when it takes an AcI complement. The first option is to let the verb *believe* have its Hintikka-style semantics – one where the quantification over doxastic alternatives is built into the verb itself. There are some advantages to this approach, since it means that *believe* merely takes a propositional complement (or, if it's a *de re belief*, a property complement). This comports with the impression that *believe* describes the same kind of attitude whether it takes a finite or infinitival complement.

(59) John believes Mary to be out of tune/that Mary is out of tune.

See-type verbs, then, would be special in needing the functional head F_{Dox} to report attitude ascriptions. This option has the advantage of keeping the semantics clean – only

proposing F_{Dox} where it has the most motivation (i.e. with *see*-type verbs) – but at the cost of a non-uniform treatment of AcI. Moreover, we’re left with looking for an explanation as to why bare infinitives can’t be used to report attitudes under *believe*.

A second option for *believe* is to put the attitude in the complement clause as well. This involves rethinking the lexical semantics of *believe* to allow it to compose with F_{Dox} . As noted, it is not clear that *believe* describes a suitable Acquaintance Relation, so we probably don’t want to treat it as we did *hear* and *perceive*. We might imagine, however, that if an embedding verb doesn’t saturate the Acquaintance Relation of F_{Dox} , the Acquaintance Relation could be closed off by existential closure. All the embedding verb would do is simply provide the state from which we recover the holder and her doxastic alternatives. This means that even *believe* doesn’t take a propositional complement. Perhaps it describes a mere belief state:

$$(60) \quad \llbracket \textit{believe} \rrbracket = \lambda s. \lambda w. \textit{believe}(s)(w)$$

On the assumption, described above, that if a verb can’t saturate the Acquaintance Relation of F_{Dox} , then that argument is by default existentially closed. FP_{Dox} would have the following denotation.

(61) *Default Existential Closure of R*

$$\llbracket FP_{\text{Dox}} \rrbracket = \lambda s. \lambda w. \exists R. \exists y_{\text{res}} [\textit{R}(y)(s)(w) \ \& \ \textit{Acquaint}(R) \ \& \ \forall \langle x', w' \rangle (\langle x', w' \rangle \in \textit{Dox}(\textit{tx} \ \textit{Holder}(x)(s)(w), w) \rightarrow \textit{P}(\textit{ty}' \ \textit{R}(y')(s)(w'))(w'))]$$

FP_{DOX} composes with *believe* via predicate conjunction. After the external argument is added, the computation returns the following:

(62) $\llbracket \text{John believes Mary to be out of tune} \rrbracket$

$$= \lambda s. \lambda w. \exists R. \exists y_{\text{res}} [\text{Holder}(\text{John})(s)(w) \ \& \ \text{believe}(s)(w) \ \& \ R(y)(s)(w) \ \& \ \text{Acquaint}(R) \ \& \ \forall \langle x', w' \rangle (\langle x', w' \rangle \in \text{Dox}(\iota x \text{Holder}(x)(s)(w), w) \rightarrow P(\iota y'. R(y')(s)(w'))(w'))]$$

$$= \exists s. \exists R. \exists y_{\text{res}} [\text{Holder}(\text{John})(s)(w_0) \ \& \ \text{believe}(s)(w_0) \ \& \ R(y)(s)(w_0) \ \& \ \text{Acquaint}(R) \ \& \ \forall \langle x', w' \rangle (\langle x', w' \rangle \in \text{Dox}(\iota x \text{Holder}(x)(s)(w_0), w_0) \rightarrow P(\iota y'. R(y')(s)(w'))(w'))]$$

‘There is a belief state, whose holder is John, and that state’s unique holder (=John) believes *de re* of *y* that it is a state of Mary out of tune’

Putting the meaning in the complement in the case of *believe* poses difficulties, of course.

I will leave it an open question as to whether we want to pursue a decompositional approach for *believe*. (But see Kratzer 2006, 2009a for one way of giving *believe* a non-Hintikka-style semantics; see also Chapter Two.) When I discuss the syntactic implementation of F_{DOX} , the treatment of *believe* will be relevant again.

3.3. Predictions: stativity and belief attribution

There are two features of the analysis that make certain predictions about what verbs allow AcI complements. The first is a stativity requirement imposed on verbs that can embed AcI. The second feature is that AcI complements report beliefs. Both predictions are borne out. In the latter case, this feature will help us provide a

characterization for the variability in judgments about which verbs allow AcI complements.

3.3.2 Stativity Requirement

F_{Dox} requires that the embedding verb provides an eventuality argument from which the attitude holder and her doxastic alternatives are recovered. Since states, not events, have unique holders, the verbs that tolerate AcI complements are going to be just those verbs that describe states with holders. This appears to be borne out. As Pesetsky (1991) discovered, all AcI verbs are stative:

- (63) believe, consider, fancy, hold, judge, suspect, presume, recognize, remember, understand, figure, find, imagine, reckon, regard, feel, know, take, ?gather

Interestingly, as Pesetsky suggests, some AcI verbs can describe events when they take non-AcI complements, but when they take AcI complements, they are stative. While more sophisticated tests could be devised to test stativity/eventivity, it is sufficient to see that some verbs (like *consider*) can be used in the progressive when they take either DP or CP complements, but not with AcI complements:

- (64) a. John was considering his options.
 b. #John was considering his options to be bad.
- (65) a. John was judging every act of Mary's.
 b. #John was judging Mary's actions to be upsetting.
- (66) a. John was thinking that Mary was crazy.
 b. #John was thinking Mary to be crazy.
 c. (cf. Mary wasn't as crazy as John thought her to be)

Consider can describe an activity when it takes a DP complement; when it takes an AcI complement it describes a state. Some verbs, on the other hand, in virtue of their lexical semantics, do not have lives as descriptions of states. The verbs *watch* and *witness*, while similar to *see*, then simply fail to compose with F_{DOX} because they don't describe states:

- (67) a. *Rita watched/witnessed Mary to be upset.
 b. Rita witnessed that Mary was upset.

The manner of speech verbs likewise don't tolerate AcI. We can tell that manner of speech verbs are eventive because they report repeated events when they are put in the progressive. If John was shouting to Mary that he was in danger for several hours he has to shout that more than once (not even a very long, drawn out shout will do). States don't require this:

- (68) a. For several hours, John was shouting to Mary that he was in danger.
b. For several hours, John believed that he was in danger.

