Cumulativity in Right Node Raising Construction*

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1 Introduction

This paper argues for a so-called *movement parse* of *right node raising* construction (RNR, Ross 1967). RNR is typically a coordination construction which features a rightmost constituent shared by the two coordinates (1).[1]

(1) a. Abe boiled and Bert fried, **these 50 dumplings**.
b. [[Abe boiled t_1] and [Bert fried t_1]] [these 50 dumplings]$_1$. **Movement parse**

- (1b): The movement parse posits rightward across-the-board (ATB) movement of the *shared item*, *these 50 dumplings*.

The literature provides mainly two types of arguments for the movement parse.

- Various movement constraints are operative in RNR formation (e.g., Bresnan 1974, Postal 1998, Sabbagh 2007).
- The shared item can be interpreted as outscoping the coordination (e.g., Jackendoff 1977, Sabbagh 2007).

As an instance of the second type of arguments, this paper investigates how RNR derives so-called *cumulative readings* or cumulative relation/cumulativity.

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[1]The acceptability judgements for the original data reported on this paper are those of several native speakers I consulted through questionnaires and informal interviews.

Goal:

- Demonstrate that the availability of cumulative readings supports the movement parse.
  - Hirsch and Wagner (2015) sketch how RNR derives cumulativity. But their analysis undergenerates with respect to a particular RNR with a cumulative reading.
  - Following Schmitt (2019), this paper presents a new analysis of cumulativity/plurals that can capture cumulative readings in a wider range of RNR than Hirsch and Wagner's analysis.

Organization:
Section 2: Define cumulative readings.
Section 3: Introduce three parses of RNR.
Section 4: Discuss Hirsch and Wagner's analysis of cumulative readings in RNR.
Section 5: Present this paper's analysis of cumulative readings.
Section 6: Demonstrate that under the proposed analysis of cumulativity, the movement parse can derive cumulativity in a wide range of RNR.
Section 7: Conclude.

2 Cumulativity

This section defines cumulativity with respect to RNR as in (1).

Schmitt (2019) shows that cumulativity can be observed in sentences with two plurals of various semantic types, as exemplified in (2).

(2) a. [$_A$ Abe and Bert] [$_B$ sank and fell]
 b. **Cumulative reading**:
 Each of Abe and Bert sank or fell and each incident (i.e., sinking and falling) happened to Abe or Bert.

Cumulative readings can be characterized by sentences' truth conditions that refer to particular binary relations between two plurals (see Scha 1981, Link 1983, Krifka 1986 a.o.), as shown in (3) for cumulativity as in (2).

(3) 1 iff $\forall x \in S_A\ \exists f \in S_B\ f(x)=1 \wedge \forall f \in S_B\ \exists x \in S_A\ f(x)=1$
 (S_A and S_B are sets of objects that plurals A and B consist of intuitively.)
 (Schmitt 2019, 8)

With (3) in mind, consider again the RNR in (1), repeated below as (4).

(4) a. [$_A$ Abe boiled and Bert fried], [$_B$ these 50 dumplings].
 b. **Cumulative reading:**
 Abe boiled some of these 50 dumplings, Bert fried some of these 50 dumplings, and each dumpling was boiled by Abe or fried by Bert.

The truth condition of the cumulative reading can be represented in the form of (3) (5).

(5) $1 \text{ iff } \forall x \in \{D_1, ..., D_{50}\}\ \exists f \in \{\text{Abe-boiled'}, \text{Bert-fried}\}\ f(x)=1 \wedge$
$\forall f \in \{\text{Abe-boiled'}, \text{Bert-fried}\}\ \exists x \in \{D_1, ..., D_{50}\}\ f(x)=1$

- *Abe-boiled'/Bert-fried'*: the two properties that A consists of intuitively.
- D_1, ..., D_{50}: contextually salient 50 dumplings that B consists of intuitively.

To sum up, this section defined cumulativity, and showed RNR as in (4) derives cumulativity.

3 Three parses of RNR

This section introduces two parses of RNR other than the movement parse, and demonstrates that they do not seem to derive cumulativity in RNR unlike the movement parse.

