

“DP conjunction” as ν P conjunction: a case for conjunction reduction*

Aron Hirsch

Massachusetts Institute of Technology

1. Introduction

The conjunction *and* appears to occur in a range of syntactic environments, as illustrated in (1). Given this broad distribution, it is difficult to provide a fully uniform semantics for *and*. A possible starting hypothesis would be that *and* makes a similar contribution to the connective $\&$ of propositional logic, as in (2). The denotation in (2) requires *and* to conjoin expressions of type t , so naturally accounts for (1a), but predicts (1b)-(1c) to be uninterpretable. Neither transitive verbs (type $\langle e,et \rangle$) nor quantificational DPs (type $\langle et,t \rangle$) are of type t .

- (1) a. [John danced] and [John sang]. (*TP and TP*)
b. John [hugged] and [pet] the puppy. (*V and V*)
c. John saw [every student] and [every professor]. (*DP and DP*)

- (2) $[[\text{and}]] = \lambda p_t . \lambda q_t . p = q = 1$

The grammar must make available mechanisms to parse examples like (1b) and (1c), and the question is: what are those mechanisms and where do they localize, in the semantics or the syntax? I focus on examples like (1c), where *and* occurs between object DPs.

One way to reconcile the syntax and semantics of *and* is to introduce flexibility into the semantics. Building on Montague (1973), Partee & Rooth (1983) associate *and* with a family of meanings of different semantic types: *and* has the denotation in (2) as its basic meaning (type $\langle t, \langle t, t \rangle \rangle$), and higher-type meanings derive by a recursive type-shifting procedure. In (1a), *and* can compose with its basic meaning. In (1c), a shifted meaning is invoked: the structure for (1c) is (3), and the meaning for *and* is (4), by which *and* can compose with generalized quantifiers to yield a new quantifier, as in (5).

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- (3) [TP John saw [_{&P} [_{DP} every student] [and [_{DP} every professor]]]]
- (4) a. [[and₂]] = $\lambda P_{\text{ett}} . \lambda Q_{\text{ett}} . \lambda f_{\text{et}} . P(f) = Q(f) = 1$
 b. = $\lambda P_{\text{ett}} . \lambda Q_{\text{ett}} . \lambda f_{\text{et}} . [[\text{and}]](P(f))(Q(f))$
- (5) [[&P]] = [[and₂]]([[every student]])([[every professor]])
 = $\lambda f . \forall x [\text{student}(x) \rightarrow f(x)] \& \forall y [\text{professor}(y) \rightarrow f(y)]$

A different option is to modify our syntactic assumptions about (1c) to allow *and* to compose with the meaning in (2) also in (1c). This is *conjunction reduction* (e.g. Ross 1967, Schein 2014, ‘CR’): although (1c) appears to involve direct conjunction of DPs, it may have a different structure where constituents of type *t* are conjoined.

- (6) [TP John [_{&P} [_{vP1} t₁ saw every student] [and [_{vP2} t₁ ~~saw~~ every professor]]]]

In this paper, I consider the CR analysis in (6), with underlying *vP* co-ordination. The structure in (6) will be elaborated in Section 2, and its advantage over other possible CR structures will be addressed later in the paper (see Section 7.2).

So, in determining how to reconcile the syntax and semantics of *and*, we need to ask two questions: (i) is *and* ambiguous in its semantic type, or not? (ii) does (1c) involve direct DP conjunction, or a CR structure? These questions interact such that the full space of possible hypotheses for how to analyze (1c) is:

(7)

H1	<i>And</i> is type-flexible.	DP conjunction available, CR unavailable.
H2		DP conjunction available, CR also available.
H3	<i>And</i> is not type-flexible	DP conjunction unavailable, CR available.

By H1, *and* is type-flexible and the only available structure for (1c) is the direct DP conjunction structure in (3). H1 amounts to a claim that there is no syntactic mechanism for CR in (1c). **By H2**, *and* is type-flexible, but (1c) is structurally ambiguous: it allows the parse in (3) where *and* composes with the higher-type meaning, and the CR parse in (6), where *and* composes with its basic meaning. **By H3**, *and* is not ambiguous in its semantic type. As a consequence, direct DP conjunction is not interpretable and the only available structure is the CR structure.

