Bound Variable Anaphora

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Abstract: *Bound variable anaphora* (BVA) is the term given to contexts where a pronominal anaphor functions like a logical variable in that its interpretation co-varies with the value assigned to its antecedent in a given universe of discourse. For example, in a math class with four girls (Alice, Beth, Carol, and Diane) the interpretation of the pronoun ***she*** in the English sentence *Every girl in math hopes that **she** will be an astronaut* varies according to which girl is picked out. For such a sentence to be evaluated as true it must be the case that each substitution of the pronoun for a constant yields a true proposition: Alice hopes that Alice will be an astronaut, Beth hopes that Beth will be an astronaut, and so on. Such sentences are often rendered by logical formulas such as [$\forall x$, girl-in-math(*x*), *x* hopes that *x* will be an astronaut]. The study of BVA has figured prominently in modern studies of grammar, and has proven to be an important testing ground for formal theories of syntax and semantics. In this chapter, we focus on the syntax of BVA.

After establishing that the necessary and sufficient conditions for BVA represent a convergence of semantic and syntactic properties (§1), we examine the distribution of bound variables in A-binding and A'-binding contexts (§2). We then turn to the question of the form of (A-bound and A'-bound) BVAs (§3), focusing on whether they can surface as reflexives, (overt or covert) pronouns, copy anaphors, unspecified binding expressions (UBEs), or indexicals. After considering whether the internal syntax of bound variables is uniform (§4), we attend to their semantic type (§5). We concude with a retrospective assessment of how analyses of BVA have developed over time, and speculate about future prospects (§6).

Bound Variable Anaphora

1. The necessary and sufficient conditions for Bound Variable Anaphora

As a starting point, we call attention to the fact that bound variable anaphora is connected to a larger set of anaphoric strategies (Evans 1980). Consider the English pronoun *she*, which occurs in three different contexts. *She* can be a DISCOURSE ANAPHOR that refers back to a previously established discourse referent, as in (1). *She* can be a sentence anaphor that refers back to previous DP in the same sentence, as in (2). And *she* can be a BOUND VARIABLE, as in (3); here the interpretation assigned to the pronoun varies according to the assignment function introduced by the quantifier *every*. For example, in a context where there are three female judges — say Anna, Betty, and Cathy — then (3) is evaluated as true if Anna, Betty, and Cathy each hold a believe about themselves, as in (3a-c).

(1)   *Beverly is the senior judge of the supreme court. **She**$_{\text{BEVERLY}}$ is underpaid.*

(2)   *Beverly believes that **she**$_{\text{BEVERLY}}$ is underpaid.*

(3)   *Every female judge believes that **she** is underpaid.*
        Set of female judges: {Anna, Betty, Cathy}
        a.   *Anna believes that **she**$_{\text{ANNA}}$ is underpaid,*
        b.   *Betty believes that **she**$_{\text{BETTY}}$ is underpaid.*
        c.   *Cathy believes that **she**$_{\text{CATHY}}$ is underpaid.*

BVA arises when three conditions are satisfied:

(i)   there is a quantificational antecedent, e.g. *every female judge*
(ii)   there is a co-varying pronominal anaphor, e.g. *she*
(iii)   the antecedent c-commands or has scope over the pronominal anaphor

We consider each of these conditions in turn.

1.1 BVA requires a quantificational antecedent

BVA is only possible if a pronominal anaphor is associated with a quantificational antecedent. Representative examples include universal quantifiers such as *each* and *every* (4), existential quantifiers such as *some* and *a* (5), and negative quantifiers such as *no* (6).

(4)   a.   [*Each female judge*]   *believes that **she** is underpaid.*
        b.   [*Every female judge*]   *believes that **she** is underpaid.*

(5)   a.   [*Some female judge*]   *believes that **she** is underpaid.*
        b.   [*A female judge*]   *believes that **she** is underpaid.*

(6)   [*No female judge*]   *believes that **she** is underpaid.*

In BVA contexts, the pronominal anaphor does not pick out a referent in the discourse. Rather, the pronominal functions as a variable that is bound by a quantificational operator.

A standard way of representing this relation is via a tri-partite quantificational structure (Partee 1991) which introduces: (i) an operator that ranges over a variable; (ii) a restriction on the variable, and (iii) a nuclear clause over which the operator takes scope. This is illustrated in (7a) with a universal operator ($\forall$, corresponding to natural language expressions such as **each N** and **every N**), in (7b) with an existential operator ($\exists$, corresponding to **some N** or **a N**), and in (7c) with a negative operator ($\neg\exists$, corresponding to **no N**).

(7)   OP   RESTRICTION   NUCLEAR CLAUSE

         a. $\forall x$ female-lawyer(x),   [x believes that x is underpaid]

         b. $\exists x$ female-lawyer(x),   [x believes that x is underpaid]

         c. $\neg\exists x$ female-lawyer(x)   [x believes that x is underpaid]

A defining feature of BVA contexts is that they require the presence of an obviously quantificational operator. Thus, when a pronominal anaphor has a non-quantificational antecedent — so-called *rigid designators* (Kripke 1980) such as a proper name or a definite description as in (8) — it need not be treated as a logical variable. In such contexts, the pronominal anaphor can be construed as standing in an identity relation with a previously mentioned antecedent. By convention, this co-reference relation is indicated via co-indexation, (9). Such indices are not inherent to syntactic representations (Safir 2004b), but simply annotate different interpretations.

(8)   a.   [*Beverly*]   *believes that **she** is underpaid.*

       b.   [*The female lawyer*]   *believes that **she** is underpaid.*

(9)   a.   [*Beverly*]$_1$ *believes that [**she**]$_1$ is underpaid.*

       b.   [*The female lawyer*]$_1$ *believes that [**she**]$_1$ is underpaid.*

The distinction between obviously quantificational operators (which pick out any relevant set of individuals) and rigid designators (which pick out a particular individual) is blurred in semantic analyses that adopt quantificational treatments of the latter. In particular, Russell's (1905) analysis of definite descriptions — extended to proper names by Quine (1939) — in terms of the iota operator (ι) yields Logical Forms such as (10a-b). Equivalently, a lambda-operator (λ) may be used, as in (10c).

(10)   a. ιx [x believes that x is underpaid]; (x=the-female-lawyer)

        b. ιx [x believes that x is underpaid]; (x=the-person-named-Beverly)

        c. λx [x believes that x is underpaid]; (x=Beverly)

The possibility of generalizing a quantificational analysis in this way means that BVA is in principle at play with both obviously quantificational operators such as **every N**, **some N**, **no N**, as well as with definite description such as **the N** and proper names.

Restricting attention to obviously quantificational antecedents, observe that they come in different guises. For the purposes of BVA, the most important contrast is between

quantifiers that require singular BVA, as in (11), versus those that prohibit singular BVA, as in (12).

(11)   QUANTIFIERS THAT REQUIRE SINGULAR BVA
a. [*Each female lawyer*] *hopes that* {***she***, ****they***} *will be promoted.*
$\forall x$, female.lawyer (x), [x hopes that x will be promoted]

b. [*Every female lawyer*] *hopes that* {***she***, ****they***} *will be promoted.*
$\forall x$, female.lawyer (x), [x hopes that x will be promoted]

c. [*Some female lawyer*] *hopes that* {***she***, ****they***} *will be promoted.*
$\exists x$, female.lawyer (x), [x hopes that x will be promoted]

d. [*No female lawyer*] *hopes that* {***she***, ****they***} *will be promoted.*
$\neg\exists x$, female.lawyer (x), [x hopes that x will be promoted]

(12)   QUANTIFIERS THAT PROHIBIT SINGULAR BVA
a. [*All female lawyers hope that* {****she***, ***they***} *will be promoted*.
= (i) $\forall x$, fem.lawyer (x), [x hopes that x will be promoted]
= (ii) $\forall x$, fem.lawyer (x), [x hopes that ***they***FEM.LAWYERS will be promoted]

b. [*Many female lawyers hope*] *that* {****she***, ***they***} *will be promoted*.
= (i) **many** x, fem.lawyer (x), [x hopes that x will be promoted]
= (ii) **many** x, fem.lawyer (x), [x hopes that ***they***FEM.LAWYERS will be promoted]

c. [*Some female lawyers*] *hope that* {****she***, ***they***} *will be promoted*.
= (i) $\exists x$, fem.lawyer (x), [x hopes that x will be promoted]
= (ii) $\exists x$, fem.lawyer (x), [x hopes that ***they***FEM.LAWYERS will be promoted]

To establish that a pronoun is serving as a bound variable, it is best to examine contexts that require singular BVA. This is because plural pronouns, although consistent with BVA, also allow collective readings, loosely "they as a group" (Rullmann 2003). For this reason, we limit our discussion to quantifiers that require singular BVA. In some languages, universal quantifiers only combine with plural pronouns, e.g. the Iroquoian language Mohawk. Indeed, Baker (1996) uses the fact that Mohawk quantificational antecedents can only associate with plural forms as an argument against the existence of "true quantifers" in that language.

1.2 BVA requires a co-varying anaphoric expression
The second ingredient of BVA is the presence of a **co-varying anaphoric expression**. Restricting the discussion for now to 3rd person pronouns (we examine 1st and 2nd person pronouns in §3.1.5), it is important to consider not only overt pronominal anaphors (13), but also various types of covert anaphors. By convention, covert pronouns are classified in terms of finiteness. On the one hand, "big *PRO*" (Higginbotham 1980) is found in non-finite clauses and is licensed by control (14). On the other hand, "small *pro*" is found in finite

clauses and is licensed in one of two ways. Some *pro*'s are licensed via pronominal agreement (Montalbetti 1984), as in Spanish (15); this is called *pro*-drop (for "pronoun drop"). Other *pro*'s are licensed by a preceding topic in the discourse (Tomioka 2003), as in Japanese (16); this is called topic-drop.

