"DP conjunction" as *v*P conjunction: a case for conjunction reduction[1]

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1. Overview

- Possible hypothesis: natural language *and* makes the same semantic contribution as the connective *&*.

(1) ***And* as sentential conjunction (type <t,<t,t>>)**
$[\![\text{and}]\!]^{w,g} = \lambda p_t \,.\, \lambda q_t \,.\, p = q = 1$

- Puzzle: the distribution of *and* appears to be freer than the hypothesis predicts. This paper focuses on examples like (2) where *and* appears to conjoin object DPs, which are not of type t.

(2) ***And* can conjoin quantifiers (type <et,t>)**
John saw [every student and every professor].

- Two responses to the observation:

The semantic response: *and* can conjoin any expressions of type <α,t> (Montague 1973); higher-type meanings for *and* are derived from its basic meaning in (1) (Partee & Rooth 1983).

(3) **Denotation for *and* to conjoin quantifiers (type <ett,<ett,ett>>)**
a. $[\![\text{and}_2]\!]^{w,g} = \lambda F_{ett} \,.\, \lambda G_{ett} \,.\, \lambda f_{et} \,.\, F(f) = G(f) = 1$
b. $= \lambda F_{ett} \,.\, \lambda G_{ett} \,.\, \lambda f_{et} \,.\, [\![\text{and}]\!](F(f))(G(f))$

The syntactic response: *and* does conjoin expressions of type t in (2), though this is obscured in the surface string by ellipsis (conjunction reduction 'CR', e.g. Ross 1967, Schein 1992, 2014).

(4) **Possible schema of conjunction reduction**
[John saw every student] and [~~John saw~~ every professor].

Question: Does *and* in (2) conjoin DPs **('the DP analysis')**, necessitating ambiguity between the denotations for *and* in (1) and (3)? Or, does *and* conjoin higher constituents of type t **('CR')**?

- This question has a profile recurrent in work at the syntax/semantics interface: do we introduce complexity into the semantics, or into the syntax?

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Goals for this talk:

❶ To provide *theoretical* plausibility for CR by demonstrating that a CR analysis of (2) can be achieved with syntactic mechanisms proposed on independent grounds.

⇝ CR derives from a modification of a mechanism for **gapping**.

❷ To provide *empirical* arguments that CR is an available analysis.

⇝ **Case 1: scope:** CR is needed to derive observed scope readings the DP analysis cannot derive.
⇝ **Case 2: ellipsis:** CR is needed to license observed VP ellipsis in certain examples.

❸ To provide initial evidence that CR may be the *only* available analysis, at least in certain examples.

⇝ **Case 3: more scope:** certain unattested scope readings are correctly predicted to be unavailable under CR; the DP analysis may over-generate these scope readings.

2. The DP analysis

- According to the DP analysis, *every student* and *every professor* are directly conjoined:

(5) John saw $[_{\&P}\ [_{DP}$ every student] [and $[_{DP}$ every professor]]]

- Semantic composition proceeds as follows to derive the correct meaning for (2):

(6) **The conjuncts have quantificational meanings (type <et,t>)**[2]
a. $[\![\text{every student}]\!]^{w,g} = \lambda f_{et} . \forall x\ [\text{student}(x) \rightarrow f(x)]$
b. $[\![\text{every professor}]\!]^{w,g} = \lambda f_{et} . \forall y\ [\text{professor}(y) \rightarrow f(y)]$

(7) **The type-lifted denotation for *and* is required (type <ett,<ett,ett>>)**
$[\![\text{and}_2]\!]^{w,g} = \lambda F_{ett} . \lambda G_{ett} . \lambda f_{et} . F(f) = G(f) = 1$ (= (3) above)

(8) **The conjunction has a quantificational meaning**
$[\![\&P]\!]^{w,g} = [\![\text{and}_2]\!]([\![\text{every student}]\!]^{w,g})([\![\text{every professor}]\!]^{w,g})$
$= \lambda f . \forall x\ [\text{student}(x) \rightarrow f(x)] \ \&\ \forall y\ [\text{professor}(y) \rightarrow f(y)]$

(9) **Like other object quantifiers, the &P must QR to be interpreted**
$[_{TP}\ [_{\&P}$ every student and every professor] $\lambda 1\ [_{TP}$ John saw $t_1]]$

(10) **The correct truth-conditions are predicted**
$[\![(5)]\!]^{w,g} = [\![\&P]\!]^{w,g}(\lambda x$. John saw x in w)
$= 1$ iff $\forall x\ [\text{student}(x) \rightarrow$ John saw x in w] & $\forall y\ [\text{professor}(y) \rightarrow$ John saw y in w]

Key properties of the DP analysis:
– *And* directly conjoins DPs; a type-lifted meaning for *and* is required.
– The conjunction takes scope via QR.

