ARBITRARY *PRO*--COMMANDED ARBITRARILY

Ed Zoerner

California State University, Dominguez Hills

1. The Puzzle

Traditional grammars note that in English, both gerunds and infinitives can stand as the subject of a sentence. However, speakers uniformly agree that (outside of a few fixed phrases) bare gerunds sound much more natural than bare infinitives do. So we note the following:

|				
1.	a.	?To box is dangerous	b.	Boxing is dangerous
2.	a.	?To draw takes great skill	b.	Drawing takes great skill
3.	a.	?To read is great fun	b.	Reading is great fun

The above data present a puzzle: why should we find such a contrast? Both the infinitives and gerunds of the above type contain so-called arbitrary PRO, a phonetically null pronominal that does not corefer with another NP. So the forms of (1a,b), in slightly more detail, follow as (4a,b) below:

4.   a.   [PRO to box] is dangerous   b.   [PRO boxing] is dangerous

This paper proposes that the answer to the puzzle lies in the nature of arbitrary PRO (henceforth simply PRO; we shall not concern ourselves with controlled PRO here). Specifically, this paper introduces a licensing condition for PRO that not only accounts for the above contrast but makes a number of other correct predictions as well. Section 2 first presents the contrasting structures of infinitives and gerunds; this will pave the way for the presentation of the analysis in section 3. Section 4 shows the predictions of the analysis. Section 5 summarizes matters and briefly discusses remaining issues on the topic

2. The PROper Structure of Infinitivals and Gerunds

We shall accept the standard depiction of infinitivals (as presented, for instance, in Haegeman (1991: 243), where PRO occupies [Spec, IP] and the infinitival marker *to*, which lacks tense and agreement features, fills the I position:

5.
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              IP
            /    \
        PRO       I'
                /    \
              I       VP
              to      box
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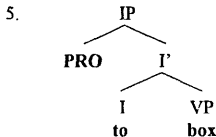
Gerunds, though also containing PRO in [Spec, IP], differ. We shall adopt the analysis of Baker (1988) and Milsark (1988). Under this view, the nominal affix *-ing* occupies the I position,

and the verb incorporates into the affix. The following diagrams show this process:

6. a.
IP
PRO   I'
I   VP
[$_N$ -ing]   box

b.
IP
PRO   I'
I   VP
[$_N$ box-ing]   t
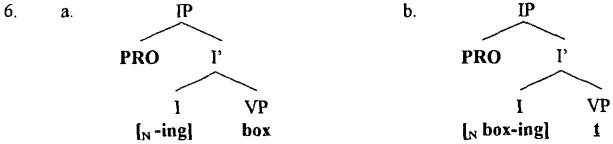
The diagram of (6b) contrasts from that of (5) in a crucial way. In (6b), the term in the I position, *boxing*, bears a [+N] feature. In (5), only the featureless *to* fills I. Note that the I position m-commands the subject PRO:

> 7.   m-command: X m-commands Y iff all maximal projections that dominate X also dominate Y.

3.   The Analysis PROclaimed

Based on the above observation, we hypothesize the following syntactic condition:

> 8.   The PRO-arb Condition (PAC)
>   Arbitrary PRO receives licensing through m-command of a noninert term.

The infinitival marker *to*, as an "inert" term, does not serve to satisfy the PAC, and hence bare infinitival subjects sound unnatural. On the other hand, the nominal feature of the gerund in (6b) satisfies the PAC, and the form goes through as perfectly natural.

The PAC actually completes a set of licensing conditions for NPs. It establishes, in structural terms, what licenses PRO in a subject position; in this way (9c) fills a previously unaddressed void:

> 9.   a.   <u>Overt NPs and *pro*</u>:   Licensed by standing in a structural relationship (typically Spec-Head) with a Case assigner/checker
>   b.   <u>Controlled PRO</u>:   Licensed by standing in the c-command domain of a coindexed NP (e.g. Robin$_i$ wants PRO$_i$ to win)
>   c.   <u>Arbitrary PRO</u>:   Licensed through m-command of a noninert term.