The goal in this paper is to dissociate H1-H3. First, I provide a series of arguments that CR is at least *available*. Theoretically, CR is a predicted epiphenomenon of independently attested syntactic mechanisms. Empirically, CR is required to account for (i) the distribution of sentential adverbs, (ii) observed instances of VP ellipsis, and (iii) certain attested scope readings. Thus, H1 is ruled out. In the final part of the paper, I provide support for the stronger H3 over H2. DP conjunction with type-flexible *and* over-generates an unattested scope reading, which is correctly predicted to be unattested *if CR is the only option*.

1.1 A clarification on sum formation ‘and’

Before proceeding, a clarification is required regarding H3. In saying that DP conjunction is unavailable, H3 intends that DP conjunction is *not interpretable with a type-lifted variant of logical ‘and’*. Logical *and* may be accidentally polysemous with a sum formation operator, (8a), which can conjoin DPs of type *e* (Link 1983). This has been invoked for examples involving collective predication like (8b).

- (8) a. $[[\text{and}_{\text{sum}}]] = \lambda x_e . \lambda y_e . x+y$
b. John and Mary met.

The potential existence of sum formation *and* will not affect argumentation in this paper and will be set aside.¹

2. CR is an epiphenomenon of independent mechanisms

There is a descriptive parallel between the apparent DP conjunction in (1c) and gapping in (9). These examples are each interpreted as parallel to (10) except that material is left unpronounced (assuming CR in (1c)).

(1c) John saw every student and every professor. (*apparent DP conjunction*)

(9) John saw every student and Mary every professor. (*gapping*)

(10) John saw every student and {(a) Mary, (b) John} saw every professor.

In (9), the second conjunct contains a pronounced subject and object, but the verb *saw* is pronounced only once. In (1c), the subject *John* and the verb *saw* are pronounced only once. Gapping and apparent DP conjunction thus differ only in that the former involves two pronounced subjects, while the latter involves one.

In the following, I demonstrate that this descriptive parallel corresponds to a theoretical parallel. In early work on conjunction, gapping was derived via a separate transformational rule from CR (e.g. Ross 1967, 1970). Building on Wilder (1994) and Schwarz (1998, 1999, 2000), I argue that the mechanism for gapping provides a uniform analysis of both (9) and (1c). This establishes the critical result of the present section: CR follows from independently needed syntactic mechanisms and, thus, is predicted to be available on theoretical grounds.

2.1 Analyzing gapping

A number of analyses of gapping share the proposal of Johnson (1996, 2009; after Siegal 1987) that gapping involves a conjunction of *v*Ps below a shared *T*. The structure for (9) is (11), where the *v*Ps *John saw every student* and *Mary saw every professor* are conjoined.

¹ While I remain agnostic about the existence of sum formation *and*, see Schein (2014) for an approach unifying sum formation *and* with logical *and*.

- (11) *Step 1: vPs are conjoined*
 [TP T [vP John saw every student] [and [vP Mary saw every professor]]]

The external argument of the left conjunct moves to spec-TP, on the assumption that A-movement is not subject to the Coordinate Structure Constraint:

- (12) *Step 2: John moves to spec-TP out of the left conjunct*
 [TP John₁ T [vP t₁ saw every student] [and [vP Mary saw every professor]]]

Additional steps derive the surface string. For concreteness, I follow Coppock (2001) for these steps. *Every professor* evacuates the VP in the right conjunct, and the VP elides.

- (13) *Step 3: every professor moves out of the VP*
 [TP John₁ T [vP t₁ saw every student] [and [vP Mary [VP saw t₂] every professor₂]]]

- (14) *Step 4: the VP elides*
 [TP John₁ T [vP t₁ saw every student] [and [vP Mary [VP ~~saw t₂~~] every professor₂]]]

2.2 From gapping to CR

With one minor modification, the mechanism for gapping can derive the string in (1c). The derivation begins as the gapping derivation did, with a conjunction of vPs.

