Clause Selection

Phillip Potamites

September 18, 2008

Contents

1 Introduction

This paper analyzes the thematic requirements of embedded clauses. It is part of a larger research agenda which hopes to characterize predicate classes, their potential alternations, and how different arguments depend on each other.

Clause selectors are known to restrict the availability of complementizers, subject manifestation, tense, aspect, and aktionsart. This ability runs contrary to implementations of "compositionality", which would restrict selection to "immediate constituents". However, such long-distance selection is immediately provided for in type-driven function application. This immediate resolution to a theoretical problem is the prime motivation for adopting a semantic-like typing over the more traditional syntactic classes. Below is a list of some of the types which I will argue for:[1]

[1]Due to confusing overlaps in the usual alphabetic choices, and because I want to use e for events

(1) a. e

b. an event

c. $< w, t >$

d. a function which, given a world, returns a truth value.

e. $< i, < w, t >>$[2]

f. a function which, given an interval and a world, returns a truth value.

g. $< x, < i, < w, t >>>$

h. a function which, given a participant, an interval, and a world, returns a truth value.

The traditional GB analysis of clause selection divided predicates among those that selected CP and those that selected IP. Building on Pesetsky (1991)'s analysis, I will argue that this distinction, while characterizing important phenomena, is not sufficient. More recent theories of clause selection are locked in a struggle over the proper contribution of the feature [+/-T/tense] (Landau (2000), Martin (2001), Pesetsky and Torrego (2001), Pesetsky and Torrego (2002), Pesetsky and Torrego (2004), Pesetsky and Torrego (2006)). While commendable in avoiding a proliferation of features, their over-lapping accounts of disparate phenomena suggest that additional distinctions are also necessary here to maintain any formal characterization of the relevant data. The semantic skeleton I adopt will be responsible for thematic assignments, while syntactic properties, such as Case (cf. Jean-Roger Vergnaud), and the concept of "range assignment" (cf. Hagit Borer), will be necessary to begin to characterize the more subtle clause distinctions. The way that these formal properties reflect deeper interpretive implications will be suggested, but not yet fully resolved.

2 Method & goals (& assumptions)

(3) I will argue in this section:

a. Type-matching is a necessary and appropriate tool for long-distance selection.

instead of entities, I have chosen to use type letters which correspond exactly to their typical representation as variables. Given the specific contexts of their use, there should be no danger of uncertainty.

[2] Abusch (1999), p. 24, actually argues for the following correlation:

(2) (a) VP: $< i, < w, t >>$: tenseless clause

(b) IP: $< w, t >$: tensed clause

(c) CP: $< i, < w, t >>$: complement clause

Given that she designates "Barak is predicted to be in the lead now" as embedding a CP, I do not think we should assume these terms have the implications that they did in the GB framework. Since my types describe the overt appearance of clauses, before their more subtle differences, they also fail to have any direct correlation with that framework.

b. Methods like the "variable-free" program (cf. Pauline Jacobson) are necessary to avoid the confusing and illicit mixture of discourse and binding in assignment functions.

c. The concept of a "chain" is only *unified* in a semantic sense, and therefore must be expanded to allow multiple θ and Case assignments.

2.1 Long-distance selection

I claimed above that clause selectors restrict their complementizer, subject manifestation, tense, aspect, and aktionsart. Below, I provide evidence for each of these.

(4) complementizer selection:

a. Jack hopes that Jill runs.

b. Jack hopes for Jill to run.

c. *Jack wants that Jill runs.

d. Jack wants for Jill to run.

e. Jack believes that Jill runs.

f. *Jack believes for Jill to run.

Although 'hope' and 'want' are usually classified together as *desideratives*, 'hope' can take 'that'- and 'for'-clauses (correlated with finiteness, of course), while 'want' fails with finite 'that', and 'believe' fails with 'for'.

(5) subject manifestation:

a. *Jack believes to be intelligent.

b. Jack believes himself to be intelligent.

c. Jack tried to win.

d. *Jack tried himself to win.

e. Jack expects to win.

f. Jack expects himself to win.

The complement of 'believe' requires an overt subject, while 'try' requires a silent subject, and 'expect' takes either.

Tense, aspect, and aktionsart involve complex semantic, syntactic, and morphological issues. Below, I divide them somewhat superficially. For present purposes, these crude distinctions should suffice to substantiate my claims about selection. In this crude sense, tense selection can be demonstrated by the selection of 'to'/'-ing'.

(6) tense:

a. Jack wants to run.

b. *Jack wants running.

c. *Jack finished to run.

d. Jack finished running.

e. Jack likes to run.

f. Jack likes running.

As shown, non-finite selectors vary in allowing one, the other, or both.

Aspect, here, means one temporal orientation embedded in another. The aspect of clausal complements also varies with the selecting predicate.

(7) aspect:

a. Jack expected to run.

b. Jack managed to run.

While 'expect' imposes a future oriented interpretation on its complement, 'managed' seems to imply a co-occurrent interpretation.

Finally, certain propositional selectors (also associated with ECM and potential passivization) are known to require "stative" complements.

(8) aktionsart: stative selection

a. *Jack believed Jill to fall down.

b. Jack believed Jill to be intelligent.

c. Jack believed Jill to have fallen down.

d. Jack believed Jill to be running.

e. Jack believed Jill to fall down often.

f. Jack believed sharks to attack humans.

As shown, "stative" apparently must include perfects and progressives, and, at least marginally, habituals and generics. As (a) shows, predicates like 'believe' do not allow simple eventives.

This paper will not be able to resolve all the distinctions presented above, but it will attempt to clarify methods which I hope may ultimately lead to their solutions. For the moment, I have merely tried to show that the selection of all these properties is a necessary ability of clause-selecting predicates.

Regardless of this evidence of long-distance selection, theories are sometimes still promoted on the basis of restricting "sub-categorization" to immediate constituents. David Adger's usually clear and up-to-date text book, *Core Syntax* (2003), reflects the problem with a rather confusing shift that leaves his ultimate position unclear. He first allows 'try' to select sub-features of its sister category, and considers extending that method to ECM verbs like 'believe', but then rejects this proposal on the basis of avoiding "further structure" (p. 311). Hasn't he then also rejected his own account of 'try'?

(9) p. 310:
"We now propose that a verb like *try* selects a CP headed by a complementizer with this [null] feature."[3]

(10) p. 311:
"An obvious approach [[to ECM predicates]] would be to say that the embedding verb selects a complementizer in the same way that *try* does. However, this complementizer has accusative features rather than a [null] case feature".

(11) p. 311:
"However, as our theory stands, we simply have no way of stating the lexical entry ... C-selection features are simply uninterpretable categorical features with no further structure ..."

(12) "no way of stating": (p. 311)
believe, [V, uC[acc]]

He ultimately argues for a little v bearing [accusative], and apparently avoids AgrO, by long-distance checking of Case. Such distance checking is just another way of achieving long-distance selection, and I will also assume that something in the verbal complex that is pronounced 'believe' *must* satisfy its accusative Case.

We have already seen that Case is not the only embedded-selection, and that many of these selected properties are highly interpretive, and not purely formal.

In a type-driven λ-calculus, these sub-selectional properties are immediately manifest (for θ-roles, though not Case). Examples to come will reflect some of the chains required by the above dependencies. For the moment, a simple example of a "lifted" subject, may serve as a better introduction, while demonstrating the sub-selection property of type-matching function application.

(13) a. Jill ran.

[3] In section 8.1, I'll discuss the further problem of selecting a phrase with a feature which should have already been deleted. I believe the problem that Adger is discussing applies more to [null] Case, which should be checked and deleted internal to a non-finite CP, than to accusative Case, which is reasonably associated with the external selector, and not necessarily deleted internally.

b. [λx . x ran]$_{<x,t>}$(Jill$_x$)

c. [$\lambda P_{<x,t>}$. P(Jill$_x$)]$_{<<x,t>,t>}$(λx . x ran)$_{<x,t>}$

d. Every boy ran.

e. [$\lambda P_{<x,t>}$. $\forall x$ s.t. boy(x): P(x)]$_{<<x,t>,t>}$(λy . y ran)$_{<x,t>}$

(b) is an extremely simple example of decomposing (a) into a function of type <x,t> and an argument of type x. The function applies to the entity (type x) Jill, and returns a t=truth value. (c) is equivalent, but 'Jill' has been lifted, so that it is the selecting function, and the predicate becomes its argument. After lifting, 'Jill' is of type $<< x, t >, t >$: it takes an argument of type $< x, t >$, i.e. the predicate, and still returns a t. Given the equivalence of (b) and (c), lifting may seem pointless, but it plays an important role in relating argument positions, and the more complex types that sometimes occupy them; for instance, the quantifier phrase shown in (d,e). Furthermore, it will play a necessary role in the "variable-free" binding system to be promoted here.

The crucial point is that (c), and (e), insure that the selected argument is also in need of a specific kind of argument. This kind of transitive restrictiveness would seem to be exactly the kind of tool we need to deal with the properties in the data presented above. Perhaps, we could allow lexical entries, like the one Adger excludes, but I would argue that that approach lacks the explicit formalism of the type-driven semantic formulas.

I have tried, in this section, to show that long-distance selection is necessary, and that type-matching provides a reasonable means to its formalization.

2.2 The variable-free program

The work of Pauline Jacobson provides numerous theoretical and empirical motivations for the variable-free program.[4] Though the name is catchy, I will continue to use the term "variable" for exactly those arguments which are bound by λ-operators, and which may be identified, through linguistic binding operations, with other arguments. I would here like to add some additional motivation for insisting that the use of variables be specifically constrained in this way, and that discourse reference not be freely intermixed with syntactically constrained binding.

Traditional approaches to binding make use of assignment functions, their modification, and the addition of a λ-operator binding the variable connected to that modification.

(14) Heim and Kratzer (1998), p. 186: Predicate Abstraction Rule (PA):
Let α be a branching node with daughter β and γ, where β dominates only a numerical index i. Then, for any variable assignment a, $[\![\alpha]\!]^a = \lambda x \epsilon D$. $[\![\gamma]\!]^{a^{x/i}}$

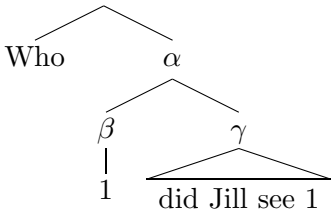
[4]The crucial nature of this program is that all variables are bound, and thus, "for representational purposes only" (Jacobson (1999a)). I think I would prefer to call it the "no free variables" program. I am not as concerned with excluding variables as much as I want explicit semantic binding without illicit binding of free variables.

(15) Heim and Kratzer (1998), p. 112:
Let a be an assignment, i ϵ $\mathbb{N}$, and x ϵ D. Then $a^{x/i}$ (read: "a modified so as to assign x to i"[5]) is the unique assignment which fulfills the following conditions:

a. $dom(a^{x/i}) = dom(a) \cup \{i\}$,
b. $a^{x/i}(i) = x$, and
c. for every j ϵ $dom(a^{x/i})$ such that $j \neq i$: $a^{x/i}(j) = a(j)$.

(a) insures that the domain of the assignment function $a^{x/i}$ includes i; (b) insures that x will be substituted for any embedded i's; and (c) insures that $a^{x/i}$ is identical to a in every way except for the interpretation of i. The rule assumes that every binder sits above a numerical index indicating its binding.

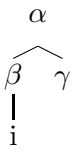
(17) a.



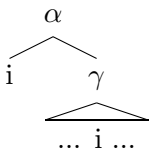
b.[Who [λx . $[\![$ did Jill see 1 $]\!]^{a^{x/1}}$]]

The rule in (14) insures that (17a) produces (17b) and the rules in (15) then insure that (17b) means [Who λx[did Jill see x]]. The abstraction rule confines itself to a context like that represented in (18a), but it should be clear that its primary function focuses on situations like that in (18b), where the daughter index is matched to one more deeply embedded by its sister.

(18) i$\epsilon\mathbb{N}$:
a.



b.



We could even represent the meaning of such an index i, equivalently, as shown in (19a). It takes any kind of argument, adds a λ-operator, and modifies the assignment function accordingly. In (b), this function is shown applying to an argument that is some function over i, like that shown in (18b).

[5]Explicitly representing, in a single notation, this super-superscript might also help to expose the problem I am talking about. We want to substitute i with x, and that's what λ-operators are for, so let's write it that way:

(16) a. $[\![$i f(i)$]\!]^a = \lambda x$. $[\![f(i)]\!]^{a^{x/i}} =$
b. $[\lambda i \lambda x$. $[\![f(i)]\!]^a](x) \neq$
c. λx . $[\![f(x)]\!]^a$

(19) a. i=$\lambda P \lambda x$. $\mathrm{P}^{x/i}$

b. $[\lambda P \lambda x$. $\mathrm{P}^{x/i}](\gamma(\mathrm{i}))$

c. $[\lambda P \lambda x$. P$](\gamma(\mathrm{x}))$

d. λx . $\gamma(\mathrm{x})$

Essentially, the interpretation of (b) is just the same as saying that (c) is equivalent to (d). However, such a move involves a fundamentally illegal operation. To maintain equivalence, uninstantiated operators should maintain the number and relative position of all variables. For instance, (20a), should not be considered equivalent to (20b) (see Chris Barker's excellent λ-tutorial, on his webpage).

(20) a. $[\lambda x[\lambda y[\mathrm{x\ y}]]](\mathrm{y})$

b. $[\lambda y[\mathrm{y\ y}]]$

c. $[\lambda z[\mathrm{y\ z}]]$

Instead a process known as α-reduction is designed to prevent such illicit bindings. All variables must be replaced by non-identical designations before formulas can be substituted into one another. Thus, (20a) could be equivalently represented as (c), but not (b). The use of assignment functions to achieve syntactic binding then seems to function as a means to circumventing this essential rule and to allow temporarily unbound elements to become bound.

Allowing these kinds of modifications to our assignment functions raises several questions about their proper representation and interpretation. They are most simply accepted as references to discourse:

(21) a. He_1 saw her_2

b. $\begin{bmatrix} 1 \rightarrow Jack \\ 2 \rightarrow Jill \end{bmatrix}$

c. Every girl_2 said he_1 saw her_2.

d. $\begin{bmatrix} 1 \rightarrow Jack \\ 2 \rightarrow x \end{bmatrix}$

Their use in binding assumes that they can also return variables, as shown in (d). But, if we allow functions of that form, and don't impose a rule of α-reduction, we can derive improper co-bindings.

(22) a. The boy that likes every girl_1 called her_2.

b. The boy that likes Jill_3 called her_3.

c. Every boy_1 said he_1 likes him_2.

d. $?\begin{bmatrix} 1 \rightarrow x \\ 2 \rightarrow x \end{bmatrix}$

I assume that one variable could have been in the assignment function to begin with, and the other would be introduced by the binding operations. But this reading, where 'every girl' binds 'her', is not truly available in (a). We could, of course, impose a rule such that only binding could introduce variables to the assignment function, but this move would only highlight the oddity of their presence there. We would still need to impose a rule of α-reduction, within the assignment function, so that multiple independent bindings don't overlap, but this only increases the number of computational stipulations that we would impose on our discourse references.[6] In fact, overlaps in the assignment function are necessary to allow for the phenomenon known as "accidental co-reference". In other words, putting binding into the assignment function requires also moving additional composition rules which serve no other purpose there. Necessary alphabetic variation is already implemented within the compositional framework implied by the lambda calculus; extending it to deal in discourse with a problem previously perceived as syntactic just reeks of manipulating inappropriate tools to push aside certain dilemmas.

Furthermore, following Reinhart (1983) and others, we would like to maintain essential differences between co-reference and binding. Thus, (b) easily achieves a co-referent interpretation while (a) cannot. If we allow our assignment functions to return bindable variables, it is no longer clear why (b) is any different than (a).

However, (c) raises more debatable issues. Any intended co-indexing between the 2 masculine pronouns would clearly violate rules on the use of reflexives, but I think it might be possible to claim that there is a *de re* reading where every boy likes, unwittingly, someone who turns out to be himself. This reading, if available, would seem to be exactly what our accidently over-lapping variables would produce, and thus, might be seen as an argument for these derivations. However, I believe it would be preferable to derive this reading from some sort of choice function mechanism, and not to wholesale mingle reference and binding to achieve this kind of singular, semi-marginal reading. I cannot pretend to fully resolve the reference-binding issues here, but it is my hope that the links between syntactically-constrained antecedent-anaphor pairs can be fully represented in the compositional semantics without appeal to external functions.

Thus, following Jacobson, I assume that unsaturated arguments can survive to the end of the derivation, just as long as no formal, syntactic features go unsatisfied. Discourse will then be the mechanism appealed to, to resolve these unsaturated arguments.

(23) a. He ran.

b. λx . x ran

c. It's necessary to study hard for this test.

[6] We'd practically be implying that our syntactic composition rules don't adhere to α-reduction, but our discourse function does.

d. λx . necessary(x to study hard for the test)

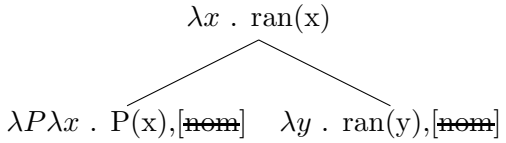
Simplifying extensively, for the moment, in ignoring gender, etc., a proposition embedding a pronoun is not fully saturated until that pronoun receives reference. Being unbound, it must be embedded in discourse before the proposition can be properly interpreted. The ultimate interpretation of the subject of 'study' also seems dependent on some extra-syntactic function (i.e. to provide it with an argument).[7]

Jacobson's combinatorics also allow for the following identity, while making use of additional syntactic apparatus to distinguish the overt manifestations.

(25) a. λx . ran(x) = ran
b. ran, $\mathrm{NP}/_L\mathrm{S}$
c. He ran, S^{NP}

I prefer to expect the presence (or absence) of λ-operators to represent some significant information, as well as making using of Case to insure or prohibit syntactic projection.

