Turn over control to the semantics!*

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We argue in this paper that it is time to turn over control to the semantics. Control cannot be properly done in the syntax, although there are ways in which the syntax is relevant. Our conclusions, if they are correct, preclude any syntactic theory of control that assumes that the controlled argument is syntactic. For practical purposes we take Hornstein’s (1999, 2001) account of control as exemplary of such syntactic theories of control.

We organize our remarks into five brief sections. First we look at some of the foundational considerations that have led to the standard approach to control in syntax, in terms of PRO, in order to set the context for the rest of the discussion. Then we touch on what kind of thing PRO might be, and review the arguments that it is not an empty NP. Then we summarize the range of control relations, to highlight the fact that local control is but a special case of a much more general and varied phenomenon. Then we review some evidence that argues for the role of semantics in the analysis of control, focusing on control in nominals. We conclude by looking at how raising fits in.

1. Uniformity and foundations of control

Historically, control in generative grammar has fallen within the province of syntactic theory, not semantics. It is useful to lay out the basis for this. First of all, mainstream generative grammar (MGG) has imposed a strong uniformity criterion on analyses of the form/meaning
mapping that serves as a measure of explanatory adequacy. There are three types of uniformity that can be distinguished (see *Simpler Syntax* (Culicover and Jackendoff 2005) for discussion).

- **Interface Uniformity (IU):** The syntax-semantics interface is maximally simple, in that meaning maps transparently into syntactic structure; and it is maximally uniform, so that the same meaning always maps into the same syntactic structure. If such structure is not present at the surface, it is nevertheless present at some covert level of structure (e.g. D-structure or LF, depending on the version of MGG).

- **Structural Uniformity:** An apparently defective or misordered structure is regular in underlying structure and becomes distorted in the course of derivation.

- **Derivational Uniformity:** Where possible, the derivations of sentences are maximally uniform.

A consequence of Interface Uniformity is that a controlled infinitival complement must have the same underlying structure as a finite complement, and the subject of the infinitive must be an NP (using the term informally) that is assigned the external θ-role of the infinitival predicate. For example, (1a) parallels (1b).
(1) a. Robin hopes [IP PRO to improvise bebop]

(2) Principle A: An anaphor must be locally bound.

b. Robin hopes [IP that she can improvise bebop]

It follows from Derivational Uniformity that to the extent that PRO behaves like an anaphor (especially a reflexive), its licensing should fall under the mechanisms that license anaphors. If the only such mechanism that is accepted is Principle A of the Binding theory –
not syntactically motivated and that control is best characterized in semantic terms leads to the conclusion that control must be semantic.

2. **PRO is not an NP**

The issue of whether PRO is an NP was taken up almost twenty years ago, by Culicover and Wilkins 1986, who gave the following arguments that it is not.

- PRO can be contained in a gap, while overt NP and trace of A' movement cannot be.²

(3) a. Arthur expects Mary to go dancing, and Archie *(expects Mary), to go to the movies.
   b. John tried PRO to leave, and Mary (tried PRO), to stay.

- The PRO subject of the complement of expect, etc. doesn’t block gapping of an adjacent verb, but the overt NP subject of the complement of expect does.

(4) a. We expect Mary to be rich and Bill *(expects) Sam to be poor.
   b. We expect PRO to be rich, and Bill (expects) PRO to be poor.

- Pseudo-clefts allow infinitives without subjects in focus position, but not infinitives with bare subjects.

(5) a. What John expects is [PRO to be elected President].
   b. *(What John expects is [Mary to be elected President].
   c. What John expects is [for Mary to be elected President].
   [cf. John expects (*for) Mary to be elected President.}
• PRO cannot take an appositive relative, while a reflexive can.

(6) a. John expects himself, who deserves it, to win the prize.

b. *John expects PRO, who deserves it, to win the prize.

• PRO cannot conjoin with an overt NP.

(7) a. *We expect PRO and John to go to Italy.

b. We expect myself and John to go to Italy.

• Stylistic Inversion is blocked by overt NP, but not by PRO.

(8) a. The man in the funny hat expects himself to sit on the stool.

  *On the stool expects himself to sit the man in the funny hat.

b. The man in the funny hat expects to sit on the stool.

  On the stool expects PRO to sit the man in the funny hat.

A few of these arguments against PRO being an NP are not applicable to contemporary proposals. For instance, the fact that overt NP cannot be conjoined with PRO follows from a movement analysis if we adopt some version of the Coordinate Structure Constraint as a constraint on extraction. The problem with appositives illustrated by (6) would not arise on a movement analysis if it was required that the maximal NP was copied (although such a requirement does not hold for Hornstein’s (2001) proposal that reflexives are licensed by copying the nominal head and leaving behind pro-self.) But the others still appear to be problematic.
No doubt there will be ways to get each property of syntactic PRO to follow from something, but they all follow immediately if we assume that there is no such thing at all. For example, it might be claimed that in (5) PRO and Mary are in a non-Case position, which rules out the latter. Or it might be stipulated that PRO receives a null Case while the overt NP does not. But we can compare this distribution with

\[(9) \quad a. \quad \text{What John} \begin{cases} \text{imagined} \\ \text{thought about} \end{cases} \text{ was [PRO flying through the air]} \]

\[b. \quad \text{What John} \begin{cases} \text{imagined} \\ \text{thought about} \end{cases} \text{ was [Mary flying through the air]} \]

Here, a different story would have to be found about Case, since both PRO and Mary are possible. But it is possible to sidestep the entire issue by assuming that [flying through the air], [Mary flying through the air], and [to be elected President] are constituents, while [Mary] [to be elected President] in (5b) is not, in which case PRO no longer enters into the explanation.