And these verbs do not tolerate AcI at all:

- (69) *John shouted/whispered/screamed/pouted/giggled/muttered himself to be in danger.

An event of muttering just can't also be a state with a unique holder.

3.3.3 Belief attribution: a source for Lexical Variation

The second feature of F_{Dox} is that it requires that an AcI construction report belief. This feature takes on an interesting twist when we look at variation among verbs. What I would like to do is explore some of the variation in AcI-taking verbs from this perspective. That variation gives us some evidence for the view that the attitude is built into the AcI complement, not necessarily the embedding verb.

Pesetsky (1991: 23) noted that “there is an unfortunate degree of fuzziness in people’s judgments concerning AcI”. Indeed, of the predicates Postal (1974) claimed could not take AcI – a sample is in (70) – Kayne responds that “we do not find Postal’s ... facts to be at all clear; that is we accept [AcI] with almost all the cited verbs” (Kayne 1984:121 ft 15).

(70) He { alleged
acknowledged
affirmed
conceded
demonstrated
discerned
established } Melvin to be a pimp. (Postal 1974:304(40))

Kayne's is a common reaction in the literature. Similar remarks are leveled against other works where inventories of AcI-taking verbs are compiled (e.g. Collins' 2002 review of Bošković 1997, see also Rooryck 1997). It could be, of course, that there are simply different idiolects at work: Kayne speaks a different English than Postal. But the fuzziness – not only its nature but the very fact that such variation exists – tells us something important. If we can find what factors affect the availability of AcI this should tell us what it requires to have an AcI complement.

Pesetsky (1991) suggests that the grammaticality of AcI is subject to the following cline: predicates that describe manner of speech and content of speech verbs, like *mutter* and *admit*, respectively, are much less comfortable with AcI complements than verbs that describe, in Pesetsky's terminology, changes of mental state (like *confirm*). These are in turn much less comfortable than verbs that describe mental states, like *assume* and *believe*. (The judgments indicated below are Pesetsky's.)

- (71) a. *Bill muttered Sue to be happy.
b. ?*Bill admitted Sue to be happy.
c. ??Bill confirmed Sue to be happy.
d. ?Bill assumed Sue to be happy.
(Pesetsky 1991:23(92))

The following table, adapted from Pesetsky (1991:23(93)) and using his labels, confirms that the variability follows the lines just suggested.

(72) *Lexical factors affecting AcI acceptability judgments*

< -- worse ----- better -- >

Manner of speech verbs	Content of speech verbs	Change of mental state	Mental activity verbs	Belief verbs
Grunt	Say	Confirm	Assume	Believe
Moan	Affirm	Decide	Imagine	Hold
Mumble	Agree	Discover	Presuppose	Consider
Mutter	Announce	Realize	Recollect	Fancy
Say	Assert	Resolve	Think	Feel
Whisper	Avow	Verify		Find
	Conjecture	Wager (mental guess)		Judge
	Declare			Know
	Wager (verbal bet)			Suppose
				Suspect
				Understand
				Remember
				[+Perception verbs: see, hear, perceive]

The classification above is not absolute – there are some predicates that can be “pushed” into taking AcI complements. In part, the table above classifies verbs based on their aktionsart properties (the event vs. state distinction already noted). We’ve already seen the role the stativity plays for AcI. But there is another point of lexical variation that is relevant for determining the acceptability of AcI: belief. I’ll concentrate on a few cases where we can bring out some contrasts.

3.3.4 I'd say AcI means something

The verbs in the first two columns of the chart in (72) do not ascribe beliefs to their subjects. The simplest way I know of to determine whether an embedding verb ascribes belief is to see whether it can report a lie. The true *verba dicendi*, the *manner of speech verbs*, and the verbs Pesetsky calls *content of speech* can report a lie. Those verbs that are perfect with AcI cannot. (I omit the factive verbs, of course, since they always entail belief.)

(73) He {whispered, said, asserted, declared, conjectured, ...} that Mary was guilty...but he knew she wasn't.

(74) He {believed, held, fancied, suspected, understood, remembered, assumed...} her to be guilty/that she was guilty ... #but he knew she wasn't.

This is a simple point about attitudes, but it interacts with AcI – and gets rather interesting when we look at the verbs where the grammaticality judgments concerning AcI are not stable. Take *say*, which on simple inspection is not an AcI taking predicate (Postal 1974). In fact, it seems to be the one verb that people agree cannot AcI, at least when they are presented a sentence like the following:

(75) *The doctors said John to be sick.

But there are actually grammatical examples of AcI with *say* – and, as we will see shortly, the *say* here is one that requires the subject to believe the content of the

complement. And that's precisely what the analysis predicts. Here's a sample of naturally occurring examples of AcI with *say*. The first several are from contemporary speakers. I don't mean to suggest these are perfect. What's important is that AcI with *say* is attested, and the examples below are better than (75).

- (76) a. I have seen about 10 movies from Colin and I would say him to be a height of between 5ft9.75" (177cm) and 5ft10" (178cm)...
(<http://www.celebheights.com/s/Colin-Farrell-96.html>)
- b. After seeing a lot of his vids I would say him to be a lil over 9NBP by a little over 6. (<http://www.mattersofsize.com/forum/showthread.php?t=11872>)
- c. Some would say her to be more than handsome, if not pretty.
(<http://forums.worldofwarcraft.com/thread.html?topicId=14990770355&sid=>)
- d. A girl of my dreams - I would say her to be.
(<http://www.helium.com/items/715875-poetry-humorous>)
- e. I would say him to be about the size of the foal of a horse.
(*New Comedies*, Lady Augusta Gregory 1913.
<http://infomotions.com/etexts/gutenberg/dirs/1/1/7/4/11749/11749.htm>)

The most telling property of *say+AcI* is the presence of *would*, which improves the AcI version. AcI is degraded – not impossible – without it:

- (77) a. I'd say him to be about the size of a foal.
b. ?I said him to be about the size of a foal.

The collocation *would-say* brings out the use of *say* that reports an opinion – this is one of the many uses of *say*. As with other belief reports, the continuation below is a contradiction.

- (78) a. I'd say that he's about 5 foot. #...but I know he's not.
b. I'd say him to be about 5 foot. #...but I know he's not.

It is important to distinguish this form from the compositional *would say*, which doesn't implicate belief on the part of the subject:

- (79) If I were you, I'd just say that she's about five feet tall, even though we know she's shorter.