[2] For time reasons, I will not be able to address alternative versions of the DP analysis with higher-type entries for the quantifiers. Discussion of this point is left to the question period.

3. Conjunction reduction: from gapping to CR

- Observe a parallel between gapping and apparent DP conjunction:

(11) **Gapping**
John saw every student and Mary every professor.
⇝ the verb *saw* is only pronounced once.

(12) **Apparent DP conjunction**
John saw every student and every professor.
⇝ the subject *John* and the verb *saw* are only pronounced once.

> **Claim (cf. Wilder 1994, Schwarz 1999):**
> Mechanisms proposed for gapping also provide a CR analysis for (12).

The derivation for gapping (after Johnson 1996, 2009, 2014):

(13) Step 1: *v*Ps are conjoined below a shared T
$[_{TP}$ T $[_{vP}$ John saw every student] [and $[_{vP}$ Mary saw every professor]]]

(14) Step 2: *John* A-moves to spec-TP out of the left conjunct
$[_{TP}$ John$_1$ T $[_{vP}$ t_1 saw every student] [and $[_{vP}$ Mary saw every professor]]]

- Additional PF steps derive the surface string, after Coppock (2001):

(15) Step 3: *every professor* evacuates the VP in the right conjunct (at PF, after Weir 2014)
$[_{TP}$ John$_1$ T $[_{vP}$ t_1 saw every student] [and $[_{vP}$ Mary $[_{VP}$ saw $t_2]$ every professor$_2$]]]

(16) Step 4: the VP in the right conjunct elides
$[_{TP}$ John$_1$ T $[_{vP}$ t_1 saw every student] [and $[_{vP}$ Mary $[_{VP}$ ~~saw t_2~~] every professor$_2$]]]

The derivation for CR = gapping, but with ATB movement at step 2

(17) Step 1: *v*Ps are conjoined below a shared T; the subject of both *v*Ps is *John*
$[_{TP}$ T $[_{vP}$ John saw every student] [and $[_{vP}$ John saw every professor]]]

(18) Step 2: *John* moves across-the-board ('ATB') to spec-TP out of both conjuncts
$[_{TP}$ John$_1$ T $[_{vP}$ t_1 saw every student] [and $[_{vP}$ t_1 saw every professor]]]

(19) Step 3 (PF): *every professor* evacuates the VP in the right conjunct
$[_{TP}$ John$_1$ T $[_{vP}$ t_1 saw every student] [and $[_{vP}$ t_1 $[_{VP}$ saw $t_2]$ every professor$_2$]]]

(20) Step 4 (PF): the VP in the right conjunct elides
$[_{TP}$ John$_1$ T $[_{vP}$ t_1 saw every student] [and $[_{vP}$ t_1 $[_{VP}$ ~~saw t_2~~] every professor$_2$]]]

- The interpreted structure is the one in step 2, prior to the PF steps:

(21) **Interpreted structure**
$[_{TP}$ John λ1 $[_{vP1}$ t_1 saw every professor] [and $[_{vP2}$ t_1 saw every student]]]

(22) **The conjuncts have type t meanings**
a. $[\![vP_1]\!]^{w,g} = 1$ iff ∀x [student(x) → g(1) saw x in w]
b. $[\![vP_2]\!]^{w,g} = 1$ iff ∀y [professor(y) → g(1) saw y in w]

(23) **The basic meaning of *and* composes**
$[\![\text{and}]\!]^{w,g} = \lambda p_t . \lambda q_t . p = q = 1$

(24) **The &P has a type t meaning**
$[\![\&P]\!]^{w,g} = [\![\text{and}]\!]^{w,g}([\![vP_1]\!]^{w,g})([\![vP_2]\!]^{w,g})$
= 1 iff ∀x [student(x) → g(1) saw x in w] & ∀y [professor(y) → g(1) saw y in w]

(25) **Predicate Abstraction is triggered**
$[\![\bullet]\!]^{w,g} = \lambda z .$ ∀x [student(x) → z saw x in w] & ∀y [professor(y) → z saw y in w]

(26) **The derived predicate is applied to *John*, yielding the correct truth-conditions**
$[\![(21)]\!]^{w,g} = [\![\bullet]\!]^{w,g}$(John)
= 1 iff ∀x [student(x) → John saw x in w] & ∀y [professor(y) → John saw y in w]

Key properties of the CR analysis:
- Apparent conjunction of object DPs is conjunction of *v*Ps; *and* composes in its basic meaning.
- The subject ATB moves to spec-TP.
- Gapping and CR are two symptoms of the same phenomenon.