In summary, while there is no question that we can find technical means to deal with the distribution of PRO if we assume that it exists, there are problems that can be more straightforwardly addressed if we simply assume that it does not exist.\(^3\)

But, accepting the conclusion that PRO does not exist as a syntactic object, how do we account for control? We must say that it is a relation between arguments at Conceptual Structure
(CS) that is realized in a particular way syntactically. In particular, a controlled subject in English is not realized syntactically at all. Exploring this position requires us to relinquish Interface Uniformity, as we are countenancing elements of meaning that lack syntactic counterparts (see Culicover and Jackendoff 2005 for many arguments for this position, involving many different phenomena).

Proceeding in this way has the advantage of allowing us to relate CS-arguments through binding, as in the syntactic analysis, while not requiring us to attribute uniform syntactic properties to the controlled argument. So, for example, the CS-control relation can be realized syntactically through a non-finite construction (which lacks a subject), as in English and similar languages, or through a finite clause with an overt or an empty subject, as in languages such as Greek and Hebrew, as amply documented by Landau (2004) and many others. Moreover, and importantly, there can be semantic conditions on the relation between controller and controlled (CS-)argument that are simply not stateable in syntactic terms. Let us see how this works.

3. Varieties of control

Jackendoff and Culicover (2003) and Culicover and Jackendoff (2005) discuss several varieties of control that differ in terms of the identification of the controller. We summarize them very briefly.

• Unique control
The most restricted form of control is generally called obligatory control in the literature; it appears in many object complements and in adjunct clauses under in order to, before, without, and so on. Standard examples appear in (10a,b): there are two possible targets of control in the matrix clause, but only one of them can serve as controller. There can be no split antecedents (10c), generic control (10d), long-distance control (10e), or speaker/hearer control (10f).

(10) a. Sally persuaded Ben to take better care of himself/*herself.
    b. Sally promised Ben to take better care of herself/*himself.
    c. * Sally promised/persuaded Ben to take better care of themselves.
    d. * Sally promised/persuaded Ben to take better care of oneself.
    e. * Amy thinks that Ben promised/persuaded Fred to take better care of herself.
    f. * Ben promised/persuaded Fred to take better care of myself/yourself.

We call this situation ‘unique control’. A major question is how the unique controller is determined. Traditional syntactic treatments (either in terms of binding or movement) take the controller to be in a local configuration with PRO (for example, Minimal Distance Principle). The case in which PRO is the subject of a complement is the canonical one; the case in which PRO is the subject of an adjunct, as in Sally left for work without packing her lunch is somewhat less straightforward.

But in general, the controller need not be in a local relationship with PRO, as we can see by looking at other varieties of control.
• No NP controller

(11) a. an American attempt to dominate the Middle East
    b. the Anglo-French agreement to respect each other's territorial claims
    (Postal 1969)

(12) a. Any such attempt [to leave] will be severely punished.
    b. Yesterday's orders [to leave] have been canceled.
    c. How about [taking a swim together]?
       [controller is speaker and hearer jointly]
    d. Undressing myself/yourself/ourselves in public may annoy Bill.

(12a,b) appear in Williams 1985; (12c) appears in Sag and Pollard 1991; the type in (12d) appears in Cantrall 1974.

In these cases there is a control relation, but no NP that serves as the controller. The control relation must hold at CS, but the controller is expressed as something other than an NP, or not expressed syntactically at all.

• Control into NP

(13) a. Bill ordered Fred\textsubscript{i} [to \textit{\textsubscript{i}leave immediately}]
    b. Fred\textsubscript{i}'s order from Bill [to \textit{\textsubscript{i}leave immediately}]
    c. the order from Bill to Fred\textsubscript{i} [to \textit{\textsubscript{i}leave immediately}].
d. Bill gave Fredi the order [to leave immediately]

e. Fredi received Bill’s order [to leave immediately].

(14) a. Billi promised Fred [to leave immediately]

b. Fred’s promise from Billi [to leave immediately]

c. the promise from Billi to Fredi [to leave immediately]

d. Billi gave Fredi a promise [to leave immediately]

e. Fredi received Billi’s promise [to leave immediately]

We see in (13-14d,e) that the controller can be outside of the immediate local domain of control. Which NP is the controller clearly depends on the semantics of the relation expressed by the head noun; order denotes a different relation than does promise. We will return to these cases.

• Free control

There are cases of control where the controller may be in the same sentence (but not local) with respect to the controllee, or there may be arbitrary control. (The subscript $i+j$ denotes joint control; gen denotes arbitrary control.)


b. Amyi told Tomj that /j/i+j/gen[dancing with Dan] might be fun.

Notice that Amy is outside the minimal clause that contains the controlled complement (and in (15b) Tom is too). This configuration for control was called ‘Super-Equi’ in the early literature
(Grinder 1970); Ladusaw and Dowty 1988 call it ‘remote control’; it is now generally termed ‘long-distance control’.

As observed by Bresnan 1982, the controller in this configuration can be a discourse antecedent (16a). Cantrall 1974 observes that the controller can also be the speaker and/or hearer (16b). The speaker and an NP in the sentence can also jointly control the complement (16c).

(16) a. Ohio State is in a lot of trouble, according to today's newspaper. Apparently, firing the football coach has turned off a lot of potential donors.

b. Here's the thing: undressing myself/yourself/ourselves [=you and me] in public could cause a scandal.