To keep the notion of "licensing" PRO consistent with that of licensing, say, an overt NP, we shall posit the following: PRO contains an "arbitrary" feature (call it X) which gets checked off by any m-commanding feature of any type. So the previously noted good gerund form would appear as (10) below:

10.

$$IP$$
$$PRO_X \quad I'$$
$$I \quad VP$$
$$[_N \text{ box-ing}] \quad t$$
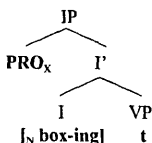
Here, the N feature of the term "boxing" in the I position checks off the X feature of PRO by virtue of m-command. For purposes of this paper, we will assume that functional heads bear a [+F] feature, which as we will see also can license PRO.

The PAC does not specify what must m-command PRO to license it, except that the m-commanding element must have features (thereby eliminating infinitival *to*). Any arbitrary m-commanding term can license PRO; hence we find arbitrary PRO commanded arbitrarily.

4. PROdictions of the Analysis

So far we have looked only at bare gerunds and bare infinitivals. The PAC of course predicts that gerunds will always sound natural with PRO, since the *-ing* affix with its nominal feature will always command PRO. More interesting predictions follow with respect to infinitivals. Specifically, we can point to the following predictions regarding the attempts to "rescue" an unnatural-sounding infinitival PRO by adding more material:

11.   a.   Material that c-commands PRO will license PRO.
      b.   Material within the VP of the clausal subject will not license PRO.
      c.   Material outside the infinitival subject that m-commands the subject will license PRO.

Let us start with the various types of data that fall under (11a) above.

First off, note that PRO as a complement of a head N sounds perfectly natural. The following examples sound fine, precisely because the underlined N c-commands PRO and checks off PRO's X-feature:

12.   a.   [A <u>desire</u> [PRO to box]] is foolish indeed
      b.   [The <u>impetus</u> [PRO to draw]] comes from within
      c.   [The <u>need</u> [PRO to read]] is undeniable

Second, notice that an overt complementizer preceding (and c-commanding) PRO also improves a bare infinitival, just as the PAC expects, thanks to the [+F] feature in the C position:

13.   a.   [<u>That</u> [PRO to box] is foolish] comes as no great surprise
      b.   [<u>Whether</u> (or not) [PRO to draw] takes great skill] remains an open question
      c.   [<u>If</u> [PRO to read] is necessary], we should all read.

Third, when a negation marker precedes PRO, matters improve, just as the PAC suggests. We may remain agnostic as to the nature of negation (whether it heads a NegP or merely stands as an adverb of sorts); what matters here is that the negation marker c-commands PRO[1]:

14.   a.   [<u>Not</u> PRO to box] shows a lack of courage
         b.   [<u>Not</u> PRO to draw] is the norm in West Podunk
         c.   [<u>Not</u> PRO to read] is a real shame in this golden age of literature

Fourth, notice that when an S-adverb(ial) appears clause-initially, it c-commands PRO. This leads to the relative acceptability of forms such as[2]:

15.   a.   <u>Predictably enough</u>, [PRO to box] is foolish indeed
         b.   <u>Undoubtedly</u>, [PRO to draw] takes great skill
         c.   <u>Perhaps unexpectedly</u>, [PRO to read is not so hard]

Fifth, in questions and conditionals, which have a filled [Spec, CP] and/or C position, matters improve somewhat (though perhaps not as much as the PAC would predict)--because the filled slot(s) within CP commands PRO in [Spec, IP]:

16.   a.   <u>Why is</u> [PRO to box so dangerous]?
         b.   <u>Was</u> [PRO to box] really so dangerous back then?
         c.   [<u>If</u> PRO to box] were foolish, only fools would box
         d.   <u>Had</u> [PRO to box] been dangerous, the state would have abolished it