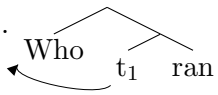
(26) a. ran: λx . ran(x),[nom]
b. He ran: λx . ran(x)
c.



2.3 Chain=semantic identity

Two traditional $\bar{\mathrm{A}}$ chains are presented in the following examples. The simplified λ-formulas show how the wh-term binds its trace, while the trees represent cyclic movements which syntacticians have argued for.

(27) a. Who λ_1 [t_1 ran][8]
b.



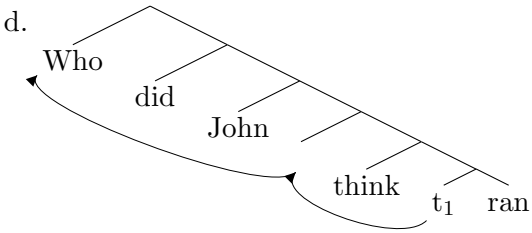
[7] Allowing unsaturated semantic slots might also help represent passive/unaccusative distinctions (though I should refrain from hastily over-simplifying this matter):

(24) a. His crown was broken (by the naughty children).
b. [$\lambda x \lambda y$. y broke x](his crown)
c. His crown broke (*by the naughty children).
d. [λx . x broke](his crown)

[8] Following the roughly isomorphic notation of Heim (1998)

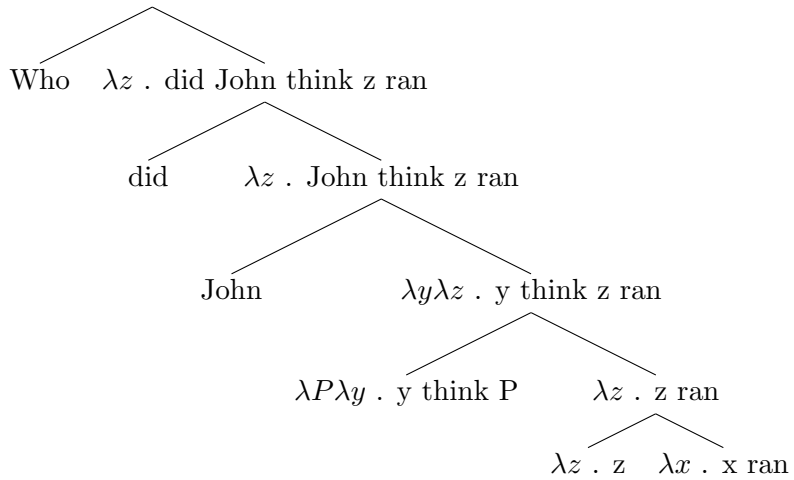
c. Who λ_1 [did John think t_1 ran]

d.



In the system advocated here, the chain doesn't necessarily project (by which I mean, leave traces in silent terminal nodes), but it is passed up as a λ-binder in the left margin, at every node, in fact, as shown below. The question of barriers, or phases, then becomes a question, not of where the chain needs temporary docks, but where it fails to pass up.

(28)



It is important to note that many of the mergers above violate our type constraints on mergers. In many cases, passing will be motivated by exactly these type mismatches. Specific operations allow these mismatches to be resolved. These operations will be presented in section 9.1, where Jacobson's analysis will be presented in greater detail. Barriers, then, can also be seen as specific prohibitions on such operations.

Both traditional and variable-free approaches ultimately try to derive roughly the following parallel representations for the various constructions below.

(29) a. Every boy thought he was smart.

b. $[\![$ Every boy $]\!](\lambda x$. thought(smart(x))(x))[9]

c. Which boy did Jill think was smart?

[9] I infer this kind of representation directly from Jacobson (2000), p. 111, ex. 60, where she represents "*thinks he lost*; $S/_L NP$; λx[thinks'(lost'(x))(x)]", which is semantically identical to "the standard account" which she presents on p. 106, ex. 53.

d. ⟦ Which boy ⟧(λx . thought(smart(x))(Jill))

e. Every boy wanted to be smart.

f. ⟦ Every boy ⟧(λx . wanted(smart(x))(x))

g. Every boy seemed to be smart.

h. ⟦ Every boy ⟧(λx . seemed(smart(x)))

While the manifest expression of pronouns, quantifiers, questions, and control (a,c,e) are all very different, the semantic formulas postulate similar structures which are derived by identical methods (either modification of the assignment function or passing operations). Raising and control (e, g) are overtly identical, but distinguishable in structure by the difference of a single θ-role. In section 9.3, however, we will see that the variable-free approach requires different operations for raising and control, though their results will equally be chains in the sense shown above.[10]

In a syntactic sense, the concept of chain must fragment into at least the following categories:

(30)
- a. A
  - (a) unaccusative
  - (b) passive
  - (c) raising
  - (d) control
- b. $\bar{A}$
  - (a) wh
  - (b) QR
- c. pronominal binding

A-chains (usually excluding control) are normally claimed to receive θ-roles at their tails, and Case at their heads. $\bar{A}$-chains are normally claimed to receive both θ-roles and Case at their tails. Control is usually not considered a chain, primarily because it relates 2 θ-positions; also, perhaps, because control predicates present evidence of CP-selection, and CPs seem to block A-movement, though not $\bar{A}$-movement; also, because arbitrarily-interpreted silent subjects are assumed to be the same thing. Binding is normally not considered a chain, since it relates positions hosting their own independent Case- and θ-satisfactions, though it is often claimed to at least have a c-command requirement[11], as all chains have been argued to.

Though grouped under the A-movement category, unaccusatives, passives, and raisers need some kind of analytic terms to characterize their overt differences:

[10] Though it is not entirely clear to me, yet, how these different operations would derive all the phenomena which distinguish raising and control, some suggestions will at least be proposed.

[11] Though both of the following kinds of sentences create complications for this claim, particularly the second:

(32) a. The table broke. (unaccusative)

b. The table was broken. (passive)

c. The table seems to wobble. (raising)

Wh-movement and QR are usually grouped as Ā-movement, though it would seem that one lexicalizes its head, and one its tail.

(33) a. Who did Jack see?

b. Wh x: did Jack see x?

c. Jack saw everyone.

d. Every x: Jack saw x

Furthermore, they demonstrate different extraction properties, as shown in the following (classic) examples:

(34) a. *Who did a friend of call Jack?

b. *Wh x: did a friend of x call Jack?

c. A man from every city loves it.[12]

d. Every x: A man from x loves x[13]

In this section, I have argued that chains are unified semantic concepts, but distinct under a variety of syntactic restrictions and licensing conditions. Pronominal binding, control, and raising interpretations all require identifications derived through chain operations. Therefore, claims that chains receive only one θ-role, or one Case, must be seen as only referring to certain kinds of chains. Pronominal binding chains necessarily receive multiple Case and θ-assignments, and (obligatory) control is even more easily seen as an example of chain formation.

Finally, let us note, as an additional argument in favor of the variable-free method, that, while the traditional semantic approach, with its assignment functions, offers no reason to project anything that would correspond to the cyclic movements required by past syntactic proposals, the variable-free method represents binders whose movements up the tree are specifically required, and licensed or restricted in specific contexts.

---

(31) a. Somebody from every city despises it. (May (1985))

b. The woman who every man admires (the most) is his mother. (Geach (1972))

See Jacobson (1999b) for a choice-function analysis of (b), and the main text here, (34), for a quick cover-up of the controversy surrounding (a).

[12] Whitewashing May's original a bit.

[13] As well as rejecting his noun adjunction revision.

3 CP/IP

Pesetsky (1991) characterizes the analysis of (non-finite) clause selection in the LGB framework according to the following paradigm:

(35) "IP Complementation":[14]

a. Jack believed Jill to be fast. (ECM)

b. Jill was believed to be fast. (passive)

c. *Jack believed to be fast. (PRO)

(36) "CP Complementation":

a. *Jack decided Jill to run. (ECM)

b. *Jill was decided to run. (passive)

c. Jack decided to run. (PRO)

If all predicates fell into just one of these classes, without ambiguity, we could make a prediction like the following:

(37) (incomplete):

	ECM	PRO
Passivizes	✓	*
Can't passivize	*	✓

Assuming that some predicates are ambiguous, we would also derive predicates like 'expect'.[15]

(40) a. Jack expected Jill to run.

b. Jill was expected to run.

[14] Which also explains why we can't say "Jack believed for Jill to be fast".

[15] There is actually a lot of confusion about the proper analysis of 'expect'.

(38) a. Jill expects Jack to leave.

b. Jill expects Jack.

Since (a) does not entail (b), it could be argued that 'Jack', in (a), does not receive a θ-role from 'expect'.

(39) a. Jill expected Jack to fetch the pail.

b. Jill expected the pail to be fetched by Jack.

The sense that these might not mean the same thing suggests that 'expect' might assign a patient θ-role after all; which would then offer an easy account of its passive ability.

c. Jack expected to run.

In fact, the LGB framework also distinguishes predicates like 'dare' or 'persuade', where the matrix accusative Case really is associated with a matrix θ-role. These types also need to be distinguished from each other, since only one allows subject-control.

(41) a. Jack dared Jill to run. (→ Jack dared Jill.)
b. Jill was dared to run.
c. Jack dared to run.

(42) a. Jack persuaded Jill to run. (→ Jack persuaded Jill.)
b. Jill was persuaded to run.
c. *Jack persuaded to run.

Predicates like 'want', however, still require additional stipulations, since they do not fit the mold above:

(43) a. Jack wanted Jill to run.
b. *Jill was wanted to run.
c. Jack wanted to run.

It's failure to passivize argues for CP-selection, while the ECM-like construction is attributed to a Case-assigning silent complementizer.

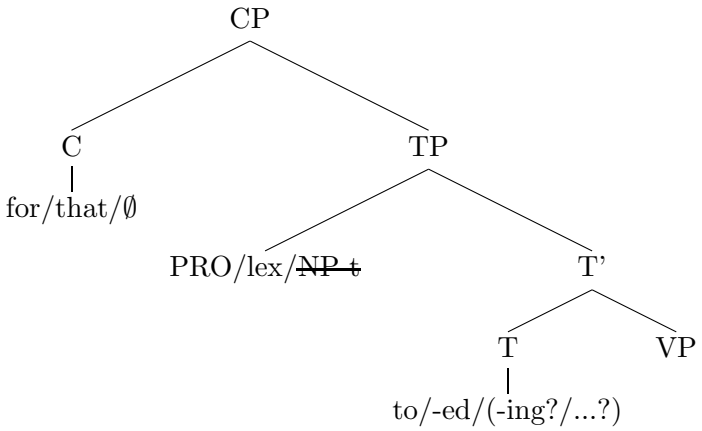
Other predicates that might be categorized with 'want' actually require overt complementizers when appearing with overt embedded subjects (which can be taken to support a CP analysis, at least for those overt subject clauses, but leaves many questions unanswered[16]).

(44) a. Jack hoped *(for) Jill to run.
b. *Jill was hoped to run.
c. Jack hoped to run.

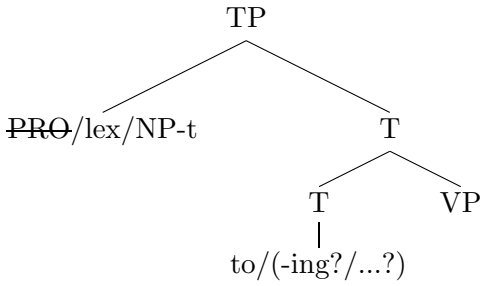
The potential instantiations of the the 2 initial categories (CP & IP) can be summed up as follows (where the crossed out items indicate prohibited elements, PRO is the subject of control clauses, lex stands for a lexical item, and NP-t for the trace of passivization, or raising).

[16]Such as when or why the silent complementizers are available, or what determines finiteness, ...

(45)



(46)



Additional principles must then explain the further restrictions in co-occurence between these terms. 'For' and 'that' have been prohibited from occuring with NP-trace, but we also need some additional rule to exclude them with PRO. Restrictions on selecting 'that', 'for', or '∅' are left to arbitrary selection. The exclusion of lexicalized subjects in many control contexts also appears to be unexplained, unless one additionally proposes different kinds of null complementizers, which is exactly what Pesetsky (1991) eventually does.

(47) a. Jack tried to run.

b. *Jack tried Jill to run.

Pesetsky (1991), instead, assumes that all clauses should be CPs, and begins with the type categorization diagrammed below.[17]

(48)

	-PRO, +NP-trace	+PRO, -NP-trace
+ECM	believe	want
-ECM	wager	demand

Pesetsky then goes on to develop a theory of null complementizer affixes which must move from C to the selecting V. His treatment of the topic is thorough and highly recommended, but also requires many kinds of silent elements making many movements. I will

[17] 'Try' falls in the 'demand' class.

try to characterize the properties of these predicates more directly with 3 independently justified tools: 1.) θ-roles, as formalized in the λ-calculus; 2.) Case, which I will generally associate with a necessary, overt reflex; and 3.) range, which links these arguments and positions with event qualities. Speaking in an informal way, if the first is purely interpretive, and the second purely formal, then I think the third is somewhere in the middle.

I have tried to show in this section that the CP/IP contrast is insufficient, and will probably not provide the most efficient path to a minimal characterization of clause selecting properties. In fact, even if the CP/IP distinction is necessary, or were sufficient, I am not really sure by what standard it would count as an explanation. I would still like some better sense of what further properties of these predicates cause them to fall into whatever class (see Pesetsky (1991), for compelling support of this analytic ethic). I have put aside Pesetsky's proposals, with insufficient discussion, in favor of what I believe will be more direct descriptions of the phenomena.

4 Entailment classes

Presumably, the classic framework would treat all finite clauses as CPs. However, the predicates which select them often impose significant differences in interpretation. Non-finite clauses also participate in these differences, as well as introducing additional complications.

Following Landau's division of clause-complement selectors, we can consider the following predicate classifications. In fact, many of these items vary their entailments across their lexical alternations.

(49) Landau (2000), p. 38, ex. 29:

a. Implicative: dare, manage, make sure, bother, remember, get, see fit, condescend, avoid, forget, fail, refrain, decline, neglect, force, compel.

b. Aspectual: begin, start, continue, finish, stop, resume.

c. Modal: have, need[18], may, should, is able[19], must.

d. Factive: glad, sad, regret, like, dislike, hate, loath, surprised, shocked, sorry.

e. Propositional: believe, think, suppose, imagine, say, claim, assert, affirm, declare, deny.

f. Desiderative: want, prefer, yearn, arrange, hope, afraid, refuse, agree, plan, aspire, decide, mean, intend, resolve, strive, demand, promise, choose, offer, eager, ready.

g. Interrogative: wonder, ask, find out, interrogate, inquire, contemplate, deliberate, guess, grasp, understand, know, unclear.

[18] I guess that he puts this predicate here because of its status in other languages. It could be more appropriate as a desiderative.

[19] This item also seems odd here.

Implicatives can imply or deny the occurrence of their complements (see Karttunen (1970), Karttunen (1971)), and their negation can reverse the implication. Given that this reversal only occurs in some of the above classified predicates (in some of their constructions), they might require reclassification. However, many of them would still fail to classify as factives in the sense to be described further along.

(50) a. Jack made sure that Jill ran. (Jill definitely ran.)
b. Jack didn't make sure that Jill ran. (uncertain)
c. Jack dared to run. (definitely ran)
d. Jack didn't dare to run.[20] (definitely didn't run)
e. Jack failed to succeed. (no success)
f. Jack did not fail to impress. (lots of impress)

Aspectuals seem to share this property, but also imply some kind of temporal properties.

(52) a. Jack started to run. (some running, but not necessarily complete)
b. Jack didn't start to run. (no running)

Modals have disparate entailments, but, if we recategorized 'need' and 'is able', we could at least say that they impose specific inflections (possibly none) on their complements which overtly appear as no more than a basic VP.

(53) a. Jack has fallen. (did fall)
b. *Jack has fall.
c. *Jack has to fall.
d. *Jack has Jill to fall.
e. *Jack has for Jill to fall.
f. *Jack has that Jill fell.

(54) a. *Jack should fallen.
b. Jack should fall. (This fall hasn't occurred yet.)
c. *Jack should to fall.
d. *Jack should Jill to fall.

[20]Notice that the object-control alternation loses this implicative property.
(51) (a) Jack dared Jill to run. (running uncertain)
(b) Jack didn't dare Jill to run. (running uncertain)

e. *Jack should for Jill to fall.

f. *Jack should that Jill fell.

Factives seem to presume the occurrence of their complements, regardless of negation (see Kiparsky and Kiparsky (1971)), at least in finite contexts. The proper treatment of their non-finite forms is less clear.

(55) a. Jack is glad that Jill ran. (Jill definitely ran.)

b. Jack is not glad that Jill ran. (Jill still ran.)

c. Jack is glad to run. (sounds hypothetical)

d. Jack is not glad to run. (same)

(56) a. Jack likes that Jill ran.

b. Jack doesn't like that Jill ran.

c. Jack likes to run. (Doesn't that presume that he runs sometimes?)

d. Jack doesn't like to run. (Do you have to have tried it to dislike it?)

In so far as "I'm glad to go to the store" can indicate a willingness to participate in a yet-to-occur event, 'glad' seems to lose it's factivity in the infinitive, while 'like' has some partial sense that it should be retained.

Imaginary NPs, however, cast doubt on the claim that factives presume the occurrence of their complement *in the matrix world*. Evaluating imaginary NPs, in so far as we accept statements about them as true, requires contextualizing them to imaginary worlds, as shown by (a-b).

(57) a. Santa Clause brings presents on Christmas.

b. In all worlds where Santa Clause exists, he brings presents on Christmas.

c. Kids love that Harry Potter is a wizard.

d. In this world, kids love that Harry Potter is a wizard in his worlds.