   Here's the thing: it might really upset Tom to have to undress ourselves [=Tom and me] in public.

Speaker/hearer control is also the usual option in the curious construction illustrated in (12c), as seen in (17a). (Richard Oehrle has suggested the final sentence of the dialogue (17b) as a case where this construction has split discourse antecedents.)

(17) a. How about undressing myself/yourself/ourselves in public?

b. How about the girls taking a swim? – Okay.

   How about the boys taking a swim? – well, okay.

   How about taking a swim together? [i.e. boys and girls]
In short, free control is a configuration in which the range of possible controllers includes (a) any NP in the sentence or surrounding discourse plus the speaker and hearer, (b) the possibility of split antecedents, and (c) the possibility of a generic controller.

Landau 2000, citing previous literature, discusses some cases where the controller is not an argument of the main verb but is rather embedded in an argument, for instance:

(18) a. It would help Bill's development to behave himself in public.
   b. Finishing his work on time is important to John's development/John's friends.
   c. It would ruin Steve's figure/career to eat so much ice cream.

Given that help, important, and ruin all take subject complements with free control, our inclination is to see these as further examples of free control.

- Nearly free control

In a slightly less free version of control, the controller may be either of two NPs in the sentence; split antecedents and generic controllers are also possible (19a). However, the other options that we have discussed are not available: long-distance control (19b), a discourse controller (19c), and control by the speaker and/or hearer (19d). Discourse control is however possible in circumstances such as (19e) (pointed out by Sag and Pollard 1991, based on Higgins 1973).
(19) a. John talked to Sarah about taking better care of himself/herself/themselves/oneself.

b. * Amy knows that John talked to Bill about taking care of herself.

c. * Brandeis is in a lot of trouble. John talked to Sarah about firing the football coach.

d. * John talked to Sarah about undressing myself/yourself in public.

e. A: John talked to Sarah about something.

    B: What was it?

    A: It was probably taking better care of himself/herself/themselves/oneself.

We call this case ‘nearly free control’. It occurs consistently as a complement of verbs of communication and thought and of nouns that denote information-bearing objects such as *book* and *hypothesis*. The controlled complement always denotes a proposition being communicated, considered, or contained in an information-bearing object (as in a *book about defending oneself*). The controlled complement is typically a gerund serving as complement of *about*, but it also occurs as the direct object complement of the verbs *mention* and *discuss*:

(20) a. John mentioned/discussed Sally’s taking care of herself.

    b. John mentioned/discussed taking care of himself/oneself.

    c. John mentioned to/discussed with Sally taking care of herself/himself/themselves.

    d. A: we think John mentioned/discussed something important.

    B: What was it?
A: It might have been taking care of himself.

e. * Amy\textsubscript{i} thinks that John mentioned \textit{taking care of herself}.

f. * John discussed undressing myself in public with Sally.

4. **Meaning in control**

How do we account for these various types of control? It is apparent that a movement account cannot help us, since the kind of movements involved would go far beyond what movement is supposed to be able to do. In particular, the derivation of many of these cases would be blocked by independently well-motivated locality constraints on movement, and especially by the requirement that movement be strictly local and upwards.\textsuperscript{4}

We could of course propose that there are two (or more) distinct phenomena that look similar but are very different, namely, a subset of the unique control cases and all of the others. But our first step should be to see if there is a way to bring them all together under one theory. The cases where there is no overt controller suggest that control is a semantic phenomenon, so that is the direction in which we choose to go.

Since the data are complex, it will not be possible to give a comprehensive account here; see Jackendoff and Culicover 2003 and Culicover and Jackendoff 2005 for details. The basic picture is the following. Control is a semantic relation between the bound subject of a predicate P\textsubscript{1} and a controller. The relation is sensitive to the thematic properties of the predicate P\textsubscript{2} of which P\textsubscript{1} is an argument. When P\textsubscript{1} is a particular argument of certain P\textsubscript{2}s, (e.g. an intended or obligated act), then the controller is another particular thematic argument of P\textsubscript{2} (intender or
person under obligation respectively) – no matter whether the controller is expressed in syntax, and if it is expressed, in no matter what syntactic position. Complements in other argument positions have different constraints (not always for reasons that we understand).

One of the insights of Pollard and Sag 1994 and of Van Valin and LaPolla 1997 is that the lexical items that govern unique control fall into a delimited number of semantic classes, and that each class determines a particular thematic role that serves as controller. We attribute this fact to the existence of a limited number of basic predicates in CS that select controlled actions as arguments; each of these can serve as a component of the meaning of verbs, nouns, and/or adjectives.

Let us mention two such cases of basic semantic predicates that select actional complements. Perhaps the simplest to explicate is intention. Contrast your believing you will do X (a situational complement) with your intending to do X (an actional complement). The difference is that in the case of an intention you are committed to playing an active role in making X take place – to executing the intention. Now, although someone else can believe you will do X, no one else can execute your intention to do X. That is, someone who holds an intention is necessarily identical with the individual who executes the intended action. (An apparent counterexample is A intends for B to do X. But in fact this sentence implicitly conveys an intended action on the part of A to bring it about that B does X, through coercion, which we do not have time to discuss here.)
The predicate \textit{INTEND} is thus a two-place relation, one of whose arguments is an animate entity, the intender, and the other of which is an action. The point of the above observation is that the Actor of the action argument of \textit{INTEND} is necessarily bound to the intender.

The structure of the predicate can thus be notated something like (21) in a simplified notation (see Culicover and Jackendoff 2005). The italicization of the complement here indicates that it must satisfy certain selectional restrictions.