This kind of speech report is simply not possible with ACI:

- (80) # If I were you, I'd just say him to be about five feet tall, even though we know he's shorter.

I don't know why the modal *would* makes it easier to understand *say* as describing a belief or opinion,³⁹ nor do I know if these are two different uses of *say* or different verbs.

³⁹ *Would* is not necessary in this respect. Present tense (a generic here) brings out the opinion meaning:

- (i) They say that he's taller than Mary, #but they know he isn't.

I think ACI is possible here as well.

- (ii) They say him to be taller than Mary.

What's important is that there *is* a use of *say* that reports a belief – perhaps in addition to its properties as a verb of communication. And it can be used, although somewhat marginally, with AcI.

Wager – another verb typically taken to resist AcI (Pesetsky 1991) – also has a use that implicates belief and this is brought out with *would* as well. It, too, allows AcI:

- (81) I'd wager him to be on the wrong side of fifty and you're young enough to be his daughter.
(*Preseli Bluestones*, Sion Pysod.
<http://homepages.which.net/~j.fish/aderyn3.htm>)

The manner of speech verbs seem never to be used as verbs that report opinions in this way even with finite complements. The modal *would* can only be interpreted in its usual sense:

- (82) I'd whisper/shout/scream/mutter that he's about five feet tall.

And this is consistent with the fact that they quite squarely resist AcI:

- (83) *I'd whisper/shout/scream/mutter him to be about five feet tall.

The fact that verbs like *say* and *wager* are forced into reporting beliefs with AcI bears out the analysis. Moreover, the general strategy of putting the attitude ascription in the embedded clause actually predicts that we would find cases where verbs like *say* – which don't necessarily report belief – must report belief with AcI complements.

So *say* and *wager* can take AcI as long as they assume a meaning that describes an opinion. Some work needs to be done to bring out these uses of *see* and *wager*, and so it is not surprising that some speakers may not access those uses in out-of-the-blue presentation – especially if the complement doesn't express something naturally subject to opinion. Verbs like *believe* and others are always compatible with F_{DOX}. *See*-type verbs, in turn, are possible in AcI as long as they describe states and can make suitable Acquaintance Relations.

3.4. The judgment effect

As noted, many AcI constructions describe subjective opinions, and as such they require that the complements contain predicates that describe subjective properties. So a predicate like *Canadian*, which normally describes someone's citizenship, is interpreted in certain AcI constructions as a judgment about someone's behavior or appearance, a subjective property (Borkin 1984):

- (84) a. I see that she's Canadian.
b. I see her to be Canadian.
- (85) a. We found that she is Canadian.
b. We found her to be Canadian.
- (86) a. We heard that she is Canadian.
b. We heard her to be Canadian.

These kinds of subjectivity effects are reminiscent of a class of predicates that are also known to be subject to personal or subjective opinion – the so-called predicates of personal taste, like *fun* and *tasty*. They are noted for giving rise to “faultless disagreement” (Kölbel 2003). That is, while A can disagree with B about the tastiness of something, there is a sense in which they are both right:

- (87) A: This tastes good.
 B: No it doesn't.

The interpretation that appears to be forced upon the embedded predicates in AcI complements has a similar quality. Below, there needn't be the sense that one of the attitude holders is correct and the other false. Rather, it's just the way they judged Mary's qualities.

- (88) a. John sees Mary to be Canadian, but Fred doesn't.
 b. The INS sees Mary to be Canadian, but the Ministry of Foreign Affairs doesn't.

We might wonder, then, if the operative distinction between finite and AcI complements is that AcI complements are forced to contain predicates of personal taste, coercing otherwise matter-of-fact predicates (like *be Canadian*). The answer is no, but it's worth showing why.

Lasersohn (2005) argues that predicates of personal taste (POPTs) require an enrichment to the procedure of semantic interpretation. Specifically, part of the index in evaluating a sentence will include, in addition to a context (c), world (w), and time (t), a

judge (j). The meaning of a predicate of personal taste, like *tasty*, is sensitive to the value of the judge while a non-judge-dependent predicate (like *Canadian*) is not:

- (89) a. $[[\text{tasty}]]^c; w,t,j = \lambda x. x \text{ is fun for } j \text{ in } w \text{ at } t$
 b. $[[\text{canadian}]]^c; w,t,j = \lambda x. x \text{ is canadian in } w \text{ at } t$

Lasersohn argues that this captures the phenomenon of faultless disagreement.⁴⁰ Important for us is what happens under attitude verbs. When a POPT is embedded under an attitude verb we typically take the perspective of the attitude holder, and so the judge is typically construed as the attitude holder. This is what Lasersohn calls an autocentric stance. A different perspective – and exocentric one – is possible though. Examples like those found in Stephenson (2007) make this point. In the following, the tastiness of the cat food can be assessed by the attitude holder John or by the cat Mittens.

- (90) John thinks the cat food is tasty.
 a. *because he likes tuna,* j = John
 b. *because Mittens gobbled it up* j = Mittens

⁴⁰ Specifically, it allows (i)B to negate the content of the sentence in (i)A. The content of A's statement is a function from indices $\langle w,t,j \rangle$ to true or false iff the cake tastes good to j in w at t. Speaker B negates this content. She's not negating *Tastes good to A*, which is bad, but *tastes good to j*.

(i) A: The cake tastes really good.

B: No it doesn't.

Lasersohn shows that a competing analysis, whereby the “judge” is an indexical, is not correct.

Both Stephenson and Lasersohn note that some attitude verbs actually *require* that the judge for an embedded predicate be the attitude holder – they do not permit the ambiguity that *think* does. Surprisingly, these are usually small clause or AcI complements (see Borkin 1984 for the original observation). The following example, with *find*, is modeled after Stephenson (2007):

- (91) After watching all the cats try the new food, the researchers could get a sense of which food was cat-tasty.

#The researchers found the tuna mixture tasty.

This suggests that the researchers ate the food (Borkin 1984, Stephenson 2007) We might then suspect that what AcI does is *force* complements to contain predicates of personal taste (or coerce those that aren't) and require that the attitude holder be the judge for those predicates.

However, while *find* shows this behavior (especially with small clause complements), AcI complements in general do not. For instance, *see* with an AcI complement – although it reports an opinion – does not force the attitude holder to be the judge for a predicate of personal taste:

- (92) After watching all the cats try the new food, the researchers could get a sense of which food was cat-tasty.