- (15) *Step 1: vPs are conjoined*
 [TP T [vP John saw every student] [and [vP John saw every professor]]]

The difference from gapping lies in the subjects of the vPs. In (11), the left vP has *John* as its subject and the right vP has *Mary* as its subject; in (15), the subject of both vPs is *John*. This has a consequence at Step 2: instead of *John* moving to spec-TP out of the left conjunct, *John* moves across-the-board ('ATB').²

- (16) *Modified Step 2: John ATB-moves to spec-TP out of both conjuncts*
 [TP John₁ T [vP t₁ saw every student] [and [vP t₁ saw every professor]]]

The remaining steps of the derivation proceed just as before. *Every professor* evacuates the VP in the right conjunct and the VP elides.

- (17) *Step 3: every professor moves out of the VP*
 [TP John₁ T [vP t₁ saw every student] [and [vP t₁ [VP saw t₂] every professor₂]]]

- (18) *Step 4: the VP elides*
 [TP John₁ T [vP t₁ saw every student] [and [vP t₁ [VP ~~saw t₂~~] every professor₂]]]

² Johnson (2002) considers a derivation with ATB-movement for coordinations in German, but rejects the analysis in part because it incorrectly predicts scope facts. Section 7 demonstrates that this analysis does correctly capture a range of scope facts for the English apparent DP conjunctions under consideration.

Hence, *John* is pronounced only once due to ATB-movement, and *saw* is pronounced due to ellipsis in the right conjunct — deriving the surface string in (1c).

To re-iterate, there is only one difference between the derivation for gapping given in the preceding subsection and the derivation for CR given here: ATB movement of the subject takes place in the latter derivation, but not the former. Given that ATB movement is a mechanism independently required in the grammar, the CR derivation “follows for free” from the availability of gapping.

3. Case 1: Adverbs

With CR predicted on theoretical grounds, we turn to empirical evidence that a CR analysis is available. The first piece of evidence involves example (19), where the adverb *yesterday* precedes the second apparent DP conjunct (Collins 1988).

(19) John saw Labov and, yesterday, Chomsky.

3.1 DP conjunction is insufficient for (21)

I argue that there is no viable analysis of (19) with the DPs *Labov* and *Chomsky* directly conjoined. Omitting the adverb, the structure would be (20) and there are, then, two positions where *yesterday* could attach.

(20) [TP John saw [&P [DP Labov] [and [DP Chomsky]]]]

One possibility is that *yesterday* adjoins on the clausal spine above the conjunction, as in (21). To derive the correct word order, *Chomsky* must extrapose out of the conjunction and attach above *yesterday*.

(21) [TP [TP [TP John saw [&P [DP Labov] [and t₂]]] yesterday] [DP Chomsky]₂]

The derivation in (21) cannot be correct. First, extraposition of *Chomsky* seems to violate the CSC. Second, (21) does not correspond to the right meaning. Given (21), (19) should be equivalent to (22), where *yesterday* clearly attaches on the clausal spine.

(22) Yesterday, John saw Labov and Chomsky.

Because *yesterday* takes scope above the conjunction, (22) conveys that John seeing Labov and John seeing Chomsky both happened yesterday. This does not, however, correspond to intuitions in (19): (19) says that John saw Chomsky yesterday, but leaves open when in the past John saw Labov.

To derive the right meaning, *yesterday* in (19) must take scope within the second conjunct. If the second conjunct is just the DP *Chomsky*, this means that the only remaining option is for *yesterday* to adjoin to that DP.

(23) [TP John saw [&P [DP Labov] [and [DP [DP Chomsky] yesterday]]]]

This structure, too, is not viable, as *yesterday* cannot in general adjoin to DPs. If *yesterday* could adjoin to DPs, (24a) and (24b) would be equally acceptable, as each could be parsed with *yesterday* adjoined to the DP *Chomsky*.

- (24) a. *John talked to, yesterday, Chomsky.
b. John talked to Labov and, yesterday, Chomsky.

The data in (25)-(26) make a similar point. The comparison between (25a) and (26a) illustrate the well-known restriction holding outside of conjunction that *yesterday* can precede a DP only if that DP is heavy (e.g. Ross 1967, Kayne 1988). The (b) examples make clear that this restriction is bled within a second conjunct. If *yesterday* were adjoined to the light DP *you* in (25b), *yesterday* would also be able to adjoin to *you* in (25a), and (25a) would be natural.