(21) \[ X^\alpha \text{INTEND} [\alpha \text{ACT}] \]

As a consequence of the inherent binding within the predicate \textit{INTEND}, any verb that contains this predicate as part of its meaning will have a control equation in which the intender uniquely controls the actional complement. Besides the verb \textit{intend} itself, this class includes \textit{decide} 'come to intend', and \textit{persuade} 'cause to come to intend'. In the latter case, the intender appears in object position and therefore the verb exhibits object control.

Crucially, the argument that holds the intention will be the controller. This fact will account for which NP is the controller in diverse cases such as the following.

(22) a. Robin\textsubscript{i} intended/decided to leave.
    b. Robin\textsubscript{i}’s intention/decision to leave
    c. Robin\textsubscript{i}’s intention/decision was to leave.
    d. Robin\textsubscript{i} formed an intention to leave.
Robin arrived at a decision to leave.

e. The intention that Robin had was to leave.

The decision that Robin arrived at was to leave.

f. Robin had every intention of leaving.

g. Robin expressed to Leslie the intention of leaving.

(23) a. Robin persuaded Leslie to leave.

b. Robin’s persuasion of Leslie to leave

c. What Robin persuaded Leslie of was to leave.

Another predicate that selects an actional argument is obligation. This is a function of three arguments: person A is obligated to person B to perform some action. One cannot be obligated to perform someone else's action; that is, the action is necessarily bound to the person under obligation. Person B is the person who benefits from the obligation being performed; this may or may not be the same person who has imposed the obligation on A (Jackendoff 1999; Jackendoff 2007). Obligation is not a special case of intention: one can have an obligation with no intention of carrying it out, and one can intend some action without being obliged to do it.

More formally, the basic semantic structure of obligation is therefore something like (24). Notice that the actor of the action is inherently bound to the individual under obligation, by virtue of the meaning of the predicate.

(24) \( X^a \text{OBLIGATED} \ [\alpha \text{ACT}] \text{ TO } Y \)
The notion of obligation plays a rich role in control verbs. *Ordering* involves an individual in authority imposing an obligation on someone to perform an action. The person under obligation falls in object position, so the verb *order* is an object control verb. *Instructing* someone to do something conveys a similar sense (though instructing someone *how* to do something is different, and the control relations are different as a consequence). For a different configuration, *promising* is undertaking an obligation to the promissee. Since in this case the person under obligation falls in subject position, *promise* is a subject control verb. There are a number of verbs of this type: *pledging, vowing, taking an oath, guaranteeing*, and so on. Verbs like *contract with, hire, and hire oneself out* describe a transfer of money in exchange for an obligation to perform an action; the character that receives the money undertakes the obligation, and is therefore the controller – whatever syntactic position this character appears in.

Now let us consider briefly what the controlled predicates may denote. As noted above, the only possible complements of intention and obligation are predicates that denote voluntary actions. But there is a wider range of predicates, which we call situational; these include actional, non-voluntary actions, and states. Non-unique control occurs with these latter types of predicates for semantic reasons.

(25) Free control predicates: not restricted to actional complements

a. Voluntary actions

\[
\begin{align*}
\text{Running the race} & \quad \{ \text{annoys Max} \} \\
\text{Being quiet} & \quad \{ \text{is a drag} \} \\
\text{Being examined by a doctor} & \quad \{ \text{annoys Max} \}
\end{align*}
\]
b. **Non-voluntary actions**

   \[
   \begin{align*}
   \{ & \text{Growing taller} \\
   \& \text{Striking Simmy as smart} \\
   \& \text{Realizing it's raining} \nonumber \\
   \} & \{ \text{annoys Max} \\
   \& \text{is a drag} \}. \\
   \end{align*}
\]

(26) Nearly free control predicates: not restricted to actional complements

a. **Voluntary actions**

   \[
   \begin{align*}
   \text{Marsha spoke to Ed about} & \{ \text{running the race} \\
   \& \text{being quiet} \\
   \& \text{being examined by a doctor} \}. \\
   \end{align*}
\]

b. **Non-voluntary actions**

   \[
   \begin{align*}
   \text{Marsha spoke to Ed about} & \{ \text{growing taller} \\
   \& \text{having struck Simmy as smart} \\
   \& \text{realizing it's raining} \}. \\
   \end{align*}
\]

But as we have seen –

(27) Unique control predicates: restricted to actional complements

   \[
   \begin{align*}
   \{ & \text{Fred promised (Louise) ...} \\
   \& \text{Fred persuaded Louise ...} \nonumber \\
   \} \\
   \end{align*}
\]

a. **Voluntary actions**

   \[
   \begin{align*}
   & \{ \text{to run the race} \\
   \& \text{to be quiet} \\
   \& \text{to be examined by a doctor} \}. \\
   \end{align*}
\]
b. Non-voluntary actions

\[
\begin{align*}
&\text{\# to grow taller} \\
&\text{\# to strike Simmy as smart} \\
&\text{\# to realize it was raining}
\end{align*}
\]

When verbs like tell, shout and call occur with about+gerund, they select situations and take nearly free control. When they occur with infinitives, they select voluntary actions and take unique control.

(28) a. Fred told/shouted to/called to Louise about running the race/growing taller.

b. Fred told/shouted to/called to Louise to run the race/#strike Simmy as smart.

The verbs whose objects are unique controller span a number of semantic classes, some of which are shown in (29a,b,c). There are also verbs and nominals whose unique controller is the object of a PP complement, seen in (29d,e).