4. Case 1: Split scope

- Consider (27), in a context where John is planning to visit a single city.

(27) John refused to visit any city in Europe and any city in Asia.[3]
⇝ Four scope operators: *refuse*, *and*, *any city in Europe*, *any city in Asia*

(28) **Available interpretation**
John refused to visit any city in Europe and he refused to visit any city in Asia.

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

¬∃w' ∈ W(John)(w_0) [∃x [city-in-Europe(x) & John visits x in w']]
& ¬∃w'' ∈ W(John)(w_0) [∃y [city-in-Asia(y) & John visits y in w'']]

- On this reading, *and* scopes above *refuse* (i.e. *refuse* occurs separately in each conjunct), and the quantificational DPs — *any city in Europe* and *any city in Asia* — each scope below *refuse*.

[3] Some informants have reported a preference to convey this reading with *or* (*John refused to visit any city in Europe **or** any city in Asia*). There are ways of clarifying the intuition with *and*, including: insertion of a prosodic boundary (*John refused to visit any city in Europe || and any city in Asia*), and addition of *possibly* (*John refused to visit any city in Europe and possibly any city in Asia)*.

The signature of split scope: *and* scopes *above* an operator, and the DPs that *and* apparently conjoins scope *below* that same operator.

The split scope signature replicates with a range of embedded nominals

- A different sort of example (due to Irene Heim):

(30) This plant is easy to take care of! It needs little water and little sunlight.

(31) ***Little* can be decomposed into *not much***
a. This plant needs little water.
b. It is **not** the case that this plant **needs** **much** water. *(not > need > much)*

(32) **Paraphrase of (30)**
It's not the case that this plant needs much water, and it's not the case that this plant needs much sunlight.

(33) **Scope: *and* > *not* > *need* > *much***
$\neg \forall w'\ [w' \in N(plant)(w_0) \rightarrow$ the plant receives much water in w'$]$
& $\neg \forall w''\ [w'' \in N(plant)(w_0) \rightarrow$ the plant receives much sunlight in w''$]$

- The split scope signature obtains: *and* scopes above *need*, and the *much* component of *little* in the DPs *and* apparently conjoins (*little water*, *little sunlight*) scopes below *need*.

Analytic question: which of CR, the DP analysis, or both can derive split scope?

CR can derive split scope

- An available CR structure for (27):

(34) $[_{TP}$ John$_1$ T $[_{\&P}\ [_{vP1}\ t_1$ refused PRO to visit any city in Europe]
and $[_{vP2}\ t_1$ refused PRO to visit any city in Asia$]]]$

(35) **The quantifiers can QR below *refuse* within each conjunct**
$[_{TP}$ John$_1$ T $[_{\&P}\ [_{vP1}\ t_1$ refused $[_{TP}$ any city in Europe$_2$ $[_{TP}$ PRO visit $t_2]]$
[and $[_{vP2}\ t_1$ refused $[_{TP}$ any city in Asia$_3$ $[_{TP}$ PRO visit $t_3]]]]]$

- Given the structure in (35), split scope derives:

(36) **The quantifiers scope below *refuse* in each conjoined *v*P**
a. $[\![vP_1]\!]^{w,g} = 1$ iff $\neg \exists w' \in W(John)(w)\ [\exists x$ [city-in-Europe(x) & g(1) visits x in w']]
b. $[\![vP_2]\!]^{w,g} = 1$ iff $\neg \exists w' \in W(John)(w)\ [\exists y$ [city-in-Asia(y) & g(1) visits y in w']]

(37) ***And* scopes above *refuse*: *refuse* occurs separately in each conjunct**
$[\![\&P]\!]^{w,g} = [\![\text{and}]\!]^{w,g}([\![vP_1]\!]^{w,g})([\![vP_2]\!]^{w,g})$
$= 1$ iff $\neg \exists w' \in W(John)(w)\ [\exists x$ [city-in-Europe(x) & g(1) visits x in w']]
& $\neg \exists w'' \in W(John)(w)\ [\exists y$ [city-in-Asia(y) & g(1) visits y in w'']]

(38) **Predicted meaning: *and* > *refuse* > *any city in Europe, any city in Asia***
$[\![(35)]\!]^{w,g}$ = 1 iff ¬∃w' ∈ W(John)(w) [∃x [city-in-Europe(x) & John visits x in w']]
& ¬∃w'' ∈ W(John)(w) [∃y [city-in-Asia(y) & John visits y in w'']]

The DP analysis does not derive split scope

- The structure for (27) according to the DP analysis:

(39) John refused to visit [$_{\&P}$ [$_{DP}$ any city in Europe] [and [$_{DP}$ any city in Asia]]]

- The &P has a quantificational meaning — so must QR.