- (25) a. ??John saw, yesterday, you.
b. John saw me and, yesterday, you.
- (26) a. John saw the old professor with white hair.
b. John saw, yesterday, the old professor with white hair.

3.2 The CR account of (21)

Our desideratum in (19) is for *yesterday* to adjoin within the second conjunct, but not adjoin directly to a DP. With CR, this can be achieved. Instead of the second conjunct just being the DP *Chomsky*, CR includes additional *vP* structure in the second conjunct. This structure provides a proper host for *yesterday*. The gapping examples in (27) provide independent corroboration that temporal adverbs can adjoin within a *vP*.

- (27) [TP John₁ T [_{vP} t₁ saw Labov] [and [_{vP} yesterday [_{vP} t₁ ~~saw~~ every professor]]]]]
- (28) a. John saw Labov and Mary, just yesterday, Chomsky.
b. John saw Labov and Mary, a long time ago, Chomsky.

Since the CR account is compatible with *yesterday* not being able to adjoin to a DP, we can also explain the contrasts in (24) and (25) above. In (24a) and (25a), *yesterday* is adjoined on the clausal spine and the DP to its right is extraposed. In (24b) and (25b), *yesterday* is adjoined to the *vP* in the second conjunct, and no extraposition takes place. The structures for (24) and (25) are given in (29) and (30), respectively.

- (29) a. [TP [TP [TP John talked to t₁] yesterday] [DP Chomsky]₁]
b. [TP J₁ [_{vP} t₁ talked to Labov] [and [_{vP} yesterday [_{vP} t₁ ~~talked to~~ Chomsky]]]]]
- (30) a. [TP [TP [TP John saw t₁] yesterday] [DP you]₁]
b. [TP John₁ [_{vP} t₁ saw me] [and [_{vP} yesterday [_{vP} t₁ ~~saw~~ you]]]]]

Following Ross (1967), the (a) derivations are ruled out if right extraposition cannot

strand a preposition (accounting for (24a)), and is licensed only when the extraposing DP is heavy (accounting for (25a)).

4. Case 2: Ellipsis

The second argument for the availability of CR continues to exploit the basic structural difference between direct DP conjunction and CR — that CR includes additional *vP* structure in the second conjunct not present under the DP analysis. In this section, we will be working with example (31), analyzed with direct DP conjunction in (31a) and CR in (31b).

- (31) Harvard invited Labov and Chomsky.
a. [_{TP} Harvard invited [_{&P} [_{DP} Labov] [and [_{DP} Chomsky]]]]
b. [_{TP} Harvard₁ T [_{&P} [_{vP} t₁ invited Labov] [and [_{vP} t₁ invited Chomsky]]]]

I argue for the presence of the VP *invited Chomsky* in the right conjunct by demonstrating that this VP can serve as antecedent to license ellipsis of another VP.

4.1 Paradigm

Example (32) introduces a complex adverbial clause (*ten years after Brandeis did*) into the second conjunct in (31). Critically, the VP in the adverbial clause is elided (Δ). The crucial observation is that Δ is most naturally interpreted as *invited Chomsky*, per the paraphrase in (33).

- (32) Harvard invited Labov and, ten years after Brandeis did Δ , Chomsky.
(33) Harvard invited Labov and – ten years after Brandeis invited Chomsky – Harvard invited Chomsky, too.

VP ellipsis is, in general, licensed only when a proper antecedent for the elided VP is present in the linguistic context. In (34), due to Johnson (2014), the antecedent is extra-sentential: *eat rutabagas* elides in (34b) under identity with *eat rutabagas* in (34a).

- (34) a. I can't believe Holly Golightly won't [_{vP} eat rutabagas].
b. I can't believe Fred won't [_{vP} ~~eat rutabagas~~] Δ , either.

In (32), though, an extra-sentential antecedent isn't required: (32) is felicitous out of the blue. A proper antecedent for Δ must be available *intra-sententially*.

4.2 The CR account

The *vPs* *invited Labov* and *invited Chomsky* are conjoined, and the adverbial clause adjoins to the *vP* in the second conjunct, as in (35a), built on (31b). The internal structure of the adverbial clause is (35b). The VP *invited Chomsky* in the second conjunct in (35a) serves as antecedent to license ellipsis of the VP *invited Chomsky* in the adverbial clause.