(29) a. John forced/helped/enabled/pressured Susan to take care of herself/himself/oneself.

b. John kept/prevented Susan from taking care of herself/himself/oneself.

c. John ordered/instructed/encouraged/reminded Susan to take care of herself/himself/oneself.

d. John counted on/relied on/called upon Susan to take care of herself/himself/oneself.
e. John$_i$’s order/instructions/encouragement/reminder to Susan$_j$ to $j^*i^*_gen$ take care of herself/ *himself/*oneself.

(30) verifies that the verbs in (29) select for actional complements.

(30) #John forced/helped/enabled/pressured Susan to be tall.

  #John kept/prevented Susan from being tall.
  #John ordered/instructed/encouraged/reminded Susan to be tall.
  #John counted on/relied on/called upon Susan to be tall.

There seems to be only one transitive verb, promise, that requires the subject to be the unique controller (31a). But there are several other verbs and adjectives that take PP complements and assign unique control to the subject (31b,c). The nominals of these verbs (31d) also require unique control by the subject, as do quite a few semantically related nominals (31e).

(31) a. John$_i$ promised Susan$_j$ to $i^*j^*_gen$ take care of himself/*herself/*oneself.

b. John$_i$ vowed to/pledged to/agreed with/is obligated to Susan$_j$ to $i^*j^*_gen$ take care of himself/*herself/*oneself.

c. John$_i$ learned from Susan$_j$ to $i^*j^*_gen$ take care of himself/*herself/*oneself.

d. John$_i$’s vow to/pledge to/agreement with/obligation to Susan$_j$ to $i^*j^*_gen$ take care of himself/ *herself/*oneself
e. John’s offer/guarantee/oath /commitment to Susan to \( i^*j^*/\text{gen} \) take care of himself/
   *herself/ *oneself

(32) shows that the verbs in (31) select actional complements.

(32) #John promised Susan to be tall.
   #John vowed to/pledged to/agreed with/is obligated to Susan to be tall.
   #John learned from Susan to be tall.

Let us take note now of a crucial point: since (29) and (31) (like (13) and (14)) are completely parallel in syntactic constituency, there is no overt syntactic basis for the difference in control. Manipulation of the nominals makes this even clearer. Compare (33), with order, and (34), with promise. (The thematic roles giver and recipient are notated by pre-subscripts and post-subscripts respectively on the nouns.)

(33) a. the order to Susan from John to \( j^*i^*/\text{gen} \) take care of herself/*himself
   b. John gave Susan some kind of order to \( j^*i^*/\text{gen} \) take care of herself/*himself.
   c. Susan got from John some kind of order to \( j^*i^*/\text{gen} \) take care of herself/*himself.
   d. A: Susan got an order from John.
      [or John gave Susan an order.]
      B: What was it?
      A: we think it was to take care of herself/*himself.
      [also instructions, encouragement, reminder, invitation, advice]
(34) a. the promise to Susan from John to take care of himself/*herself

b. John gave Susan some sort of promise to take care of himself/*herself.

c. Susan got from John some sort of promise to take care of himself/*herself.

d. A: John made/gave Susan a promise.

B: What was it?

A: we think it was to take care of himself/*herself.

[also vow, offer, guarantee, pledge, oath]

The same distinctions can be seen even when there is no overt controller or where the controller is connected to the controlled predicate by a chain of inference.

(35) a. The volunteers will be responsible to the organizers for any promises to pick up the garbage.

b. The messengers will deliver to the troops on the ground all orders to invade the city.

These completely elude a solution in terms of syntactic structure: the controller is in too many different positions – including in a previous sentence. The clear generalization is that the complement is controlled by the recipient of the order and the giver of the promise – in both cases the individual under obligation – wherever that character may be located in the syntax. Minimal Distance clearly has nothing to do with what is going on here. Rather, the reason why
these work the way they do is that the obligation for carrying out the action is on the source of a promise and on the recipient of an order.

The two paradigms together show that no principle based on syntactic structure can account for controller position, since apart from control the paradigms are syntactically identical. All that varies is the lexical semantics of the nominals order and promise – namely, whether the giver or the recipient ends up under obligation. Control with the verbs order and promise follows the same generalization. With both verbs, the role of giver falls in subject position, and recipient falls in object position; hence order has object control and promise has subject control.

5. The syntax of raising and control

We could elaborate much further, but the point is clear: important well-known cases of the control relation are governed by semantic, more precisely thematic, factors. The question that we conclude with is how raising fits into the picture. Raising has the same superficial syntax as control, but differs from it in at least two crucial respects. First, raising out of an adjunct and long distance raising are impossible, while control into an adjunct and long distance control are quite possible, as we have seen.

(36)  a. *Robin seemed [that it would rain] [without t_i getting dressed].  
[ Raising of Robin out of without Robin getting dressed ]

b. *Robin seemed [that it would be fun [t_i to yodel all by herself]]  
[ Long distance raising of Robin out of complement of complement ]

c. *Robin seemed that [it was obvious [that [t_i to yodel all by herself] would not be a whole lot of fun]]
(37)  a. Robin can yodel without PRO giggling. [Control into adjunct]

b. Robin thought [that it would be fun [PRO to yodel all by herself]]

[Long distance control into complement of complement]

c. Robin thought that [it was obvious [that [PRO to yodel all by herself] would not be a whole lot of fun]]

[Long distance control into subject of complement of complement]

Second, control relations hold within NPs, while raising within NP is generally held to be impossible.\(^6\)

(38)  a. Terry’s eagerness [PRO to please]

(cf. Terry is eager to please.)

b. *Terry’s appearance [t to be pleasant]

(cf. Terry appears to be pleasant.)