(40) $[\![\&P]\!]^{w,g} = \lambda f_{et} . \exists x$ [city-in-Europe(x) & f(x)] & ∃y [city-in-Asia(y) & f(y)]

- Because the &P QRs as a constituent, split scope does not derive: *and* and the quantifiers either each scope above *refuse*, or each scope below.

- **If &P QRs above *refuse*:**

(41) [$_{TP}$ [$_{\&P}$ any city in Europe and any city in Asia] λ1 [$_{TP}$ John refused [$_{TP1}$ PRO to visit t_1]]]

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

∃x [city-in-Europe(x) & ¬∃w' ∈ W(John)(w_0) [John visits x in w']
& ∃y [city-in-Asia(y) & ¬∃w'' ∈ W(John)(w_0) [John visits y in w'']]

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

– This reading is unavailable: for NPI *any* to be licensed, the quantifiers must be in the scope of *refuse*.

- **If &P QRs below *refuse*:**

(43) [$_{TP3}$ John refused [$_{TP2}$ [$_{\&P}$ any city in Europe and any city in Asia] λ1 [$_{TP1}$ PRO to visit t_1]]]

(44) **Scope: *refuse* > *and* > *any city in Europe, any city in Asia***
¬∃w' ∈ W(John)(w_0) [∃x [city-in-Europe(x) & John visits x in w']
& ∃y [city-in-Asia(y) & John visits y in w']]

'What John refused was for there both to be some city in Europe that he visits and some city in Asia that he visits.'

– This reading should also be unavailable[4]: *and* scopes between *refuse* and the quantifiers, and *and* is an intervener for licensing of NPI *any* (Linebarger 1987):

(45) *I didn't both drink a cocktail and any soda. (after Guerzoni 2006)

[4] Even if this reading *were* available, it is trivial in the context: it is a premise of the context that John will only visit a single city; since no city is both in Europe and in Asia, (44) trivially follows.

Result: CR is required to derive split scope readings.

5. Case 2: Ellipsis

- Adverbs can appear in a second apparent DP conjunct (cf. Collins 1988):

  (46) a. John saw Bill and, **yesterday**, Sue.
  b. John saw Bill and **perhaps** Sue.

  These examples have been argued to involve CR: Hirsch (in prep) for *yesterday* (see Appendix A), Bogal-Allbritten (2014) for modal adverbs like *perhaps*.

- Focus here: examples with a complex adverbial clause containing an elided VP.

  (47) Harvard invited Labov and, ten years after Brandeis did Δ, Chomsky.
  ⇝ Δ = *invited Chomsky*

  (48) John resembles his father and, though he would rather not Δ, his mother.
  ⇝ Δ = *resembles his mother*

- Assumed licensing condition for VPE :

  — VPE requires an antecedent for the elided VP to be present in the linguistic context.

  — An appropriate antecedent is semantically identical to the elided VP (modulo focus).

  (Sag 1976, Williams 1977, also cf. Rooth 1992, Merchant 2001, 2004, Takahashi & Fox 2005)

- VPE can be licensed by an extra-sentential antecedent:

  (49) a. I can't believe Holly Golightly won't eat rutabagas. (Johnson 2014)
  b. I can't believe Fred won't Δ, either

– (49a) introduces *eat rutabagas* into the linguistic context, and the VP in (49b) is interpreted as *eat rutabagas* and elides under identity with the VP in (49a).

- **But, the examples in (47)-(48) are different:** they do not require *invited Chomsky* or *resembles his mother* to be salient in the extra-sentential context — so, an appropriate antecedent for Δ must be present *intra-sententially*.

Analytic question:
Which of the CR analysis, the DP analysis, or both correctly predict VPE to be licensed in (47)-(48)?