(13)   *Every female laywer hopes that **she** will get a raise.*
         $\forall x$, female-lawyer(x), [x hopes that x will get a raise]

(14)   *Everybody wants* [***PRO** to be promoted*].
         $\forall x$, person (x), [x wants x to be promoted]

(15)   *Nadie   cree   que* [***pro** es inteligente*].
         nobody believes that   is intelligent
         'Nobody believes that **he** is intelligent.' (Montalbetti 1984:83, (15b))
         $\neg\exists x$, person (x), [x believes x is intelligent]

(16)   *Dono gakusei-no   [Dan-ga   **pro** buzyokushi-ta] to it-ta.*
         which student-even Dan-NOM   insult-PERF   C say-PERF
         'Every student said that Dan insulted **him**.' (Tomioka 2003:322, (2))
         $\forall x$, person (x), [x said that Dan insulted x]

1.3 Bound variable anaphora requires a dependency relation
The third ingredient of BVA is the **dependency relation** that holds between the quantificational antecedent and the co-varying anaphoric expression. The nature of this dependency relation is subject to debate. Some suggest that the dependency is syntactic and best stated in terms of c-command (Reinhart 1983). Others take it to be a purely semantic relation that is best stated in terms of scope (Barker 2012). It is a matter of continuing debate whether c-command and scope reduce to the same phenomenon: according to Szabolcsi (2001) they do, according to Barker (2012) they don't.

2. The distribution of the co-varying anaphoric expression
When considering the distribution of BVA it is useful to distinguish between two distinct syntactic contexts, having to do with the position of the antecedent. We first consider BVA that arises in the context of binding from an argument position (A-binding; §2.1) and then we consider BVA that arises in the context of binding from an A'-position (A'-binding; § 2.2).

2.1 A-binding of a bound variable requires c-command
We review evidence that supports the c-command requirement for BVA as well as evidence that shows that c-command may not be a necessary condition. We show that authentic bound variables are c-commanded by a quantificational antecedent.
     By definition, a bound variable is dependent on a quantificational antecedent. Since Reinhart (1983), this dependency is considered to have a syntactic correlate in the form of a C-COMMAND requirement, as stated in (17).

(17) a. C-COMMAND REQUIREMENT FOR BVA (Reinhart 1983:122)
A quantifier must c-command any pronoun that it binds.

b. C-COMMAND
A node A c-commands a node B iff neither A nor B dominates the other, and every branching node dominating A also dominates B.

Reinhart's (1983) c-command requirement predicts that BVA is syntactically conditioned: specifically the quantificational antecedent must c-command the co-varying anaphor. C-command, but not linear order (in the form of precedence), is a pre-requisite for BVA (§2.1.1.). Moreover, semantic scope, while a necessary condition, is not sufficient for BVA. For cases where c-command does not hold, various diagnostics indicate that pronouns found in those contexts are E-type pronouns (§2.1.2.).

2.1.1 C-command, but not linear precedence, is a pre-requisite for BVA
BVA is subject to a c-command requirement. To see this, consider the example in (18) where the quantificational antecedent c-commands and precedes the pronoun and BVA is possible.

(18) [*Every female pilot*]$_1$ *was outraged that* [***she***]$_1$ *was underpaid.*
$\forall x$, female pilot(x), [x was outraged that x was underpaid]

To see that c-command rather than linear precedence is at play consider the examples in (19) and (20). In the (a) examples, the quantificational antecedent precedes but does not c-command the pronoun and BVA is ruled out. In particular, in (19a), the quantificational antecedent is embedded in a relative clause, and so cannot c-command the pronoun in the matrix clause. In contrast BVA is possible if the quantificational antecedent serves as the head of the relative clause and thus c-commands the pronoun as in (19b). In (20a) the quantificational antecedent in the matrix clause cannot c-command the pronoun embedded in an adjoined clause: this is because the VP-adjoined clause (Jones 1991) is structurally higher than the quantifier. Again, BVA becomes possible if the quantificational antecedent is higher than the adjunct clause, for example if it is an indirect object (20b), or a subject (20c).

(19) a. *[$_{DP}$ [$_{DP}$ *The men*] [$_{CP}$ *who worked with* [*every female pilot*]$_1$]] *denied that* [***she***]$_1$
was underpaid.
$\neq \forall x$, fem.pilot(x), [the men [who worked with x] denied that x was underpaid]

b. [$_{DP}$ [$_{DP}$ *Every female pilot*]$_1$ [$_{CP}$ *who worked for a large airline*]] *claimed that* [***she***]$_1$
was underpaid.
= $\forall x$, fem.pilot(x) [x worked for a large airline & x claimed that x was underpaid]

(20) a. *We* [$_{VP}$ [$_{VP}$ *fired* [*every injured worker*]$_1$] [$_{CP}$ *in order* PRO *to pay* [***his***]$_1$ *insurance*]]
$\neq \forall x$, injured.worker(x) [we fired x in order for us to pay x's insurance]

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b. *We sent* [_every injured worker_]$_1$ *home* [$_{CP}$ [**PRO**]$_1$ *to live on* [**his**]$_1$ *insurance*].
$\forall x$, injured.worker(x) [we sent x home for x to live on x's insurance]

c. [_Every injured worker_]$_1$ *resigned* [$_{CP}$ *in order* [**PRO**]$_1$ *to receive* [**his**]$_1$ *insurance*].
$\forall x$, injured.worker(x) [x resigned in order for x to receive x's insurance]

For completeness note that, as predicted, BVA is ruled out if neither precedence nor c-command holds between the quantificational antecedent and the pronoun:

(21) **The man who worked with* [**her**]$_1$ *respected* [_every commanding officer_]$_1$.
$\neq \forall x$, com.officer(x), the man who worked for x respected x

The above establishes that linear precedence is not a <u>sufficient</u> condition for BVA; moreover, it is also not a <u>necessary</u> condition. To see this, consider the examples in (22). Under Reinhart's definition of c-command, the negative quantifier *nobody* in (22a) c-commands the fronted PP *near his child's crib* in its surface position. In contrast, if the quantifier is in a position where it cannot c-command the pronoun inside the PP, e.g. if the quantifier is in object position as in (22b), a BVA interpretation is no longer available. And if the relevant PP occupies a position where it is c-commanded by the quantifier, as in (22c), BVA is again possible.

(22) a. [$_{PP}$ *Near* [**his**]$_1$ *child's crib*], [_nobody_]$_1$ *would keep matches.*
$\neg\exists x$ person(x) [x would keep matches near x's crib]

b. **[$_{PP}$ *Near* [**his**]$_1$ *child's crib*], *you should give* [_nobody_]$_1$ *matches.*
$\neq \neg\exists x$ person(x) [you should give x matches near x's crib]

c. *You should give* [_nobody_]$_1$ *matches* [$_{PP}$ *near* [**his**]$_1$ *child's crib*].
$\neg\exists x$ person(x) [you should give x matches near x's crib]

This establishes the necessity of c-command for BVA. If BVA is structure-dependent, then we expect that semantic scope will not be sufficient for BVA to arise. This is what Reinhart argues on the basis of examples such as (23) where the pronoun is in the scope of the operator (as indicated by its semantic interpretation) but is not c-commanded by it. Crucially, BVA is impossible in these cases.

(23) **The secretary who works for* [**him**]$_1$ *despises* [_each manager_]$_1$.
$\neq \forall x$ manager(x) [the secretary who works for x despises x]
(Reinhart 1983: 55 (16))

2.1.2 If c-command fails, there is E-type anaphora
The c-command requirement is often taken to be a definitional criterion for bound variables. Because of this, the possibility of BVA is used to test hierarchical relations: if c-command obtains, then BVA is possible. In this context, it is instructive to consider claims according to which c-command is not required for BVA (Postal 1971, Wasow 1972,

Higginbotham 1980). This push against c-command-based analyses acquires greater interest in light of the fact that other recent work also challenges the structural basis for Condition C, which is generally considered a core testing ground for hierarchical relations. For example, Bruening (2014) argues against c-command as a relevant syntactic notion generally, and tries to show that c-command need not be invoked to explain Condition C effects.

More recently, relative to BVA, as an alternative to the c-command requirement, both Safir (2004a, 2004b) and Barker (2012) propose that the dependency between the quantificational antecedent and the co-varying anaphor should be expressed in terms of SCOPE, as in (24).

(24)   a.   SCOPE REQUIREMENT FOR BVA (Safir 2004b, Chapter 2)
           A quantifier must take scope over any pronoun that it binds.

       b.   OPERATIONAL TEST FOR SCOPE
           A quantifier can take scope over a pronoun only if it can take scope over an existential inserted in the place of the pronoun (Barker 2012:619, (16))

Observe that, in many instances, c-command and scope are indistinguishable. The examples that are consistent with a c-command analysis are also consistent with the scope requirement. In particular, the same set of contexts that allow or prohibit BVA using the c-command test, also allow or prohibit BVA using the operational scope test. For example, if the pronoun in (25a) — which can be construed as a bound variable — is replaced with an existential quantifier, then the universal quantifier can scope over it, as in (25b).