The researchers see the tuna mixture to be tasty (...but their RAs don't).

This does not imply that the researchers were the judges of *tasty* in any way that requires them to have eaten the cat food. Furthermore, as Stephenson notes, the presence of an overt “judge” is odd with *find* (presumably because the verb simply requires the judge to be the attitude holder) but fine with *think* (which doesn’t):

- (93) a. The researchers thought that the tuna mixture was tasty to the cats.
b. *The researchers found the tuna mixture tasty to the cats.
(after Stephenson 2007)

AcI constructions, however, are fine with an overt judge argument, even with *find*:

- (94) The researchers saw/considered/found/ the cat food to be tasty to the cats.

This is not to suggest that there aren’t attitude verbs that, as Stephenson and Lasersohn show, require judge-dependent predicates in their complement. Nonetheless, it is not a property of AcI constructions.

This is a welcome result, too, since there are plenty of AcI complements that do not coerce predicates in their complements to be judge-dependent, such as *believe* and *hold*:

- (95) John believes/holds/knows/understands her to be Canadian.

These sentences simply report John’s beliefs (or understandings, etc.) about someone’s citizenship.

Of course, we are still going to have to understand *why* the AcI complements of verbs like *see* and *hear* must describe opinions about subjective matters. We don't have to worry too much about this yet, however, since there are uses of these verbs that have the same requirement. I turn to these uses next.

3.4.5 Intensional transitive perception verbs

Many of the perception verbs that can take AcI can also take opaque nominal complements. These are the opaque transitive uses of *see* discussed by Zimmerman (1993), among others. An example is given below:

(96) (Looking out at some dark figures across the lake), John sees a moose.

The object position has the features we expect of an opaque position, such as failure of substitution of extensional equivalents and lack of existential import. In terms of the latter test, (96) of course does not imply that there is a moose. Other perception verbs have uses as intensional transitive verbs as well.

- (97) a. As for the identity of the instrument, John hears a lute, not a guitar.
 b. ...#but he believed it was a guitar.
 c. ...^{ok}but it really was a guitar.
- (98) a. As far as the identity of the object, John perceives a ghost.
 b. ...#but he believes it's just a billow of smoke.
 c. ...^{ok}but it really was just a billow of smoke.

The judgment flavor we found with AcI is present in these constructions. That is, there are intensional transitive uses of *see* and *hear* that report opinions like AcI does.

- (99) Given the state of the building, the tenants see a collapsed house.
- (100) a. In Mary, John sees a Canadian/Mary to be a Canadian.
 b. John hears a lute/it to be a lute.

The semantics of intensional transitive verbs is a topic of much research (Zimmerman 1993, Moltmann 2003, Schwarz 2008) and it goes beyond the scope of this chapter.⁴¹ Crucially, though, the judgment requirement of these complements is replicated in their transitive versions, and so it is not a property of AcI constructions in general, but of the

⁴¹ The situation here is a little different from other intensional transitive verbs, like *look for* and *seek* and perhaps *need* (see Schwarz 2008 on differences among these). These do not take finite clause complements either, but there is a general incompatibility, it seems, between the kinds of modality involved and finite clauses (*?John needs that he leave*). In fact, there is a general question of course about why verbs like *want* and *need* do not take finite clauses. The question of why *see* doesn't take a finite clause in its (non-factive) epistemic meaning is a different kind of puzzle, because it appears that finite complements are generally available to express what the AcI complement of *see* appears to express.

kinds of beliefs that verbs like *see* and *hear* report when they are used as intensional verbs. The existence of intensional transitive perception verbs poses a complication for the proposal made here. If *see* type verbs do not in and of themselves involve belief, then some extra material is going to be needed to get opacity in these DP-taking cases just as in AcI. I leave this for future research.⁴²

4. The syntactic distribution of F_{DOX}

See AcI constructions report de re beliefs and part of the analysis involved putting the belief component inside the AcI complement itself. I identified a meaningful functional head, F_{DOX} . The basic claim, then, is that *see* only means believe when there is F_{DOX} . Direct perception reports, then, must simply not have F_{DOX} . But we need to make sure that the presence of F_{DOX} lines up with the syntax we observe. Here it is helpful to have some basic syntax about AcI constructions on the table.

4.1. AcI constructions: some history and syntax

AcI constructions have played a central role in generative syntax. The interest in AcI constructions – now standard textbook fare – revolves around the status of the accusative-marked noun phrase (i.e. *her* (in a)).

⁴² Deal (2008) has suggested intensional transitive verbs might require the use of a modal subordinating head that introduces modal quantification. This is consistent with the ‘meaning in the complement’ approach taken here.

- (101) a. I believed her to be sick.
 b. We hold these truths to be self-evident.

It's well established that the embedded subject is not a semantic argument of the matrix verb. Besides evidence from idiom expletives and chunks (*He believes there to be a problem/believes advantage to have been taken*), the scopal behavior of the embedded subject shows that it enjoys a position inside the embedded clause. This fact serves to argue against a possible objection to the very characterization of AcI complements of *see* as clausal complements. In particular, one might treat AcI-taking *see* as a 3-place predicate – a type of ditransitive – essentially an object control verb (see e.g. Bach 1977, Chierchia 1984:251 for such an approach to AcI constructions).^{43,44} The question is whether these infinitival constructions receive, then, the parse in (102)a or (102)b?

- (102) a. Martha saw [him_i] [PRO_i to be driving too fast]. *Object control analysis*⁴⁵
 b. Martha saw [him to be driving too fast]. *AcI analysis*

⁴³ Other frameworks, which pursue a kind of lexicalist treatment of AcI (following Bresnan (1982)) don't assume movement, but they do offer a view sophisticated enough to allow the matrix object to bear certain relations to the embedded clause (see, e.g., the head driven phrase structure grammar approaches in Pollard & Sag 1994; Sag, Wasow & Bender 2005). I imagine anything I say here is compatible with these frameworks.

⁴⁴ Of course, as we saw in Chapter Three, *believe* is often give a 3-place analysis as a *de re belief* (Quine 1956, Kaplan 1969). The extra argument might be the *res*. The data presented below show **conclusively** that the embedded subject/raised object in AcI constructions is not the syntactic expression of the *res* argument.