VPE is licensed under CR (illustrated with (47))

- The structure for (47) under CR:

  (50) a. [$_{TP}$ Harvard$_1$ T [$_{vP}$ t_1 invited Labov] [and [$_{vP}$ [$_{CP}$ ...(50b)...] [$_{vP}$ t_1 invited Chomsky]]]]
  b. [$_{CP}$ ten years after [$_{TP}$ Brandeis$_1$ T [$_{vP}$ t$_1$ ~~invited Chomsky~~ Δ]]]
  ⇝ Δ = VP in the right conjunct = *invited Chomsky*

– The conjoined *v*Ps contain the VPs *invited Labov* and *invited Chomsky*; *invited Chomsky* in the right conjunct serves as antecedent for Δ in the adverbial clause.[5]

- On this approach, (47) is parallel to the gapping example:

  (51) Harvard invited Labov, and McGill Chomsky, ten years after Brandeis did Δ.
  ⇝ There is an available reading where Δ = *invited Chomsky*

– The structure for (51) on the relevant reading:

  (52) a. [$_{TP}$ Harvard$_1$ T [$_{vP}$ t_1 invited Labov] [and [[$_{vP}$ McGill invited Chomsky] [$_{CP}$ ...(52b)...]]]
  b. [$_{CP}$ ten years after [$_{TP}$ Brandeis$_1$ T [$_{vP}$ t$_1$ ~~invited Chomsky~~ Δ]]]
  ⇝ Δ = VP in the right conjunct = *invited Chomsky*

VPE is not licensed under the DP analysis

- The structure for (47) under the DP analysis[6]:

  (53) a. [[$_{TP}$ John$_1$ T [$_{vP}$ t$_1$ invited [$_{\&P}$ [$_{DP1}$ Labov] and [$_{DP2}$ Chomsky]]]] [$_{CP}$ …(53b)…]]
  b. [$_{CP}$ ten years after [$_{TP}$ Brandeis$_1$ T [$_{vP}$ t$_1$ ~~invited Chomsky~~ Δ]]]

– In (53), the only available antecedent for Δ is the matrix VP.

  The matrix VP = *invited Labov and Chomsky*, which is not identical to *invited Chomsky*.

  Therefore: the antecedence requirement for VPE is not met with Δ = *invited Chomsky*.

– If Δ *were* interpreted as *invited Labov and Chomsky*, a detectably different interpretation obtains:

  (54) Harvard invited Labov and Chomsky — ten years after Brandeis invited Labov and Chomsky.
  ⇝ (47) is in fact compatible with Brandeis never having invited Labov.

Result: CR, but not the DP analysis, allows for the observed VPE in (47).

[5] The antecedent VP in the right conjunct itself elides at PF, with *Chomsky* its only pronounced remnant. Since the antecedence condition on VPE is taken to be evaluated at LF (e.g. via a presuppositional E-feature, Merchant 2001, 2004), it is unsurprising that ellipsis does not compromise the availability of the VP in the right conjunct to serve as antecedent for Δ.

[6] I assume here that the adverbial clause adjoins on the clausal spine; the conclusions are not compromised, however, if the adverbial clause can also adjoin to DP_2 within the second conjunct: **see Appendix B** for discussion.

6. Case 3: A scope prediction

- Consider the possible scope readings of (55):

  (55) Someone hired a maid and a cook. (adapted from Rooth & Partee 1982, cf. Larson 1985)

- What is the relative scope of the subject *someone* and the conjunction operator?

- ***Someone > and* is available:**

– The sentence can convey that some one person both hired a maid and a cook.

  (56) ∃x [∃y [y is a maid & x hired y]] (*someone* > *and*)
  & ∃z [z is a cook & x hired z]]

- ***And > someone* is not available:**

– The sentence cannot be interpreted like (57), which conveys that someone hired a maid and *potentially someone different* hired a cook.

  (57) Someone hired a maid and someone hired a cook.

  (58) ∃x ∃y [y is a maid & x will hire y]] (**and* > *someone*)
  & ∃x' ∃z [z is a cook & x' will hire z]]

- The intuition replicates:

  (59) Some woman married some criminal and some prince.

  (60) Someone read more than one poem and more than one essay. (cf. Takahashi 2006)

Analytic question:
Which of CR, the DP analysis, or both predict the data: ✓*someone > and*, **and > someone*?

The data are consistent with CR

- Suppose CR were the only analysis. Because CR involves *v*P co-ordination, a prediction follows:

Conjunction Scope Generalization
Scope possibilities in apparent DP conjunction should track scope possibilities in overt *v*P conjunction.