(c), on the other hand, would be misconstrued if we assumed that Potter is a wizard in this world, or if we assumed that children only love Harry Potter in worlds where he is a real wizard. I, therefore, accept that factives can contextualize their complements to appropriate discourse worlds.[21]

Propositionals do not verify anything about their complements, but their complements can have truth or falsity predicated of them.

[21] I was forced to this conclusion by a number of friends who refused to accept that me saying "Jack loves that Santa brings presents" had to imply that I believe in Santa, although they accepted that "Jack loves that Jill ran" implied that I believed Jill ran.

Anankastic conditionals also offer unexpected examples of pragmatic world availability.

(58) a. There's some biscuits in the cupboard, if you want some.

(59) a. Jack believes Jill to be a spy, which is true/false.

b. Jack believes that Jill is a spy, which is true/false.

This property seems to contrast with desideratives, which are more *emotive*.

(60) a. *Jack wanted to run, which is true.

b. *Jack planned to be right, which is true.

However, it also seems clear that temporal-aspectual, and (non)-indicative mood restrictions interfere with a full comparison. Many desideratives prohibit finite, indicative complements[22] , and those that allow them don't seem quite as bad. Use of individual-level predicates, or shifting the aspect of the truth predication also seems to improve quality.

(62) a. (?)Jack hoped that Jill is a genius, which is true.

b. (?)Jack is afraid that Jill is a spy, which is true.

c. (?)Jack wanted Jill to be a genius, which is true.

d. (?)She hoped he won, which turned out to be true.

e. (?)She intended to win, which came true.

---

b. If you want to go to Harlem, you have to take the A train.

The special characteristic of the "biscuit" sentence in (a), is the fact that it is, typically, *not* relativized to the antecedent world. We can imagine a reading where the speaker only asserts the reality of the biscuits in the cupboard in those worlds where you want some, but it is more likely to assume that they are there regardless of our desires.

In (b), 'want' is again disregarded, on the usual interpretation, and the train-taking should be restricted to just those worlds where one actually goes to Harlem. Again, we can imagine a reading where you (have to) take the A train in all worlds where you want to go, but it seems more reasonable to assume that the sentence only implies A-train-taking in all worlds where you *actually* go to Harlem. Alternative proposals have stumbled in defining the set of train-taking worlds as all those where one wants to. Then contradictory desires or restrictive desires within multiple options can result in unintended falsifications. Getting the consequent relativized to worlds of going, in the case of the train sentence would seem to resolve at least some of these issues.

The combination of the biscuit and train sentences suggest that the consequent can be relativized to the "real"/"speech" world (as in the case where the biscuits are assumed to exist in any case), to the wanted worlds (where the biscuits manifest themselves according to my desires, and I have to take the A train, even if I want to go to Brooklyn more), or to the worlds of actually going (where I (have to) take the train in all those worlds where I go).

[22]Desideratives also vary in their ability to take the subjunctive:

(61) a. *Jack hopes that Jill run.

b. Jack demands that Jill run.

I will not attempt to include any account of licensing the subjunctive in what follows. Hopefully, this licensing will eventually be derived from certain world relationships. However, it would certainly seem odd to say that the complement of 'hope' must be less hypothetical than the complement of 'demand'.

Nonetheless, the contrast between certain, superficially similar non-finites can be quite strong, and requires some account:

(63) a. Jack believes Jill to be a spy, which is true.

b. *Jack chose Jill to be a spy, which is true.

I do not believe that calling them *irrealis* provides a sufficient account of this oddity, in so far as the complement of 'believe' must also be asserted in hypothetical worlds.

Finally, interrogatives embed questions, and they seem to share the factive property.

(64) a. Jack said who ran.

b. Jack didn't say who ran.

c. Jack asked who ran.

d. Jack didn't ask who ran.

These sentences presume that someone ran, probably in the matrix world, but maybe in some other.

(65) a. Jack asked where Santa lives.

b. Jack said where Santa lives.

Again, I assert the asking and saying in this world, while I presume Santa's existence in some other(s).

In the following sections, I will consider formal characterizations intended to capture at least some of the above distinctions, first as they apply to finite clauses, then overt subject infinitives, and finally silent subject infinitives. Many questions about world-time interactions, their possibilities, and meanings will be considered, but often postponed for further research.

5 P(w)

5.1 Propositionals, desideratives, and implicatives: P(w)

Heim and Kratzer (1998), in their contemporary classic, propose exactly this complement type for intensional "attitude verbs", like 'believe':

(66) a=p. 306a:[23]

a. $[\![\text{ believe }]\!]^w = \lambda p \epsilon D_{<w,t>}$. [$\lambda x \epsilon D$. p(w') =1 for all w' ϵ W that are compatible with what x believes in w]

[23] I have taken the liberty of changing their s type to my w.

b. "x believes p" means that p is true in all worlds that are compatible with what x believes in w.

Since, desideratives also require hypothical worlds, we can consider an exactly parallel definition for 'hope'. Heim and Kratzer (1998) also make this proposal. Obviously, this fails to account for any difference sensed in the "which is true" test. In fact, I will also have to leave this problem as a topic for future research.

(67) a=p. 306a:
under consideration:

a. $[\![\text{ hope }]\!]^w = \lambda p \epsilon D_{<w,t>}$. [$\lambda x \epsilon D$. p(w') =1 for all w' ϵ W that are compatible with what x hopes in w]

b. "x hopes p" means that p is true in all worlds that are compatible with what x hopes in w.

I, however, am a little uncomfortable with the notion that a specific hope must be true in all worlds that are compatible with anything I hope.[24] It seems to rule out the possibility of contradictory hopes or disparate hopes. For instance, hoping that I find a good job seems to rule out the possibility that I hope even more that I win the lottery and never work again. Of course, the statement of hope should only be interpreted within the exact parameters that it describes, but it is the universal quantification that seems to go beyond these parameters. Therefore, I think it is worthwhile to at least consider another possibility. The hoped-for event must occur in a hypothetical world, but this world is otherwise assumed to be identical to this one. I make use of a second order equation to achieve this effect.[25]

(68) under consideration:

a. $[\![\text{ hope }]\!]^w = \lambda p \epsilon D_{<w,t>}$. [$\lambda x \epsilon D$. x hopes w=ιw'ϵW: $\forall q_{<w,t>} \neq$p, q(w')=q(w), and p(w')=1

b. "x hopes p" means that x hopes that w is the unique world of the current discourse with all the characteristics of w, but also where p is true.[26]

[24] I also wonder how these equations survive under negation. Presumably, we need to make sure that the negation results in $\neg\exists$ rather than $\neg\forall$.

[25] A potentially simpler alternative is to treat worlds as sets of statements which are true in them and propose w'=w$\cup$p, but then we would have to reconsider how to appropriately relativize statements across multiple worlds.

[26] It might seem more reasonable to say that "I hope you know" means that I hope the world is such that it includes an event of you knowing, but this would entail the problems mentioned in the previous footnote.

In general, however, I would like to adopt a notation which divides propositions up into constituent conjuncts as much as possible, thus making it easier to see fundamental implications and allowing us to represent the event arguments which will eventually become necessary. λ-operators will "bind" all uninstantiated variables, and all other letter symbols should be considered skolem constants, that is to say, items defined just by the properties attributed to them in the formulas. Skolem constants normally function in a way equivalent to existentially bound variables, but here it should be understood that they are allowing us to postpone resolution of the questions raised above about the proper quantification of these variables, their proper context, accessibility, etc. These are important questions, which I cannot resolve at this time, but hopefully the proposals I advocate will be able to survive their resolution in some form or another.

(69) a. $[\![$ hope $]\!] = \lambda p \lambda x \lambda w$. hope(e,w) $\wedge$ ag(e,x) $\wedge$ pat(e,w') $\wedge$ p(w')

b. "x hopes p" means that there is an event of hoping where x was the agent, w' was the patient, and p is true in w'.

Notice both e and w' are like constants, or implicitly bound variables, and w' is, for the moment, defined just as being the world(s) of x's hope where p's truth is asserted. Being the patient of 'hope' is assumed to imply that one hopes w=w'. Also, I have discarded the assignment-function-like superscripting of world arguments, to represent them in the more explicit, and consistent, variable-free form.

To adopt this conjunctive, event-oriented notation, I have also found it most convenient to make use of *proto-roles*, like agent and patient. This step also disregards significant theoretical issues about their existence, character, and relation to structural configurations. For the moment, however, they are a reasonably simple way of representing the intent of the formulas. I will not place too much stock in their specific characters nor say much here about how they might be derived.

Returning to the issue at hand, and how it applies to implicatives: In so far as implicatives have been claimed to imply the truth of their complements, it may not be clear why they would be relativized to any world other than the matrix discourse. The crucial issue is that their negations do not imply events in the matrix discourse. Recall that 'make sure' (one of the (few?) finite implicatives) implies uncertainty in its negation. To capture the positive implication, we can add the assertion that the event implies that the complement world is equal to the matrix world.

(70) a. $[\![$ make sure $]\!] = \lambda p \lambda x \lambda w$. make-sure(e,w) $\wedge$ ag(e,x) $\wedge$ pat(e,w') $\wedge$ p(w') $\wedge$ (make-sure(e,w)$\rightarrow$(w=w'))

b. $[\![$ not make-sure $]\!] = \lambda p \lambda x \lambda w$. $\neg$make-sure(e,w) $\wedge$ ag(e,x) $\wedge$ pat(e,w') $\wedge$ p(w') $\wedge$ (make-sure(e,w)$\rightarrow$(w=w'))

Playing rather roughly with theories of negation, in (b), since there is not an event of making sure in w, we have no idea if w=w'.

Although I have not discussed tense, and non-finites yet, I note that the definite negative implications can be achieved by strengenthing the conditional to a bi-conditional.

(71) a. $[\![$ manage $]\!] = \lambda p \lambda x \lambda w$. manage(e,w) $\wedge$ ag(e,x) $\wedge$ pat(e,w') $\wedge$ p(x)(i)(w') $\wedge$ (manage(e,w)$\leftrightarrow$(w=w'))

b. $[\![$ not manage $]\!] = \lambda p \lambda x \lambda w$. $\neg$manage(e,w) $\wedge$ ag(e,x) $\wedge$ pat(e,w') $\wedge$ p(x)(i)(w') $\wedge$ (manage(e,w)$\leftrightarrow$(w=w'))

Since manage(e,w) is false, so is w=w'. I have already argued w' should be defined as identical to w, except that p(w') is true, and therefore the failure of equality must be due to p(w') being false. I admit the formulation of these inferences requires better precision and efficiency, but they hopefully, at least, approximate a possible resolution.[27]

Up to this point, we have ignored temporal effects. Below, I will begin to remedy this deficiency.

5.1.1 Sequence-of-tense

Other researchers have claimed that embedded past finites relativize to the time of the embedder event (Abusch (1999), Altshuler (2006), Gennari (1999), Higginbotham (2001)). These proposals might seem to contradict the proposal here, which only supplies finites with a world argument. In fact, the system here still allows relativization of time, but restricts it to mediation through the world argument. This shift provides a novel approach to well-known problems with relativization.[28] Pasts and futures are crucially distinct in their modal/intensional representations, and this difference is used to account for their distinct relativization properties.[29]

We can consider an LF like (b) for a sentence like (a). (c) gives an English approximation, which (d) more concisely summarizes. (e) and (f) show part of its composition, in repeating our basic pattern for 'thought' which merges with 'that Jill won'.

(72) a. Jack thought that Jill won.

[27] Since they, mostly, just intend to replicate Karttunen's claims, with the provision that there are predicates which exist in a gap between the full definite implicatives and factives.

[28] Although I have claimed that implicatives, factives, and interrogatives are not specifically assigned world arguments, the same argument should hold of the discourse satisfaction that they have been argued to undergo.

[29] I will not attempt to include an explanation of the additional "double access" issue here, but I hope it may fall prey to a similar analysis. In so far as the double access reading implies anything about the speech present as a relative future of a past event, it poses a serious threat to the theory here, which implies the impossibility of relative future modalities without future operators. However, a developed analysis of the simple present will be required to ultimately resolve the issue. Generics and habituals have been claimed to require intensional world modalities, and thus, it might not be surprising to find simple present statives licensing reference to times outside the domain of the specific, discourse world.

b. think(e,w) ∧ t(e)<now(w) ∧ ag(e,Jack) ∧ pat(e,w') ∧ win(e',w') ∧ t(e')<now(w'?) ∧ ag(e',Jill) –**to be reconsidered**

c. There was an event e of thinking, in world w, which preceded now, and Jack was the agent[30] of e, and the patient of e is a world w' such that there was an event e' of winning, in w', which preceded now in the world of Jack's thought, and Jill was the agent of e'.

d. In the world of Jack's thought, Jill won.

e. ⟦ thought ⟧=$\lambda P \lambda x \lambda w$. think(e,w) ∧ ag(e,x) ∧ t(e)<now(w) ∧ pat(e,w') ∧ P(w')

f. ⟦ that Jill won ⟧=λw . win(e',w) ∧ ag(e',Jill) ∧ t(e')<now(w) –**to be reconsidered**

I assume that now(w')=t(e), since w' is the patient of e. Therefore, the thinking preceded the utterance time, and the winning preceded that thinking time. We certainly have to admit that the winning that Jack is thinking of could not have preceded the utterance time, and yet followed the thinking time (see the table below). That is why we say that the past tense relativizes to the embedder time. We will see, however, that there is a surprising complication.

Although the past seems to undergo something like this kind of relativization, the future behaves differently. "Jack insisted that Jill will win" cannot mean that Jack spoke of an event of winning which followed his insistence, but preceded the utterance time. That is why the future might, instead, be called "absolute". 'Would', however, seems able to fill in the gap. The tables below diagram my judgments about the potential timing of the embedded event. t(think) and t(speech) are intended to indicate the thought time and the time of asserting the complete utterance.

(73) does winning at time i, in the world of Jack's thought, guarantee the sentence is true?[31]

i:	past			future
		t(think)	t(speech)	
a. Jack thought Jill won.	✓		X	X
b. Jack thought Jill would win.	X		✓	✓
c. Jack thought Jill will win.	X		X	✓

The above characterization of an absolute future, and a relative past runs into problems when examined under a future matrix clause. When embedded under a future operator,

[30] It's not entirely clear to me whether the subject of thinking should be an agent or an experiencer, but I will stress again that I am not taking these tenative roles too seriously.

[31] How can we also formalize the way that futures under past eventives are so much better than futures under past statives, as in (c)?

the past seems to continue its relativization to the embedder, while it now appears that the future also relativizes. In (b), the winning cannot be future to the utterance time, but past to the thinking time.

(74) does winning at time i, in the world of Jack's thought, guarantee the sentence is true?

i:	past			future
		t(speech)	t(think)	
a. Jack will think Jill won.	✓		✓	X
b. Jack will think Jill will win	X		X	✓

Another problem for simple relativization centers around a phenomena called "sequence of tense". In the more complete diagram of the table below, we see (with ✓!!!) that embedded pasts can produce co-occurant readings. (76) is presented for some semblance of completeness.

(75) does being pregnant at time i, in the world of Jack's thought, guarantee the sentence is true?

i:	past				future
		t(think)		t(speech)	
a. Jack thought Jill was pregnant	✓	✓!!!	X	X	X
b. Jack thought Jill will be pregnant	X	X	X	X	✓

(76) does being pregnant at time i, in the world of Jack's thought, guarantee the sentence is true?

i:	past				future
		t(speech)		t(think)	
a. Jack will think Jill was pregnant.	✓	✓	✓	X	X
b. Jack will think Jill will be pregnant	X	X	X	X	✓

Gennari (1999) and Altshuler (2006) have claimed that the simultaneous interpretation is restricted to stative contexts. I think that this is only true if we again use the word, "stative", so broadly as to include perfects, progressives, habituals, generics, and even activities. If someone says "Jack thought the horse trotted, but Jill said it galloped", I think it is quite likely, or at least easy to imagine, that they are making judgments that are co-occurant with the horses movements. She might have even said something like "Can't you see that it's galloping right now?!" If the earlier examples lack this effect, I

would suggest that it has something to do with telicity and the different implications that bounded or unbounded events force on potential interpretations. A full account of this interference is another problem that I must leave to future investigation.

I suggest that the sequence-of-tense phenomenon can be resolved by allowing the embedded past to relativize to the matrix time, while assuming that events in the embedded world are undefined for events occurring beyond the temporal existence of that embedded world.[32] As Bridget Copley puts it, "we adopt the common assumption that the actual world only exists up to the time of utterance" (Copley (2004), p. 12). Well, I don't really have any assumptions about the "actual" world, but a strict division should be maintained between a given discourse world and events which are future oriented to that world.

(77b) spells out this assumption a little more formally, in regards to (a), while (c) shows that the result allows Jill's pregnancy to occur at any time that is included in the world of Jack's thought. That, of course, should include the present of his thought, and also any previous time, since there is no restriction on a world's past. The event of her pregnancy is occurring, in his thought, some time prior to the utterance time, but also necessarily within times where his thought actually existed, t(w). This utterance time is referred to as now(SW) to indicate that it is the now of the speech world.

(77) a. Jack thought Jill was pregnant.

b. there is no e (here, the pregnancy) in w (here, Jack's thought) such that e is defined for $t(w) < t(e)$

c. since $t(w) < now(SW)$, $((t(e) < now(SW)) \cap (t(e) \leq t(w))) = t(w)$[33]

Taken too strictly, what I've said might lead one to conclude that it is impossible to think about the future. That, however, is clearly not the case. When a future oriented operator is present, we immediately postulate hypothetical worlds which are defined for future times (see Copley's work for good presentation and elaboration of interesting issues). One might wonder why worlds of thought can't already be defined for future times, but we are simply maintaining consistency. 'Would' (in the sense used here) then appears to fix on the embedder world's time, as in (78). I tentatively suggest that 'will', on the other hand, apparently, must be fixed relative to the maximum of any time which embeds it, as in (79, 80). This claim seems necessary to account for its absolute nature under a past, as

[32] In fact, it worries me a great deal to suggest that a single predicate like 'won' could assert its event in one world and its tense in another, but the data, combined with my framework, almost begs for this explanation.