(25)   a.   [*Every woman*]$_1$ *was outraged that* [***she***]$_1$ *was underpaid.*

       b.   [*Every woman*] *was outraged that* [***someone***] *was underpaid.*
           = $\forall x$, woman(x), $\exists y$, [x was outraged that y was underpaid]
           ✓ every woman > someone

As shown in (26)-(27), in contexts where BVA is prohibited, the counterpart scope test also prohibits an indefinite to be scoped over:

(26)   a.   ***The man who worked with* [*every woman*]$_1$ *denied that* [***she***]$_1$ *was underpaid.*

       b.   *The man who worked with* [*every woman*] *denied that* ***someone*** *was underpaid.*
           ≠ $\forall x$, woman(x), $\exists y$, [the man who worked with x denied that y was underpaid]
           ✗ every woman > someone

(27) a. *The man who worked with [**her**]$_1$ respected [every commanding officer]$_1$.

     b. The man who worked with [**someone**] respected [every commanding officer].
        ≠ ∀x, com.officer(x), ∃y, [the man who worked with x denied that y was underpaid]
        ✗ every special agent > someone

In Reinhart's view, in such cases the pronoun is **<u>not</u>** a bound variable anaphor, but rather is more akin to a regular anaphor licensed by co-reference. She argues that, for examples such as those in (28), the quantificational antecedent introduces a discourse referent. Evidence in support of this comes from the fact that the quantifier phrase can be anaphorically related to a plural pronoun across sentence-boundaries, as shown in (29).

(28) a. [The father [of [each of the boys]$_1$]] hates [**him**]$_1$

     b. [Gossip [about [every business man]$_1$]] harmed [**his**]$_1$ career.
        (Reinhart 1983: 56 (20))

(29) a. [The father [of [each of the boys]$_1$]] is having a hard time.
        [**They**]$_1$ are too difficult to discipline.

     b. [Gossip [about [every business man]$_1$]] has spread.
        It harmed [**their**]$_1$ career.

Barker (2012) revisits contexts where co-varying anaphors occur in the absence of c-command; illustrative examples are given in (30). In all of these examples a quantificational antecedent is contained in a larger constituent and so cannot c-command a following pronoun. Thus, in (30a) the quantifier everyone is contained in DP, in (30b) it is contained in PP, in (30c) it is contained in VP, in (30d) it is conatined in a non-finite (adjunct) CP, and in (30d) in a finite (complement) CP.

(30) a [$_{DP}$ [Everyone]$_1$'s mother] thinks **he**$_1$'s a genius.
       (Barker 2012:620 (22a))

     b. [$_{PP}$ In [everyone]$_1$'s own mind], **he**$_1$ is the most important person in the world.
       (Barker 2012:623 (29a))

     c. John [$_{VP}$ left [every party]$_1$] angry at the person who had organized **it**$_1$.
       (Kayne 1994:71)

     d. [$_{CP}$ After seeing [each animal]$_1$] but before categorizing **it**$_1$
       on the computer or recording **it**$_i$ on their response sheet…
       (Barker 2012:624 (31b))

e. *But the actual thinking seems to be [$_{CP}$ that [each person]$_1$ owns his own body], and that **he**$_1$ may not alienate his own body, by selling it, and that no one may buy...*
(Barker 2012: 624 (34b))

In all of Barker's examples, despite the absence of c-command between the quantificational antecedent and the pronoun, a co-varying interpretation is possible. However, recall Reinhart's (1983) caution against treating all referentially dependent readings as instances of BVA. An indication that the Barker examples are not authentic cases of BVA comes from the fact that, as shown (31), it is possible to substitute the pronoun for an epithet.

(31) a. [$_{DP}$ [*Everyone*]$_1$*'s mother*] *thinks **the idiot**$_1$ is a genius.*

b. [$_{PP}$ *In* [[*everyone*]$_1$*'s own mind*]], **the pretentious idiot**$_1$ *is the most important person in the world.*

c. *John* [$_{VP}$ *left* [*every party*]$_1$] *angry at the person who had organized **the shindig**$_1$.*

d. [$_{CP}$ *After seeing* [*each animal*]$_1$] *but before categorizing **the poor thing**$_1$ on the computer or recording **the poor thing**$_i$ on their response sheet...*

e. *But the actual thinking seems to be* [$_{CP}$ *that* [*each person*]$_1$ *owns his own body*], *and that **the bastard**$_1$ may not alienate his own body, by selling it, and that no one may buy...*

The possibility of replacing the Barker pronouns in (30) with the definite descriptions in (31) suggests that they may be definite descriptions in disguise, also known as E-type pronouns (Evans 1977). This is further confirmed by the fact that with authentic BVA — namely when a c-command relation holds between the quantificational element and the dependent DP — substitution of a pronoun for an epithet is not possible, as shown in (32).

(32) a. [*Every woman*]$_1$ *was outraged that* [**she**]$_1$ *was underpaid.*
b. *[*Every woman*]$_1$ *was outraged that* [**the bitch**]$_1$ *was underpaid.*

Epithets are not the only type of definite description that can be referentially dependent. As shown in (33), any definite DP may be used in this way (Stowell 1979, Higginbotham 1985, Lasnik and Stowell 1991):

(33) a. *I went to visit* [*John Smith*]$_1$ *last week, but* [**the man**]$_i$ *was too busy to talk to me.*
b. *All of* [*Bill*]$_1$*'s friends love* [**the guy**]$_1$.

Notably, both epithets, which have an expressive dimension (Potts 2007), as well as ordinary definite descriptions, which lack an expressive dimension, allow for a co-varying interpretation. Moreover, as shown in in (34), definite descriptions may be dependent on a

quantificational antecedent (Williams 1997): here reference of the definite description *the hospital administrator* co-varies with the quantified expression *every first-year intern.*

(34) *Every first-year intern was mistreated by **the hospital administrator***.
      (Williams 1997:590, (34))

On independent grounds, definite descriptions cannot be c-commanded by their antecedent; this is Condition C of the Binding Theory (*pace* Bruening (2014)). So definite descriptions can only be dependent on a quantificational antecedent if c-command does **not** hold. This indicates that the grammar allows for a mechanism of referential dependence in the absence of c-command; this is precisely what Evans' (1977) E-type interpretation allows for. In the Evans analysis, pronouns that appear to be bound variables without being in the c-command domain of their antecedent are (disguised) definite descriptions. For example, in a donkey anaphora context such as (35), the pronoun *it* co-varies with the DP *the donkeys* which in turn co-varies with *the farmers*; crucially c-command does not hold. Evans' (1977) solution to this problem is to treat such pronouns as (disguised) definite descriptions. That is, the pronoun in (35a) covertly spells out the full definite description in (35b). This is indicated in the representation in (35c), where the pronoun is analysed as a determiner with a silent restriction. (In (35c), the restriction is represented as an elided NP [$_{NP}$ e]; we return to the representation of anaphoric pronouns in §4.)

(35) a. *Every farmer who owns a donkey beats **it***.
      b. *Every farmer who owns a donkey beats* [***the donkey that he owns***].
      c. *Every farmer who owns a donkey beats* [$_{DP}$ [$_D$ ***it*** [$_{NP}$ e]]]

This establishes that, in principle, it is possible to interpret a pronoun as a (disguised) definite description. The question that arises is when is this possible? The answer seems to be only when a pronoun is not c-commanded by its quantificational antecedent. This leads us to conclude that the Barker examples involve pronouns that are (disguised) definite descriptions, and so predictably fail to be c-commanded by their quantificaitonal antecedent. This finding is consistent with the fact that authentic BVA is in fact subject to more rigorous constraints than other types of anaphoric relations. Consider in this context, the minimal pair in (36) modeled on Reinhart's (1983: 55 (16)) examples.

(36) a. *The man who works for* [***her***]$_1$ *respects* [*M*]$_1$.
      b. **The man who works for* [***her***]$_1$ *respects* [*every commanding officer*]$_1$.

When a non-c-commanding antecedent is a definite description (*M*) the pronoun can be co-referent with it, (36a). However, as already discussed, if the non-c-commanding antecedent is a quantifier, the pronoun cannot be interpreted as a bound variable (36b). This indicates that quantificational binding is more restrictive than definite anaphora. Crucially, the types of examples Barker discusses as evidence against a c-command constraint for BVA cannot be replicated with reflexive binding (Baltin, Déchaine et al. in preparation). For example, while the antecedent of an anaphorically bound <u>pronoun</u> can be contained within a possessive DP (37a), that of an anaphorically bound <u>reflexive</u> cannot be (37b).

(37) a. [*Everyone*]$_1$*'s father*] *thinks* [**she**]$_1$*'s a genius.*
    b *[*Everyone*]$_1$'s father loves [**herself**]$_1$.

Confirmation that BVA with anaphors is licit only if c-command holds comes from contexts with two PPs, as in (38a), where the first PP in a VP can bind an anaphor in the second PP (Van Riemsdijk and Williams 1986), But this binding becomes impossible when the first PP is fronted, as in (38b). This indicates that the structural condition of c-command is a <u>necessary</u> condition for the interpretation of reflexives as bound variable anaphors.

(38) a. *The career counselor talked* [$_{PP}$ *to* [*every female pilot*]$_1$] [$_{PP}$ *about* [**herself**]$_1$].
    b. *[$_{PP}$ *To* [*every female pilot*]$_1$] *the career counselor talked* [$_{PP}$ *about* [**herself**]$_1$].

In sum, we have seen that some co-variant interpretations are not dependent on c-command. But in precisely those contexts where c-command does not hold, definite descriptions are possible as well. We take pronouns that allow for a co-varying interpretation in the absence of c-command to be interpreted as (disguised) definite descriptions. More generally, this predicts the existence of languages that distinguish two forms of pronouns, with one form interpreted as a bound variable, and the other interpreted as a definite description. Such languages are in fact attested; we return to this in §4 when we discuss the internal syntax of co-varying anaphoric expressions.

2.2 A'-binding of a bound variable requires c-command
Content questions — also called wh-questions — are standardaly analyzed as involving a relation between a wh-antecedent (in the form of *who, what, where, when, how, why, which x, what x, how many x*, etc.) and a corresponding "gap" in the proposition that the wh-expression takes scope over, as in (39).