We will show how Simpler Syntax captures these differences.

To begin, let us consider the classical approach to raising, and contrast that with the Simpler Syntax treatment. A point that is taken for granted in MGG discussions of raising and control is that raising is movement out of a complement. There is some a priori motivation for movement in terms of the concrete alternations between that-complements and infinitival complements, although a strict interpretation of what it means for there to be concrete evidence
of movement might take the view that raising would be movement only if the following two sentences were grammatical.

(39)  a. It seems (that) Robin is a genius.

       b. *Robin seems (that) t is a genius.

       [cf. Robin seems t to be a genius]

The fact that (39b) is ungrammatical is actually *prima facie* evidence that there is no movement in raising. Of course we could say that (39b) would be grammatical if it were not for the fact that there happens to be a constraint that has the effect of blocking the extraction of the subject of a tensed S to an A-position (e.g. the Tensed S Condition of Chomsky 1973). This is scarcely an explanation, though, since the motivation for this constraint is that it blocks the movement of the subject, for which there is no independent empirical motivation in this case. Of course, there is also methodological motivation, the desire to achieve derivational uniformity (see §1), but at best uniformity only provides a hypothesis about how to treat (39), not evidence that the analysis is correct. Furthermore, a movement analysis of raising does not provide a ready solution for similar constructions where raising is not plausible, e.g.

(40)  Robin seems \{like\ \as if\ he’s a genius.

By way of contrast, in *Simpler Syntax* raising occurs when the CS-argument that corresponds to the subject of the complement is mapped into the syntactic subject relation role of the raising verb. The CS-arguments are linked through the grammatical functions (GF) to
particular syntactic configurations, somewhat but not entirely along the lines of LFG. As in LFG, how the GFs are realized syntactically varies across languages, and includes possibilities such as the configurational pattern of languages like English, nominative/accusative and ergative/absolutive case marking, and agreement through inflection on the verb. CS-arguments that are not linked through GFs are realized transparently, e.g. by means of prepositions or case marking that reflects semantic properties of the argument (the latter is sometimes called ‘inherent case’).

Here is a schematic of the correspondence for *John seems to like scotch*. Subscripts function to connect constituents on different levels of structure. Crucially, there are two instances of GF\(_3\), one linked to CS and one to syntax. We cannot go into GFs here in great detail; see *Simpler Syntax*, Chapter 6. The notation ‘>’ means ‘thematically outranks’, so that the highest CS argument in terms of thematic hierarchy is mapped to the highest available GF. In the case of raising, the construction by definition involves a CS argument mapped to a GF that is not directly realized in syntax – the missing subject of the infinitive. This GF is coindexed with a GF in the upper clause that is realized as that clause’s syntactic subject. The picture is similar to that adopted in monostratal approaches such as HPSG and LFG.

(41)

```
[SEEM ([LIKE (JOHN_3, SCOTCH_4)]_2)]_1
  |     |
[GF_3]_1  [GF_3 > GF_4]_2
  |     |
[NP_3 [VP V_1 [VP to V_2 NP_4]]_2]_1
  |     |     |     |
John  seems  to like scotch
```

Conceptual structure

Grammatical functions

Syntactic structure

Phonology
Crucially, the appearance of raising follows from identification of the subject grammatical role of *seem* with the first argument of the complement; the rest of the complement is realized syntactically as an infinitival complement. This is not movement. It relies on the fact that a grammatical function can be linked to a syntactic argument associated with one predicate (in this case, *seem*), and to a semantic argument associated with another (in this case *like*). Since the linking rule is lexically governed (by *seem* and similar predicates), the only GFs that can be related in this way are the ones that are associated with the predicates that are mentioned in the lexical conceptual structure of the lexical item.

Since adjuncts are not syntactically or semantically selected by verbs, it is impossible in this framework to formulate a general linking rule for the lexical entry of *seem* (and similar predicates) that would map a GF associated with the adjunct to the subject of *seem*. Hence we derive this restriction directly from the fact that raising is lexically governed in the *Simpler Syntax* framework, and in a particular way. In contrast, under a movement analysis it is not clear how to constrain movement in such a way that a derivation like (42) does not occur, except by some kind of bald stipulation.

(42)  
* [e] seemed [that it would rain] [without Robin$_i$ getting dressed]  
\[\Rightarrow \] *Robin$_i$ seemed [that it would rain] [without t$_i$ getting dressed]
Similarly, we cannot have ‘long distance’ raising.

(43)  [e] seemed [that it was fun [Robin to yodel]]

=/> *Robin seemed [that it was fun [t to yodel]]

As in the case of raising out of adjuncts, the complement of the complement of seem is not accessible to the GF that links to the subject of seem in the lexical structure of the verb, which only mentions the complement of seem.

On the other hand, control does not involve a mapping of arguments to grammatical roles, but a realization of a CS-binding relation. There are a number of cases, as outlined in §3. For the simplest case, Simpler Syntax has a representation like (44).

(44)  TRY((JOHN₃, [LIKE (α₅, SCOTCH₄)])₂)₁ Conceptual structure

| [GF₃]₁ [GF₅ > GF₄]₂ Grammatical functions

| [NP₃ [VP V₁ [VP to V₂ NP₄]₂]₁ Syntactic structure

| John tries to like scotch Phonology
The first argument of *LIKE*, namely $\alpha$, is bound by *JOHN* but is not realized overtly in the syntactic structure. In this case, the identification of $\alpha$ with *JOHN* is determined at least in part by thematic conditions.