- (35) a. [TP Harvard₁ [&P [_{VP} t₁ invited Labov] [and [_{VP} (35b) [_{VP} t₁ invited Chomsky]]]]]
 b. [CP ten years after [TP Brandeis₂ [_{VP} t₂ invited Chomsky Δ]]]

4.3 The insufficiency of DP conjunction

Referring back to (31a), if (32) involved direct conjunction of the DPs *Labov* and *Chomsky*, there would be just one intra-sentential VP present to serve as antecedent for Δ: the matrix VP containing the conjunction, *invited Labov and Chomsky*. Since *invited Labov and Chomsky* is not identical to *invited Chomsky*, ellipsis of *invited Chomsky* would not be licensed. Importantly, if Δ were interpreted as *invited Labov and Chomsky* a distinct meaning would obtain. (32) would paraphrase as:

- (36) Harvard invited Labov and – ten years after Brandeis invited Labov and Chomsky
 – Harvard invited Chomsky.

Whereas (36) commits to Brandeis having invited both Labov and Chomsky, (32) intuitively commits only to Brandeis having invited Chomsky. Hence, ellipsis in (32) argues for CR: CR accounts for the target interpretation of (32), where the antecedent for Δ is *invited Chomsky*.

5. Case 3: Split scope

Cases 1 and 2 both argue for CR by considering examples with an adverbial in the second conjunct, the simple adverb *yesterday* in Case 1 and the complex adverbial clause *ten years after Brandeis did* in Case 2. Is CR generally available in the absence of an adverbial? I argue that it is using a semantic diagnostic involving scope. I demonstrate that the conjunction *and* can take scope above an operator while the DPs *and* apparently conjoins scope below that same operator. These “split scope” readings are predicted with CR, but are not easily derived with direct DP conjunction.

5.1 The split scope signature

Example (37) contains four scope operators: the conjunction *and*; the quantificational DPs *any city in Europe* and *any city in Asia*; and the intensional predicate *refuse*.

- (37) John refused to visit any city in Europe and any city in Asia.

The most natural reading of (37) is the one paraphrased in (38a) and stated formally in (38b), where *refuse* is modeled as a quantifier over worlds compatible with what John is willing to do at the evaluation world, $W(j)(w_0)$.

- (38) a. J refused to visit any city in Europe and he refused to visit any city in Asia.
 b. $\neg \exists w' \in W(j)(w_0) [\exists x [\text{city-in-Europe}(x)(w') \ \& \ \text{visits}(x)(j)(w')]]$
 $\& \ \neg \exists w'' \in W(j)(w_0) [\exists y [\text{city-in-Asia}(y)(w'') \ \& \ \text{visits}(y)(j)(w'')]]$

In (38), *and* scopes above *refuse*, as the modalization contributed by *refuse* occurs

separately in each conjunct. The quantifiers, on the other hand, scope below *refuse*. This is required for NPI *any* to be licensed, and is clear from (38b), since the existentials contributed by the quantifiers occur within the scope of the modal in each conjunct. Hence, scope is split: *and* > *refuse* > *any city in Europe, any city in Asia*.

Split scope is not restricted to examples with NPIs, but recurs with a range of embedded nominals. Irene Heim points out the datum in (39):

(39) This plant requires little water and little sunlight.

Building on Buring (2007) and Heim (2008), I take it that *little* decomposes into negation and *much*, as made clear in the simpler example (40), paraphrased in (41). The negative component of *little* scopes above *require*, while the *much* component scopes below.

(40) This plant requires little water.

(41) a. This plant does not require much water.
b. $\neg \forall w' \in R(\text{plant})(w_0)$ [this plant receives much water in w']

With decomposition of *little* in hand, the full paraphrase for (39) is (42), which again displays split scope: *and* scopes above *require*, while the *much* component of *little* in *little water* and *little sunlight* scopes below *require*.