(39) [*What*] *did you see* __ ?

The antecedent-gap relation found in wh-questions is often modeled in terms of movement (Chomsky 1977): the wh-word, which is positioned at the left-periphery of the clause, originates in — or is construed with — a clause-internal position. The left-peripheral position is generally taken to be Spec,CP (Rizzi 1997), which is a non-argument (A', pronounced "A-bar") position. For this reason, this type of movement is called A'-movement, as it involves movement to an A'-position.

(40) a.   [$_{TP}$ you PAST see [**what**]]
    b. [$_{CP}$ [**what**] [$_{C'}$ [$_C$ did [$_{TP}$ you __ see __]]]

Independent of how the movement relation is modeled (Takahashi 2010a, 2010b), the logic of movement is such that it is always the case that the wh-expression c-commands the position with which it is associated. Given that bound variable anaphora is subject to a c-command restriction — i.e., the quantificational antecedent c-commands the co-varyiang anaphoric expression — a question that naturally arises is whether the relation between the wh-expression and the gap is a species of BVA. Certainly, as shown in (41), relative to

their Logical Form, wh-expressions have the status of quantificational operators that introduce a variable (Chomsky 1977). On the basis of this parallel, the wh-gap relation is often treated as an operator-variable relation in the syntax as well, and is referred to as an "**A'-bound** variable" (as distinct from an **A-bound** bound variable).

(41)   Wh*x*, thing(*x*) [you saw *x*]

3. The binding-theoretic status of the co-varying anaphoric expression
Modern treatments of the binding-theoretic status of BVAs fall into two broad groups according to whether they attend to A-bound BVAs (§3.1) or A'-bound BVAs (§3.2). We consider each in turn.

3.1 The form of A-bound BVAs
Many treatments of the syntax of A-bound BVAs focus on the binding-theoretic status of the co-varying dependent relative to the classification of nominal expressions in Binding Theory. Classical Binding Theory (Chomsky 1981) posits three types of nominal expressions, namely *anaphors* (which include reflexives and reciprocals)*, pronouns,* and *R-expressions* (which include definite descriptions, proper names, and quantificational expressions). The distribution of these nominal types is legislated by the binding conditions in (42).

(42)   Condition A: An anaphor must be bound in its local domain.
        Condition B: A pronoun must be free in its local domain.
        Condition C: An R-expression must be free.

        (X binds Y if X c-commands Y and X is co-indexed with Y.)

A terminological warning is in order. Note that the Binding-theoretic notion of *anaphor* departs from traditional usage were it is a descriptor for any backward-referring referentially dependent expression. As such, in traditional grammar, *anaphor* contrasts with *cataphor* (a forward-referring referentially dependent expression), and *exophor* (an "outward-referring" expression with deictic force). In Binding Theory, *anaphor* is restricted to reflexive and reciprocal anaphors.

Relevant to the present discussion is the question of which nominal types can serve as a co-varying anaphoric expression in the context of A-bound BVA. We consider in turn reflexives (§3.1.1), pronouns (§3.1.2), and R-expressions (§3.1.3), which, according to Classical Binding Theory, are the creatures we expect to find. We show that any one of these forms can function as a co-varying anaphoric expression. In addition, we show that Zribi-Hertz's (1995) *unspecified binding expressions* (UBEs) — anaphoric forms can that be locally or non-locally bound — can also function as bound variable anaphors (§3.1.4). The section closes with a discussion of contexts where 1st and 2nd person pronouns — which are normally indexical — function as bound variable anaphors (§3.1.5).

3.1.1 Reflexives can be BVAs

Reflexives must be bound within a local domain, as in (43); these are Condition A forms. Relative to BVA, classical Binding Theory correctly predicts that, in a language such as English, a locally bound BVA will take the form of a reflexive (44).

(43)   a.   [*Marilyn Monroe*]$_1$ *admired* [**herself**]$_1$.
         b.   *[*Marilyn Monroe*]$_1$ *believed that the producer admired* [**herself**]$_1$.

(44)   a.   [*Every actress*]$_1$ *admires* [**herself**]$_1$.
         b.   *[*Every actress*]$_1$ *believes that the producer admires* [**herself**]$_1$.

Current analyses, dating back to Reinhart (1983) , standardly assume that both (43a) and (44a) are instances of BVA. The motivation for this comes from the resolution of VP ellipsis, which permits a BVA construal, also called *sloppy identity*. The term *sloppy identity* reflects the fact that the identity of the referent in (45a-i) is not preserved (i.e. it is sloppy) across the two conjuncts. When the identity of the referent is preserved across the two conjuncts, as in (45a-ii), this is called *strict identity*. Sloppy identity is possible with both an apparently non-quantificational antecedent (45a), and an obviously quantificational antecedent (45b). This interpretive parallelism supports Russell's quantificational analysis of definite descriptions (of which proper names are a special case).

(45)   a. $^{\&}$*Marilyn Monroe admired* **herself** *and so did Cary Grant.*

         = (i) [M.M.]$_1$ admired [**herself**]$_1$ and [C.G.]$_2$ admired [**himself**]$_2$ (BVA)
         = (ii) [M.M.]$_1$ admired [**M.M**]$_1$ and [C.G.]$_2$ admired [**M.M**]$_1$

         b. $^{\&}$*Every nun prays for* **herself** *and so does every priest.*

         = (i)   [Every nun]$_1$ prays for [**herself**]$_1$ and [every priest]$_2$ prays for [**himself**]$_2$ (BVA)
         = (ii) [Every nun]$_1$ prays for [**herself**]$_1$ and [every priest]$_2$ prays for [**her**]$_1$

3.1.2 Pronouns can be BVAs

Now consider *pronouns*, which must be free in a local domain, as in (46); these are Condition B forms. Relative to BVA, classical Binding Theory correctly predicts that, in a language such as English, a non-locally bound BVA will take the form of a personal pronoun (47). That both (46b) and (47b) involve BVA can be shown by applying the VP ellipsis test; this is shown in (48).

(46)   a. *****[*Marilyn Monroe*]$_1$ *admired* [**her**]$_1$.
         b.   [*Marilyn Monroe*]$_1$ *believed that the producer admired* [**her**]$_1$.

(47)   a. *****[*Every actress*]$_1$ *admires* [**her**]$_1$.
         b.   [*Every actress*]$_1$ *believes that the producer admires* [**her**]$_1$.

(48)　a.　&*M. Monroe believed that the producer admired **her** and so did Cary Grant.*

　　= (i)　[Marilyn Monroe]$_1$ believed that the producer admired [**her**]$_1$ and
　　　　　[Cary Grant]$_2$ believed that the producer admired [**him**]$_2$. (BVA)

　　= (ii)　[Marilyn Monroe]$_1$ believed that the producer admired [**M.M.**]$_1$ and
　　　　　[Cary Grant]$_2$ believed that the producer admired [**M.M.**]$_1$.

　　b.　& *Every actress believes that the producer admires **her** and so does every actor.*

　　= (i) [Every actress]$_1$ believes that the producer admires [**her**]$_1$ and
　　　　　[every actor]$_2$ believes that the producer admires [**him**]$_2$ (BVA)

　　= (ii) [Every actress]$_1$ believes that the producer admires [**her**]$_1$ and
　　　　　[every actor]$_2$ believes that the producer admires [**her**]$_1$

3.1.3 R-expressions can be BVAs

In addition to Conditions A and B, classical Binding Theory also has Condition C, which regulates referring expressions (*R-expressions*) such as proper names and definite expressions. Such R-expressions are defined as being obligatorily free (49), and so predictably fail to support BVA (50).

(49)　**The diva admires **Lady Gaga**.*
　　　The diva believes that the producer admires **Lady Gaga.*

(50)　**Every diva admires **Lady Gaga**.*
　　　Every diva believes that the producer admires **Lady Gaga.*

However, the prohibition against R-expressions serving a bound variables is not universal. Indeed, in some languages, not only do R-expressions support BVA, they are the only strategy to express a bound variable dependency. For example, in Zapotec, anaphora is expressed via a copy strategy (Lee 2003). The copy may be a pronoun (51)a, or an R-expression (51)b, and is also attested with non-local binding (51)c. Failure to use the copy strategy forces disjoint reference (52).

(51)　a.　*R-yu'làààz-ëng　**la'anng**.*
　　　　　HAB-like-3SG.PROX 3SG.PROX
　　　　　= (i) 'He likes himself; She likes herself'
　　　　　≠ (ii) 'He likes him, She likes her'
　　　　　(adapted from Lee 2003:84, (2))

　　b.　*R-yu'làààz Gye'eihlly **Gye'eihlly**.*
　　　　　HAB-like　Mike　　Mike
　　　　　'Mike likes himself' [lit. 'Mike likes Mike']
　　　　　(Lee 2003:84 (3))

c. *A   w-nalààa'z   bxuuhahz g-uhcnèe Lia   Paamm **bxuuhahz**.*
already PERF-remember priest   PERF-help FEM Pam   priest
'The priest$_1$ remembers that Pam helped him$_1$.'
[lit. 'The priest remembered that Pam helped the priest']
(Lee 2003:84, (4))

(52)   a. *R-yu'làὰa'z-ih   **la'anng**.*
HAB-like-3SG.PROX 3SG.DIST
= (i) 'He likes him, She likes her'
≠ (ii) 'He likes himself, She likes himself'
(adapted from Lee 2003:84, (12))

       b. *R-yu'làὰa'z Gye'eihlly **la'anng**.*
HAB-like   Mike   3SG.PROX
≠ (i) 'Mike likes himself'
= (ii) Mike likes him'
(adapted from Lee 2003:86, (11)

That Zapotec copy-anaphors are authentic bound variables is confirmed in three different ways. A first piece of (indirect) evidence comes from the fact that when a language lacks copy-anaphora, as in English, then the introduction of an identical definite description (53a) or an epithet (53b) yields a Condition C violation. The absence of such Conditiion C effects with Zapotec copy-anaphors is expected if they are a species of bound variable.

