Verb phrase (VP) ellipsis and antecedent-contained deletion (ACD) may be analyzed as free anaphora in a grammatical framework that makes no reference to free variables, movement, structured representations, or deletion or copying of material under identity. Jacobson (1992) provides such an account within the framework of Combinatory Categorial Grammar (CCG), specifically the variable-free account of anaphora sketched out in Jacobson (1999). Jacobson (1992)'s account of VP ellipsis (VPE) and ACD is much in the spirit of Hardt (1993). Both proposals analyze ellipsis sites as free pro-forms which are semantically identified (i.e. co-indexed) with antecedent material, either by the processor or the grammar.

Alternatively, Szabolcsi (1992) shows that in a CCG framework, instances of VP ellipsis where the ellipsis site occurs in the same sentence as its antecedent can in certain cases be analyzed analogously to reflexive pronouns with argument-reductive mechanisms such as Curry and Feys's **W** type-shifter. Using argument reducers like **W** or Jacobson's **z** in this way is referred to as "binding" in a sense distinct from the variable binding of the lambda calculus or predicate logic. Argument reducers merge two distinct argument slots of some functor *f* into one:

(1) **Argument reducers**
   (a) $\mathbf{W}f = \lambda x[\mathrm{f}(x)(x)]$
   (b) $\mathbf{z}f = \lambda g \lambda x[f(gx)(x)]$

Ellipsis sites, then, have been variously described in the literature as free or bound pro-forms but not as potentially both. Noun phrase (NP) anaphora, however, is generally recognized to occur in (at least) two distinct ways: (1) via accidental/free co-reference and (2) via variable binding plus argument reduction (cf. Sag (1976)'s Derived VP rule). The free versus bound ambiguity explains, *inter alia*, the possible semantics of constructions with quantificational antecedents (i.e. *every man$_i$ loves his$_{i/j}$ mother*), the existence of both strict and sloppy identity of pronouns in elided VPs (i.e. the two readings of *Bill$_i$ loves his$_i$ mother, and John does too*—cf. Sag (1976)), and the semantics of sentences with focused *e*-type antecedents (i.e. the two readings of *only SUE$_i$ thinks she$_i$ is smart*).

Although English (and likely natural language in general) lacks quantificational pro-verb antecedents, Schwarz (2000) has shown that VP analogs of strict/sloppy constructions do exist: i.e., *when John has to cook he doesn't want to, and when he has to clean he doesn't either*, which is ambiguous between John not wanting to cook when he has to clean and John not wanting to clean when he has to clean. Schwarz shows that quantifier raising (QR) plus argument-reductive binding of a silent variable pro-VP at the ellipsis site facilitates analysis of these constructions.

Schwarz (2000) and Kratzer (1991), moreover, have argued that VP ellipsis constructions whose antecedent VPs are associated with sets of focus alternatives seem to suggest a binding relationship between antecedent and ellipsis site. Kratzer's "Tanglewood" cases make the point most clearly. If the salient alternatives to Tanglewood are Boston and Philadelphia, *Bill only went to TANGLEWOOD after Emma did* asserts both that Bill did not go to Boston after Emma went to Boston and that Bill did not go to Philadelphia after Emma went to Philadelphia. Assuming *only* takes a proposition p and a focus value ϕ and returns a presupposition equivalent to p and an assertion equivalent to the negation of every proper alternative to p in ϕ, we may conclude that the focus value associated with *Bill went to TANGLEWOOD after Emma did* is the following set:

$\{p : p = [[\text{Bill went to } x \text{ after Emma went to } x]]$, for all $x \in \mathrm{D}_{<e>}{}^{c}\}$

In other words, the focus set contains no "mixed" alternatives, evidence that the antecedent VP binds the ellipsis site.

This paper shows that the empirical generalizations of Schwarz (2000) and Kratzer (1991) may be entirely recast in a variable-free Combinatory Categorial Grammar, in particular the Jacobson (1999) logic. The account provided here makes no reference to variables, assignment functions, movement, or structured representations. Binding is achieved with two combinators: Jacobson's **z** and Curry and Feys's **S**, both of which receive independent motivation in the CCG literature:

(2) $\mathbf{z}$: $<(A/B)/C, f> \Rightarrow_{\mathbf{z}} <(A/B)/C^{B}, \lambda g\lambda x[f(gx)(x)]>$

(3) $\mathbf{S}$: $<(A/C)/B, f> \Rightarrow_{\mathbf{S}} <(A/B)/C^{B}, \lambda g\lambda x[f(x)(gx)]>$

Different syntactic-semantic configurations necessitate different binding combinators. **S** binds a free pro-form in *f*'s second argument slot, and **z** a free pro-form in *f's* first argument slot. This apparatus provides a natural way to arrive at both un-mixed focus sets and strict/sloppy identity of pro-verbs in ellipsis constructions. **S** and **z** are further shown to facilitate the first binding account of antecedent-contained deletion (ACD), a free-pro-form account of which has been provided in Jacobson (1992).

So Schwarz and Kratzer's data suggest a binding relationship between intra-sentential VP ellipsis antecedents and ellipsis sites. Moreover, both accounts assume that un-mixed focus sets are the only kinds which result when a focused VP serves an antecedent for VP ellipsis. However, I highlight a new set of VP ellipsis constructions evincing what I call a "free focus" reading analogous to the unbound reading of *only SUE_i thinks she_i is smart*. These constructions, I argue, force us to acknowledge that an elided VP may or may not carry focus in cases where its antecedent does:

(4) A: John is so pedantic at track meets. He follows me around, doing everything I do and then trying to show me up on top of it. Yesterday after I sprinted, he sprinted and somersaulted. After I pole-vaulted, he pole-vaulted and ran a 5-minute mile.
B: In general, I suppose you're right. But here's a counterexample: Yesterday, [John only RAN after you did.] He didn't run and try to juggle or anything like that.

(4B)'s bracketed sentence seems to mean something like *running was the only P such that I P_{past} when you ran.* If, as with free readings of constructions with focused NP antecedents, we assume that free meanings are picked without focus marking, the semantics of *only* guarantees that none of the proper alternatives to the proposition expressed by *I ran when you ran* in the set $\{p : p = [[\text{I } P_{\text{past}} \text{ when you ran}]], \text{ for all } P \in D_{<e,t>}^{c}\}$ are true—the intuitively correct reading in this context. This meaning is is exactly analogous to the aforementioned "free focus" readings of constructions like *only SUE_i thinks she_i is smart*. In both cases the inherited contextually salient meaning does not carry focus marking. Therefore the pronoun and the ellipsis site remain constant in the focus alternatives associated with their respective expressions. What emerges, then, is a unified treatment of verb and NP anaphora. Both pro-verbs and pro-nominals may be either free *or* bound.

The paper concludes with a binding account of so-called across-the-board (ATB) ellipsis constructions (i.e., *Sue ran_i and Bill $jumped_j$ when James did $\varnothing_{i/j}$*, *John had to $print_i$ and Mary had to $file_j$ every document we neglected to $\varnothing_{i/j}$*), which seem somewhat marginal but which are nevertheless tolerated by many informants. These constructions require a binding analysis for the same reason as does *$Bill_i$ loves and $Harry_j$ hates $his_{i/j}$ mother*—in short, since the pro-form/ellipsis site cannot be understood as referential to both antecedents (i.e. the latter sentence means something like *Bill loves Bill's mother, and Harry hates Harry's mother*), a binding mechanism is required. It is shown that the variable-free CCG framework provides a ready account of ATB ellipsis.

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