⁴⁵ Chierchia (1984) doesn't actually posit a controlled PRO. His 3-place analysis of AcI is couched in theory of property type meanings for infinitives without PRO.

That the AcI analysis is the right one is demonstrated by the fact that the embedded subject can receive a narrow scope interpretation (Partee 1973):

(103) John believes a communist to have been at the heart of the plot.

(Partee 1973)

There needn't have been a communist of which John believed anything. Below, I test the scope of the embedded subject with respect to an embedded predicate, because this makes it most clear that the embedded subject can be interpreted inside the complement clause. (It can also be interpreted in the scope of the attitude verb, of course.) In the following two cases of AcI, the indefinite embedded subject can be interpreted narrow scope and opaque with respect to *need*.

(104) a. Martha sees a new syntactician to be needed – any one would do.

b. Martha believes a new syntactician to be needed – any one would do.

A new syntactician falls under the scope of *need*: (104)a can mean that *Martha believes that what's needed is some syntactician or other*. It can, but needn't, mean that there is a particular syntactician she believes is needed.⁴⁶

⁴⁶ This doesn't exhaust the scope possibilities for the indefinite (especially when we consider various combinations of scope and opacity/transparency options available). What's important here is that the indefinite can be interpreted narrow scope, opaque with respect to the embedded *need*. I am collapsing here the distinction between narrow scope for the quantifier and the opacity/transparency of the description (Fodor 1970), which cross-classify to some extent. All that is important here is that it can get a narrow scope, opaque reading with respect to *need*.

- (105) There is a new syntactician that Martha sees/believes to be needed #any one would do.

The position the embedded subject occupies, then, is one that can scopally interact with predicates in the embedded clause. (104)a expresses the proposition in (106). In all worlds that satisfy the relevant needs, there is a (possibly) different syntactician (according to Martha's beliefs). I give predicates like *syntactician* a world variable (assuming it is bound syntactically, see Percus 2000).

- (106) $\lambda w. \forall w'(w' \in \text{Dox}(\text{Martha}, w) \rightarrow \forall w''(w'' \in \text{ACC}_{\text{need}}(w') \rightarrow \exists x(\text{syntactician}(x)(w''))))$

We would not generally expect *a new syntactician* to be able to scope below *need* if it were a matrix argument, much as this is not possible in (107):⁴⁷

- (107) John sees of a new syntactician that he or she's not needed.
*A new syntactician > need; *Need > a new syntactician*

⁴⁷ I am not confident whether it would be technically *impossible* to invent a way to get the low scope reading while treating *a syntactician* as a matrix argument, but it would considerably complicate the raising/control distinction. The usual evidence for expletives and idioms should be enough to support the AcI diagnosis for these cases of *see*:

- (i) a. Martha sees there to be a problem with this account.
 b. Martha sees too much advantage to have been taken of her time.

I think the reconstruction evidence is the strongest, since it doesn't rely on assumptions about idiom chunks and difficulties with expletives (e.g. while object control verbs resist expletives, this could be the result of the semantics of verbs like *persuade* as opposed to *force*, for instance).

The simplest account, then, is that the embedded subject belongs in the embedded complement, at least at one level of representation. The AcI construction is a clausal complement.

The second question posed by AcI constructions is the position the embedded subject ends up in. Postal (1974) argued that it occupied an object position in the matrix clause at surface structure. Bresnan (1972, 1976) and Chomsky (1981) allow it to remain in the embedded clause and yet still bear the grammatical function of an object (the exceptional case marking approach). And the debate has gone back and forth several times (see Johnson 1991, Runner 1995, and Runner 2006). At no point will this chapter decide this question, nor will the evidence I offer about AcI bear on it.

Another question about AcI is the categorical status of the infinitive. Here it is instructive to distinguish the AcI complements from a number of other similar types of embedded non-finite complements, for which the observations made here do not hold, but are quite reliably different kinds of constructions. Since Bresnan (1972) and Postal (1974), at least two different kinds of infinitival constructions with overt, accusative subjects are distinguished. One class is what I have been calling the AcI construction, identified by Postal as the *believe*-class. In contrast there are constructions superficially similar to AcI, typically found under bouletic or desiderative attitude verbs like *want* (hence the *want*-class) which show a slightly different behavior. In *want*-class infinitives, as in (108)a, the embedded subject does not enjoy full status as a matrix object.⁴⁸ Passivization cannot promote the embedded subject (108)b. In addition, a

⁴⁸ Lasnik and Saito (1991) offer additional evidence from binding that purports to show that *W*-class construction's embedded subjects cannot move into the matrix clause.

complementizer, *for*, can appear with *want*-class verbs. This can be seen most clearly when the complement is extraposed (108)c or fronted (108)d:

- (108) a. John wants/needs/would like/would hate there to be a better solution.
b. *There is wanted/needed/liked/hated to be a better solution.
c. What John wants/needs/would like/would hate is for there to be a better solution.
d. For there to be a better solution, that's what I want/would like/need most.

AcI constructions show the opposite behavior, allowing passivization but not an overt complementizer, and so they do not allow the infinitival complement to appear removed from its embedding verb.

- (109) a. John believes/sees/hears/holds/considers there to be a better solution.
b. There was believed/seen/heard/held/considered to be a better solution.
c. *What John believed/seen/heard/held/considered is there to be a better solution.

The *want*-class verbs are also different from the *AcI* predicates in allowing control:

- (110) *Want-class vs. AcI: control*
a. John wants/needs/would like/would hate to be a better linguist.
b. *John believes/sees/hears/holds/considers to be a better linguist.

A standard approach to this range of facts, due primarily to Bresnan (1972), is that the infinitival complements to *want*-class verbs are headed by a complementizer, which can appear overtly as *for*. This complementizer, often null, is sometimes treated as the case

marker of the embedded subject, while in AcI constructions, it is the embedding verb (like *believe*) which is responsible for licensing the embedded subject (abstract case being the most widely assumed mechanism). A further assumption is required to block passivization in *want*-class complements. This is usually reduced to a general ban on letting arguments undergo A-movement from clauses headed by complementizers. Cashing this out is non-trivial. (See Bošković 1997 for an earlier attempt, as well as recent approaches making use of the Phrase Impenetrability Condition – see recent discussion by Nevins 2004). And it is by no means uncontroversial that there is a null version of *for* that licenses case on the embedded subject in (108)a (Pesetsky 1991, McFadden 2008). What I wish the reader to take away from this is simply that the kind of infinitives found with these verbs are sufficiently distinct to warrant a different treatment, and that the very ability of these clauses to appear with a complementizer is all that needs to be established at this point.