(53)   a. *[The bishop]$_1$ forgave [**the bishop**]$_1$.*
       b *[The bishop]$_1$ forgave [**the jerk**]$_1$.*

Second, as shown in (54), in VP-deletion contexts, locally bound copies only allow the bound variable reading: this holds of both pronoun (54a) and R-expression (54b) copies.

(54)   a. *R-yu'làὰa'z-ëng   **la'anng** chiru' zë'cy cahgza' Gye'eihlly.*
HAB-like-3SG.PROX 3SG.PROX   also   likewise Mike
'He/she likes himself/herself, and Mike does too'
= (i) He/she likes himself/herself and Mike likes himself too' (BVA)
≠ (ii) He/she likes himself/herself and Mike likes him/her too'
(adapted from Lee 2003:89, (20))

       b. *B-gwi'ih   Gye'eihlly lohoh **Gye'eihlly** zë'cy cahgza' Li'eb.*
PERF-look Mike   at   Mike   also likewise Felipe
'Mike looked at himself, and Felipe did too'
= (i) Mike looked at himself, and Felipe looked at himself' (BVA)
≠ (ii) Mike looked at himself, and Felipe looked at Mike'
(Lee 2003:89, (19))

A third piece of evidence that indicates that Zapotec copy-anaphors are authentic bound variables is that the copy strategy is blocked when the antecedent is quantificational. Thus,

while the copy-anaphor is licit with definite descriptions (55a), it is not licit with quantificational DPs (55b). Instead, the quantificational DP is dislocated, and a copy pronoun is used (55c).

(55)   a.   *R-yu'làòa'z ra bxuuhahz **ra bxuuhahz***
            HAB-like   PL priest   PL priest
            'The priests like themselves'
            [lit. 'The priests like the priests']
            (Lee 2003:84 (3))

       b.   **B-guhty yra'ta' ra bxuuhahz **yra'ta' ra bxuuhahz***.
            PERF-kill every PL priest   every PL priest
            ['Every priest killed himself']

       c.   *Yra'ta' ra bxuuhahz* [*b-guhty-rih*   **la'arih**].
            every PL priest   PERF-kill-3PL.DIST 3PL.DIST
            'Every priest killed himself'
            [lit. 'As for every priest, he killed himself']
            (Lee 2003:90 (27))

The take-way message is that any binding-theoretic nominal type — be it a reflexive, a personal pronoun or an R-expression — can function as a bound variable. There is no dedicated form for bound variable anaphora.

3.1.4 Unspecified Binding Expressions (UBEs) can be BVAs
Some languages lack dedicated condition A or B forms; in such languages pronouns have the status of *unspecfied binding expressions* (Zribi-Hertz 1995) which can be locally or non-locally bound. For example, in Haitian (Déchaine and Manfredi 1994), personal pronouns can be locally bound or locally free (56), and may take quantificational antecedents in both contexts (57).

(56)   a.   [&]*Jak wè **l**.*
            Jak see 3SG
            = (i) '[Jak]₁ washed [**himself**]₁'
            = (ii) '[Jak]₁ washed [**him/her**]₂'
             (adapted from Déchaine & Manfredi 1994:203, (1a))

       b.   [&]*Jak panse ke **li**   entèlijan.*
            Jak think C 3SG intelligent
            = (i) '[Jak]₁ thinks that [**he**]₁ is intelligent'
            = (ii) '[Jak]₁ thinks that [**he**]₂ is intelligent'
            (Déchaine & Manfredi 1994:214, (14))

(57) a. &*Tout moun   wè **l**.*
     all   person see 3SG
     = (i) '[Everyone]$_1$ sees [**himself/herself**]$_1$' (BVA)
     = (ii) '[Everyone]$_1$ sees [**him/her**]$_2$'

   b. &*Tout moun   panse ke **li**   entèlijan.*
      all   person think C   3SG intelligent
      = (i) '[Everyone]$_1$ thinks that [**he/she**]$_1$ is intelligent' (BVA)
      = (ii) '[Everyone]$_1$ thinks that [**he/she**]$_2$ is intelligent'

That Haitain UBE's function as bound variables is confirmed by the fact that, with ellipsis, they are compatible with BVA (sloppy identity) readings:

(58) a. &*Mènm jan ak   Pyè, Jak lave **l**.*
     same kind with Pyè Jak wash 3SG
     = (i) 'Just like [Pyè]$_2$ washed [**himself**]$_2$, [Jak]$_1$ washed [**himself**]$_1$' (BVA)
     = (ii) 'Just ike [Pyè]$_2$ washed [**Jak**]$_1$, [Jak]$_1$ washed [**Jak**]$_1$'
      (adapted from Déchaine & Manfredi 1994: 214 (14))

   b. &*Mènm jan ak   Pyè, Jak panse ke **li** entèlijan.*
      same kind with Pyè Jak think C   3SG intelligent
      = (i) 'Just like [Pyè]$_2$ thinks [**he**]$_2$ is intelligent, [Jak]$_1$ thinks [**he**]$_1$ is intelligent' (BVA)
      = (ii) 'Just like [Pyè]$_2$ thinks [**he**]$_2$ is intelligent, [Jak] thinks [**he**]$_1$ is intelligent'
      (adapted from Déchaine & Manfredi 1994: 214 (15))

The behaviour of unspecified binding expressions (UBE's) further confirms that there is no dedicated form for BVA.

3.1.5 Indexicals can be BVAs
Most of the data discussed in the BVA literature focuses on 3rd person forms. This is because it is often assumed that 1st/2nd person pronouns, by virtue of being indexical (Fillmore 1971/1997), are unable to function as bound variables (Kaplan 1989). Data such as (59), where only the strict identity reading is possible, confirm this view.

(59) *I considered **myself** stupid and my sister did too.*
    ≠ (i) '[I]$_1$ considered [**myself**]$_1$ stupid, and [my sister]$_2$ considererd [**herself**]$_2$, stupid.' (BVA)
    = (ii) '[I]$_1$ considered [**myself**]$_1$ stupid, and [my sister]$_2$ considererd [**me**]$_1$, stupid.'

However, the prohibition against 1st/2nd person pronouns functioning as variables is not completely general. First is the fact that, in contexts where English prohibits a BVA construal of 1st/2nd person, as in (59) above, French 1st/2nd freely permits BVA (Bouchard 1984, Déchaine and Manfredi 1994):

(60) &*Je*   ***me***   *trouvais bête*   *et*   *ma sœur aussi.*
         1SG.NOM 1SG.ACC find   stupid and my sister also
         = (i)   '[I]$_1$ considered [**myself**]$_1$ stupid, and [my sister]$_2$ considererd [**herself**]$_2$, stupid.' (BVA)
         = (ii) '[I]$_1$ considered [**myself**]$_1$ stupid, and [my sister]$_2$ considererd [**me**]$_1$, stupid.'
         (adapted from Bouchard 1984:60 (131))

Second is the fact that, even in English, in a restricted set of contexts, 1st/2nd person supports BVA (Partee 1989):

(61)   a.   &*Only I got a question that **I** understood, nobody else did.*
           = (i)   … nobody else got a question that they understood. (BVA)
              λ**x** [**x** got a question that **x** understood]
           = (ii) … nobody else got a question that I understood.'
              λ**x** [**x** got a question that **y**$_{SPEAKER}$ understood]
               (adapted from Déchaine & Wiltschko, to appear, (2a))

        b.   &*Only you did **your** homework; nobody else did.*
           = (i)   … nobody else did your homework. (BVA)
              λ**x** [**x** did **x'**s homework]
           = (ii) … nobody else did your homework.
              λ**x** [**x** did **y**$_{ADDRESSEE}$'s homework]
               (adapted from Déchaine & Wiltschko, to appear, (2b))

Empirically, the challenge is to determine, for a given language, under what conditions BVA is available with indexicals. Theoretically, current debates center around the question of whether BVA with indexicals is legislated by syntactic mechanisms (Déchaine and Wiltschko to appear), semantic mechanisms (Rullmann 2004), or some combination thereof.

3.2 The form of A'-bound BVAs
The movement approach to wh-questions has consequences for the analysis of bound variable anaphora: the gap left by movement has the semantic status of a logical variable, and the syntactic status of an A'-bound varaible. We first discuss gapped wh-questions (§3.2.1), and then turn our attention to resumptive pronouns (§3.2.2) and wh-questions formed via copying (§3.2.3).

3.2.1 A'-bound BVAs can be covert
Earlier analyses of wh-movement. represent the movement relation via co-indexicaton of the wh-expression and a trace, as in (62a). Some recent analyses adopt a copy theory of movement, whereby the wh-expression is copied and remerged, and the phonological content of the original phrase is deleted, represented as ~~*what*~~ in (62b). For a review of the relative merits of each analysis, see Takahashi (2010a, 2010b) .

(62)   a.   [*What*]$_1$ *did you see* [**t**]$_1$?
        b.   [*What*]   *did you see* [~~**what**~~] ?

Just as A-bound BVAs can be covert (in the form of *pro* or *PRO*) or overt (in the form of reflexives, pronouns, underspecfied bindable expresions (UBE's), or copy-anphors), A'-bound BVAs show the same range of possibilities. Covert A'-bound variables abound, and correspond to the "traces" or "deleted copies" of standard syntactic analyses of wh-movement. As for overt A'-bound BVAs, they come in two flavours: they may be pronouns or copies. We consider each in turn.