By contrast, consider true long distance control, as exemplified in (37c,d). In this case the bound argument is not in a complement that is itself an argument of a control predicate, and its interpretation is therefore free. It can be interpreted as arbitrary control, or more restrictively, depending on the constraints placed upon it by the interpretation of the rest of the sentence. So, for example, in (37c,d), the predicate *fun* has the implicit beneficiary *Robin*, so it is natural to interpret the agent of yodeling as Robin; the phrase *by herself* reinforces this interpretation. If we replace *fun* with *realistic* and replace *Robin* with *John*, we get a very different interpretation. For us, the controller can be interpreted very naturally here as external to the sentence, but a specific individual mentioned in the discourse (because of *by herself*).

(45)  

a. John thought [that it would be realistic [PRO to yodel all by herself]].

b. John thought that [it was obvious [that [PRO to yodel all by herself] would not be realistic]].

Thus, *Simpler Syntax* gets just the right pattern for raising and control. The evidence suggests that raising is not movement, and of course that control is not movement, except if we adopt a rather unprincipled notion of movement.
Let us turn to the second difference between raising and control, namely, the fact that control occurs within NPs and raising does not. As far as we can determine, in English, at least, GFs mediate only the mapping of semantic arguments to NP arguments of verbs. Semantic arguments that are mapped to arguments of nouns, as well as semantic arguments that are mapped to PP constituents of Ss, are not mediated by GFs.

The difference between NPs and Ss can be clearly seen in the behavior of dummy NPs, like *it* and *there*, which satisfy the English condition that at least one GF must be realized in any S, but do not correspond to semantic arguments. These dummy NPs cannot appear in NPs, which is consistent with the assumption that NPs lack GFs. (46a) shows that weather *it* cannot be the possessive of an NP, (46b,c) shows that the *it* of extraposition cannot be, and (46d-f) show the same for existential *there* and presentational *there*.

(46)  

a.   *I was awoken by it’s loud raining.  
[cf. I was awoken by it raining loudly.]

b.   *We discussed it’s being obvious that you had been here.  
[cf. We discussed it being obvious that you had been here.]

c.   *We discussed it’s obviousness that you had been here.

d.   *You should not be surprised by there’s being a donkey in your backyard.  
[cf. You should not be surprised by there being a donkey in your backyard.]

e.   *Robin denied there’s existence of an intelligent designer.

f.   *We were startled by there’s entering of the room a 600 pound gorilla.  
[cf. We were started by there entering the room a 600 pound gorilla.]
The dummy NPs cannot be possessive subjects of NPs into which raising occurs, as noted earlier and further exemplified in (47).

(47)  

(a) *it’s appearance of/for Terry to be pleasant
     *Terry’s appearance [t to be pleasant] [=38b)]

(b) *it’s likelihood of/for Terry to leave early
     *Terry’s likelihood [t to leave early]

(c) *it’s certainty of/for Terry to outyodel Robin
     *Terry’s certainty [t to outyodel Robin]

Since the raising relation is mediated by GFs, and since there is no realization of GFs in NP, there can be no raising in NP.

Moreover, what has been called ECM (and earlier, Raising to Object) also involves a syntax-semantics correspondence that crucially involves GFs. Here is a simple case adapted from Simpler Syntax.

(48)  

[BELIEVE (SUE3, [LIKE (FRED4, SAM5)]2)]1
       [GF3 > GF4]1 [GF4 > GF5]2
       [NP3 [VP V1 NP4 [VP to V2 NP5]]2]
          Sue believes Fred to like Sam
Crucially, the ‘external’ GF of the complement is realized as the direct object of *believes*, which is not linked to a CS argument of *believe*. Since there are no GFs in NPs, the upshot is that there can be no ECM in NPs, also a well known fact, but one that in our view has never received a satisfactory explanation. (49) illustrates.

(49) *Sue’s expectation of Fred to like Sam

In general, constructions that are treated in MGG as A movements, such as raising and passive, are dealt with in *Simpler Syntax* in terms of the mapping of GFs to syntactic structure, more or less paralleling HPSG and LFG. Space limitations preclude a detailed discussion here, but it is worth pointing out an interesting consequence of this approach.

Since GFs do not map to syntactic configurations within NP, *Simpler Syntax* predicts that there will not be passive NPs. At first blush this appears to be a false prediction, especially in view of the long history of the idea in generative grammar, from Lakoff 1965/1970 through Chomsky 1970 that Ss and NPs display strikingly similar active/passive alternations.

But note that there is a significant difference between the passive in Ss and the passive in NPs. The passive in Ss is unrestricted; it applies to virtually any transitive verb, demoting its subject and promoting its object to subject position. In contrast, the passive in NPs is restricted. It appears in classic examples such as the following.

(50) a. the enemy’s destruction of the city

b. the city’s destruction by the enemy
There cannot be a passive in NP unless the by phrase is an AGENT/INSTRUMENT (Grimshaw 1990: 91) and the possessor is a THEME. In contrast with the classic cases of (50), we have the following.

(51) a. Sandy’s receipt of the letter
    b. *the letter’s receipt by Sandy
       [cf. The letter was received by Sandy.]

(52) a. Sandy’s view of the backyard
    b. *the backyard’s view by Sandy
       [cf. The backyard was viewed by Sandy.]

(53) a. Sandy’s experience of (considerable) frustration
    b. *considerable frustration’s experience by Sandy
       [cf. Considerable frustration was experienced by Sandy.]