(42) a. This plant does not require much water and it does not require much sunlight.
b. $\neg \forall w' \in R(\text{plant})(w_0)$ [this plant receives much water]
& $\neg \forall w'' \in R(\text{plant})(w_0)$ [this plant receives much sunlight in w'']

Partee & Rooth (1983) observe a similar split scope reading with the disjunction in (43), which can be interpreted as in (44). In (44), *or* scopes above *look for*, while *a maid* and *a cook* are interpreted de dicto in the scope of *look for*.

(43) John is looking for a maid or a cook.

(44) a. John is looking for a maid or he is looking for a cook.
b. $\forall w' \in L(j)(w_0)$ [$\exists x$ [maid(x)(w') & finds(x)(j)(w')]]
& $\forall w'' \in L(j)(w_0)$ [$\exists y$ [cook(y)(w'') & finds(y)(j)(w'')]]

Partee & Rooth, however, claim that conjunction does not allow split scope on the basis of (45a), which lacks the reading in (45b). An empirical contribution of this paper is to demonstrate that conjunction does, in fact, exhibit split scope. I will explain the absence of a split scope reading in (45a) in Section 7.3.

(45) a. John hopes that some company will hire a maid and a cook.
b. *'John hopes that some company will hire a maid and he hopes that some company will hire a cook.'

5.2 The CR account

Split scope straightforward derives with CR. Illustrating with (37), for *and* to scope above *refuse*, the conjoined vPs are *refused to visit any city in Europe* and *refused to visit any city in Asia*, as in (46). *Any city in Europe* and *any city in Asia* can then QR to a position in the scope of *refuse* within their respective conjuncts, as in (47).

(46) [TP John [&P [vP t₁ refused [vP PRO to visit any city in Europe]]
[and [vP t₁ refused [vP PRO to visit any city in Asia]]]]]]

(47) [TP John [&P [vP t₁ refused [vP [DP any city in Europe]₂ [vP PRO refused to visit t₂]]
[and [vP t₁ refused [vP [DP any city in Asia]₃ [vP PRO refused to visit t₃]]]]]]

5.3 The insufficiency of DP conjunction

Suppose *any city in Europe* and *any city in Asia* were directly conjoined, as in (48). Assuming that *any city in Europe* and *any city in Asia* are generalized quantifiers, the &P is also a generalized quantifier. I assume that the &P takes scope via QR.

(48) [TP J₁ [vP t₁ refused [vP PRO to visit [&P [DP any city in E] and [DP any city in A]]]]]]

Because the &P QRs as a constituent and contains both *and* and the quantifiers, *and* necessarily scopes at the same height as the quantifiers: above *refuse* if the &P QRs above, as in (49a), or below *refuse* if the &P QRs below, as in (49b). The structure in (49a) predicts the reading in (50), and the structure in (49b) predicts the reading in (51).

(49) a. [TP &P₂ [TP John₁ [vP t₁ refused [vP PRO to visit t₂]]]]]
b. [TP John₁ [vP t₁ refused [vP &P₂ [vP PRO to visit t₂]]]]]

(50) *Scope: and > any city in Europe, any city in Asia > refuse*

a. ‘There is some city in Europe that John refused to visit, and there is some city in Asia that John refused to visit.’

b. $\exists x$ [city-in-Europe(x)(w₀) & $\neg \exists w' \in W(j)(w_0)$ [visit(x)(j)(w')]]
& $\exists y$ [city-in-Asia(y)(w₀) & $\neg \exists w'' \in W(j)(w_0)$ [visit(y)(j)(w'')]]

(51) *Scope: refuse > and > any city in Europe, any city in Asia*

a. ‘What John refused was to visit *both* a city in Europe and a city in Asia (but he was potentially willing to visit one or the other).’

b. $\neg \exists w' \in W(j)(w_0)$ [$\exists x$ [city-in-Europe(x)(w') & visits(x)(j)(w')]
& [$\exists y$ [city-in-Asia(y)(w') & visits(y)(j)(w')]]

Neither (50) nor (51) is the target split scope reading — and, in fact, neither is an attested reading of (37). This is expected, since NPI *any* is not licensed in either structure in (49). In (49a), QR of the &P moves *any* out of the scope of *refuse*, its licenser. In (49b), *any* is in the scope of *refuse*, but *and* scopes between *refuse* and *any*. *And* is an intervener for

NPI licensing (Guerzoni 2006, Linebarger 1987). Hence, CR is required to derive the observed split scope reading in (37).