3.2.2 A'-bound BVAs can be overt (resumptive) pronouns

In addition to the gap strategy, wh-movement can aso involve a relation between a wh-antededent and a pronoun. This is illustrated in (63a) for Lebanese Arabic (Aoun and Li 2003). In such contexts, the pronoun is called a "resumptive pronoun" because it is viewed as resuming the wh-expression; this is reflected by the fact that the resumptive pronoun agrees in phi-features (e.g. person, gender, number, and case) with the wh-expression that it is construed with. Crucially, such resumptive pronouns permit reconstruction (63b); this indicates that the wh-word can be construed in the position from which it originates, as predicted by the movement analysis.

(63)   a.   *ʔayya mmasil šə̄ft*-[***uu***]   *bə-l-maṭʕam*
            which actor   saw.2MS-3MS.ACC in-the restaurant
            'Which actor did you see [**him**] in the restaurant?'
            (Aoun & Li 2003:15)

       b.   *ʔayya ṭaalib   min   ṭulaab-a   fakkarto   ʔenno kə̄ll*
            which student among students her thought.2PL C   every

            mʕallme   hatnaʔ-[***ii***].
            teacher.FS FUT.3FS.choose-3MS.ACC

            '[Which of her₁ students]₁ did you think that [every teacher]₁ would choose [**him**]₂?
            = A***x***, teacher(x), Wh***y***, student(y) [you throught that ***x*** would choose ***y***]
            (Aoun & Li 2003: 16)

Some languages require the presence of a resumptive pronoun whenever A'-movement applies; this includes wh-movement and relativization. Such systems are amenable to analyses which treat the resumptive pronoun as the overt pronounciation ("spell out") of an A-bar bound variable (Shlonsky 1992). However, the distribution of resumptive pronouns is not uniform across languages. Some languages exhibit a complement/non-complement asymmetry, requiring resumption only when a non-complement is moved. Other languages exhibit island effects, requiring resumption only when movement occurs from an island. And yet other languages have more than one set of resumptive pronouns; in such cases we observe competition effects that are not yet well understood. For a review of the literature in this area, see the introductory chapter of Rouveret (2011), as well as the accompanying papers.

3.2.3 A'bound BVAs can be overt copies

A copy analysis of wh-movement predicts that it will sometimes be possible for the A'-bar bound variable to surface as a copy, and this is indeed attested (du Plessis 1977, McDaniel 1989, Nunes 2004, Kandybowicz 2008). An illustrative example is provided from Yugoslav Romani:

(64)   *Kas   o Demìri mislinola* [***kas***]   *i Arìfa dikhIa?*
       whom Demir   thik   whom Arifa   saw
       'Whom does Demir think Arifa saw [**whom**]?'
       (McDaniel 1989: 569)

Note that the possibility of copy wh-expressions mirrors the possibility of copy anaphora (see §3.1.5 above).

3.3 Summary: A- and A'- bound BVAs

In sum, we have shown that any nominal expression — be it a reflexive, a (covert or overt) pronoun, a copy anaphor, an underspecfied bindable expression (UBE), or an indexixal — can function as an A-bound variable anaphor. And just as A-bound BVAs can be covert or overt, the same holds of A'-bound BVAs that arise with wh-movement. While covert A'-bound variables correspond to the classical filler-gap strategy, overt ones corresponds to either resumptive pronouns or copied wh-expressions.

4. The internal syntax of the co-varying anaphoric expression

Recent work has drawn attention to how the internal syntax (i.e. morphology) of the co-varying dependent constrains its interpretation. Pronouns are sometimes claimed to be a uniform syntactic and semantic class (Elbourne 2001b, 2008a). There are both theoretical and empirical reasons to doubt this, and these have implications for the analysis of BVA. We first introduce the *homogeneity hypothesis*, according to which all pronouns are created equal and form a homogeneous class (§4.1). We then consider the *heterogeneity hypothesis*, according to which pronouns can, in principle, differ from each other, and so constitute a heterogeneous class (§4.2).

4.1 The homogeneity hypothesis: uniform syntax and semantics

In the early stages of generative grammar (1960s', 1970s'), two approaches to pronouns emerged. On one view (Stockwell, Schachter et al. 1973), a pronoun is equated with NP, (65a). On another view, a pronoun is equated with a determiner (Postal 1969), and positioned in Spec,NP (65b). With the advent of the DP hypothesis (Abney 1987), these two analyses are restated in term of whether a pronoun is equated with DP as in (66a), or is introduced as D with an elided NP (Elbourne 2001a), as in (66b). (In analyses that adopt bare phrase structure (Giusti 2002), a mono-morphemic pronoun is both minimal (a head) and maximal (a phrase), as in (65a.ii).)

(65)   a.   [$_{NP}$ ***pronoun***]   (cf. Stockwell, Schachter & Partee 1973
       b.   [$_{NP}$ [$_{SPEC}$ ***pronoun***] [$_{N'}$ e]]   (cf. Postal 1969)

(66) a.i [$_{DP}$ ***pronoun***] (cf. Abney 1987)
      a.ii [$_{D.MIN/MAX}$ ***pronoun***] (cf. Giusti 2002)
      b. [$_{DP}$ [$_{D}$ ***pronoun***] [NP e] (cf. Elbourne 2001a)

What these analyses share in common is the assumption that pronouns are homogeneous in their syntax and their interpretation. We call this the HOMOGENEITY HYPOTHESIS:
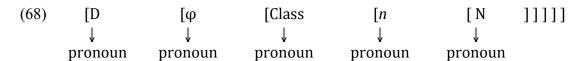
(67) HOMOGENEITY HYPOTHESIS
      pronouns are homogeneous in their:
      (i) syntax: they are always of the same syntactic category
      (ii) semantics: they are always of the same semantic type

Most semantic analyses of BVA assume some version of the homogeneity hypothesis, either explicitly (Elbourne 2001b, 2008a), or implicitly (Kratzer 2009). On the surface, the homogeneity hypothesis is supported by languages such as English, which uses the same pronominal form for BVA, for sentence anaphora and for discourse anaphora. Thus, English anaphoric expressions are homophonous in that they fulfill a number of different anaphoric functions. On the basis of the homophony that is characteristic of English-type pronoun paradigms, Elbourne (2001b, 2008a) claims that BVA is never formally distinct from discourse or sentential anaphora.

4.2 The heterogeneity hypothesis: non-uniform syntax and semantics

Advances in modeling nominal syntax, as well as the availability of detailed description and analysis of a wider range of languages, has lead to a more fine-grained structural architecture for nouns. Relative to the syntactic spine association with nominal categories, pronouns may, in principle, associate to any position. To see this, consider (68), which partitions the nominal spine into (at least) five domains:

(68)   [D   [φ   [Class   [n [N   ]]]]]
        ↓   ↓   ↓   ↓   ↓
      pronoun   pronoun   pronoun   pronoun   pronoun

A nominal proform may correspond to anyone of these positions. For example, Déchaine & Wiltschko ((in press)) apply this type of heterogeneous syntactic analysis to reflexives to model the cross-linguistic variation in their morphology, syntax, and semantics. For pronouns, this approach predicts a similar range of variation, namely pro-DPs, pro-φPs, pro-ClassPs, pro-nPs, and pro-NPs. The possibility that pronouns are syntactically heterogeneous has impolications for their semantic type. In particular, it gives rise to the HETEROGENEITY HYPOTHESIS:

(69) HETEROGENEITY HYPOTHESIS
      pronouns are heterogeneous in their:
      (i) syntax: they can differ in syntactic category
      (ii) semantics: they can differ in semantic type

Not surprisingly, analyses that adopt the HETEROGENEITY HYPOTHESIS take as their starting point the fact that, in some languages at least, anaphoric functions — BVA, sentence anaphora, and discourse anaphora — are realized by morphologically distinct pronominal forms (Cardinaletti and Starke 1999, Déchaine and Wiltschko 2002a). In such languages, the surface form of an anaphoric expression correlates with differences in distribution and interpretation. In particular, in some languages, the surface form of a bound variable anaphor systematically differs from other types of pronominal anaphors.

The heteregeneity hypothesis has consequences for the analysis of pronouns, and in turn, for BVA. Relevant to the present discussion is the fact that the forms that function as BVAs come in different shapes and sizes. For BVAs, the most important diagnostic is whether or not a pronominal can function as a bound variable. Significant is the fact that, while some pronouns can be BVAs, others cannot be. For example, Malagasy has two pronoun series (Zribi-Hertz and Mbolatianavalona 1999): one is not specified for number (*azy* 'him, her, them') while the other one is (*azy ireo* 'them'). While number-neutral pronouns are compatible with BVA, number-marked pronouns are not. This difference is detectable in ellipsis contexts, where number-neutral *azy* (70a) yields a BVA (sloppy identity) construal, while number-marked *any ireo* (70b) yields a strict identity construal.