Finally, constructions with so-called "heavy" elements [those containing CP or PP; (Aarts (1989))]elements that follow the infinitive sound perfectly natural. This follows if we assume that heavy constituents can undergo rightward shift, even vacuously. When the heavy constituents right-adjoin to IP, they will c-command the PRO in the subject. The diagram in (18) shows why the form in (17) sounds so natural:

17.   [PRO to box <u>a champion who has defended the title six times</u>] is dangerous
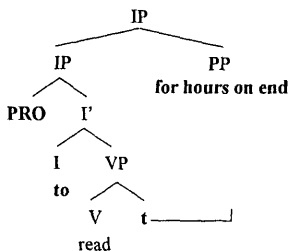
18.
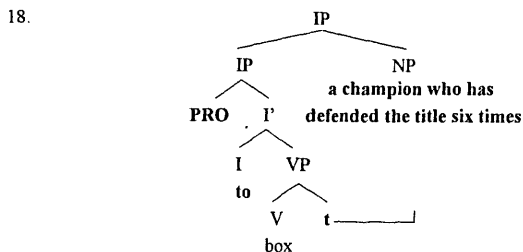
As noted, the moved NP c-commands PRO, hence satisfying the PAC. The same logic applies

to rightward-moved PPs. The forms in (19) all improve greatly on bare infinitivals, and the diagram in (20) suggests why--the (vacuously) moved PP licenses PRO from its new position:

19. a.   [PRO to box <u>without proper training</u>] is dangerous
     b.   [PRO to draw <u>under such adverse conditions</u>] takes great skill
     c.   [PRO to read <u>for hours on end</u>] is tremendous fun

20.

```
                            IP
                     _____
                    IP                  PP
                  /    \          for hours on end
               PRO      I'
                      /    \
                     I      VP
                    to     /  \
                          V    t_____|
                        read
```

We turn now to the prediction of (11b)--that material added to a bare infinitive which does not m-command PRO will not license PRO. Two sets of facts support this prediction. First, note that non-heavy NP complements after the infinitival do not improve matters much; the forms below all sound considerably less natural than their corresponding gerundives do:

21. a.   ?To box <u>the champion</u> is dangerous
     b.   ?To draw <u>nudes</u> takes great skill
     c.   ?To read <u>old magazines</u> is great fun

The PAC correctly predicts the awkwardness of the above forms. The underlined NPs, as complements to the verb, simply do not m-command the PRO in [Spec, IP]. In a similar vein, APs within VP also fail to m-command the subject PRO and the PAC therefore correctly predicts the relative ungrammaticality of the following:

22. a.   ?[PRO to box <u>unprepared</u>] is foolish
     b.   ?[PRO to draw <u>slowly</u>] is painful
     c.   ?[PRO to box <u>last year</u>] was dangerous

The underlined APs above do not undergo rightward shift, and from their position within VP they do not license PRO. Note that a form nearly synonymous with (22a), "*To box without preparation is foolish*," sounds natural enough--if we grant that PPs undergo rightward movement, as suggested earlier, whereas APs do not.

Next we consider the prediction of (11c)--that material m-commanding PRO will license PRO. We can point to two specific pieces of support for this prediction. First, consider coordinated structures. If we accept the position that a coordinator & heads its own syntactic phrase &P (see

Rothstein (1991) and Zoerner (1995), among others), then a coordination of two clauses appears as:

23.

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              &P
           ⟋    ⟍
        CP₁       &'
                ⟋   ⟍
              &       CP₂
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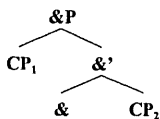
The coordinator m-commands everything in the first conjunct clause--including PRO, if any. It also, of course, c-commands everything in the second conjunct. The prediction therefore ensues that PRO will receive licensing in coordinations, regardless of which clause it occupies, and this seems to bear out:

24. a. [PRO to box is dangerous], and [no one should do it]!
  b. [PRO to read Pride and Prejudice is torture], but [my prof doesn't care]
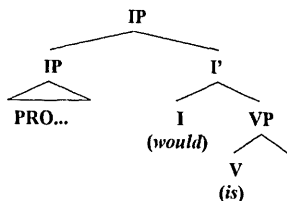 c. [PRO to err is human], (but) [PRO to forgive, divine]

Perhaps the familiar saying in (c) above sounds natural enough because we interpret it as a coordinated structure.