- The datum in (55) is then expected, as it tracks overt *v*P conjunction:

  (61) Someone hired a maid and fired a cook.
  ⇝ Unambiguous, like (55): *someone > and*, **and > someone*

- CR predicts (55) — and links this example to a more general question: **what regulates the relative scope of *someone* and *and* in *v*P conjunction?**

– *Someone* > *and* straightforwardly derives: because *someone* has ATB moved to spec-TP, there is a single occurrence of *someone* scoping above the *v*P conjunction.

(62) $[_{TP}$ someone λ1 T $[_{\&P}$ $[_{vP1}$ t_1 hired a maid]
[and $[_{vP2}$ t_2 hired a cook]]]]

– *And* > *someone* requires ATB reconstruction:

(63) $[_{TP}$ T $[_{\&P}$ $[_{vP1}$ someone hired a maid]
[and $[_{vP2}$ someone hired a cook]]]]

– The distribution of *and* > *someone* follows from constraints on ATB reconstruction, e.g. Fox (2000) proposes that ATB reconstruction is constrained by principles of **scope economy**.

- A further correct prediction of the Conjunction Scope Generalization:

– In overt *v*P conjunction, *and* > *someone* is enabled by replacing *a* with *every*:

(64) Someone hired every maid and fired every cook.

(65) **Possible readings of (64): (a) *someone* > *and*, (b) *and* > *someone***
a. Some one person hired every maid and fired every cook
b. For every maid, someone hired them, and for every cook, someone fired them.

– The pattern is tracked in apparent DP conjunction:

(66) Someone hired every maid and every cook. (*someone* > *and, and* > *someone)*

- More work is needed to assess if the Conjunction Scope Generalization fully holds and, if not, where it does and does not hold.[7]

The DP analysis

- Structure for (55) under the DP analysis:

(67) $[_{TP}$ someone hired $[_{\&P}$ $[_{DP}$ a maid] [and $[_{DP}$ a cook]]]]

- *Someone* > *and* and *and* > *someone* can be derived by QRing the conjunction to different positions:

(68) **If the conjunction QRs below *someone***
$[_{TP}$ someone λ1 T $[_{vP}$ $[_{\&P}$ a maid and a cook] λ2 $[_{vP}$ t_1 read t_2]]]
⇝ Predicted meaning: *someone* > *and*

[7] Although all of the examples discussed in this section involve quantificational DPs, apparent conjunction of referential DPs, where non-Boolean *and* may also be an available analysis, should be considered. One example from the literature does show *and* > *someone* (*A 9mm bullet killed the first victim and the last victim*.) (Zamparelli 2011), and it is not clear whether the intuition replicates with overt *v*P conjunction (*A 9mm pierced the first victim and killed the last victim*.). I am grateful to an anonymous reviewer for drawing my attention to this example.

(69) **If the conjunction QRs above *someone***
$[_{TP}\ [_{\&P}$ a maid and a cook] λ1 $[_{TP}$ someone λ2 $[_{vP}\ t_2$ read $t_1]]]$
⇝ Predicted meaning: *and* > *someone*

- It appears that the DP analysis over-generates *and* > *someone*, in which case it must be *unavailable* if the absence of *and* > *someone* is to be accounted for.

- To maintain the DP analysis, a constraint on QR prohibiting the structure in (69) would be needed.

Results:

— Combined with an independently needed theory of ATB reconstruction in *v*P co-ordination, the proposed CR analysis is adequately restrictive so as to predict the scope readings of (55).

— The DP analysis may over-generate, depending on how QR is constrained; in so far as it *does* over-generate, it must be excluded — **CR *may* be the only analysis in at least some examples**.

7. Outlook

- This talk has demonstrated that:

  ❶ **CR is expected to be available, given independently proposed mechanisms for gapping.**

  ❷ **Empirical evidence supports the availability of CR.**

  CR is needed to derive split scope readings (Case 1).

  CR is needed to license VPE in examples with complex adverbial clauses (Case 2).

  ❸ **CR may be the *only* available analysis, at least in some examples.**

- This study opens several avenues of research to generalize its results.

- **Open issue: mechanisms:** the full range of CR mechanisms and constraints on their distribution, both in English and cross-linguistically, remains to be explored.

– To illustrate within English, consider an apparent conjunction of *subject* DPs:

(70) Every student ~~played canasta~~ and every professor played canasta.