(70) a. *Mieritreritra ireo   ankizy ireo   fa miresaka   **azy**   aho,   Rasoa koa.*
          PRES.think   DEM.PL child   DEM.PL C PRES.discuss 3.ACC 1SG.NOM Rasoa too
          'Those children think that I am discussing them, and Rasoa too'
          = (i) 'Those children think that I am discussing **them**, and
           Rasoa thinks that I am discussing **her**' (BVA)
          ≠ (i) 'Those children think that I am discussing **them**, and
           Rasoa thinks that I am discussing **them**'
          (adapted from Zribi-Hertz & Mbolatianavalona 1999:198 (57))

      b. *Mieritreritra ireo   ankizy ireo   fa miresaka   **azy ireo** aho,   Rasoa koa.*
          PRES.think   DEM.PL child   DEM.PL C PRES.discuss 3.ACC PL 1SG.NOM Rasoa too
          ≠ (i) 'Those children think that I am discussing **them**, and
              Rasoa thinks that I am discussing **her**' (BVA)
          = (i) 'Those children think that I am discussing **them**, and
              Rasoa thinks that I am discussing **them**'
              (adapted from Zribi-Hertz & Mbolatianavalona 1999:198*f.* (58))

A similar contrast is found in German, where it presents itself as a contrast between D-pronouns and personal pronouns (Wiltschko 1998). Under the homogeneity hypothesis, according to which "a pronoun is a pronoun is a pronoun", the existence of pronominal paradigms such as those found in Malagasy and German is puzzling. But under the heterogeneity hypothesis, this state-of-affairs is predicted. In particular, Déchaine & Wiltschko (2002a) propose that the categorial status of a given pro-form determines whether it is bindable (at all), and if bindable, whether it may function as a bound variable (i.e. as a co-varying anaphoric expression). They specifically argue that while φ-pronouns are compatible with BVA, D-pronouns (which are disguised definited descriptions) are not.

Languages like Malagasy and German, which distinguish two pronoun series, refute Elbourne's claim that natural languages don't distinguish pronouns that function as bound variables from pronouns that fail to do so. Specifically, languages such as Malagasy and German establish that there is a formal difference between pronouns *qua* variables and pronouns *qua* hidden definite descriptions (i.e. anaphoric pronouns). We take this to be a universal property of natural language. A general consequence is that pronouns in languages such as English, where the same form is used for distinct semantic functions, are in fact structurally ambiguous, according to whether they are D-pronouns or φ-pronouns. This predicts that, even in a language such as English, we will find evidence for a formal difference between pronouns as bound variables (φ-pronouns) versus pronouns as (disguised) definite descriptions (D-pronouns). And indeed, we do find such evidence. (See §2.1 for discussion.)

According to Déchaine & Wiltschko ((in press)), reflexives also come in different guises. This is true within and across languages. For English, they argue that 1st/2nd person reflexives are pro-DPs as in (71), while 3rd person reflexives are pro-φPs, as in (72).

(71)   [DP my [NP self]]
        [DP your [NP self]]

(72)   [φP him [NP self]]

One of the arguments for this analysis is the fact that 1st and 2nd person reflexives have the same form as regular possessive pronouns: *myself* parallels *my book*; *yourself* parallels *your book*. Assuming that possessive pronouns instantiate D (Abney 1987), it follows that reflexive pronouns of this type are DPs. This contrasts with 3rd person reflexives, which contain an accusative pronoun (*himself*) instead of a genitive one. This leads Déchaine & Wiltschko to analyse 3rd person reflexives as pro-φPs. Given the assumptions of Déchaine & Wiltschko (2002), according to which only pro-φPs can be true bound variables, it follows that in English, in the unmarked case, only 3rd person reflexives are able to function as bound variables. Interestingly, some dialects of English use a possessive pronoun even in the 3rd person reflexive form, e.g. *hisself*.

(73)   a. *He presented **hisself** to me in a very unprofessional manner.*
        b. *...the American people need to wean **theirselves** off student...*

If the Déchaine & Wiltschko (2002a, (in press)) analysis is on the right track, it is predicted that in these dialects, *hisself* cannot function as a bound variable. Striking evidence to this effect is presented in a corpus study of tweets by Storoshenko (2013) which shows that even in dialects where *hisself* is used, there are no instances in which it is bound by a quantificational antecedent. Rather, in such contexts, *hisself* dialects use *himself*.

5. The semantic type of the co-variant dependent (and its implications for syntax)

We now turn to the question of whether there is a uniform semantic type for argument variables, and what implications this has for syntactic analyses. Semantic analyses of bound variable pronouns typically treat them as a homogeneous class, with two broad approaches

discernible. On one view, the bound variable interpretation arises when the pronoun has the status of an *individual variable* bound by an operator. On another view, pronouns are equated with definite descriptions, and so are treated as *individual constants*. We have seen that syntactic treatments of pronouns differ according to whether they analyze pronouns as structurally homogeneous or heterogeneous. In principle, a similar difference could hold in the semantic analysis of pronouns. However, in practice, semantic treatments adopt the homogeneity hypothesis, with the two most prevalent approaches being the individual variable analysis (§5.1), and the individual constant analysis (§5.2).

5.1 The pronoun is an individual variable
Consider (74a) where the pronoun *she* is construed as a bound variable. Recall that one way of annotating the bound variable interpretation is with the tri-partite structure in (74b) where the quantificational operator (the universal quantifier $\forall$) is a function that ranges over an individual variable (x) that is restricted by the property *female judge*.

(74)   a. *Every female judge believes that **she** is underpaid.*
       b. $\forall x$, female judge(x), [x believes that x is underpaid]

This traditional view, informed by predicate logic, treats the pronouns that instantiate BVA as individual variables of type <e>, namely a variable that ranges over individuals. This approach to BVA is associated with a number of ontological commitments (Heim and Kratzer 1998), namely:

(i)   a pronoun is a variable of type <e>
(ii)   a variable saturates an argument
(iii) the quantificational operator that introduces the variable does not saturate an argument; i.e. the QP is not of the correct semantic type to saturate an argument
(iv)   type-shifting of the quantifier via "Quantifier Raising" resolves the type mismatch

The view that pronouns have an invarient semantic type, namely they are of type <e>, has lead many semanticists to assume that pronouns are also invariantely of the same syntactic category (Rullmann 2003, Elbourne 2008a, Kratzer 2009). This is one reason why the homogeneity hypothesis introduced above — which holds that pronouns have a uniform semantic type and syntactic category — is so prevalent in the semantics literature.

5.2 The pronoun is an individual constant (i.e. a definite description)
A vein of semantic analyses takes Postal's (1969) analysis of pronouns as determiners as a starting point, and treats all pronouns as determiners with an elided NP. Such analyses equate pronouns to DPs, and equate DPs to definite descriptions (Elbourne 2005)Thus, a pronoun such as *she* is a determiner that introduces a null NP complement, as in (75).

(75)   [D *she* [NP $\varnothing$]]

For analyses that treat pronouns as definite descriptions in this way, an additional mechanism is necessary to account for the bound variable interpretation of a pronoun. For example, in Elbourne's analysis the bound variable interpretation arises indirectly via a situation variable. In the situation variable analysis, although the pronoun (as a definite description) is an individual with a constant value, there is a situation variable that ranges over the contextually relevant set of situations. An assignment function applies to each situation in the domain, and if all situations satisfy the function assignment, the proposition is evaluated as true. The conceptual difference between the traditional individual variable analysis and the definite description analysis is subtle but significant. The difference is summarized in (76).

(76) PRONOUNS AS INDIVIDUAL VARIABLES VERSUS INDIVIDUAL CONSTANTS

	INDIVIDUAL VARIABLE ANALYSIS	INDIVIDUAL CONSTANT ANALYSIS
SYNTACTIC CATEGORY	D	D
SEMANTIC TYPE	<e>	<e>
VARIABLE	individual	situation
CONSTANT	situation	individual
BVA CONSTRUAL VIA	binding individual vbl	binding situation vbl

Observe that both the variable analysis and the definite description analysis make the same claims about syntactic category and semantic type of pronouns, treating them as D of type <e>. However, they use different semantic mechanisms to account for the BVA construal. In the individual variable analysis, a situation is held constant, and the variable ranges over a contextually relevant set of individuals. The assignment function applies to each individual in the domain; if all individuals satisfy the assignment function, the proposition is evaluated as true. In contrast, in the definite description analysis, an individual is held constant, and the variable ranges over a contextually relevant set of situations. The assignment function applies to each situation in the domain; if all situations satisfy the assignment function, the proposition is evaluated as true.

For discussion on how to tease apart the empirical differences between the invidvudal variables versus individual constant analyses, see Johnson (2012). Obverse that both of these approaches take pronouns to be uniform in their syntactic category and semantic type; thus, they assume the homogeneity hypothesis. However, in principle, nothing precludes a mixed analysis; to our knowledge, noone has attempted such an analysis.

6. Bound variable anaphora: restrospect and prospect(s)
Early treatments of bound variable anaphors focused on differentiaing BVA from discourse and sentence anaphora. These early studies established that BVA requires c-command, and that VP ellipsis is a reliable test for detecting BVA. More recent discussions have focused on the finer details of both the distribution and form of BVA. Relative to distribution, there is renewed interest in contexts where c-command fails, yet there is nevertheless a dependency between the quantificaitonal antecedent and the pronoun. No one disputes the data, but two distinct strategies are pursued concerning how to integrate this data set into

the analysis of BVA. On one view, the non-c-command environments are used to argue that BVA is <u>semantically</u> conditioned; specifically, the quantificational antecedent takes scope over the co-varying anaphoric expression. On another view, the non-c-command environments are used to argue that authentic BVA is syntacticialy conditoined — the quantificational antecedent c-commands the covarying anaphoric expression — and any departures from this are treated as instances of E-type anaphora. If we restrict our attention to English, these two approaches are notational variants, as they account for the same range of data, but invoke different mechanisms to do so. However, if we cast our eyes further afield, cross-linguistic variation in both the distribution and form of pronouns supports a syntactic approach. Specifically, BVA is formally heterogeneous in that any nominal type — reflexive, pronoun, copy anaphor, underspecified bindable expression, indexical — can function as a bound variable. In addition, some languages have two series of pronouns, with one series prohibited from functioning as a bound variable. Such a partition is predicted by syntactic analyses that countenance structural heterogeneity for pronouns, and so perforce also semantic heterogeneity. There is a growing interest in the cross-linguistic typlogy of A'-bound forms, and recent work in this area — especially as it relates to resumptive pronouns and copy strategies — has generated new empirical findings which have yet to be integrated into a comprehensive theory of BVA. This is a most interesting time to be working on BVA. On the one hand, linguists' theoretical tools are sharper and more judicious. On the other hand, the empirical swathe is both deepening (as new insights continue to be uncovered about well-studied languages) and broadening (as new data sets are coming to light from a larger set of languages).