Interestingly, most of the "grammatical" examples of PRO in the literature involve the auxiliary verb *would*. It so happens that modal auxiliaries in general help rescue constructions with PRO. Note, for instance, that in each case below, the primed sentence without a modal auxiliary sounds less natural than the corresponding form with the modal:

25. a. [PRO to box] would be foolish in these times
  a'. ?[PRO to box] is foolish in these times
  b. [PRO to draw well] can take 10 years' training
  b'. ?[PRO to draw well] takes 10 years' training
  c. [PRO to read Pride and Prejudice] would require masochistic tendencies
  c'. ?[PRO to read Pride and Prejudice] requires masochistic tendencies

The above data follow simply enough from the PAC, if we grant that modals fill the I position, while copulae/main verbs fill V:

26.

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                    IP
                ⟋        ⟍
            IP              I'
          ⟋   ⟍          ⟋    ⟍
        PRO...          I        VP
                     (would)    ⟋ ⟍
                              V
                             (is)
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384

Note, by the way, that aspect markers, which occupy a position lower than I (perhaps they head AspectP; see Hendrick (1991)) and hence do not m-command the subject, do not rescue constructions with PRO to the extent that modals do; the PAC makes this correct prediction as well.

27.   a.   [PRO to box] <u>would</u> be dangerous
        b.   ?[PRO to box] <u>has</u> been dangerous

5.   PROtracting the Analysis--and a PROlepsis

If the PAC truly stands as a licensing condition for PRO, it should serve crosslinguistically. Burkhardt Mohr (p.c.) notes that the facts in German parallel those in English. One might also point to Japanese facts as potential support for the PAC. Consider the following forms, focusing on the so-called "gerundive *no*."

28.   a.   [PRO yomu]-no-ga muzukashii desu
               read-**no**-SUB difficult   is
               'Reading is difficult'
        b.   *[PRO yomu-ga] muzukashii desu

Say that the subject-marker *ga* proves inert, much like English *to*. If so, the addition of the *no* serves simply to satisfy the PAC; as the bracketing of (28a) suggests, it cliticizes not to the verb but rather to the IP node. It remains a question for future research why English PRO can receive licensing from any m-commanding term, whereas Japanese requires a specific element (*no*). We do not, then, find arbitrary PRO commanded arbitrarily in all languages--this needs further investigation.

Another important question remains: Why should the bare infinitivals, which do not satisfy the PAC, not prove totally ungrammatical? We have seen that forms such as *To box is dangerous* do not fail completely. The answer must lie in the English infinitival marker *to*. Although inert, the *to* does in fact m-command PRO and thereby partially satisfies th PAC. A better answer to this question will require further investigation into the nature of infinitival *to*.

Summing up, we find that a simple licensing condition--the PAC--manages to account for a number of previously unaddressed distributional facts regarding arbitrary PRO.

NOTES

1.   Gregory Ward (p.c.) correctly points out that negation seems to improve upon a bare infinitival even if it follows the infinitival marker *to*, where it would not m-command PRO:

       i)   [PRO to <u>not</u> box] shows a lack of courage]

The relative acceptability of the above poses a problem for the current analysis, unless we accept that the negative marker has lowered from an original position preceding PRO--a perhaps possible though unsavory analysis.

2.   The analysis does not, however, seem to predict that fact that the S-adverbial can (at least sometimes) appear after the infinitival. Though the comparative awkwardness of the first form below follows from the analysis, the well-formedness of the second form does not; this needs further investigation.

> i)   ?[PRO to box], predictably enough, is foolish indeed
> ii)   [PRO to draw] undoubtedly takes great skill

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