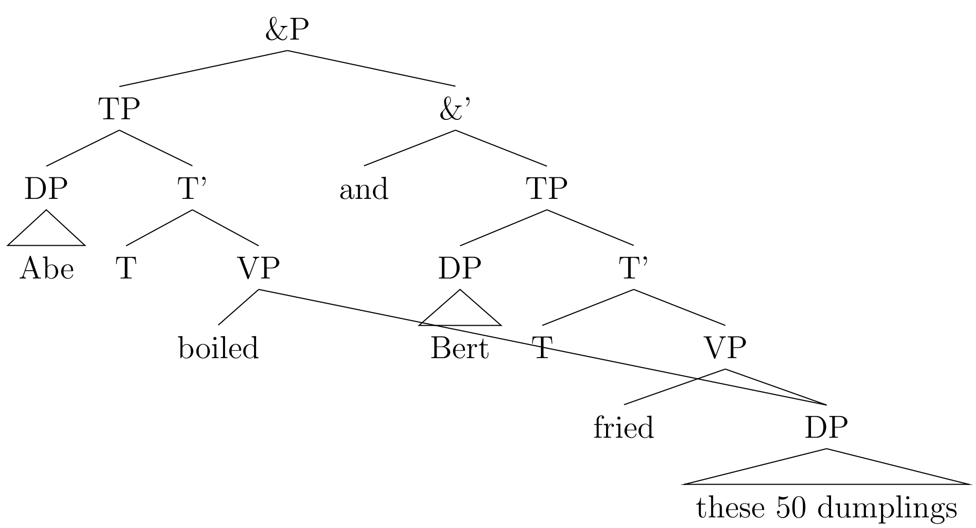
Ellipsis parse:
The ellipsis parse posits backwards PF deletion in the first conjunct, as shown in (6) for (4) (e.g., Wexler and Culicover 1980, Hartmann 2001, An 2007, Ha 2008).

(6) Abe boiled ~~these 50 dumplings~~ and Bert fried these 50 dumplings.

- The ellipsis parse only derives distributivity, just like its purported source sentence.
- In each conjunct, *these 50 dumplings* does not have a plural to cumulatively compose with.

Multi-dominance parse:
The multi-dominance parse, sketched in (7) for (4), posits that the shared item is literally shared by two conjuncts (e.g., Wilder 1999, Bachrach and Katzir 2009a, Grosz 2015).

(7)

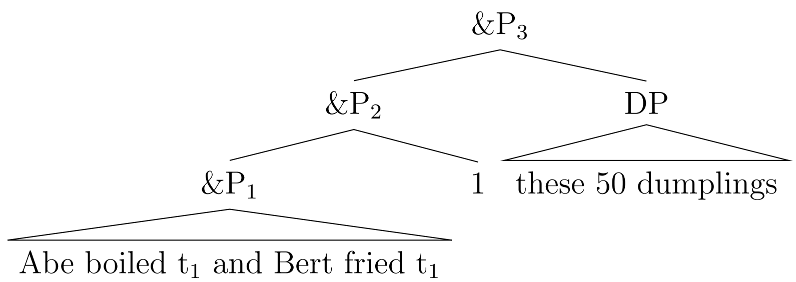


- If the shared item is interpreted as an object of *boiled* and *fried* in each conjunct *separately*, the multi-dominance parse also derives only the distributive reading.

In fact, Grosz (2015) assumes that a shared item in RNR is interpreted in each conjunct separately. Thus, at least his multi-dominance analysis does not predict the presence of cumulativity in RNR.

Movement parse:
The movement parse of (4) is sketched in (8).

(8)



At first sight, the movement pare also seems to derive only distributivity. For example, consider the composition in (8) under the Boolean analysis of English *and*.

- $[\![\&P_1]\!]$ = 1 iff Abe boiled g(1) $\wedge$ Bert fried g(1) (where $1 \in dom(g)$)
- $[\![\&P_2]\!] = \lambda x_e$.Abe boiled x $\wedge$ Bert fried x
- $[\![\&P_3]\!]$ = 1 iff Abe boiled $[\![$these 50 dumplings$]\!]$ $\wedge$ Bert fried $[\![$these 50 dumplings$]\!]$.

However, consider the non-RNR sentence in (9), which can denote a cumulative reading and structurally resembles (8).

(9) [Abe and Bert]$_1$ [[$_{VP}$ sank t$_1$] and [$_{VP}$ fell t$_1$]] **non-RNR**

- The sentence involves a propositional conjunction and a plural DP that has ATB moved from the conjuncts as in (8).
- Whatever mechanism derives the cumulativity in (9) is likely to derive the cumulativity in (8).[2]

To sum up, while the three parses of RNR can all derive distributive readings, only the movement parse seems to be compatible with the availability of cumulative readings.

Question: Can the movement parse indeed derive cumulativity?

I will positively answer this question. We will first observe a previous compositional analysis of cumulativity in RNR.

[2]There are other types of sentences that structurally resemble the movement parse of RNR.

(1) a. Abe boiled and Bert fried, **these 50 dumplings**. **RNR**
b. **Which dumplings** did Abe boil and Bert fry? **wh-question**
c. **These 50 dumplings**, Abe boiled and Bert fried. **Topic sentence**

Interestingly, while (1b) allows a cumulative reading, (1c) does not. I leave the lack of cumulativity in topic sentences for future research.

4 Hirsch and Wagner (2015)

4.1 Cumulative derivation

Hirsch and Wagner (2015) sketch an analysis of how cumulativity is derived in RNR in (4) based on two assumptions.