[33] This argument borrows heavily from Abusch's derivation of the potential simultaneity in "Barak is predicted to be in the lead now". It is also reminiscent of Gennari's argument that sequence-of-tense relies on a "super-interval" property of states. Both of them work with intersections on acceptable times. However, both also assume that embedded events are relativized to the time of matrix events, rather than worlds.

in (79, also 73c), and its relative nature under another future, as in (80, also 74b).[34] Both 'would' and 'will' allow e' to be defined for times greater than t(w'), which is determined by t(e).

(78) a. Jack thought Jill would win.
b. (t(e)<now(SW)) ∧ (t(w)<t(e'))

(79) a. Jack thought Jill will win.
b. (t(e)<now(SW)) ∧ (now(SW)<t(e'))

(80) a. Jack will think Jill will win.
b. (now(SW)<t(e)) ∧ (t(w)<t(e'))

(81) a. Jack will think Jill won.
b. (now(SW)<t(e)) ∧ (t(e')<t(w))

Other approaches to the sequence-of-tense problem, have had to assume ambiguity for tense morphemes. The approach here also seems to imply ambiguity, in so far as t(w) and t(SW) vary for both the past (77c, 81b) and the future (79b, 80b). However, I suggested above that the indicative future should be understood as the maximum of the world-times which embed it. I think it may also be possible to derive the past's behavior with the exact same assumption (qualified by the constraint outlined in (77b)). The resolution of this issue will certainly be contingent on how people evaluate more complex constructions:[35]

(82) a. Jack said Jill will think Jane went.
b. Jack will say Jill thought Jane will go.
c. t(e) orients to t=max(t(w), t(w'), ...) over all the w that embed e?

I have tried, in this section, to argue that simple world arguments can still provide for necessary temporal relativizations. They, in fact, suggest new approaches to old problems. Furthermore, where other systems have been indifferent to the intensional type proposed by Heim and Kratzer (1998), I have tried to derive temporal properties while maintaining the basic type.

[34] Hopefully this effect could be derived from its contrast with 'would', similar, perhaps, to the way that Pancheva and von Stechow (2004) derive idiosyncrasies of the English perfect from its competition with the past.

[35] Aspectual effects also need fuller consideration in regards to this hypothesis.

5.2 Factives

It would be pleasantly simple if we could analyze all finite embedders as that same basic type, but we have already seen that factives require a different interpretation. Furthermore, even if extra meaning postulates could produce the extra implication, I worry that, as with desideratives, universal quantification over a contextual set of worlds would make wrong predictions.

(83) under consideration:

a. $[\![\text{ love }]\!]^w = \lambda p \epsilon D_{<w,t>} \ . \ [\lambda x \epsilon D \ . \ \text{p(w')} = 1 \text{ for all w' } \epsilon \text{ W that are compatible with what x loves in w}]$

b. "x hopes p" means that p is true in all worlds that are compatible with what x loves in w.

I utilize the following simplified notation to explicate what I find wrong with the above proposal:

(84) a. Jack loves that Jill ran.

b. false: $\forall$w Jack-loves(w) $\rightarrow$ Jill-ran(w)

c. false: $\forall$w Jill-ran(w) $\rightarrow$ Jack-loves(w)

Both of the above entailments are false because Jack should still be able to love worlds where he has a million dollars, but Jill didn't run, and hate worlds where she ran, but he has leprosy, for instance.

Instead, I would like factives to simply refer to event arguments occurring in some appropriate discourse world. 'Loves' would take an event argument as complement and 'that Jill ran' would mean something like 'the current discourse's unique event of Jill running that occurred in the past'.

(85) a. $[\![\text{ loves }]\!] = \lambda e' \lambda y \lambda w \ . \ \text{love(e,w)} \wedge \text{ag(e,y)} \wedge \text{now} \subseteq \text{t(e)} \wedge \text{pat(e,e')}$

b. $[\![\text{ that Jill ran }]\!] = \iota e'$: run(e',w') $\wedge$ ag(e',Jill) $\wedge$ t(e')<now[36]

Use of the definite operator ι would immediately derive the presupposition associated with these predicates, but how these would compose together is not entirely clear. Simply inserting the full definite definition in the pat predicate certainly would make a mess of our formulas. It might be preferable to consider a lifting operation, but then it also seems more appropriate to use the unique existential, and we would lose the presupposition.

[36] w' is presumed to already be fixed by discourse, and not necessarily the same as the matrix world. Furthermore, 'now' is represented without any world argument, pending resolution of the issues discussed in section 5.1.1.

(86) $[\![$ that Jill ran $]\!]=\lambda P$. $\exists!e'$: run(e',w') $\wedge$ ag(e',Jill) $\wedge$ t(e')<now $\wedge$ P(e')

The complement would then take the embedder as argument and hand it the event argument that it is looking for. There is still the internal composition problem of deriving the event denotation for 'that Jill ran'. I have generally adopted an ethic of maintaining the event argument as a constant strictly defined within the predicate's lexical entry. The $\iota e'$ would then have to be derived through some kind of co-referent relationship paralleling maneuvers I have criticized in traditional binding. Thus, this ethic of strictly local definition may have to be discarded. Furthermore, these kinds of formulations will run into even bigger obstacles when we attempt to deal with control/raising. Resolving these issues will require further research, and ultimately may entail radical revisions to the system advocated here.

Additionally, we would also have to handle plural events, which I would assume to be present in both generics and other quantified constructions.

(87) a. Jack loves that birds fly.

b. Jack loves that every girl likes him.

c. Every boy loves that some girl likes him.

Also note, clause subjects also frequently fall into the factive class ((88c) is the lifted, existential version of (88b) and produces a cleaner final equation, but loses the presupposition effect.):

(88) a. That Jill ran pleased Jack.

b. [λe . please(e',w) $\wedge$ t(e')<now $\wedge$ pat(e',Jack) $\wedge$ ag(e',e)](ιe: run(e,w) $\wedge$ t(e)<now $\wedge$ ag(e,Jill))

c. [λP . $\exists!e'$: run(e',w) $\wedge$ ag(e',Jill) $\wedge$ t(e')<now $\wedge$ P(e')](λx . please(e',w) $\wedge$ t(e')<now $\wedge$ pat(e',Jack) $\wedge$ ag(e',x))

5.3 Interrogatives

As with factives, I assume that the world argument of the complement is satisfied by discourse. It is frequently presumed to be the same as the matrix discourse world, but is not necessarily so. The selector takes a question quantifier as argument. As a rough preliminary approximation, we might use something like Karttunen's proposal for questions (1977).

(89) a. Who ran?

b. Wh x: x ran

c. {P|$\exists x$ P(x)=$[\![$x ran$]\!]$=1}

d. $\{P|\exists x\ P(x)=(run(e,w) \wedge t(e)<now \wedge ag(e,x))=1\}$

However, I am currently uncertain whether it is (90c) or (90d) that correlates better with intuitions or any relevant tests.

(90) a. Jack asked who ran.

b. Jack asked wh x s.t. x ran

c. $ask(e,w) \wedge t(e)<now \wedge ag(e,Jack) \wedge pat(e,P) \wedge \{P|\exists x\ P(x)=(run(e,w) \wedge t(e)<now \wedge ag(e,x))\}$

d. $ask(e,w) \wedge t(e)<now \wedge ag(e,Jack) \wedge pat(e,x) \wedge$ x s.t. $\{P|P(x)=(run(e,w) \wedge t(e)<now \wedge ag(e,x))\}\neq\emptyset$

I have tried in these last two subsections to acknowledge specific and important exceptions to the more general pattern I would like to describe. They present significant problems and suggest potential revisions, but I will have to leave these as topics for future research.

6 P(i)(w)

Unlike the temporal complications observed in the sequence-of-tense phenomenon for finite complements, non-finites necessarily relativize to the embedder time. However, as shown in section 2.1, they relativize differently for different selectors.[37]

(92) a. Jack believes Jill to be nice.

b. Jack wants Jill to win.

While (92a) receives a co-occurrent interpretation, (92b) appears to be strongly future oriented. However, it would be incorrect to say that (92b)'s complement *must* have a

[37] It's also clear that relativization, *sometimes*, depends on the kind of non-finite selected. For instance:

(91) a. Jack remembered to buy milk.

b. Jack remembered buying milk.

c. Jack likes to run.

d. Jack likes running.

e. Jack likes Jill to run.

f. (?)Jack likes Jill running.

While in (a), the remembering must have preceded the buying, and results in a factive interpretation (odd to think that a future oriented predicate would be factive, isn't it?), in (b), the buying must have preceded the remembering, though with a hypothetical implication (just as ironic). On the other hand, I sense no intuitive difference between (c) and (d), though some kind of difference seems to arise when an overt subject is introduced (e, f). These topics, I also have to leave to future research.

future interpretation.[38] (93) shows some future orienters, which also allow co-occurent interpretations.

(93) a. Jack really wants to be on holiday right now.

b. Jill is likely to be running now.

c. Jack demands to be let in now!

I will continue to call these future oriented, in so far as they certainly allow the reading, but they are not quite identical to those predicates which almost seem to lose all meaning with co-occurant complements.

(94) a. ?Jack intends to be here now.

b. ?Jill hopes to be working now.

c. ?Jack expects to live in L.A. now.

Therefore, while the predicates in (94) would probably just need something like (t(e)<t(e')), for 'want'-like predicates, I'll use (t(e)≤t(e')).[39] Because the interpretation of the complement varies with the selector, I assume the temporal orientation is imposed by the selector (see Stowell (1982), Abusch (1999) for more discussion). For instance,

(95) a. $[\![$ want $]\!]=\lambda i\lambda P\lambda x\lambda w$. want(e,w) $\wedge$ ag(e,x) $\wedge$ i(e) $\wedge$ pat(e,w') $\wedge$ P($\lambda e'$. t(e)≤t(e'))(w')

b. $[\![$ Jill to win $]\!]=\lambda i\lambda w$. win(e',w) $\wedge$ ag(e',Jill) $\wedge$ i(e')

'Believe', on the other hand, needs something like (96a), using t(e)=t(e').

(96) a. $[\![$ believe $]\!]=\lambda i\lambda P\lambda x\lambda w$. believe(e,w) $\wedge$ ag(e,x) $\wedge$ i(e) $\wedge$ pat(e,w') $\wedge$ P($\lambda e'$. t(e)=t(e'))(w')

b. $[\![$ Jill to be nice $]\!]=\lambda i\lambda w$. nice(e',w) $\wedge$ ag(e',Jill) $\wedge$ i(e')

Notice that since t(e)=t(e') and e is stative, and e' has no other reference time than t(e), e' must also be stative. That is, it must have duration and be atelic (i.e. lacking completion). I have not yet specifically shown how these aktionsart properties would need to be represented.

We can also consider the hypothesis, that 'for' is only associated with t(e)≤t(e')/t(e)<t(e'), and thus does not appear with stative selectors.

(97) a. *Jack believes for Jill to run.

b. *Jack imagines for Jill to run.

[38] Thanks to Abusch (1999) for reminding me.

[39] Abusch's notation: [t,∞).

c. Jack decided for Jill to run.

Pesetsky and Torrego (2000-2006) basically claim that 'for' is only associated with *irrealis* selecting predicates, further associating this with tense, and future orientation, as I will discuss more fully in section 7.1. First, we need the qualification about potential over-lapping discussed above. Furthermore, we would have to exclude factives from consideration.

(98) a. Jack likes for Jill to run.

b. Jack hates for Jill to fall.

It would also depend highly on how one judged the quality and interpretation of the predicates like the following:

(99) a. ?Jack made sure for Jill to run.

b. Jack saw fit for Jill to run.

I find (a) much worse than (b), but hesitate to classify either as truly unacceptable. That said, I think the matrix predicates do suggest a temporal precedence, so the future orientation of non-factive 'for' might be tenable.

The denotations in (95) and (96), however, leave a significant generalization unexplained. Why do most stative selectors allow passivization, while future orienters *usually* don't?

(100) a. Jack was considered to be intelligent.

b. *Jack was wanted to be intelligent.

The behavior of these passivizers (not to be confused with object-controllers which also passivize) is particularly odd for 2 reasons: 1.) Passives are usually problematic for statives, as shown by (101a), and 2.) They don't even assign a θ-role to the passivized subject, as shown by (101b)– though that is, by definition, the nature of raisers.

(101) a. ?Jill was liked.[40]

[40] There is an appreciable difference, when the 'by'-phrase is used, and I would guess that this is exactly because if its ability to assign range indirectly. See the discussion on locatives in Ch. 10, Borer (2005b), or more generally, for various means of satisfying range.

(102) (a) ?Jack was liked.

(b) Jack was liked by all.

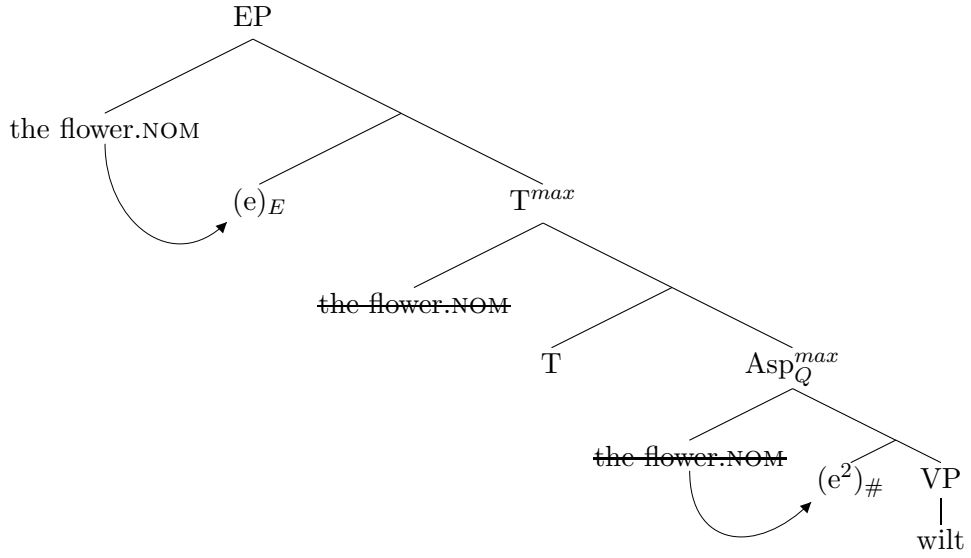
(c) ?Jill was wanted.

(d) Jill was wanted by the police.

b. Jack was believed to be a liar.

I believe that the key to both these puzzles lies in the concept of "range assignment" (Borer (2005a), Borer (2005b)). Borer derives the telicity of unaccusatives, by proposing they have two "open values" ('e', in her tree, having, perhaps, a more open-ended implication than just "event"). Non-telic transitives will also need to fill in 2 values, but the internal one will have a non-quantity implication, and agree with non-quantity DPs. Unergatives, on the other hand, will only need 1 $(e)_E$. Notice that this system will give us a way to talk about "subjects" in a way that is distinct from both θ and Case.

(103) Borer (2005b), p. 84, ch. 3, ex. 15a (slightly modified):
The arrows indicate the range assignments.



In fact, we can say that a necessary property of passives and unaccusatives is that range($(e)_E$)=range((e^2)), since they were both assigned by the same argument. When I use e to refer specifically to events, as I normally do, and assuming that a predicate is just one event (which may be a questionable assumption, but will jive more with a layman's intuitions), I will, henceforth, generalize this passive property as $r_{ex}(e)=r_{in}(e)$. That is to say, the external range of the event is equal to its internal range. The argument that I am going to present below will, in fact, rely on the idea that passives are specifically licensed by intuitively satisfying this condition, $r_{ex}(e)=r_{in}(e)$.

Given that many languages assign different cases to quantity and non-quantity (i.e. of unspecified quantity) objects, Borer argues that different functional projections are associated with these Cases. AspQ above is associated with accusative Case, but this accusative Case is dependent on nominative also being assigned (Borer (2005b), p. 81). In the unaccusative construction above, AspQ is projected, but accusative Case is not assigned. Thus,

we see that we cannot reduce one to the other. For partitive objects, she still postulates a distinct functional projection, F^sP, (p. 109).

I'd like to suggest that stative events are characterized by being in a superset relation to their internal arguments. I'd also suggest that we return to the assumption that the objects of activities and telics are hosted in the same functional category, regardless of their Case differences in some languages. That will allow us to associate them both with a $\subseteq$ relation, and derive the argument effect straight away.[41]

(104) a. stative: $\mathrm{r}_{in}(e) \supseteq \mathrm{arg}_{in}(e)$

b. activity: $\mathrm{r}_{in}(e) \subseteq \text{open-arg}_{in}(e)$

c. telic: $\mathrm{r}_{in}(e) \subseteq \text{closed-arg}_{in}(e)$

While the telicity of non-stative predicates is, frequently, dependent on their internal arguments, this property is not characteristic of stative predicates:

(105) a. Jack ate hamburgers (*in an hour). (atelic)

b. Jack ate a hamburger (in an hour). (telic)

c. Jack likes girls (*in an hour). (atelic)

d. Jack likes a girl (*in an hour). (atelic)

The proposal in (104) captures this distinction. The same subset relation is at work, in 'ate', but an argument with a closed quantity will insure that the internal range of the event is also closed, while an argument with open, unspecified quantity will leave the issue open. Because stative events, like 'like', maintain a superset relation with their internal arguments, they are not closed either way.

I furthermore suggest that external ranges are necessarily subsets of some argument, though whether their range becomes definitively restricted is not insured, *in English.*[42]

(106) □For some X, $\mathrm{r}_{ex}(\mathrm{e}) \subseteq \mathrm{X}$

That's why even atelics can passivize, but statives don't like to (but see fn. 40).