6. Taking stock

I have argued on theoretical and empirical grounds that CR is *available*. The aim in the remainder of the paper is to provide support for a stronger conclusion: not only is CR available, but logical conjunction directly of DPs is *unavailable*. Referring to the hypotheses in (7), the goal is to consider evidence for H3.

7. A missing scope reading

In this section, I present data which are most straightforwardly understood if direct DP conjunction is unavailable, since direct DP conjunction over-generates an unattested scope reading in these data. Example (52), adapted from Partee & Rooth's example in (45a) above, is unambiguous. (52) allows a reading where the subject *some company* scopes above *and*, but lacks an inverse reading where *and* scopes above *some company*. That is, (52) conveys that some one company made two hires, not that a maid and a cook were hired by two potentially different companies.

(52) Some company hired a maid and a cook.

(53) *Available: some > and*

$\exists x$ [company(x) & $\exists y$ [maid(y) & hired(y)(x)] & $\exists z$ [cook(z) & hired(z)(x)]]

(54) *Unavailable: and > some*

a. Some company hired a maid and some company hired a cook.

b. $\exists x$ [company(x) & $\exists y$ [maid(y) & hired(y)(x)]]
& $\exists x'$ [company(x') & $\exists z$ [cook(z) & hired(z)(x')]]

7.1 If direct DP conjunction were possible

If the DPs *a maid* and *a cook* were directly conjoined, the structure for (52) would be (55). If the &P QRs below *some company*, as in (56a), the attested scope reading, *some > and*, obtains. However, the unattested scope reading, *and > some*, can obtain just as easily by QRing the &P above *some company*, as in (56b).

(55) [TP some company₁ [_{VP} t₁ hired [_{&P} [_{DP} a maid] [and [_{DP} a cook]]]]]]

(56) a. [TP [_{&P} a maid and a cook]₂ [TP some company₁ [_{VP} t₁ hired t₂]]]

b. [TP some company₁ [_{VP} [_{&P} a maid and a cook]₂ [_{VP} t₁ hired t₂]]]

Hence, the problem: both the unattested reading and the attested reading derive, depending on what position QR targets. If direct DP conjunction is available, a new constraint on QR must be introduced to block the structure in (56b). On the other hand, if the DP analysis is unavailable, the over-generation problem does not arise.

7.2 The data are consistent with CR

Under CR, the scope judgment in (52) is predicted and links to a more general pattern of scope in overt vP conjunction. A longstanding objection to CR is that CR over-generates scope readings. This is, however, based on the assumption that CR involves ellipsis of full clausal structure. If so, (52) would have the structure in (57), which corresponds to unavailable *and* > *some*.

(57) [_{&P} [_{TP} some company hired a maid] [_{and} [_{TP} some company hired a cook]]]

The proposal in the present paper avoids this prediction: apparent co-ordination of object DPs does not derive from full clausal co-ordination, but rather vP co-ordination. The CR structure for (52) is not (57), but (58).

(58) [_{TP} some company₁ [_{vP} *t*₁ hired a maid] [_{and} [_{vP} *t*₁ hired a cook]]]

To see what is predicted for (52), suppose that CR as proposed were the only available analysis of apparent DP co-ordination. The prediction for scope is then:

(59) *Conjunction scope prediction ('CSP')*
Scope in apparent DP co-ordination should track scope in vP co-ordination.

Given the CSP, the pattern of scope judgments in (52) is expected. The baseline is (60), which involves a conjunction of vPs , both of which are overt (*hired a maid, fired a cook*) (for similar examples, see Moltmann 1992, Fox 2000).

(60) Some company hired a maid and fired a cook.

Like (52), (60) conveys that a single company both hired a maid and fired a cook (*some* > *and*), and is incompatible with potentially different companies hiring a maid and firing a cook (*and* > *some*). Scope in apparent DP conjunction is tracking overt vP conjunction.