The AcI construction, on the other hand, never shows any presence of a complementizer, null or otherwise. Following Bresnan's suggestion, it appears to be the case that the complementizer *for* is simply incompatible with the semantics of the AcI verbs (see Portner 1992):

(111) *AcI verbs incompatible with for complementizer*

*What John sees/considers/believes/heard was for Mary to be Canadian.

In the Government and Binding literature (and much of what followed), AcI constructions are treated on a par with raising constructions. And when it comes to raising, there is evidence that complementizers are absent. Here we turn to languages that

express complementizers in non-raising constructions. Italian, for instance, allows control under verbs like *sembrare* and *parere*. Here there is a complementizer *di* (see Kayne 1984 for evidence that this is a complementizer), and the dative argument (*mi* below) controls the null infinitival subject:

(112) *Control complements with complementizer*

Mi	sembra/pare	di	aver	capito
to-me	seems/appears	Comp	to-have	understood.
'I seem to have understood.'				
(Kayne 1984:106(30))				

When these verbs are used as raising predicates, however, the complementizer *di* is ungrammatical:

(113) *Raising complements do not have complementizers*

Gianni	sembra/pare	(*di)	essere	partito.
Gianni	seems/appears	Comp	to-have	left.
'Gianni seems to have left.'				
(Kayne 1984:106(27))				

Icelandic is helpful in this respect as well, since it has AcI constructions of the English sort and it has complementizers that head non-finite clauses under verbs of acceptance (the 'simultaneous' complements). The complementizer *að* is compatible with control

verbs⁴⁹, but not with raising or AcI. In (114), the verb *claim* embeds a non-finite complement with a controlled subject and the complementizer is present.

(114) *Control Verbs compatible with Complementizer*

Þess vvegna	fullyrðir	Pétur	að	hafa	oft	hugsað	um
Therefore	claimed	Peter	COMP	to.have	often	thought	about

foreldra sína.
parents his.

‘Therefore, Peter claimed to have often thought about his parents.’
(Johnson and Vikner 1998:(6))

With both raising and AcI complements, the complementizer is prohibited:

(115) *Raising and AcI verbs incompatible with for complementizer*

a. Maria hafði	virst	(*að)	hafa	vasað upp	diskana
Mary had	seemed	Comp	to.have	washed up	the.dishes

‘Mary had seemed to have washed up the dishes’

b. Eg tel	(*að)	hana	hafa	borðað	epli
I believe	Comp	her	to.have	eaten	an.apple

‘I believe her to have eaten an apple’

⁴⁹ In this case, the complementizer is not limited to the kinds of bouletic verbs that the English non-finite complementizer *for* is. This means that the unavailability of the complementizer in the raising and AcI constructions can’t merely be attributed to a “clash” in the semantics of the verb with the complementizer. In fact, *að* is compatible with finite complements of the *belief* sort, here under *say*.

(i) Hann segir að hún lesi bækur
He says that she reads books
(Thráinsson 1993 (13))

The classic Government and Binding approach (see especially Kayne 1984, and Chomsky 1981) sought a general correlation: control complements (here included are *want*-class infinitives with overt subjects) are headed by a complementizer, whereas raising complements (which includes AcI) are smaller, Inflectional Phrases (IPs) or Tense Phrases (TPs).⁵⁰ The control theory of this era was designed so that control complements had to have more “structure” separating the matrix verb from the embedded subject position – theories of government made this connection (see Chomsky 1981).

With the advent of Minimalism, the government approach to control was abandoned, and so with it went the CP~IP distinction for handling control. Bošković (1997) and Martin (1996, 2001), spell out a theory of control that does not rely on the presence of a complementizer for control. They follow a long tradition of connecting tense to the licensing of subjects, and these authors sought a way to connect control and raising to temporal properties of infinitives. Following Stowell (1982), Martin and Bošković suggest that the difference between control and raising complements can be traced to differences in the temporal properties of these two types of infinitival complements. The operative intuition that these authors want to exploit is that control infinitives denote future possibilities (Stowell 1982), while the AcI infinitives denote temporally simultaneous complements (most often verbs of acceptance in the sense of Stalnaker 1984, see section 2.3):⁵¹

⁵⁰ This misrepresents Kayne (1984) a little. He proposed that raising complements had a prepositional complementizer, but one that could tolerate – in English at least – stranding.

⁵¹ I am glossing over “simultaneous” here. What I mean is that the running time of the event must hold throughout the time at which the attitude holder believes he is at. It is often thought that the internal now of an attitude is a point and eventive predicates can’t “fit” in it (see, e.g. Cable 2008, among many others on this point). Sequence of tense complements – that is, the ‘uninterpreted’ tense directly under an

- (116) a. Lilah promised/wanted/tried/decided/hoped/ to be in bed later that night.
- b. Lilah's parents believed/knew/understood/considered her to be in bed
 ...^{ok}at that very moment).
 ...#later that night

Aspectual properties of the embedded clause also reveal a difference. In simultaneous infinitives, eventive predicates are not possible without *have* or *be*, whereas they are in future-oriented infinitives.

- (117) a. John tried/wanted/expected/hoped to prepare the meal.
- b. *John believes/considers/knows/understands/sees Mary to prepare the meal.
- c. John believes/considers/knows/understands/sees Mary to be preparing/have prepared the meal.

While there are certainly differences between simultaneous and future-oriented infinitives (Abusch 2004, Katz 2001), the distinction doesn't line up with control/raising. There are raising/AcI complements that are "future" oriented and there are control complements that aren't (Collins 2002; see also Wurmbrand 2006 for similar counterexamples). Verbs like *forecast/anticipate* allow raising and yet their complements are future oriented (surely, a result of the lexical semantics of *anticipate* and *forecast*). *Claim*, on the other hand, is a control verb but like raising verbs, requires a simultaneous interpretation for its

attitude verb – show the same effects. Both types of complements would be properties of times, once we incorporated tense into the picture. But *both* would be – so again, nothing about tense will help us. There's work to be done on the semantics on simultaneous complements. But the main point here is that it cross-cuts the raising/control distinction – even the finite, non-finite distinction.

complement. This makes eventive predicates ungrammatical in the complement without the “stativizing” effects of *have* or *be* (or a generic/habitual interpretation).