(107) a. Naughty students will be severely punished.

b. $\mathrm{r}_{ex}(\mathrm{e}) = \mathrm{r}_{in}(e) \subseteq \text{open-arg}_{in}(e)$

c. ?Polite students will be really liked.

d. $?\mathrm{r}_{ex}(\mathrm{e}) = \mathrm{r}_{in}(e) \supseteq \mathrm{arg}_{in}(e)$

[41] It does not account for inherent telics.

[42] Apparently not in other languages. See Borer, and others, for discussions on bare subject restrictions in other languages.

Although, (b)'s argument is open, having some $\subseteq$-relation seems to suffice. In (d), the subject condition is not satisfied, and thus, 'polite students' do not qualify as a subject of the event.

Now, we are prepared to look at ECM passives, and other raisers. I characterize those that passivize and those that don't as follows:

(108) a. $\Diamond$passive: $\mathrm{r}_{in}(e) = \mathrm{r}_{ex}(\mathrm{e'})$ (for instance, 'believe')
b. $\Box\neg$passive: $\mathrm{r}_{in}(e) \supset \mathrm{r}_{ex}(\mathrm{e'})$ (for instance, 'want')

Crucially, (a) doesn't mean a predicate is not a stative event, even if the subject of my belief is closed. Note that it still satisfies the condition in (104a).

Trying to speak intuitively, it seems reasonable to say that the internal range of an event of my belief is limited to the external range of what's believed. For instance, I know that leprechauns don't exist, but I believe that they are stealing my socks, makes no sense (though we should always make room for subjective contradictions). Their range is not within my belief world, so there can be no such belief-event of sock-stealing. On the other hand, the internal range of my 'want' is in no way restricted by the subject. I think that leprechauns don't exist, but I still want them to.

(109) a. Jack is believed to be smart.
b. $\mathrm{r}_{ex}(\mathrm{e})=\mathrm{r}_{in}(e) = \mathrm{r}_{ex}(\mathrm{e'})\subseteq \mathrm{X}$
c. *Jack is wanted to be smart.
d. $*\mathrm{r}_{ex}(\mathrm{e})=\mathrm{r}_{in}(e) \supset \mathrm{r}_{ex}(\mathrm{e'})\subseteq \mathrm{X}$

X is whatever assigns the external range of the embedded event (in this case 'Jack'). It qualifies as a subject of the matrix event in (109a,b) because the formula in (b) is consitent with (106); in other words, because the event is sufficiently characterized. In (109c,d), the external argument of the embedded event has no sufficient relation to the matrix event.

There is an intuitive appeal to the notion that stative selectors imply $\mathrm{r}_{in}(e) = \mathrm{r}_{ex}(\mathrm{e'})$, and passivize, because $\mathrm{t(e)}=\mathrm{t(e')}$. However, it would be a mistake to assume that these were identical. Though uncommon, there are future orienters, such as 'expect', which also allow passivization, and raisers like 'likely', which also allow non-θ assigned subjects. Furthermore, their passive/raised alternations are not in any way restricted to $\mathrm{t(e)}=\mathrm{t(e')}$.

I also admit that I am highly tempted to associate $\mathrm{r}_{in}(e) = \mathrm{r}_{ex}(\mathrm{e'})$ with some greater likelihood of e', in so far as 'expect' is much more likely than 'want' and, of course, 'likely' is more likely than 'possible', which does not allow raising. But then, what would I say about 'probable'?

In fact, I *need* to claim that 'possible' and 'probable' have *no* external range. Iatridou (1990) goes even further, claiming that 'possible' has *no tense*. She offers the following judgment:

(110) Iatridou's judgment, p. 123, ex. 3:
#It was/will be possible/probable that John stole the tapes.

I do not agree with this judgment. I think embedding 'possible/probable' in appropriate circumstances gives reasonable saliency to the use of a past tense.

(111) Jack thought that it was possible/probable that John stole the tapes.

However, by claiming that complement selecting 'possible' and 'probable' have no *external* range, we can both account for her intuition, and explain why they never take thematic subjects in their complement taking forms.

(112) a. It is possible/probable that Jack ran.
b. It is possible/probable for Jack to run.
c. *Jack is possible/probable to run.
d. For Jack to run is possible.

'Possible', though having both finite and non-finite forms, has no alternation where r_{ex}(e)=$r_{in}(e)$=r_{ex}(e').

Having an additional property beyond Case and θ also makes it possible for us to divide the varying clause ellipsis properties of these kinds of predicates.

(113) a. Did Jack win?
b. He tried.
c. *He wanted.
d. *He believed. (i.e. cannot mean 'believed that he won')

I have argued that unsaturated θs do not cause a derivation to crash. Furthermore, Case has never, to my knowledge, really been considered an option to enforce complement clause selection. However, now we can say that 'try' has an alternation which projects without internal range, while 'want' and 'believe' do not.

To summarize, I have proposed the following characterizations:

(114) a. □For some X, $r_{ex}(e) \subseteq X$
b. passive: $r_{ex}(e) = r_{in}(e)$
c. stative: $r_{in}(e) \supseteq arg_{in}(e)$
d. activity: $r_{in}(e) \subseteq$ open-$arg_{in}(e)$
e. telic: $r_{in}(e) \subseteq$ closed-$arg_{in}(e)$
f. clause selectors that can passivize: $r_{in}(e) = r_{ex}(e')$

g. clause selectors that can't: $r_{in}(e) \supset r_{ex}(e')$

If these arguments are on the right track, they suggest a unified means, using Borer's independently justified mechanism, to characterize stativity, passivization, its exceptional behavior and how that is *partially* related to stative selection, surprising raising failures, and clause ellipsis. However, a more in-depth examination of the data suggests that the current generalizations may be too broad, and the effects of tense, DP-quantity, and possibly other factors must be given more prominence to ultimately capture the subtle shifts of linguistic acceptability.

In this section, I have also distinguished future orienters from stative selectors, and discussed the *partial* future property of 'for'.

6.1 fin-comp ⇛ non-fin-comp

In section 9.1, I am going to present some of the operations which Jacobson argues are at work in binding, and which I have also assumed to be relevant to control and raising. In so far as they relate those constructions, and those constructions appear within patterns of lexical alternations, we will be able to see them as specifically describing, in a highly analytic sense, those lexical alternations. In that spirit, I would like to formally define the function that relates a finite-selector to a non-finite selector (at this point, with an overt embedded subject; the silent subject alternations will be described when a more complete presentation of Jacobson's theory is given in section 9.1).

I have generally assumed an ethic of fixing the event as close to the predicate as possible. Then, because the temporal relativizations above make use of ($\lambda e'$. t(e)=t(e')) or ($\lambda e'$. t(e)≤t(e')), defining a totally general function to relate them runs into difficulties. With the functions in section 9.1, it seems to make little difference whether we define them in the "lexicon" or in the "syntax". Perhaps because of my potentially erroneous assumptions, I will have to make a claim like "this function must be defined in the lexicion". That is to say, since I need to introduce another instantiation of a pre-existing constant, it appears almost necessary, and at least most convenient, to define this function as applying before that constant, the event argument, is resolved.[43]

(115) a. $d_R(f)=\lambda e\lambda Q$. f(e)(Q($\lambda e'$. t(e)Rt(e')))

b. It is likely that Jill won.

c. $\lambda e\lambda P\lambda i\lambda w$. likely(e,w) ∧ pat(e,w') ∧ i(e) ∧ P(w')

d. It is likely for Jill to win.

e. $\lambda e\lambda Q\lambda i\lambda w$. likely(e,w) ∧ pat(e,w') ∧ i(e) ∧ Q($\lambda e'$. t(e)≤t(e'))(w')

[43] 'd' stands for "diachronic", since all the other good letters are taken.

The reader is invited to ascertain that $d_{\leq}(c)=e$[44]. When, why, and with which lexical items, an alternation like this is permitted is the more challenging, exciting, and mysterious question. It is my hope that precise formulations may, eventually, shed some light on, at least, some of the underlying causes.

7 T

I have assumed that all complement infinitives receive i-type arguments from their selectors.[45] Various syntacticians have, on the other hand, argued that non-finites must be distinguised by the presense or absence of T features. At least 3 recent proposals associate these T features with both different interpretative results and different syntactic licensing. In the 3 subsections that follow, we can observe the phenomena these researchers associate with T, see how we can distinguish these properties, and try to see what other accounts may be available.

7.1 C^0

Since the turn of the century, David Pesetsky and Esther Torrego have been building a body of works which construct a theory of the "that-trace" effect (shown in (117)) around the parallel behavior of tense-inversion (shown in (116)).

(116) Pesetsky and Torrego (2004), ex. 21: (Koopman 1983):

a. What a nice book Mary read _!

b. What did Mary read _?

c. Who _ read the book?

d. *Who did _ read the book?/*What a nice person did read the book!

Although (116a) and (116b) have different meanings, they are argued to show that tense-inversion is optional in the case of object extractions. In the case of subject extractions, (116c,d), however, tense-inversion is prohibited. The use of 'that' in embedded complements shows a similar asymmetry.

(117) Pesetsky and Torrego (2004), ex. 23: (Perlmutter 1971):

a. What do you think [Mary read _] ?

[44]Notice that this $\leq$ introduces a future oriented complement, which I would intuitively associate with "greater than". It appears that this is because I have maintained a notion where precedence is always on the left; thus, the embedded argument is on the right, since we have cause to talk about future orientations most. We've also seen constructions where R is = or <, but other relations might also be available.

[45]Notice that I do not touch on "small clauses" anywhere within this paper, as well as setting aside the issues of '-ing'.

b. What do you think [that Mary read _] ?

c. Who do you think [_ read the book] ?

d. *Who do you think [that _ read the book] ?

They, therefore, argue that 'that' is just another manifestation of "T-to-C movement", and that subject movement to or through C satisfies a (u)T feature in C (because of its nominative case), excluding tense movement (by economy, i.e. why move both?).[46] In the case of object extraction, either Tense or the nominative subject also must move to C, because the object's (u)T feature (argued for in the later development) has already been deleted. Notice that in (117b), they then must claim that tense is phonologizing in 2 places, like a "resumptive pronoun" (2000/01, p. 12).

Since there are also "for-trace" effects, they extend this explanation to 'for'-clauses:

(118) a. What do you want Mary to read _?

b. What do you want for Mary to read _?

c. Who do you want _ to read the book?

d. *Who do you want for _ to read the book?

Notice that there is just as much a "for-PRO" effect:

(119) a. I want to read the book.

b. *I want for to read the book.[47]

Thus, they require a separate account for this phenomenon and propose that "the uT feature on C is [-EPP] in a declarative clause whose subject is PRO" (2000/01, p. 28). In other words, that uT doesn't cause T-to-C movement. Neither the cause nor the means of this dependency between the PRO subject and C's uT are entirely clear, as they admit (2000/01, p. 28).

I'd like to modify their proposal, in some specific ways, which I hope will provide for a more direct description of our intuitions. We want to insist that 'that' and 'for' always have overt DPs directly to their right (excluding parenthetical insertion). While it appears that 'for' assigns accusative Case, this checking relationship is always immediately adjacent (within the potential checking relations), as shown in (a) and (b).

[46] Don't they need to assume that wh-movement precedes Tense movement, so that C knows if its uT has been checked by the subject before moving Tense? Also notice that the subject seems to enter 2 T-checking relations. As the theory develops, what is iT or uT or when/why features are deleted shifts. On p. 5 (2000/01), they give an example of "Attraction to Spec,TP" as "$[_{TP}[_{DP}$ subject, ~~uT~~, $\phi]_i$ [T, ~~uϕ~~] [t-subject$_i$ bought the book]]", clearly marking the subject's uT for deletion, and then seem to imply that delaying deletion will play some significant role, before switching to the "closeness" issue.

[47] Such sentences are acceptable in Belfast English, and therefore, any theory needs to attribute some slightly different status to the Belfast 'for'. In fact, these x-ec effects are quite language specific.

(120) a. *Who did you want for _ to come?

b. *Jack wants for usually Jill to run.

c. Whom did you speak to _?

d. I usually drink coffee in the morning.

e. *I drink usually coffee in the morning.

Accusative case, as well as nominative, is usually assumed to be transmitted by wh-chains, as in (c). It also appears that nominative Case allows adverbial intervention (d), and accusative Case doesn't, as in (e).[48] However, because we need to allow for wh-movement, we can't say that the verb's accusative feature is strong, so I'll assume that the adverb problem is strictly prohibited because adverbs merge outside of the basic VP (as most researchers have ultimately concluded). 'For'-accusative, on the other hand, is strong, in the sense that it forces an overt checking adjacency.

To be more specific, avoid confusion with morphological Case, and account for these special properties, I propose that overt C always has a uD*⇒ feature. This feature necessarily checks itself against an overt, adjacent DP on its right. With 'for', this also bears [accusative], thus satisfying the embedded subject DP's case requirement, when this type of uD feature on C gets checked. This feature, without accusative Case, applies to 'that', just as much as to 'for', since they both imply overt, adjacent DPs (n.b. the qualification above). In fact, it is the same feature which transitive verbs appear to bear, except that it is not strong in the verb case, uD⇒, thus allowing wh-movement. Presumably DPs never loose their D feature, so there is nothing wrong with letting an object check uD for both its transitive verb and 'that/for'. Of course, an overt subject can also check C's uD.

'Do', on the other hand, I would argue, arises to support a uT*⇒ feature on the question particle, in Spec, CP, which drives wh-movement. Since T on tense is undeletable, there is nothing wrong with letting it check both the subject and the manifestation of a question word.

Notice that I have now separated what Pesetsky and Torrego attempted to put together. I believe that this is correct exactly because (116a) and (116b) *do not* mean the same thing. I'd argue that (116a) is really just a simple topicalization like "Such a wonderful book Mary read!", and should not be mixed with the issue of tense inversion which accompanies question formation.

[48] Chomsky attributes this suggestion to Stowell (while protesting). The argument was that certain word order variations might be accounted for by adjacency conditions (Chomsky (1995)). In other words, French and English differ, not in the Strength of Tense, but rather, the adjacency requirement on Case being at work in just one of the languages.

(121) a. *John reads often books.

b. Jean lire souvent les livres.

Thus, I have argued that Cs need their own uD to be checked, while 'do' checks Qu's uT. They appear partially identical just because overt subjects, with undeletable D, can check C's uD, and, when merged with Qu, allow Qu direct adjacency to an undeletable T.[49] That is to say, manifestations of T and C have somewhat similar effects because they either license or insure the presence of DPs at the left margin of clauses. That does not mean they should be completely identified.

(122) Summarizing:

a. 'for': uD*⇒(acc)

b. 'that': uD*⇒

c. transitive verb: uD⇒(acc)[50]

d. 'do': T

e. 'Qu': uT*⇒[51] , ...?

7.2 Independent tense and partial control

Landau (2000) proposes an entirely different function for T features. He observes an extremely interesting correlation between the licensing of distinctive, embedded, temporal adverbials and what he calls "partial control".

He divides his previously discussed predicate groups into 2 classes:[52]

(124) Untensed: Implicative, Aspectual, Modal
Tensed: Factive, Propositional, Desiderative, Interrogative

He argues that these tense properties are made manifest by the possibility of embedded adverbs representing distinct time frames:

(125) a. *Yesterday, Jack tried to run tomorrow.

b. Yesterday, Jack wanted to run tomorrow.

[49] In fact, "Who *did* see John?" just has the emphatic separation of tense and the predicate.

[50] Perhaps, really, transmitted from little v. Also notice that given Strength and Case, uD⇒ appears with one, the other, or both. Could neither exist? What about the other direction?

[51] In fact, if we made this feature directionless, then, in embedded contexts, we could let it check against a selecting verb on the left (that is, if we accepted Pesetsky and Torrego's later theories that verbs also bear a kind of T feature), and thus account for the lack of "T-to-C" movement in embedded questions.

(123) (a) Who did Jack see?

(b) I know who Jack saw.

[52] In fact, many of these items are not control predicates, *in English*, and might require finite complements, bare verbs, etc.

He claims the exact same classes correlate with the ability to license partial control. Partial control is the ability of a singular argument to control a collective predicate:

(126) a. *Jack tried to meet.
b. Jack wanted to meet.

While the general correlation is compelling, I worry about the minor exceptions. Sometimes, the predicates shift classes in their various alternations, but still maintain the correlation. For instance, 'dare' is implicative in subject control (127a), but, perhaps more desiderative with object control (b). Just as the theory would predict, only its object control alternation can take temporally independent adverbs, and partial control (c,d). Other times, the correlation, itself, is not entirely consistent. For instance, 'like', whether a factive or not, can't take an independent adverb (e), while it does license collectives, (f). The behavior of 'decide', as shown in (g,h), also questions the correlation.

(127) a. Jack dared to run (definitely ran)
b. Jack dared Jill to run. (maybe didn't)
c. ?Jack dared to meet tomorrow..
d. Jack dared Jill to meet tomorrow.
e. *Yesterday, I liked to meet you tomorrow.
f. Jill likes to meet on Fridays.
g. Yesterday, Jill decided to run tomorrow.
h. ?Jill decided to kiss.

More generally, different collectives seem to be coercible under different circumstances:

(128) a. She can kiss.[53]
b. ?She can work together.

(129) a. Jill wanted to kiss.
b. ?Jill wanted to gather.

Landau assumes that the controlled subject (PRO) must be plural and that different Agree mechanisms, based on the presence or absence of T, provide for PRO either equaling the overt subject or merely including it. If Landau is correct, this potential lack of identity poses a serious threat to any theory of control as either raising or binding.

Due to the murkiness of the data and the complexity of reciprocity, I will not be able to reply with a truly formal analysis. However, I assume that there are many situations

[53]Though it's interesting to note how this only seems to have an ability reading.

where predicates are licensed to project with more or less Case features; passives, nominals, intrinsic reflexives, and non-controlled collectives are a few examples. Collective predicates are normally licensed to appear in such an alternation, not by any process of *syntactic* Agreement, but instead through pure semantic plurality.

(130) a. *The boss met.
b. The committee met.