(54) a. Sandy’s denial of guilt
    b. *guilt’s denial by Sandy
       [cf. Guilt was denied by Sandy.]

(55) a. The position of editor is currently vacant. The post was departed by Mark Douglas-Home in December 2005.10
    b. *the post’s departure by Mark Douglas-Home
       [cf. The gate was departed by the plane.]

(56) a. Sandy’s avoidance of the problem
    b. *the problem’s avoidance by Sandy
       [cf. The problem was avoided by Sandy.]
These and similar examples suggest that in fact the “passive within NP” is an illusion. The by phrase denotes an AGENT/INSTRUMENT, which restricts the possible nouns to those that denote actions. The possessor is interpreted generally as expressing a role in the relation denoted by the noun. The available role is THEME, so the interpretation of the NP is what one would get if it was passivized. But there is no passive.

6. Summary

Here are our main points.

- There are many different types of control; some show locality and some do not.
- Whether or not there is locality, and what the controller is, can be accounted for in terms of semantics, particularly in terms of thematic roles.
- The syntactic realization of control is dependent on the CS-binding relation meeting these thematic conditions.
- ‘Raising’ is a way of realizing the subject of a complement of certain predicates associated with certain verbs; hence it cannot occur in NPs. Neither raising nor control are movement.
- Control should be taken out of the hands of the syntax and turned over to the semantics.
References


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Notes

* (Culicover, Peter W. and Ray Jackendoff. Turn over control to the semantics. Syntax. 9.2. 131-152. 2006.) A significant portion of this material is taken from our joint work, especially Culicover and Jackendoff 2001, Jackendoff and Culicover 2003, and Culicover and Jackendoff 2005. We are grateful to the editors and anonymous reviewers for their comments and suggestions that have led to a number of improvements. We alone are responsible for any remaining deficiencies.

1 PRO behaves like a reflexive in that it may be bound by a local antecedent. The earliest discussions of control (in terms of EQUI) typically exploited the parallels between examples like Lucy wanted to win; Lucy wanted herself to win, deriving both from Lucy wanted [Lucy to win]. In the first case, the subject of the complement is deleted. In the second case, it is replaced by a reflexive. In GB theory, both PRO and the reflexive are assigned the feature [+anaphor].

2 Depending on one’s assumptions, the interaction between traces and gapping may be somewhat more complex than our simple summary here suggests. For one thing, if PRO exists, it is not obvious that gapping deletes PRO rather than just the verb that precedes it. A similar issue arises for raising, if it is A movement.

(i) a. John seems to be a good linguist, and Susan, (seems t₁) to be a good psychologist.

   b. John seems to be a good linguist, and Susanₙ, (seems) t₁ to be a good psychologist.

On the other hand, if PRO and this trace do not exist, the issues do not arise.

3 The non-existence of PRO also eliminates the puzzle of why overt NP and trace of A'-movement block wanna-contraction (Jaeggli 1980), while PRO does not.
4 Of course one could weaken the constraints on movement so that movement could be used to keep track of any two related positions in a structure; e.g. one could envision downward movement, sideways movement, movement across a very long distance, movement from one sentence to another, etc. Unless there is strong independent motivation for such weakening, though, it would be difficult to see such a proposal as anything but a use of the word ‘movement’ to denote ‘syntactic relationship mediated by a CS relationship.’ See Culicover and Jackendoff 2005 for related remarks on even classical ‘movement’ phenomena.

5 Some verbs in this class, such as count on and rely on, may be raising rather than or in addition to control; see Postal (2004).

6 There are a few cases of apparent raising in NPs, along the lines of

(i) Robin’s likelihood of winning.

Likely is a raising predicate, as shown by There is likely to be dissatisfaction with this approach. However, the following data suggest that likelihood is a control predicate. The examples in (ii)-(iii) show that the ‘raised’ argument is not semantically neutral, in contrast with the sentential cases.

(ii) a. Robin’s likelihood of defeating Leslie [not synonymous with (iib)]

   b. Leslie’s likelihood of being defeated by Robin

(iii) a. Robin is likely to defeat Leslie [synonymous with (iiib)]

   b. Leslie is likely to be defeated by Robin
There are also cases where *likelihood* has a possessor but no possibility of raising.

(iv) Robin’s likelihood of victory

Although we have the alternative form *the likelihood of Robin’s victory*, raising out of a possessive NP position is generally ruled out. It is possible that cases such as (i)-(ii) actually involve control.

Similarly, *tend* is a raising verb, hence *tendency* appears to permit raising in NP. Even here there are unexpected gaps in the pattern, though.

(v)  

a. *it’s tendency to rain on Sundays* [cf. *it tends to rain on Sundays*]

b. *it’s tendency to be difficult to swim wearing lead pants* [cf. *it tends to be difficult to swim wearing lead pants*]

c. *stupidity’s tendency to run in families* [cf. *stupidity tends to run in families*]

d. *the devil’s tendency to be in the details* [cf. *the devil tends to be in the details*]

7 Grimshaw 1990 argues that the possessive NP within an NP is an adjunct; in our terms, it cannot be linked to a GF. Grimshaw claims that PPs to which θ-roles are assigned in NPs are arguments. In our terms, they are oblique arguments, but also are not linked to GFs.

8 This is the Simpler Syntax counterpart to the Extended Projection Principle. It is, admittedly, a stipulation. The latter is also a stipulation, although not generally admittedly.

9 See Grimshaw 1990 for some similar examples and an account in terms of the non-argumenthood of the possessor of NP.

11 Suggested by Adrian Akmajian at the Formal Syntax conference in Newport Beach in 1976.