- (118) a. There was forecast/anticipated to be a storm tomorrow.
b. *John claimed to prepare the meal tomorrow

The temporal connection, then, is closed. A general theory of control is slightly beyond the scope of this chapter. But I would like to suggest that the best candidate for this distinction remains the classic one – English raising constructions don’t have complementizers but control ones do. (See Landau 2006 for a more comprehensive, modern approach to control that relies on properties of complementizers.)

The earlier approach to AcI complementation – the complementizer deletion rule (Chomsky 1981) – simply made it a lexical property of verbs that triggered this rule, which was attractive in that it accounted for the seeming “idiosyncrasies” as to which verbs allow AcI. But we have seen that there are semantic generalizations about AcI that won’t be captured on such a story. The evidence provided in the first part of this chapter – that *see* AcI involves a meaningful functional head in the complement, F_{DOX} , actually turns the question around: why does F_{DOX} correlate with AcI and not bare infinitives? It is to this question I turn next.

4.2. F_{DOX} : *to* or syntactic selection?

We have two options for making the connection between F_{DOX} and AcI. If we stick closely to the surface distinction between bare infinitivals and AcI, one possibility is that

F_{DOX} is in fact spelled out as *to* itself. Of course, this can't be the only meaning that *to* spells out and this poses problems concerning the generality of the proposal. The second option is to treat F_{DOX} as a head that *selects* for infinitivals. This would have to be a form of syntactic selection, of course, but not by the embedding verb. I'll evaluate both options in turn.

One difficulty for associating F_{DOX} with *to* is that it requires a view of *believe* type verbs as involving F_{DOX}. I suggested a way of letting *believe* combine with F_{DOX} in 3.2.1, but at the cost of recognizing a version of *believe* that merely described a belief state. Another problem with identifying F_{DOX} as *to* is that we would have to have many *to*'s; *de re belief* cannot be the meaning of *to* generally. However, one wonders if it is a general function of the infinitival marker to indicate *some* sort of modality. Many – but not all – instances of infinitivals implicate modality. It appears, though, that the consensus is that *to* is not responsible for modality.

The existence of implicative infinitivals also casts doubt on infinitival *to* always imposing modality (Karttunen 1971):

(119) John managed/remembered/forgot to turn out the lights. #But he didn't.

And the existence of what Pesetsky calls 'factive' infinitives – albeit control ones – further complicates the issue (Pesetsky 1991: 31(117a,b)):

(120) John loved to ride in the back seat yesterday.

(121) The Angels hated to lose Sunday's game to the Red Sox.

It's of some interest, though, that AcI constructions are not possible with the 'factive' use of *love* and *hate*:

(122) a. *John loved Mary to be riding in the back seat.

b. John loved Mary('s) riding in the back seat.

c. *The Angels hated the Expos to be playing the Red Sox.

d. The Angels hated the Expos playing the Red Sox.

Bhatt (1999) investigated the modality of infinitivals and concluded that the modality of infinitives is represented in the complementizer, not *to*. Although the flavor of modality is different than with AcI, Bhatt observes, for instance, that non-subject infinitival relatives must be modal, but subject infinitival relatives are not:

(123) a. This is the best book to appear until now (on this topic).
(non-modal, subject gap)

b. This is the best book to read.
(modal, object gap)

Bhatt traces the obligatory modality in object infinitivals to the presence of a complementizer. The subject infinitival relative, Bhatt argues, is a reduced relative. No complementizer, and therefore no modality.

The second option is that F_{DOX} merely *selects* for infinitives. This is certainly a possibility but we would need to identify what and where F_{DOX} is. Is it in the main or embedded clause? Certainly the category most usually associated with selecting for tense is complementizer (Bresnan 1972, Stowell 1981). Could F_{DOX} be a complementizer? I closed off the idea that there is a complementizer in AcI constructions given the syntax evidence. We could either reassess that option⁵² or find a way to ensure that F_{DOX} – whatever it is – only has *to*-infinitive as its complement. Identifying F_{DOX} as *to* – while raising difficulties of its own – is the most natural and straightforward way to make the connection.

5. Conclusion and speculation: finite clauses

We have distinguished AcI complements from bare infinitival complements. AcI complements report belief and do so because AcI contains the morpheme F_{DOX} (which in turn determines, via selection or because F_{DOX} is *to*, the syntactic shape of the complement). A full theory of complementation would need to derive how AcI complements differ from the finite clause complements, too. We have already seen how AcI *see* differs from finite *see*, in that the latter is factive. In this concluding section I want to lay out what the landscape of finite clause complementation looks like, and point to where this project would go in these cases.

⁵² Kayne 1984 actually proposes that AcI complements have a complementizer, but one that undergoes reanalysis with the main verb (see also Pesetsky 1991).

The first thing to know, as Kiparsky and Kiparsky (1970) showed, is that AcI complements are not factive. There is a class of verbs that must always be factive and these never allow AcI complements:

- (124) a. Martha didn't {regret/resent/comprehend/forget/grasp/make clear} that Fred was a fool.
b. *Martha didn't {regret/resent/comprehend/forget/grasp/make clear} Fred to be a fool.

As Kiparsky and Kiparsky (1970) also showed, there are predicates that are not necessarily factive. With finite clauses they are, but with AcI complements they are not (see also Hegarty 1992). This class includes *remember* and *understand*. The familiar tests (negation and denial of the complement by the speaker) show that the AcI complement is not factive.

- (125) a. Martha didn't remember that John was bald.
b. Martha didn't remember John to be bald.
(after Kiparsky and Kiparsky 1970)
c. Martha remembered that John was bald, #but he wasn't.
d. Martha remembered John to be bald, but he wasn't.
- (126) a. Martha didn't understand that Fred was mocking her.
b. Martha didn't understand Fred to be mocking her.
c. Martha understood that Fred was mocking her, #but he wasn't.
d. Martha understood Fred to be mocking her, but he wasn't.

It's old news that AcI complements are not factive. The puzzle – the one we found with *see* – is that the finite complements *must* be factive. They cannot report the kinds of *beliefs* that the same verbs with AcI complements can. The reason this is a puzzle is that (a) there's nothing about *see* (or *remember* or *understand*) that require factivity (given their interpretation with AcI complements) and (b) there's nothing about finite complements that requires factivity. This is surprising.