How does *some* > *and* derive, and how is *and* > *some* blocked? *Some* > *and* directly derives from the structure in (58): due to ATB-movement, there is a single occurrence of *some company* in spec-TP scoping over the lower conjunction of vPs . For *and* > *some* to derive, *some company* would need to undergo ATB-reconstruction into its base position within each conjunct. The scope judgment in (52) independently establishes that ATB-reconstruction is blocked in this configuration. The question of how ATB reconstruction is constrained has been treated in the literature, for instance in Fox (2000). Applying Fox's idea to (58), reconstruction is subject to an economy constraint which allows *some company* to ATB reconstruct into the two vPs only if, within each vP , *some company* reverses its scope relation relative to another operator with which *some* is non-commutative. The only other scopal operator within vP_1 is *a maid*, and the only other scopal operator within vP_2 is *a cook*. Since two existentials are commutative, the economy condition is not met.³

³ In fact, it may be possible to conjoin *a maid* and *a cook* in (52) with sum formation *and*, as in 'A maid and a cook met'. If the resultant plurality could distributively scope over *some company*, a reading mimicking

7.3. Returning to (45a)

Let us now return to Partee & Rooth's actual example in (45a), upon which (52) is based, and fully address why (45a) lacks a reading with *and* > *some*.

(45a) John hopes that some company will hire a maid and a cook.

There are two ways to derive *and* > *some*. First, since the embedded clause in (45a) is identical to (52), *and* > *some* could derive by QRing *a maid and a cook* as a DP conjunction above *some company*, as in (52). If direct DP conjunction is unavailable, this parse is blocked for (45a), just as for (52).

(61) *_{[TP John hopes that [_{TP} [_{&P} a maid and a cook]₂ [_{TP} some company will hire t₂]]]}

The second way to derive *and* > *some*, which looks consistent with CR, is to conjoin the matrix vPs, as in (62). Yet, it has been observed that gapping is degraded across a finite clause boundary, as in (63), indicating that (62) is also unavailable.⁴

(62) *_{[TP John₁ [_{&P} [_{VP} t₁ hopes that some company will hire a maid] and [_{VP} t₁ hopes that some company will hire a cook]]]}

(63) ??John hopes that this company will hire a maid and Bill a cook.

7.4 More correct predictions of CR

In addition to predicting where *some* > *and* is unavailable, CR also predicts where *some* > *and* is available. Fox (2000) observes that (64a) allows a reading where *a guard* takes narrowest scope, paraphrased (65a). The CSP predicts a parallel reading in (64b), which is indeed observed; the reading is paraphrased (65b).

(64) a. A guard is standing in front of every church and sitting beside every mosque.
b. A guard is standing in front of every church and every mosque.

(65) *Scope: and* > *every church*, *every mosque* > *a guard*
a. Every church has a guard in front of it and every mosque has a guard beside it.
b. Every church has a guard in front it and every mosque has a guard in front it.

and > *some* would derive. Yet, scope in (52) is consistent with the availability of a sum formation analysis, given an independent fact: 'these two employees' cannot distributively take scope over *some company* in 'Some company hired these two employees'. Note that the structure in (56b) with logical *and* seemingly must be blocked in a different way from the distributive reading in 'Some company hired these two employees'. In (56b), *a maid and a cook* is a generalized quantifier, and generalized quantifiers can take scope over existential subjects from direct object position (e.g. *every* > *some* in 'Some company hired every one of these maids').

⁴ Recall that conjunction of matrix vPs embedding *non-finite* clauses is deployed in (37) (*John refused to visit any city in Europe and any city in Asia*) to derive split scope. Gapping can occur across non-finite clause boundaries, as in the counterpart *John refused to visit any city in Europe and Mary any city in Asia*.

7. Conclusion

This paper has built a new case for CR with apparent DP conjunction: CR is at least *available*, and a range of scope data are most straightforwardly understood if *logical conjunction directly of DPs is unavailable*. This latter result challenges the idea that logical *and* is ambiguous in its semantic type. As such, this paper offers motivation to re-visit the question of whether type-shifting is an available mechanism to analyze other operators with an apparently cross-categorial distribution, like focus operators, as in (66) (Rooth 1985).

- (66) a. John only saw BILL. ('only' apparently adjoined to vP)
 b. John saw only Bill. ('only' apparent adjoined to DP)

Aron Hirsch
 aronh@mit.edu

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