I also suspect that those predicates which fail to license partial control are ones that imply overlapping events, thus entailing identical times and subjects.

(131) a. Jack tried to run.
b. *Jack tried Jill to run.
c. *Yesterday, Jack tried to run tomorrow.
d. *Jack tried to meet.
e. Jack managed to run.
f. *Jack managed Jill to run.
g. *Yesterday, Jack managed to run tomorrow.
h. *Jack managed to meet.

Thus, there is some connection between the semantic-pragmatic understanding of open participants, and leaving argument satisfaction to discourse. Specifically singular arguments, in a semantic sense, and inherently overlapping events disallow these vagaries. However, even sustaining these generalizations requires excluding -ing-complements from consideration.

(132) a. Jill has tried kissing, but she didn't really like it.
b. I avoid meeting on holidays.

'-ing'-complements seem to be even closer to nominals than 'to'-infinitives. That is to say, I believe the phenomenon should be related to the way that nominalizations can abstain from argument projection, while maintaining their implicit understanding.

(133) Williams (1987), ex. (1): (also in 1985)

a. Control: The attempt to leave
b. (attempter=leaver)
c. Binding: Respect for oneself is important
d. (respecter=respectee)

This comparison to nominals is not intended to claim that non-finites are nominalizations, but simply that they might share similar Case abstinence properties. Nominative case (in English) is never assigned to subjects in non-finite constructions. Thus, I leave the topic, in just such a mess.

7.3 Non-stativity

Martin (2001), following Chomsky and Lasnik (1993), in fact, does argue that silent control subjects are assigned "null Case". This null Case crucially distinguishes raising and control, and is, as we should expect by now, argued to be assigned by a [+tense], non-finite T. Raising predicates are argued to select [-tense] complements, and the [-tense] property is said to be reflected in a stativity requirement. In other words, "... eventive predicates are impossible in raising infinitivals" (Martin (2001), p. 150). He offers examples like the following:

(134) Martin (2001), p. 150, ex. 39:

a. *Geno believed Rebecca to win the game.

b. *The doctor showed Bill to take the wrong medicine.

c. *The defendant seems to the DA to steal the car.

Martin claims these ideas also account for the passivization contrast between 'believe' and 'want'-type predicates, because he actually lets lexical items receive null Case, and thus they cannot raise.

(135) a. He was believed to be intelligent.

b. *He was wanted to be intelligent.

This theory also forces Martin to recategorize predicates traditionally assumed to be raisers. However, he admits that (136b) shows that 'likely' and 'certain' "need not have external arguments" (p. 159).

(136) Martin (2001), p. 159, ex. 72-3:

a. Sarah is likely/certain to leave.

b. It is likely that Sarah will leave.

Still, he argues that "only agreeing functional categories ... permit ellipsis of their complement",[54] and that control predicates allow ellipsis, but not raisers, which his null Case checking thus also accounts for. By this standard, 'likely' and 'certain' also appear as control predicates.

(137) Martin (2001), p. 159, ex. 74:

a. Kim may leave but Sarah is likely/certain to [$_{VP}$ e]

[54]See his paper, p. 153, for numerous researchers working on this claim.

b. *Bill believes Sarah to be [$_{AP}$ honest], and he believes [Kim [$_{T}$ to] [$_{VP}$ e]] as well.

Though the oddity of ellipsis in these stative selectors, under most circumstances, is certainly noteworthy, I'm not entirely convinced that traditional raisers never allow ellipsis:[55]

(138) a. Does he have his coat?

b. He appears to.

c. I know that Jack has his vest, and Jill appears to.

d. Does he like raisins?

e. He seems to.

f. I know that Jack likes raisins, and Jill seems to.

'Likely' and 'certain' are distinct from most raisers in taking 'for'-complements, though these predicates adhere to the generalization proposed in this paper that non-factive 'for' is always future-oriented:

(139) a. It is likely for Jill to win.

b. It is certain for Jill to win.

c. *It seems for Jill to be nice.

I have already argued that control and raising share fundamental chain mechanisms, so I have no intention of bickering about predicate classifications in those terms. The data above shows that there is *not* an exact correlation between stativity and θ-less Case satisfaction, which are predicate properties I consider significant. In section 6, I treated stative selection as a lexical fact, and considered an alternative account for its association with passivization.

8 Case

In this section, I continue defending the traditional proposal, and apparent fact, that nominative case is checked in the presence of finite tense, and that silent subjects are licensed in non-finite clauses specifically by its absence. I will furthermore argue against distinguishing the EPP from Case. In the following subsection, I question the arguments which originally motivated the theory of "null Case". Given that I argue for a complete lack of projection, I clearly have no use for "null Case".

[55]How significant is prosody? Does it change across varying temporal relations? Can it account for the unacceptable sentences which have been advanced?

8.1 Chomsky and Lasnik (1993)

Chomsky and Lasnik (1993) discuss three environments where the distribution of PRO cannot be accounted for by Caselessness (p. 555). These environments can be characterized as, 1.) adverb interventions, 2.) adjective environments, 3.) nominative environments. I will attempt to qualify each of these observations in turn.

Most importantly, notice that it's not entirely clear how null Case would actually resolve any of the problems discussed below. This point returns to the one discussed by Adger in section 2.1. In each case, there is a problem with why silent subject infinitives (with different interpretations) can or can't merge with different elements. The problem, in each environment, is external to the infinitive clause, but they then draw the conclusion that an internal modification (PRO Case checking with non-finite tense) will resolve it. However, if Case is simply checked and deleted, an external element really should be indifferent to the presence or absence of PRO. The external element should have no way of Agreeing or selecting infinitive phrases with or without null Case, since these Case properties should be invisible by the time of the external merger. The real problem lies in the assumption that PRO even exists, and once we remove this assumption, we can begin to consider real solutions to some of the following problems.

8.1.1 Adverb interventions

As they observe on p. 557, "Case generally conforms to an adjacency requirement," (in English, and I believe we should add: at least for accusative Case). They offer the following examples:

(140) Chomsky and Lasnik (1993), p. 557, ex. 279:

a. Bill sincerely believed Sam.

b. *Bill believed sincerely Sam.

The logic extends to ECM constructions, which they discuss on p.555:

(141) Chomsky and Lasnik (1993), p. 555, ex. 253:

*John believes sincerely [Mary to be clever].

They argue that if PRO merely avoids Case, the following sentence should be possible.

(142) Chomsky and Lasnik (1993), p. 555, ex. 254:

*John believes sincerely [PRO to be clever].

I simply argue that 'believe' *must* check accusative Case (as does Pesetsky (1991)). There is nothing wrong with the internal composition of the bracketed phrase. It is the

external composition which causes the derivation to crash. No one would be silly enough to argue that any and all constructions containing a Caseless PRO should automatically converge. The current situation really is no different than the construction without the adverb.

(143) a. John believes her to be clever.
b. *John believes (PRO) to be clever.

In (b), regardless of adverb intervention, 'believes' causes a crash whether PRO does or not. Predicates that possess non-accusative alternations do permit the construction.

(144) a. Jack wanted intensely to win.
b. Jack hoped sincerely to be accepted.

8.1.2 Adjective Caselessness

Chomsky and Lasnik (1993) use the following examples to illustrate the failure of adjectival Caselessness in accounting for the distribution of PRO.

(145) Chomsky and Lasnik (1993), p. 555, ex. 255-6:

a. *It is likely [PRO to solve the problem].
b. It is important [PRO to solve the problem].

The (a) example is confusing in a couple of ways. For one, it is important to understand the meaning conveyed by PRO, which, I think, is intended to convey an arbitrary interpretation, as in the (b) example. There is nothing wrong with the overt string itself.

(146) Thanks for the advice. It's likely to solve the problem.

In fact, most theories claim that complements can *not* license arbitrary control (see Landau (2000), Manzini (1983), Manzini (1983), Mohanan (1983), Mohanan (1985), Bresnan (1982), Borer (1989)). Therefore, the more important question is why 'important' fails to either control (a) or raise (a≠b).

(147) a. *John is important to go.
b. It is important for John to go.

As I argued in section 6, we can also distinguish these predicates with the concept of range. Although 'important' has finite and non-finite selecting forms, it is only capable of assigning one range. 'Likely', though it lacks an external θ-role, can project external range, which is determined by the external argument of its internal complement. In fact, most speakers believe that when it takes a silent subject complement, it *must* be specified for this external range.[56]

[56]I have become less and less comfortable with treating this as a fact of the English language. I have no problem with the following sentences:

8.1.3 Nominative environments

Chomsky and Lasnik (1993), additionally point out that nominal environments have also been argued to lack Case, and thus should also allow PRO-infinitivals.

(149) Chomsky and Lasnik (1993), p. 555, ex. 259-60:

a. *My belief [Harry to be intelligent]

b. *My belief [PRO to be intelligent]

I again claim the silent subject is fully licensed, and furthermore, that *all* nouns can take infinitival (relative) clause adjuncts, but there are often problems with the thematic, selectional properties of the items involved. The question is not why PRO can't appear (because it, or rather, a silent subject can) but why it doesn't produce a reading of believing in *my* intelligence. I argue that the following sentences show infinitival adjuncts are available to nouns.

(150) a. The man to call lives in LA now.

b. The method to solve this problem hasn't yet been discovered.

The question remains why, or how, different nominals allow different thematic assignments.

(151) from Pesetsky and Torrego (2006), ex. 10,11:

a. Mary's desire to win

b. Mary's need to intervene

c. *Sue's love to solve problems

d. *John's hatred to have to leave

Pesetsky and Torrego (2006) claim that nominals of *irrealis* selectors differ from those which select "infinitival complements without the characteristic semantics of *for*-clauses (i.e. factive and implicative clauses)" (p. 5).[57] They claim that this is due to the way that the nominal head and an *irrealis* complement can check each other's T features. I believe that they are on the right track, but question if this basic generalization can really be sustained.

(152) a. Jack's failure to attend the meeting resulted in his dismissal.

(148) a. Do you think it's likely to win the war in Iraq?

b. It's pretty likely to get killed over there.

[57] Of course, we've observed that factives *do* allow for-clauses, but they are not necessarily future-oriented.

b. Jack's ability to resolve problems resulted in his promotion.

Therefore, we still lack a truly formal and consistent way of representing the crucial properties. I believe, however, that the type-driven system advocated here, at least, provides formal, axiomatic mechanisms which should be useful in their final characterization. For now, I'll just say some nominalizations retain their verbal thematic frames, and others don't.

8.2 EPP: movement to Caseless positions

An EPP-feature forcing movement to Caseless positions has been argued to be necessary to derive the cyclic movement that is assumed in sentences like the following.

(153) Jack seemed t' to be likely t to win.

t' is in a Caseless position, so the traditional theory requires some other feature to force movement there. Movement to this intermediate position is said to be necessary in so far as long leaps are not possible. Examples like (154) are taken to provide evidence for this assumption.

(154) *Jack seemed it was likely t to win.

Manzini and Roussou (2000) argue that this is an unfortunate consequence of the category theory of A-movement, and replace this theory, first, with a theory of θ features, as in (155a, without any intermediate pitstop), and then even more radically, with a bare theory of "Attract", as indicated by the italics in (155b). They claim that the latter is consistent with Hale and Keyser's (1993) configuration-based theory of predicate-argument assignment, and argue that the "Minimal Link Condition", as applied to Attract, will insure that sentences like (154) will not be derived.

(155) a. John θ-I [seems [to work ($\not\theta$)]] (Manzini and Roussou (2000), ex. 18)

b. [*John* I [*seems* [to *work*]]] (Manzini and Roussou (2000), ex. 45)

c. *John seems [that it was told [that Mary left]] (Manzini and Roussou (2000), ex. 47)

According to their theory, 'John', in (b), attracts both 'seems' and 'work'. In (c), they argue that 'John' also attracts 'seems', but "the interpretive requirements of *John* cannot be satisfied by a predicate like *seem*," and there is no way to attract 'told', because "*told* is in the immediate scope of *it*" (p. 430). In more traditional terms, the derivation crashes because 'John' has no θ-role.

Thus, they actually replace cyclicity with "Attract Closet"/"MLC". As shown in (28), the variable-free system that I am advocating represents an even stricter notion of cyclicity,

by imposing the representation of potential bindees at the margin of every intermediate node. The system being developed here is much more explicit, and elaborate, than the system advocated by Manzini and Roussou (2000). In that sense, if the simple equations above turned out to an effective means to accurate predictions, their system would certainly be preferable. However, their system makes no comment about the potential candidates for merger, determined by selectional restrictions, and derives no association with binding (which some might consider a good thing). Therefore, I presently maintain the current methods, even for all the complexity that they impose on the system.

In the system being advocated here, we can easily formalize the intuition behind "Attract Closest", by imposing a rule of "Immediate Match". While pronouns often skip past potential binders, silent subjects, generally do not.

(156) a. Every boy$_1$ thought he$_2$ liked him$_1$.

b. Every boy$_1$ thought he$_2$ wanted to win. (definitely not every boy winning)

In section 9.1, we will see that similar, though not identical, operations derive both chains. We should assume that operations licensed by overt pronouns have the ability to continue passing, even where type matches are available. By assuming that silent subject chains lack this ability to skip matchers, we can immediately derive the results of "Attract Closest", as it applies to silent subject interpretations.[58]

Because there are other means available to account for cyclic intervention effects, there is no need to postulate an EPP that is distinct from Case. Furthermore, as discussed in the previous subsection, I don't believe null Case can help shed any light on silent subjects and the selection of clauses that they are embedded in. Thus, we should maintain the traditional generalization that finite clauses must check nominative Case, and non-finites simply don't; that is to say, there is no Case distinction between raising and control complements. I now turn to my own analysis of silent subject selectors.

9 P(x)(i)(w)

I claim that an infinitive complement with a silent subject, at least one which is ultimately bound by a higher element, necessarily requires 3 arguments: the subject reference, a temporal reference, and a world of interpretation. I assume the following order of satisfaction so that an identical denotation of 'to win' can be used in 'Jack wants to win' and 'Jack wants Jill to win.'

(157) a. $[\![$ to win $]\!]=\lambda x \lambda i \lambda w$. win(e',w) $\wedge$ ag(e',x) $\wedge$ i(e')

[58] This comment may need to be qualified to deal with the interaction of arbitrary control constructions and binding. I will spare the reader the large number of relevant, but highly debatable issues, until a later date.

b. ⟦ wants ⟧=$\lambda P \lambda x \lambda w$. want(e,w) ∧ ag(e,x) ∧ now⊆t(e) ∧ pat(e,w') ∧ P(x)($\lambda e'$. t(e)≤t(e'))(w')

c. ⟦ Jill wants to win ⟧=λw . want(e,w) ∧ ag(e,Jill) ∧ now⊆t(e) ∧ pat(e,w') ∧ win(e',w') ∧ ag(e',Jill) ∧ t(e)≤t(e')

In fact, I have made no assumptions about any kind of verb-raising, and since tense usually appears directly on the verb stem, I have assumed that verbs usually take their interval argument first. Even in the case of present and past participles, we can assume that this interval argument is satisfied by some temporal relativization function which would then put out a new interval argument seeking satisfaction. I will not formally present this analysis of participles here, but we should consider how patient arguments will merge in the case of bare verbs, such as those under 'to', 'should', etc.. Under such circumstances, there will be a type mismatch and the object will have to pass the other arguments, over itself to repair it. Thus, 'Jill' would have to take on the denotation in (b).

(158) a. ⟦ kiss ⟧=$\lambda i \lambda x \lambda y \lambda w$. kiss(e,w) ∧ ag(e,y) ∧ pat(e,x) ∧ i(e)

b. ⟦ Jill ⟧=$\lambda P \lambda i \lambda y \lambda w$. P(i)(Jill)(y)(w)

c. ⟦ kiss Jill ⟧=$\lambda i \lambda y \lambda w$. kiss(e,w) ∧ ag(e,y) ∧ pat(e,Jill) ∧ i(e)

Furthermore, since 'to' is assumed to merge with predicates seeking temporal satisfaction (as in 159a), and yet, both postpone this satisfaction, and create a phrase which would be able to merge immediately with a subject (as in 157a, repeated as 159b), we can attribute to 'to' a denotation as in (c).

(159) a. ⟦ win ⟧=$\lambda i \lambda x \lambda w$. win(e',w) ∧ i(e') ∧ ag(e',x)

b. ⟦ to win ⟧=$\lambda x \lambda i \lambda w$. win(e',w) ∧ i(e') ∧ ag(e',x)

c. ⟦ to ⟧=$\lambda P \lambda x \lambda i \lambda w$. P(i)(x)(w)

9.1 Binding: g & z, Jacobson (1999b)

Pauline Jacobson defines 3 fundamental operations which are crucial to binding in a variable-free system.

The first allows certain mismatches to be resolved, by passing the interfering element up over the selecting function. In other words, suppose that I am a function which takes elements of type a and returns elements of type b. That means I am a function of type $< a, b >$. What if I encounter an element of type $< c, a >$? Then, "the Geach rule" (g) allows me to shift my functional definition in such a way that I can take elements of type $< c, a >$ and return an element of type $< c, b >$. Thus, I shift to an element of type $<< c, a >, < c, b >>$.

When c is an argument that has been introduced by an overt pronoun, we will let this operation apply freely, to pass the argument up just as far as any speaker can remember

what the hell that they are actually talking about, but in other cases, it becomes an extremely important theoretical question when and where this operation is licensed or restricted.

'Love', in the example below, would normally take an argument of type x, but, by shifting with the g rule, it is able to take an argument of type $< x, x >$. Jacobson uses a rather reduced notion, which I simply copy for the moment. See footnote 60 and the end of section 2.2 for more comment.