– Gapping is restricted to occur in a second conjunct, (71), so (70) must receive a different analysis if it is to be analyzed with CR (e.g. Right Node Raising after Schein 2014)

(71) a. John saw every student and Mary every professor.
b. *John every student and Mary saw every professor.

- **Open issue: collective predication:** a well-known challenge for CR:

  (72) John and Mary met.

  (73) *John met and Mary met.

- Schein (2014) suggests a CR analysis in event semantics, where (72) receives a different translation from (73), as in (74)-(75). Further work is needed to integrate Schein's proposal with the syntactic/semantic framework I have assumed.

  (74) ∃e [John is a participant in e & Mary is a participant in e & e is a meeting event] (=72)

  (75) ∃e [John is a participant in e & e is a meeting event] (=73)
  & ∃e' [Mary is a participant in e' & e' is a meeting event]

- The present contribution is not designed to *solve* the collective prediction problem — but to provide urgency for *asking the question* of how to analyze (72) with CR.

References

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Appendix A: an argument for CR with *yesterday*

- Consider the example introduced in Section 5 with *yesterday* in a second conjunct:

  (76) John saw Labov and, **yesterday**, Chomsky.

  (77) **The DP analysis**
  $[_{TP}$ Harvard$_1$ $[_{vP}$ t_1 invited $[_{\&P}$ $[_{DP1}$ Labov] and [yesterday $[_{DP}$ Chomsky]]]]]
  ⇝ *Yesterday* adjoins to the DP in the right conjunct.

  (78) **The CR analysis**
  $[_{TP}$ Harvard$_1$ $[_{\&P}$ $[_{vP}$ t_1 invited Labov] [and $[_{vP}$ yesterday $[_{vP}$ t_1 invited Chomsky]]]]]
  ⇝ *Yesterday* adjoins to the *v*P in the right conjunct.

- Notable difference: the DP analysis, but not CR entails that *yesterday* can adjoin to DPs.

- **Empirical observations:**

  When yesterday linearly precedes an object DP *outside of conjunction* that DP must be heavy ('heavy NP shift').

  (79) a. ??John saw, yesterday, Chomsky.
  b. John saw Chomsky yesterday.

(80) a. John saw, yesterday, the happy professor with long hair.
b. John saw the happy professor with long hair yesterday.

- The weight effect neutralizes *in a second conjunct*: (76) is natural even though *Chomsky* is light.

- **The pattern cannot be easily understood on the DP analysis:**

- If *yesterday* is adjoined to the DP *Chomsky* in (76), per (77), we must conclude that *yesterday* can adjoin to a DP when that DP is light.

- The weight effect should not then be observed outside of conjunction either, as (79a) would have an available parse:

(81) $[_{TP}$ Harvard$_1$ $[_{vP}$ t_1 invited [yesterday $[_{DP}$ Chomsky]]]]

⇝ *Yesterday* is adjoined to the DP *Chomsky*, parallel to in (77).

- **The pattern *can* be understood under CR:**

- **Outside of conjunction:** the CR structure in (78) is compatible with *yesterday* never adjoining to DPs, in which case the only available structure for (79a) is:

(82) $[_{TP}$ $[_{TP}$ $[_{TP}$ Harvard$_1$ $[_{vP}$ t_1 invited t_2]] yesterday] Chomsky$_2$]

⇝ *Yesterday* is right adjoined on the clausal spine; *Chomsky* extraposes to its right.

The weight effect can be understood as a constraint on rightward extraposition. E.g. extraposition may be regulated by processing considerations and motivated only when the DP is heavy.

- **In a second conjunct:** it is unsurprising that the weight effect neutralizes. In order to escape ellipsis, *Chomsky* must move to escape ellipsis:

(83) $[_{TP}$ Harvard$_1$ $[_{\&P}$ $[_{vP}$ t_1 invited Labov] [and $[_{vP}$ yesterday $[[_{vP}$ t_1 ~~invited~~ t_2] Chomsky$_2$]]]]]

The movement in (83) differs in important ways from the movement in (82). Most critically, this movement is *not* motivated by processing considerations. Assuming that *Labov* and *Chomsky* contrast and are both focused, movement in (83) is likely due to a grammatical constraint against eliding focused material, which would apply regardless of the weight of the focused constituent.

- **Conclusion:** the CR analysis, but not the DP analysis, provides a way of understanding the observed weight effect outside of conjunction and its neutralization in a second conjunct.