The verb *consider* shows the same thing. *Consider* can take finite clause complements (cf. Postal 1974) but in this case, the finite complement reports a fact, unlike the AcI complement. Some naturally occurring examples of *consider* with a finite complement are below.⁵³

⁵³ There are, however, numerous examples a Google search revealed that suggest that some speakers can use *consider* with a finite clause without committing to the truth of the complement.

(i) What can I do if the Taxman *considers that* I have 'lied' over the real price of the property declared on the deeds? (<http://www.marbella-lawyers.com/questions/showQuestion/19>)

I find such examples ungrammatical. I suspect that *consider* may be like *believe* for certain speakers in having the ability to take finite complements. When it is made clear that *consider* is being used to report an opinion, the finite clause is clearly out:

(ii) *John considers that Mary is taller than Fred.

(iii) John considers Mary to be taller than Fred.

- (127) a. Even a polemic has some justification if one *considers that* my own first poetic experiments began during a dictatorship
(http://www.brainyquote.com/quotes/authors/s/salvatore_quasimodo.html)
- b. ... Particularly when one considers that some images were crossed out.
(www.lotsofessays.com/essay_search/considers_deep.htm)
- c. This feat is even more impressive when one considers that in order to deduce the approximately 24-million-base-pair sequence of the Y chromosome, the team had to sequence well over 50 million base pairs of DNA.
(<http://news.bio-medicine.org/>)

That these complements can be paraphrased by *the fact that*, following Kiparsky and Kiparsky (1970), confirms that they can report facts. With an AcI complement, non-factive interpretations are available; with finite clauses, they are not. And, recall, this can't be a general property of finite clauses.

But the landscape of finite complements is even more complicated. The verb *hear* is not factive when it takes a finite clause. Instead, we have seen that it reports something like hearsay.

- (128) a. Martha heard (from her friends) that Bob was out of tune, but he wasn't.
b. Martha heard Bob to be out of tune, but he wasn't.

The distinction between *hear* AcI and *hear-that*, then, is more complex than factive vs. non-factive. Finite clauses are able to report more varied kinds of attitudes than AcI complements.

The strategy for handling the selection of finite complements should be to re-assign the meaning from the embedding verb to the embedded clause. But that project is

even bigger than the one I have attempted for AcI complements, since the variety of meanings that finite clauses correspond to appears to be bigger. We would have to admit of finite complements that reported facts and those that reported beliefs, and those that report the things one hears, as in (128)a. We would need to line up the right complements with the right embedding verbs. And that is no easy task since the interpretation of the finite complement is determined, it would seem, by the embedding verb. That's different from AcI. There we saw a uniform contribution of AcI complements – that's what allowed us to factor out the meaning to the complement. But it looks as though the lexical semantics of the embedding verb should determine the complement meaning for *that*-clauses. We now have something of a paradox. We factored out meaning to the complement to capture the distribution and meaning of AcI, but now we've lost control of the kinds of finite complements these verbs can select.

But the proposed extension of the project – that finite clauses bear the meanings once thought to be part of the embedding verb – finds some initial support from languages that lexicalize differences among finite complements, often via complementizers. Factive complementizers, for instance, are well attested (Japanese (Kuno 1973b), Greek (Roussou 1991, 2004), Marathi (Wali 1988)). A language such as Korean (Yoon 1990) lexicalizes, via meaningful complementizer-like heads, the difference between factive and non-factive complement clauses. One clause-final functional head *-um* signals factive clauses, while another, *-ko*, non-factive complements:

- (129) John-un [CP Mary-ka cengcikhay-ss-um]-ul alassta
 John-nom Mary-nom honest-past-Comp_{FACT}-acc knew
 ‘John knew that Mary was honest’
- (130) John-un [CP Mary-ka cengcikhay-ss-ta-ko] malhay-ss-ta
 John-nom Mary-nom honest-past-decl-Comp said
 ‘John said that Mary was honest’
 (Jeon 2008:2a,c)

What makes systems like Korean particularly tantalizing for investigating the meaning of complement types is the extent to which the embedded clause determines the meaning of the embedding verb (much in the way Acl forced verbs like *say* and *wager* into ascribing beliefs). In Korean this “flexibility” of lexical items comes out when we exchange the complementizers for the verbs shown above. The factive marker *-um* can “shift” non-factive verbs into reporting facts, e.g. *think* becomes *think about* (Jeon 2008):

- (131) John-un [CP Mary-ka cengcikhay-ss-um]-ul sangkakhay-ss-ta
 John-NOM Mary-NOM honest-PAST-C-ACC think-PAST-DECLAR.
 ‘John thought about that Mary was honest’
- #Kulnea Mary-nun cengikhaci anhassta.
 But Mary wasn’t honest.
 (Jeon 20098:18c)

With the non-factive complementizer, *know* is not factive and it is reported (Yoon-Ho Jeon (p.c.)) that it translates to “think”:

- (132) John-un [CP Mary-ka cengcikhay-ss-ta-ko] alassta
 John-NOM Mary-NOM honest-PAST-DECL-C knew
 ‘John thought that Mary was honest’ or ‘thought he knew’
- Kulena Mary-nun cengcikhaci anhassta
 But Mary was not honest.
 (Jeon 2008:7c)

It is clear, then, that the complementizers carry meaning and that the embedding verbs do not determine, entirely, the interpretation of the complement. It is, in some ways, the other way around. As with AcI, it seems the complement selects the verb. The standard Hintikka account of attitude verbs needs revising in the face of this. But that may not be a bad thing, because once we put the meaning in the complement, we suddenly have a very straightforward way of accounting for why certain clause types appear as the complements to certain classes of verbs with similar meaning. They do so because the meaning is actually in the complement.

But we’re still not quite ready to make the case for English. English lexical items aren’t so flexible as Korean, it would seem. *Know* is always factive with a finite clause; *believe* always non-factive. That would suggest the meaning is in the verbs. The evidence I gathered from AcI suggests otherwise. In fact, *know* appears not to be factive with an AcI complement:

- (133) a. Donna never knew him to lie. ...so he must not have
 b. Donna never knew that he lied ...#so he must not have.

The semantics of knowledge ascription is another topic altogether – raising difficult philosophical issues (the Gettier cases (1963) to start with) – and so a full accounting of the famous *See* Paradigm will have to wait.

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