(160) The Geach Rule: Passes a variable up 'over'.

a. $g_c(f)=\lambda P[\lambda x[f(P(x))]]$

b. $< a, b >, << c, a >, < c, b >>$

c. $[\![\text{ love}_g \text{ }]\!]([\![\text{ her }]\!])=$

d. $\lambda P[\lambda x[\text{love}(P(x))]](\lambda y[y])$[59]$=$

e. $\lambda x[\text{love}(x)]$[60]

Jacobson's reduced notation doesn't necessarily make it clear that if we g over a predicate with an argument slot, we actually end up with an additional slot. The next operation is necessary to bind 2 slots together, by identifying the item that has caused the mismatch with the argument that the function normally would receive next.

(161) Jacobson's binding rule: Identifies the next arg up as the embeddee's desired arg. (see Jacobson (1999b), p. 134, ex. 23, for the properly generalized version; here we have the introductory version).

a. $z_b(f)=\lambda P[\lambda x[f(P(x))(x)]]$

b. $< a, < e, b >>, << e, a >, < e, b >>$

c. $[\![\text{ love}_z \text{ }]\!]([\![\text{ herself }]\!])=$

d. $\lambda P[\lambda x[\text{love}(P(x))(x)]](\lambda y[y])=$

e. $\lambda x[\text{love}(x)(x)]$

It is important to note that these operations only apply to functions, and not arguments. If we want to pass an argument over an argument, then we must first lift the latter argument before applying g. I already introduced this operation in section 2.1. As noted there, it also defines a relationship between entities and quantifiers.

[59] Following Jacobson, we here treat pronouns as a basic identity function from individuals to individuals, and abstract from gender, number, etc.. Note that $[\lambda y[y]]$(Jill)=Jill.

[60] Jacobson adopts this kind of combinatory semantics without much discussion of the implication on the configurational-lexicalist debates. Recall that, for her, $\lambda x[\text{love}(x)]$=love. Remember that I usually put more informative value in the presence or absence of these operators.

(162) Lift: Are all subjects lifted? g requires a lifted subject.

a. l_b(a)=λF[F(a)]

b. a, $<< a, b >, b >$

c. ⟦ Jill_l ⟧(⟦ smokes ⟧)=

d. λF[F(Jill)](λx[x smokes])

An attentive reader may have caught the scent of a subtle inconsistency. I suggested that g was for resolving type mismatches, but here suggested that lifting is useful to pass arguments over arguments. As mentioned in section 8.2, we should be able to derive the effects of "Attract Closest" by not allowing this kind of skipping for variables related to specific chains. The behavior of overt pronouns, on the other hand, seems to require such a capability.

We are now prepared to observe that the following lexical alternation is nothing but an application of z. However, we return to the intentional notation that I have also advocated. We see that 'expect_2'='z(expect_1)'. That is to say, (d) is z applied to (b).

(163) [61]

a. Jill expected Jack to win.

b. ⟦ expected_1 ⟧=$\lambda P_{<i,<w,t>>}\lambda x\lambda w$. expect(e) ∧ t(e)<now(w) ∧ ex(e,x) ∧ pat(e,w') ∧ P($\lambda e'$. t(e)≤t(e'))(w')

c. Jill expected to win.

d. ⟦ expected_2 ⟧=$\lambda P_{<e,<i,<w,t>>>}\lambda x\lambda w$. expect(e) ∧ t(e)<now(w) ∧ ex(e,x) ∧ pat(e,w') ∧ P(x)($\lambda e'$. t(e)≤t(e'))(w')

e. ⟦ z(expected_1) ⟧=$\lambda P_{<e,<i,<w,t>>>}\lambda x\lambda w$. expect(e) ∧ t(e)<now(w) ∧ ex(e,x) ∧ pat(e,w') ∧ P(x)($\lambda e'$. t(e)≤t(e'))(w')

(164) shows the work a little more explicitly:

(164) z(expect):

a. $\lambda P[\lambda Q[\lambda y[\text{P(Q(y))(y)}]]](\lambda R_{<i,<w,t>>}\lambda x\lambda w$. expect(e) ∧ t(e)<now(w) ∧ ex(e,x) ∧ pat(e,w') ∧ R($\lambda e'$. t(e)≤t(e'))(w'))=

b. $\lambda Q[\lambda y[\lambda w$. expect(e) ∧ t(e)<now(w) ∧ ex(e,y) ∧ pat(e,w') ∧ Q(y)($\lambda e'$. t(e)≤t(e'))(w'))]]

For convenience, I repeat examples of the kinds of complements each function could, respectively, take as an argument.

[61] Notice that I am applying this operation in the syntax, after tense has been assigned, so that I can claim that it is type-driven. This might be a little goofy, and it may, ultimately make more sense to consider it a lexical operation. The formulas would only require minor shifts.

(165) a. ⟦ Jack to win ⟧=$\lambda i \lambda w$. win(e',w) ∧ i(e') ∧ ag(e',Jack)

b. ⟦ to win ⟧=$\lambda x \lambda i \lambda w$. win(e',w) ∧ i(e') ∧ ag(e',x)

There really is nothing especially profound about this relationship, in so far as I, with pretty much all semanticists, have maintained that binding, control, and raising are fundamentally identical operations. However, it is nice to be able to name a specifically defined, and more generally applicable operation as a fundamental component of a common lexical alternation. Of course, I have also acknowledged that accusative Case must be varied as well, in appearing in the former version, and being discarded where z, as licensed by control predicates, applies.

9.2 Reflexivity

Naming the operation in this way, furthermore, allows us to shed light on a debate which raged throughout the GB era: the *anaphoric* (i.e. reflexive) nature of control predicates. Although attempts were made to reduce the behavior of PRO to that of a silent reflexive (Manzini (1983)), just as NP-trace was already assumed to be, these efforts were also met with vehement criticism (Mohanan (1985)), while other inventive researchers found reasonable middle grounds (Borer (1989)). Within the present system, I don't even claim that there is any projected element which is or isn't reflexive. Rather, both reflexives and control can be seen as distinct syntactic-lexical[62] environments licensing applications of z.

Following Reinhart and Reuland (1993), I assume that overt reflexives merely serve to mark their *predicates* as reflexive. Furthermore, some predicates are "intrinsically reflexive", and some predicates alternate (p. 666). Applying these comments to the alternations of predicates like 'shave' or 'embarrass', we see further evidence of applications of z which license the discarding of accusative Case. However, it should be clear that this ability is somehow restricted to specific lexical items.

(166) (representing just the relevant elements)

a. Jill shaved Jack.

b. ⟦ shave ⟧=$\lambda x \lambda y$. shave(e,w) ∧ ag(e,y) ∧ pat(e,x), [acc]

c. Jack shaved.

d. ⟦ shave ⟧=λy . shave(e,w) ∧ ag(e,y) ∧ pat(e,y)

9.3 Raising

Crucially, however, raising predicates do not allow applications of z. Raisers do not have argument slots which are identified with the embedded element being passed up. They never returned $< e, b >$ to begin with. Trying to apply z to them would result in a kind of

[62] As noted, I slipped in the perhaps-overly-radical position that these shifts occur after insertion.

"over-saturated" formula. We would have doubled our argument, and it would expecting an additional θ-role. In that sense, we can say that such an operation would violate the θ-principle. Therefore, raisers must be restricted to applications of g.

I assume non-finite selecting 'likely' is future-oriented (in the present-inclusive sense).

(167) a. It was likely for Jill to win.

b. $[\![$ likely $]\!]=\lambda P \lambda i \lambda w$. likely(e,w) $\wedge$ pat(e,w') $\wedge$ i(e) $\wedge$ P($\lambda e'$. t(e)$\leq$t(e'))(w')[63]

c. Jill was likely to win.

d. $[\![$ g(likely) $]\!]=\lambda P \lambda x \lambda i \lambda w$. likely(e,w) $\wedge$ pat(e,w') $\wedge$ i(e) $\wedge$ P(x)($\lambda e'$. t(e)$\leq$t(e'))(w')

Notice that to use (d) we'll then need to lift and g 'was', because of the type mismatch with 'x'.

(168) a. $[\![$ g(likely) to win $]\!]=\lambda x \lambda i \lambda w$. likely(e,w) $\wedge$ pat(e,w') $\wedge$ i(e) $\wedge$ win(e',w') $\wedge$ ag(e',x) $\wedge$ t(e)$\leq$t(e')

b. $[\![$ was $]\!]=\lambda e$. t(e)<now

c. $[\![$ l(was) $]\!]=\lambda P$. P(λe . t(e)$\leq$now)

d. $[\![$ g(l(was)) $]\!]=\lambda Q \lambda x$. Q(x)(λe . t(e)$\leq$now)

e. $[\![$ g(l(was)) g(likely) to win $]\!]=\lambda x \lambda w$. likely(e,w) $\wedge$ pat(e,w') $\wedge$ t(e)<now $\wedge$ win(e',w') $\wedge$ ag(e',x) $\wedge$ t(e)$\leq$t(e')

Of course, most raisers don't even allow for-clauses anyways.

(169) a. *It seemed (for) Jill to win.

b. *$[\![$ seem $]\!]=\lambda i \lambda P \lambda w$. seem(e,w) $\wedge$ pat(e,w') $\wedge$ i(e) $\wedge$ P(i')(w')

c. Jill seemed to win.

d. $[\![$ seem $]\!]=\lambda i \lambda P \lambda x \lambda w$. seem(e,w) $\wedge$ pat(e,w') $\wedge$ i(e) $\wedge$ P(x)(i')(w')

I have argued that the for-clause is excluded because it must be either factive or future-oriented. However, I have not offered an explicit, formal characterization of 'for', which would properly reflect this impossibility. This issue awaits full resolution.

I have also suggested that 'seem' lacks an alternation without 'for' because 'seem' cannot check accusative Case. Whether there is any deeper, underlying cause for this character also remains an open question.

[63] Here, I assume that the adjective merges with its complement before merging with tense.

10 Landau's critique of Hornstein

As with Hornstein (1999) and Manzini and Roussou (2000), I have basically reduced control and raising to essentially identical chains, though just above, I offered a formal description of the specific difference of these chains. In fact, that difference really was no more nor less than the difference of a single θ-role, i.e. an argument slot, which basically everybody already knew. I have differed from Hornstein in essentially ignoring even the possibility of category-movement for A-like chains (see Manzini and Roussou (2000) for supporting arguments), and also argued for a more elaborate system than the one offered by Manzini and Roussou (2000).

Thus, though our theories differ in significant ways, we are all equally susceptible to the scathing critique which Landau (2000) launches on Hornstein (1999). In an effort to give full consideration to the issue, I will briefly present the important distinctions which Landau notes, and at least try to suggest that the current account has not given up all hope of deriving them.

Landau (2003) points out some 6 differences between raising and control which he claims Hornstein (1999), mostly, fails to account for. They may be listed as follows:

(170)

	raising	control
expletives/idioms	✓	X
complementizers	X	✓
unaccusative tests	✓	X
clause-superior 'each'	✓	X
Case concord	✓	X
partial control	X	✓

I have already touched on the topic of partial control in section 7.2, so I will not repeat myself here. Landau additionally claims that Hornstein's theory would overgenerate passive constructions, and I have also previously considered this issue, in section 6. Below, I consider each of the remaining issues in turn.

10.1 Expletives and Idioms

As Landau admits, this is the "one" (p. 487) distinction which Hornstein points out, and it is easily handled by the claim that the matrix control predicate assigns a θ-role which expletives are unable to receive. I also believe that a range assignment analysis might be more appropriate, but have yet to work out the application to 'there'-constructions.[64]

[64]Legalizing surviving λ-operators at the end of a derivation seems to me to basically violate one half of the θ-principle. In fact, I take it for granted that arbitrary control, nominalizations, passives, and the prolific use of silent arguments in other languages all show that the traditional interpretation of the θ-principle is not maintainable. We can still say that all DPs must receive θ-roles, but we cannot say that all θ-roles are necessarily assigned. Instead we must look at how Case and range interact with θ-assignments to insure argument projection, or license its absence.

Idiom chunks also break if one of their components is separately assigned a θ-role.

(171) Landau (2003), p. 487, ex. 32 (rearranged):

a. There seems to be a man in the garden.

b. *There expects to be a man in the garden.

c. The shit seems to have hit the fan.

d. *The shit expects to hit the fan.

10.2 Complementizers

Landau (2003) offers the following claim, "presumably a universal generalization" (p. 488).

(172) Landau (2003), p. 488, ex. 33:
Control complements may be introduced by complementizers; raising complements are never introduced by complementizers.

He cites "*de* in French, *di* in Italian, *om* in Dutch, *att* in Swedish, *að* in Icelandic, *me* in Hebrew, *for* in Belfast English, *i* in Welsh, and so on" (p. 488).

First, this collection of items should not be too hastily grouped with the declarative *English* complementizers, 'for' and 'that'. 'For' and 'that' *always* introduce overt subjects. Many of these items *never* do. In that sense, these items often look more like 'to' than 'for'. Notice that Landau, following Sigurðsson, later even glosses Icelandic 'að' as 'to', as shown in (177) (though I am not familiar enough with Icelandic to know why PRO is positioned below it). Since it appears with another complementizer, 'til', above it, glossed as 'for', Landau must be suggesting that Icelandic is a double C language. I do not know if this is correct or not. Of course, 'to' does appear with raisers.

I'm a little afraid that the reasoning that derives this "universal generalization" is circular. Traditional GB theory concluded that control complements were CPs and raisers were not. Since all of these items introduce control complements, they must be Cs. On the other hand, items which link raisers, such as English 'to', would automatically fail to classify as complementizers.

Landau seems to find it ridiculous that adding arguments would contribute to adding words, asking "why should the presence of an external θ-feature on the matrix verb license a CP projection in the complement?" (p. 489).[65] Since I'm not trying to account for CP projections, the notion that links are more likely to appear between predicates with independent participants does not strike me as so shocking.

[65]Is such a proposal really any more ridiculous than the standard interpretation of Burzio's generalization which suggests that an external θ-feature is necessary to license accusative Case and the projection of an internal argument.

10.3 Unaccusatives

Landau presents 2 pieces of data which seem to indicate that raisers are unaccusative and controllers are not. Licensing 'en' is said to indicate unaccusativity, and 'si' rejects it. Landau couches his discussion in a theory of A-movement for passives, unaccusatives, impersonals, and raisers. However, even in movement theories, all of these are also conditioned by the absence of external and/or agentive arguments. In that sense, there is nothing surprising about them patterning together to the exclusion of control which is defined by its external, agentive argument. Thus, the results of these tests also could be reduced to the difference of the single, additional θ-role. That said, I do not understand all the full intricacies of these phenomena, so this is another topic which I have to place on my already crowded backburner. I provide Landau's examples, for the interested reader.

10.3.1 en

(173) Landau (2003), p. 490, ex. 35 (Ruwet (1972)?):

a. Le directeur du département semble être accepté.
the head of-the department seems to-be accepted
'The head of the department seems to be accepted.'

b. Le directeur semble *en* être accepté.

(174) Landau (2003), p. 490, ex. 36:

a. Le directeur du département espère être accepté.
the head of-the department hopes to-be accepted
'The head of the department hopes to be accepted.'

b. *Le directeur espère *en* être accepté.

10.3.2 si

(175) Landau (2003), p. 490, ex. 37 (Rizzi (1986)?):

a. *I due candidati$_1$ *si*$_1$ risutavano [t$_1$ poter vicere].
the two candidates to-each-other appeared to-be-able to-win
'The two candidates appeared to each other to be able to win.

b. I due concorrenti$_1$ *si*$_1$ sono promessi [di PRO$_1$ essere leali].
the two competitors to-each-other were promised DI to-be loyal
'The two competitors promised to each other to be loyal.'

10.4 'Each'

Landau also cites Burzio's argument that control interfers with the link between 'each' and elements that it is intended to quantify over.

(176) Landau (2003), p. 491, ex. 38 (Burzio (1981)?):

a. One interpreter$_1$ each was assigned t_1 to the visiting diplomats.

b. One interpreter$_1$ each seemed [t_1 to have been assigned t_1 to the visiting diplomats].

c. *One interpreter$_1$ each tried [PRO$_1$ to be assigned t_1 to the visiting diplomats].

d. *One interpreter$_1$ each said [he$_1$ had been assigned t_1 to the visiting diplomats].

Eventually I would like to develop a theory of distributivity that focuses on events, and the plurality of the arguments assigned to them. With the subject-raisers, 'each' is not in the domain of a new argument assignment, but with the controllers it is. Thus, the controllers intervene and the raisers don't. I again lack a fully formal characterization, but I hope such an analysis would be possible.

Thus, I have again argued that the introduction of additional arguments should make all the difference.

10.5 Case concord

Icelandic 'quirky Case' is argued to demonstrate both the raising/control distinction and the existence of a Case-marked PRO (Sigurðsson (1991)). The Case of PRO is assumed to account for the Case mismatch between the accusative 'all' and the nominative 'boys', in (a). Crucially, there is no mismatch in the raising Case, (b).

(177) Landau (2003), p. 492, ex. 40a, 41a (Sigurðsson (1991)?):

a. Strákarnir vonast til [að PRO vanta ekki alla í skólann].
the-boys.NOM hope for to PRO.ACC lack not all.ACC in the-school
'The boys hope not to be all absent from school.'

b. Strákarna virðast [t vanta ekki alla í skólann].
the-boys.ACC seem to-lack not all.ACC in the-school
'The boys seem not to be all absent from school.'

Although I do not know enough about Icelandic, I would argue that Icelandic Case is heavily associated with θ-roles. Clearly, there are 2 Cases in (a) because there are 2 θ roles, and there is only 1 Case in (b) because there is only 1. 'The boys' get both θ-roles in (a), but they manifest the Case of the closer one. In (b), they manifest the only thing they've got. Hopefully, the floated quatifier's Case can also be accounted for without PRO.

In this section, I have suggested that additional θ-roles should be considered significant enough factors to bear on all the interesting data which Landau has collected, and which I have repeated above.