Appendix B: more on ellipsis under the DP analysis

- The assumption above was that the adverbial clause adjoins on the clausal spine, repeated:

(84) a. $[[_{TP}$ John$_1$ T $[_{vP}$ t_1 invited $[_{\&P}$ $[_{DP1}$ Labov] and $[_{DP2}$ Chomsky]]]] $[_{CP}$ …(84b)…]]
b. $[_{CP}$ ten years after $[_{TP}$ Brandeis$_1$ T $[_{vP}$ t_1 ~~invited Chomsky~~ Δ]]]

- A second possibility is that the adverbial clause adjoins to DP_2 in the second conjunct:

(85) a. John$_1$ [$_{VP}$ invited [$_{\&P}$ [$_{DP}$ Labov] [and [[$_{CP}$ …(85b)…] [$_{DP2}$ Chomsky]]]]]
b. [$_{CP}$ ten years after [$_{TP}$ Brandeis$_1$ T [$_{vP}$ t$_1$ ~~invited Chomsky~~ Δ]]]

- Given this structure, there is a problem of **antecedent containment**. The only VP available to serve as antecedent for Δ is the matrix VP: *invited Labov and, ten years after Brandeis did Δ, Chomsky*. The problem is that Δ is properly contained in the matrix VP, and no two VPs can be identical if one properly contains the other.

- Antecedent contained ellipsis (ACE) is familiar from examples like:

(86) John read [every book which Mary did Δ].

– To resolve ACE, the DP containing the relative clause can QR out of the matrix VP:

(87) [$_{TP}$ [$_{DP}$ every book which Mary did Δ]$_1$ [$_{TP}$ John [$_{VP}$ read t$_1$]]]
⇝ Δ = matrix VP = *invited x*

- Similarly, ACE can be resolved in (84) by QRing the conjunction out of the matrix VP:

(88) a. [$_{TP}$ [$_{TP}$ John [$_{VP1}$ invited t$_1$]] [$_{\&P}$ Labov and [$_{CP}$ …(88b)…] Chomsky]$_1$]
b. [$_{CP}$ ten years after [$_{TP}$ Brandeis$_1$ T [$_{vP}$ t$_1$ ~~invited Chomsky~~ Δ]]]
⇝ Δ = *invited Chomsky*; matrix VP = *invited x*; ellipsis is not licensed

- The last attempt to license ellipsis: also QR *Chomsky* out of the VP in the adverbial clause:

(89) a. [$_{TP}$ [$_{TP}$ John [$_{VP1}$ invited t$_1$]] [$_{\&P}$ Labov and [$_{CP}$ …(89b)…] Chomsky]$_1$]
b. [$_{CP}$ ten years after [$_{TP}$ [$_{TP}$ Brandeis [$_{VP}$ invited t$_1$]] [$_{DP}$ Chomsky]$_1$]]
⇝ Δ = matrix VP = *invited x*

– Movement in (89b) must be covert; if movement were overt, *Chomsky* would be external to the VP at PF and, therefore, would survive ellipsis, yielding the incorrect surface string:

(90) John invited Labov and, ten years after Brandeis did Chomsky, Chomsky.
⇝ This is not the observed string in the original example in (47).

– There is independent evidence that VPE cannot be licensed via the movement in (89).

- **The descriptive profile of (89):** an XP is moved out of the matrix VP (the &P) and an XP is moved out of the VP in the adverbial clause (the DP *Chomsky*) to create VPs which appear identical (*invited x*). Of particular importance, the two XPs that are moved are **non-identical** (&P ≠ DP *Chomsky*)

- Ellipsis is not licensed in parallel configurations:

(91) **Interpretation of the elided VP in (a) indicates (b) does not license VPE**
a. John saw Bill and Fred did Δ. *(Δ must = 'saw Bill'; Δ cannot = 'saw Sue')*
b. [$_{\&P}$ [$_{TP}$ [$_{TP}$ John [$_{VP1}$ invited t_1]] $Bill_1$] [and [$_{TP}$ [$_{TP}$ John [$_{VP1}$ invited t_2]] Sue_2]]]
⇝ *Bill* moves out of the right conjunct; *Sue* moves out of the left conjunct; *Bill* ≠ *Sue*

(92) **Sauerland's contrast, building on Kennedy (1994)**
a. *I visited [a city near the lake John did <visited x>].
b. I visited [a city near the one John did <visited x>].

- Sauerland provides an account of *why* the moved XPs must be identical in order for VPE to be licensed based on the copy theory of movement.

- **Confirmed conclusion:** the DP analysis cannot predict the observed ellipsis in (47).