References

Abney, S. A. (1987). <u>The English Noun Phrase in its Sentential Aspect</u>. PhD, PhD dissertation, Massachusetts Institute of Technology.

Aoun, J. and A. Y.-h. Li (2003). <u>Essays on the representational and derivational nature of grammar: the diver- sity of wh-constructions</u>. Cambridge, MA, MIT Press.

Baker, M. C. (1996). <u>The Polysynthesis Parameter</u>. Oxford, UK, Oxford University Press.

Baltin, M., R.-M. Déchaine and M. Wiltschko (in preparation). Two types of variables, Ms. NYU & UBC.

Barker, C. (2012). "Quantificational binding does not require c-command." <u>Linguistic Inquiry</u> **43**(4): 614-633.

Bouchard, D. (1984). <u>On the Content of Empty Categories</u>. Dordrecht, NL, Foris.

Bruening, B. (2014). "Precede-and-Command Revisited." <u>Language</u> **90**: 342--388.

Cardinaletti, A. and M. Starke (1999). The Typology of Structural Deficiency: A Case Study of the Three Classes of Pronouns. <u>Clitics in the languages of Europe</u>. H. C. van Riemsdijk**:** 145-233.

Chomsky, N. (1977). On Wh-Movement. <u>Formal Syntax</u>. P. W. Culicover, T. Wasow and A. Akmajian. New York, NY, USA, Academic Press**:** 71-132.

Chomsky, N. (1981). <u>Lectures on Government and Binding</u>. Dordrecht, Foris.

Déchaine, R.-M. and V. Manfredi (1994). "Binding Domains in Haitian." <u>Natural Language and Linguistic Theory</u> **12**(2): 203-257.

Déchaine, R.-M. and M. Wiltschko (2002a). "Decomposing Pronouns." <u>Linguistic Inquiry</u> **33**(3): 409-442.

Déchaine, R.-M. and M. Wiltschko ((in press)). "The Heterogeneity of Reflexives (Special thematic issue on reflexives; guest editors: M. Everaert and E. Reuland) < http://ling.auf.net/lingbuzz/001665 >." <u>Studia Linguistica</u>.

Déchaine, R.-M. and M. Wiltschko (to appear). <u>When and Why Can First and Second Person Pronouns be Bound Variables?</u> Proceedings of the MIT Pronouns Workshop (November 2009), MIT.

du Plessis, H. (1977). "Wh-movement in Africaans." <u>Linguistic Inquiry</u> **8**: 723–726.

Elbourne, P. (2001a). "E-type anaphora as NP-deletion." <u>Journal of Natural Language Semantics</u> **9**(3): 241-288.

Elbourne, P. (2001b). On the semantics of pronouns and definite articles. West Coast Conference on Formal Linguistics (WCCFL).

Elbourne, P. (2005). Situations and individuals. Cambridge, MA, USA, MIT Press.

Elbourne, P. (2008a) "The interpretation of pronouns." Language and LInguistics Compass **2**, 119-150 DOI: 0.1111/j.1749-818X.2007.00041.x.

Evans, G. (1977). "Pronouns, Quantifiers, and Relative Clauses (II): Appendix." Canadian Journal of Philosophy **7**(4): 777-797.

Evans, G. (1980). "Pronouns." Linguistic Inquiry **11**(2): 337-362.

Fillmore, C. (1971/1997). Lectures on Deixis [originally distributed as Fillmore (1971/1975) Santa Cruz lectures on deixis by the Indiana University Linguistics Club]. Stanford, CSLI Publications.

Giusti, G. (2002). The functional structure of noun phrases: a bare phrase structure approach. Functioanl Structure of DP and IP. G. Cinque. Oxford, UK, Oxford University Press**:** 54-90.

Heim, I. and A. Kratzer (1998). Semantics in generative grammar. Oxford, UK, Blackwell.

Higginbotham, J. (1980). "Pronouns and Bound Variables." Linguistic Inquiry **11**(4): 679-708.

Higginbotham, J. (1985). "On Semantics." Linguistic Inquiry **16**: 547-593.

Jones, C. (1991). Purpose clauses: Syntax, thematics, and semantics of English purpose constructions. Dordrecht, NL, Kluwer.

Kandybowicz, J. (2008). The Grammar of Repitition: Nupe Grammar at the Syntax-Phonology Interface. Amsterdam, NL, John Benjamins.

Kaplan, D. (1989). Demonstratives. Themes from Kaplan. J. Almog, J. Perry and H. Wettstein. New York, Oxford University Press**:** 481-563.

Kratzer, A. (2009). "Making a pronoun: fake indexicals as windows into the properties of pronouns." Linguistic Inquiry **40**(2): 187-227.

Kripke, S. (1980). Naming and Necessity. Cambridge, MA, Harvard University Press.

Lasnik, H. and T. Stowell (1991). "Weakest crossover." Linguistic inquiry **22**(4): 687-720.

Lee, F. (2003). "Anaphoric R-expressions as bound variables." Syntax **6**(1): 84-114.

McDaniel, D. (1989). "Partial and multiple wh-movement." Natural Language & Linguistic Theory **7**: 565–604.

Montalbetti, M. M. (1984). After Binding: On the Interpretation of Pronouns. PhD, MIT.

Nunes, J. (2004). Linearization of chains and sideward movement. Cambridge, MA, MIT Press.

Partee, B. (1989). Binding implicit variables in quantified contexts. Papers from CLS 25, Chicago: Chicago Linguistic Society.

Partee, B. (1991). Topic, focus, and quantification. SALT 1.

Postal, P. (1969). On so-called pronouns in English (Reprinted from F. Dinneen, ed., the 19th Monograph on Languages and Lnguistics; Washington, DC: Georgetown University Press, 1966). Modern Studies in English. D. Reibel and S. Schane. Englewood Cliffs, NJ, Prentice-Hall**:** 201-223.

Postal, P. (1971). Crossover Phenomena. New York, Holt, Rinehart and Winston.

Potts, C. (2007). "The Expressive Dimension." Theoretical Linguistics **33**: 165-197.

Quine, W. V. O. (1939). "Designation and Existence." Journal of Philosophy **36**(26): 701–709.

Reinhart, T. (1983). Anaphora and Semantic interpretation. Chicago, IL, The University of Chicago Press.

Rizzi, L. (1997). The fine structure of the left periphery. Elements of Grammar. L. Haegeman. Dordrecht, Kluwer Academic Publishers**:** 281-337.

Rouveret, A., Ed. (2011). Resumptive Pronouns at the Interfaces, John Benjamins Publishing.

Rullmann, H. (2003). Bound Variable Pronouns and the Semantics of Number. Proceedings of the Western Conference on Linguistics (WECOL 2002), Department of Linguistics, California State University.

Rullmann, H. (2004). "First and Second Person Pronouns as Bound Variables." Linguistic Inquiry **35**(1): 159-168.

Russell, B. (1905). "On Denoting." Mind and Language **14**: 479-493.

Safir, K. J. (2004a). The syntax of (in)dependence. Cambridge, MA, MIT Press.

Safir, K. J. (2004b). The syntax of anaphora. Oxford, UK, Oxford University Press.

Shlonsky, U. (1992). "Resumptive Pronouns as a Last Resort." Linguistic Inquiry **23**(3): 443-468.

Stockwell, R. P., P. Schachter and B. H. Partee (1973). The Major Syntactic Structures of English. New York, Holt, Rinehart and Winston.

Storoshenko, D. R. (2013). Only cool people tweet theirselves: variation in the English reflexive paradigm. Talk presented at the Canadian Linguistic Association (June 2013). University of Victoria.

Stowell, T. (1979). Restricting Relatives. Proceedingsof the Ninth Annual Meeting of NELS, GLSA, University of Massachusetts, Amherst.

Szabolcsi, A. (2001). The Syntax of Scope. The handbook of contemporary syntactic theory. M. Baltin and C. Collins. Oxford, UK, Blackwell: 607-633.

Takahashi, S. (2010a). "Traces or Copies, or Both — Part I: Characterizing Movement Properties." Language and LInguistics Compass **4**(11): 1091-1103.

Takahashi, S. (2010b). "Traces or Copies, or Both — Part II: Introducing Further Considerations." Language and LInguistics Compass **4**(11): 1104-1115.

Tomioka, S. (2003). The Semantics of Japanese Null Pronouns and Its Cross-Linguistic Implications. The Interfaces: Deriving and Interpreting Omitted Structures. K. Schwabe and S. Winkler. Amsterdam, John Benjamins. **61:** 321-340.

Van Riemsdijk, H. C. and E. S. Williams (1986). Introduction to the Theory of Grammar. Cambridge, Mass, MIT Press.

Wasow, T. (1972). Anaphoric relations in English, PhD thesis.

Williams, E. (1997). "Blocking and Anaphora." Linguistic Inquiry **28**(4): 577-628.

Wiltschko, M. (1998). "On the Syntax and Semantics of (Relative) Pronouns and Determiners." Journal of Comparative Germanic Linguistics **2**: 143-181.

Zribi-Hertz, A. (1995). "Emphatic or reflexive? On the endophoric character of French lui-même and similar complex pronouns." Journal of Linguistics **31**(2): 333-374.

Zribi-Hertz, A. and L. Mbolatianavalona (1999). "Towards a Modular Theory of Linguistic Deficiency: Evidence from Malagasy Personal Pronouns." Natural Language and Linguistic Theory **17**(1): 161-218.