11 Additional overt/covert differences

Having generally collapsed binding, raising, and control, in so far as they are chains, I must also recognize that there are significant differences between overt pronouns and silent arguments. Below, I take note of two important distinctions which have been discussed in the literature. The explanations for both should rely on the fact that overt pronouns have a greater range of interpretations. Whereas silent arguments are often licensed by specific, lexical identifications, pronouns can appeal to discourse referents at any time. Furthermore, overt pronouns appear to license 'choice-function' interpretations which allow a greater breadth in their resolution of identity.

11.1 De se/re

De se readings insist that the participant have knowledge of the referent specified in his intensional world. De re readings allow co-reference even where the participant is unaware of it.

(178) a. The amnesiac expected that he would receive a medal.
b. Every amnesiac expected that he would receive a medal.
c. The amnesiac expected himself to receive a medal.
d. Every amnesiac expected himself to receive a medal.
e. The amnesiac expected to receive a medal.
f. Every amnesiac expected to receive a medal.

Even the bound pronoun (b,d) and the reflexive (c,d) have been claimed to allow the "de re" readings. Thus, it is claimed that the amnesiac can fail to recognize himself as the recipient, although he is making an observation about someone who turns out to be himself. Such a reading is denied for the control cases (e,f), i.e. the silent subject cases. I find this interpretation of the reflexive highly questionable, but since I will have to admit the reflexive's licensing of strict readings, it is probably in my own interest to maintain the overt/covert significance.

Getting this reading in the bound cases, would seem to require identifying a relationship from individuals to individuals: the person who one is, without knowing. That is to say, it seems to require a choice function. Thus, I propose, simply, that overt pronouns have choice function interpretations and silent arguments don't.[66]

[66] I don't believe that I am the first to propose this idea, but I have yet to locate specific references.

11.2 Missing strict readings

It has been noted that the overt pronouns, as in (a) and (b), license either 'strict' or 'sloppy' readings of the ellipsis site, whereas the silent subject in (c) only allows the 'sloppy reading'. The strict reading interprets the argument of the ellipsis site as identical to the argument in the overt representation, i.e. Jack. The sloppy reading interprets the argument of the ellipsis site as the argument in its own sentence, i.e. Joe.

(179) a. Jack expects that he will win, and Joe does too.

b. Jack expects himself to win, and Joe does too.

c. Jack expects to win, and Joe does too.

While other accounts have had to proliferate indices to account for this behavior (for instance, Heim (1998)), such explanations are not available to the variable-free system advocated here.[67]

Since "Attract Closest"/"Immediate Match" applies to covert chains, there is only the 'sloppy reading', in (c), i.e. Joe to win, and no 'strict reading'. With, (a), we'd expect that any discourse reference is available, so not only is the 'strict reading', i.e. Jack to win', available, but also some identical other person that they both think will win. The odd sentence is (b), since discourse should license "accidental co-reference", rather than a reflexive. Isn't there a preference for the 'sloppy reading'? In any case, the silent replacement of the reflexive still seems to have a choice function-like ability to return a different individual for the individual binding it. A more explicit analysis could perhaps even correlate with the precise features that undergo "vehicle change" (Fiengo and May (1994)).

I have not offered a full characterization of choice functions here, but see Reinhart (1997), regarding their necessity.

12 Conclusion

Numerous questions remain unanswered. How can we account for the erractic selection and interpretation of 'to' vs. '-ing'? How many meanings does 'that' have?

Numerous phenomena have been overlooked. Small clauses and subjunctive selection were ignored. Complications introduced by the interpretation of arbitrary silent subjects were omitted. Purpose clauses, logophors, super-equi, and split antecedence were also left out.

This paper still maintains a number of radical positions and proposes a number of original ideas. All hierarchal configuration should be analyzed as type-driven function application, and syntactic argument projection should be accounted for with a combination

[67] I also think a discourse appeal would be illegitimate, because the discourse appeal needs to license "accidental co-reference", and wouldn't license the reflexive in the first place.

of Case and range. All binding is represented in the literal notations, and syntactic modifications to assignment functions are avoided. The sequence-of-tense phenomenon is strictly restricted to world relativization. Range assignment accounts for stativity, passivization, raising, and clause ellipsis. Lexical alternations can be identified as generalized formulas. 'For' is only *partially* future oriented, and 'to' may be an argument shifter. The "that-trace", "for-trace", and "for-PRO" effects are unified, and tense inversion is distinguished. The proposed absence of projection denied null Case, and replaced the EPP with a combination of Case and range assignment. z showed reflexivity and (obligatory) control to be distinct manifestations of the same operation. I have tried to consider the many properties which distinguish raising and control. The additional properties of overt pronouns may derive from the combination of discourse access and choice function binding.

I have not necessarily made any negative predictions, but I have tried to work on tools which can provide for precise, linguistic description.

References

Abusch, Dorit (1999) "On the Temporal Composition of Infinitives," To appear in *The Syntax of Time*, J. Gueron and J. LaCarme (eds), Cambridge: MIT Press, 2004.

Adger, David (2003) *Core Syntax*, Oxford, Oxford.

Allen, Cynthia L. (1984) "On the Dating of Raised Empty Subjects in English," *Linguistic Inquiry*, 15(3), 461–465.

Altshuler, Daniel (2006) "Sequence of tense and double access," Manuscript, Rutgers University.

Bach, Emmon (1979) "Control in Montague Grammar," *Linguistic Inquiry*, 10, 515–531.

Baker, Mark, Johnson, Kyle, and Roberts, Ian (1989) "Passive Arguments Raised," *Linguistic Inquiry*, 20(2), 219–251.

Battistella, Edwin (1985) "On the Distribution of PRO in Chinese," *Natural Language and Linguistic Theory*, 3, 417–340.

Boeckx, Cedric (2001) "Scope Reconstruction and A-Movement," *Natural Language and Linguistic Theory*, 19, 503–548.

Boeckx, Cedric and Hornstein, Norbert (2004) "Movement under Control," *Linguistic Inquiry*, 35(3), 431–452.

Borer, Hagit (1989) "Anaphoric Agr," in *The Null Subject Parameter*, pp. 69–109, Kluwer, Drudrecht.

Borer, Hagit (2005a) *Structuring Sense Volume I: In Name Only*, Oxford University Press, Oxford.

Borer, Hagit (2005b) *Structuring Sense Volume II: The Normal Course of Events*, Oxford University Press, Oxford.

Bouchard, Denis (1983) *On the content of empty categories*, Foris, Dordrect.

Bresnan, Joan (1972/9) *Theory of Complementation in English Syntax*, Ph.D. thesis, MIT.

Bresnan, Joan (1982) "Control and Complementation," *Linguistic Inquiry*, 13(3), 343–434.

Brody, Michael (1985) "On the Complementary Distribution of Empty Categories," *Linguistic Inquiry*, 16(4), 505–546.

Brody, Michael (1999) "Relating syntactic elements," Unpublished.

Chierchia, Gennaro (1984) *Topics in the Syntax and Semantics of Infinitives and Gerunds*, Ph.D. thesis, UMass, Amherst.

Chierchia, Gennaro (1985) "Formal Semantics and the Grammar of Predication," *Linguistic Inquiry*, 16, 417–443.

Chierchia, Gennaro (1992) "Functional WH and Weak Crossover," in Bates, D., ed., *WCCFL 10*.

Chomsky, Noam (1995) "Bare Phrase Structure," in Webelhuth, Gert, ed., *Government and Binding Theory and the Minimalist Program*, Blackwell, Cambridge, USA.

Chomsky, Noam and Lasnik, Howard (1993) "The Theory of Principles and Parameters," in Jacobs, Joachim, von Stechow, Arnim, Sternefeld, Wolfgang, and Vannemann, Theo, eds., *Syntax: An International Handbook of Contemporary Research*, pp. 506–569, Walter de Gruyter, Berlin, reprinted in Noam Chomsky (1995), *The Minimalist Program*, Cambridge, Mass.: MIT Press, 13–127.

Copley, Bridget (2004) "Aspect and Scope in Future Conditionals," .

Enç, Mürvet (1987) "Anchoring conditions for tense," *Linguistic Inquiry*, 18(4), 633–657.

Epstein, Samuel David (1984) "Quantifier-pro and the LF Representation of PRO," *Linguistic Inquiry*, 15(3), 499–505.

Fiengo, Robert and May, Robert C. (1994) *Indices and Identity*, MIT Press, Cambridge, MA.

Gennari, Silvia (1999) "Tense, aktionsart, and sequence of tense," in Corblin, F., Dobrovie-Sorin, C., and Mandarin, J., eds., *Empirical Issues in Formal Syntax and Semantics 2*, pp. 309–332, Peter Lang, Berne France.

Heim, Irene (1998) "Anaphora and Semantic Interpretation: A Reinterpretation of Reinhart's Approach," *MITWPL*, 25, 205–246.

Heim, Irene and Kratzer, Angelika (1998) *Semantics in Generative Grammar*, Blackwell, Malden, MA.

Higginbotham, James (2001) "Why is Sequence of Tense Obligatory?" Manuscript, USC University.

Hirai, Daisuke (2004) "Control Infinitives and Two Types of CP Phases," *English Linguistics*, 21, 241–264.

Hornstein, Norbert (1999) "Movement and Control," *Linguistic Inquiry*, 30(1), 69–96.

Huang, C. T. James (1989) "pro-Drop in Chinese: A Generalized Control Theory," in *The Null Subject Parameter*, pp. 185–214, Kluwer, Drudrecht.

Huang, C.T. James (1984) "On the Distribution and Reference of Empty Pronouns," *Linguistic Inquiry*, 15(4), 531–574.

Iatridou, S., Anagnostopoulou, E., and Izvorski, R. (2001) "Observations about the Form and Meaning of the Perfect," in Kenstowicz, M., ed., *Ken Hale: A Life in Language*, pp. 189–238, MIT Press, re-printed in A. Alexiadou, M. Rathert, and A. von Stechow (eds.) (2003) Perfect Explorations. Mouton de Gruyter.

Iatridou, Sabine (1990) "The Past, the Possible, and the Evident," *Linguistic Inquiry*, 21, 123–129.

Jacobson, Pauline (1999a) "Binding without pronouns (and pronouns without binding)," To appear in R. Oehrle and G-J. Kruiff (eds.), *Binding and Resource Sensitivity*, Kluwer Academic Press.

Jacobson, Pauline (1999b) "Towards a Variable-Free Semantics," *Linguistics and Philosophy*, 22, 117–184.

Jacobson, Pauline (2000) "Paycheck Pronouns, Bach-Peters Sentences, and Variable-Free Semantics," *Natural Language Semantic*, 8(2), 77–155.

Karttunen, Lauri (1970) "On the semantics of complement sentences," in *CLS 6*, pp. 328–339.

Karttunen, Lauri (1971) "Implicative Verbs," *Language*, 47, 340–358.

Kiparsky, Paul and Kiparsky, Carol (1971) "Fact," in Steinberg, D. and Jakobovits, L., eds., *Semantics*, pp. 143–173, Cambridge.

Koster, Jan (1984) "On Binding and Control," *Linguistic Inquiry*, 15(3), 417–459.

Landau, Idan (2000) *Elements of Control*, Kluwer, Dordrecht.

Landau, Idan (2001) "Control and Extraposition: The Case of Super-Equi," *Natural Language and Linguistic Theory*, 19, 109–152.

Landau, Idan (2003) "Movement Out of Control," *Linguistic Inquiry*, 34(3), 471–498.

Landau, Idan (2004) "The Scale of Finiteness and the Calculus of Control," *Natural Language and Linguistic Theory*, 22, 811–877.

Larson, Richard (1991) "*Promise* and the Theory of Control," *Linguistic Inquiry*, 22, 103–139.

Lasnik, Howard (1992) "Two notes on control and binding," in Larson, Richard, Iatridou, Sabine, Lahiri, Utpal, and Higginbotham, James, eds., *Control and grammar*, pp. 235–251, Kluwer, Dordrect.

Lasnik, Howard (2006) "A Family of Questions," USC, lecture HO.

Lasnik, Howard and Saito, Mamoru (1991) "On the subject of infinitives," in Dobrin, L., Nichols, L., and Rodriguez, R., eds., *CLS 27*, pp. 324–343, University of Chicago, Chicago.

Manzini, Rita M. (1983) "On Control and Control Theory," *Linguistic Inquiry*, 14, 421–446.

Manzini, Rita M. and Roussou, Anna (2000) "A Minimalist Theory of A-movement and Control," *Lingua*, 110(6), 409–447.

Manzini, Rita M. and Savoia, Leonardo M (1997) "Null subjects without pro," *UCLWPL*, 9.

Martin, Roger (2001) "Null Case and the Distribution of PRO," *Linguistic Inquiry*, 32(1), 141–166.

May, Robert (1985) *Logical Form*, MIT Press, Cambridge, MA.

Mohanan, K. P. (1983) "Functional and Anaphoric Control," *Linguistic Inquiry*, 14, 641–674.

Mohanan, K. P. (1985) "Remarks on Control and Control Theory," *Linguistic Inquiry*, 16(4), 637–648.

Pancheva, Roumyana (2003) "The Aspectual Makeup of Perfect Participles and the Interpretations of the Perfect," in *Perfect Explorations*, pp. 277–306, Mouton de Gruyter, (Ms. USC, 2002).

Pancheva, Roumyana (2004) "Another Perfect Puzzle," in *WCCFL 23*, pp. 621–634, Cascadilla Press.

Pancheva, Roumyana and von Stechow, Armin (2004) "On the Present Perfect Puzzle," in *Proceedings of NELS 34*, Stony Brook University.

Perlmutter, David M. (1970) "The two verbs begin," in *Readings in transformational grammar*, pp. 107–19, Ginn and Co., Waltham, MA.

Pesetsky, David (1987) "Wh-in-Situ: Movement and Unselective Binding," in Reuland, Eric and ter Meulen, Alice, eds., *The Representation of (In)definiteness*, pp. 98–129, MIT Press, Cambridge, Mass.

Pesetsky, David (1991) "Zero Syntax II: Infinitives," Unpublished MS.

Pesetsky, David and Torrego, Esther (2001) "T-to-C Movement: Causes and Consequences," [Final version in Michael Kenstowicz (ed.), *Ken Hale: A Life on Language*. Cambridge, MA: MIT Press. (2001)].

Pesetsky, David and Torrego, Esther (2002) "Tense, case, and the nature of syntactic categories," [Final version in *The Syntax of Time*, J. Guron and J. Lecarme (eds.), MIT Press 2004].

Pesetsky, David and Torrego, Esther (2004) "The Syntax of Valuation and the Interpretability of Features," To appear in *Clever and Right: a Festschrift for Joe Emonds* (S. Karimi, V. Samiian and W.Wilkins, eds).

Pesetsky, David and Torrego, Esther (2006) "Probes, Goals and Syntactic Categories," To appear in Proceedings of the Seventh annual Tokyo Conference on Psycholinguistics (Y. Otsu, ed.).

Reinhart, T. (1997) "Quantifier Scope: How labor is divided between QR and choice functions," *Linguistics and Philosophy*, 20, 335–397.

Reinhart, Tanya (1983) *Anaphora and Semantic Interpretation*, The University of Chicago, Chicago, IL.

Reinhart, Tanya and Reuland, Eric (1993) "Reflexivity," *Linguistic Inquiry*, 24, 657–720.

Roeper, Thomas (1987) "Implicit Arguments and the Head-Complement Relation," *Linguistic Inquiry*, 18, 267–310.

Rosenbaum, Peter S. (1967) *The Grammar of English Predicate Complement Constructions*, MIT, Cambridge, MA.

Schein, Barry (1997) "Conjunction Reduction Redux," Ms.

Schein, Barry (2002) "Events and the semantic content of thematic relations," in *Logical Form & Language*, pp. 263–344, Oxford University Press, Oxford.

Schein, Barry (2003) "Adverbial, descriptive reciprocals," in Hawthorne, John, ed., *Language & Philosophical Linguistics, Philosophical Perspectives*, vol. 17.1, pp. 333–367, abridged in Rachel Hastings, Brendan Jackson & Zsofia Zvolenszky, eds., Proceedings of Semantics and Linguistic Theory XI. Ithaca: CLC Publications, Department of Linguistics, Cornell University, 2001.

Sigurðsson, Halldór Ármann (1991) "Icelandic Case-Marked PRO and the Licensing of Lexical Arguments," *Natural Language and Linguistic Theory*, 9, 327–363.

Stowell, Tim (1982) "The Tense of Infinitives," *Linguistic Inquiry*, 13, 561–570.

Stowell, Tim (1995) "What do the present and past tenses mean?" in Bertinetto, P., Bianchi, V., Higginbotham, J., and Squartini, M., eds., *Temporal Reference, Aspect, and Actionality: Semantic and Syntactic Perspectives*, vol. 1, pp. 381–396, Rosenberg and Sellier, Torino.

Stowell, Tim (2004) "Tense and Modals," in Guéron, J. and Lecarme, J., eds., *The Syntax of Time*, MIT.

Tanaka, Hidekazu (2004) "Raising to Object out of CP," *Linguistic Inquiry*, 33(4), 637–652.

Williams, Edwin (1980) "Predication," *Linguistic Inquiry*, 11, 203–238.

Williams, Edwin (1985) "PRO and Subject of NP," *Natural Language and Linguistic Theory*, 3, 297–315.

Williams, Edwin (1987) "Implicit Arguments, The Binding Theory, and Control," *Natural Language and Linguistic Theory*, 5, 151–180.

Williams, Edwin S. (1977) "Discourse and Logical Form," *Linguistic Inquiry*, 8, 101–139.

Wurmbrand, Susi (2001) *Infinitives: Restructuring and Clause Structure*, Walter de Gruyter, Berlin.

Wurmbrand, Susi (2005) "Tense in infinitives," Plenary speaker at the workshop on New Horizons in the Grammar of Raising and Control, LSA Summer Institute, Cambridge, Mass, July 2005. [last available at http://depts.washington.edu/lingweb/events/wccfl25/abstracts/Wurmbrand.html].