Assumption 1: English *and* is optionally analyzed as a non-Boolean *and*.
The non-Boolean *and* can be defined as the type-polymorphous ⊔ in (11), which is based on the notion of *e-conjoinable types* (10).

(10) ***e*-conjoinable types**
e is an e-conjoinable type and if $a_1,...,a_n$ are e-conjoinable types, then $((a_1)...(a_n)t)$ is an e-conjoinable type.

(Schmitt 2019, 12)

(11)
$$X\sqcup Y = \begin{cases} X\oplus Y \text{ if } X,Y \in D_e \\ \\ \lambda Z_a.\exists Z', Z" \ [Z = Z'\sqcup Z" \wedge X(Z') \wedge Y(Z")\ ] \\ \text{if } X,Y \in D_{<a,t>} \text{and } <a,t> \text{ is e-conjoinable} \\ \\ \lambda Z^1, ...,Z^n.\ \exists Z^1, Z^{1"}, ..., Z^{n'}, Z^{n"}[Z^1 = Z^{1'}\sqcup Z^{1"} \wedge ... \wedge Z^n = Z^{n'}\sqcup Z^{n"} \\ \wedge X(Z^{1'})...(Z^{n'}) \wedge Y(Z^{1"})...(Z^{n"})] \\ \text{if } X,Y \in D_{<a_1<...<a_n,t>...>>} \text{ and } <a_1<...<a_n,t>...>> \text{ is e-conjoinable.} \end{cases}$$

(Schmitt 2019, 12)

To understand how the non-Boolean *and* works, consider (12).

(12) $[_A$ Abe and Bert$]$ $[_B$ sank and fell$]$

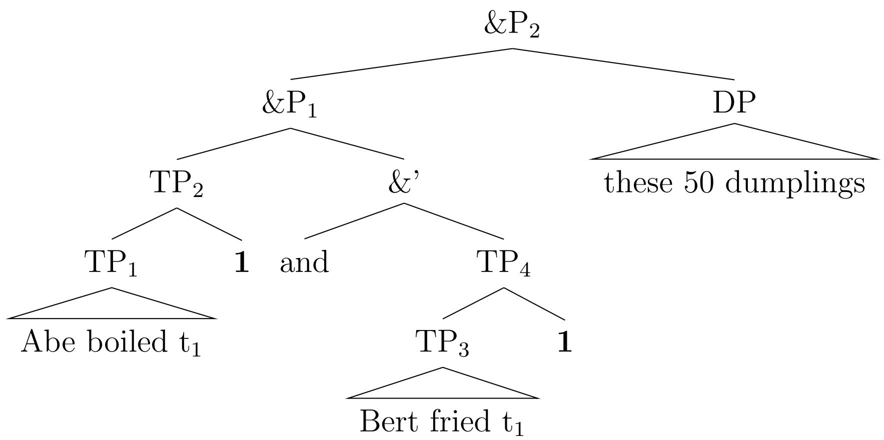
- $[\![$Abe and Bert$]\!]$ = Abe⊕Bert
- $[\![$sank and fell$]\!]$ = $\lambda x_e.\exists y,z[x = y\oplus z \wedge \text{sank'}(y) \wedge \text{fell'}(z)]$
- $[\![(12)]\!]$ = 1 iff $\exists y,z[\text{Abe}\oplus\text{Bert} = y\oplus z \wedge \text{sank'}(y) \wedge \text{fell'}(z)]$

Importantly, the non-Boolean *and* encodes cumulativity in its meaning.

Assumption 2: The movement of a shared item introduces one binder index in each conjunct. Under this assumption, the movement parse of the RNR in (13a) can be illustrated as in (13b).

(13) a. Abe boiled and Bert fried these 50 dumplings.

b.



- There is a binder index *1* under TP_2 and TP_4.

Cumulative derivation in (13a):
Based on the two assumptions above, Hirsch and Wagner (2015) explain how cumulativity is derived in (13a).

- $[\![TP_1]\!]$ = 1 iff Abe boiled g(1)
  = Abe-boiled' **Abbreviation**
- $[\![TP_2]\!]$ = Bert-fried'
- $[\![\&P_1]\!] = \lambda x_e.\exists y,z[x = y \oplus z \wedge \text{Abe-boiled'}(y) \wedge \text{Bert-fried'}(z)]$
- $[\![DP]\!] = D_1 \oplus ... \oplus D_{50}$
- $[\![\&P_2]\!] = 1$ iff $\exists y,z[D_1 \oplus ... \oplus D_{50} = y \oplus z \wedge \text{Abe-boiled'}(y) \wedge \text{Bert-fried'}(z)]$

4.2 Undergeneration problem

Hirsch and Wagner's analysis do not appear to derive cumulativity in RNR as in (14), where the shared item itself is not a plural but *involves* a plural.

(14) a. John says [[that Friederike must t_1] and [that Konrad may t_1]], [record **two quite different songs**]$_1$.

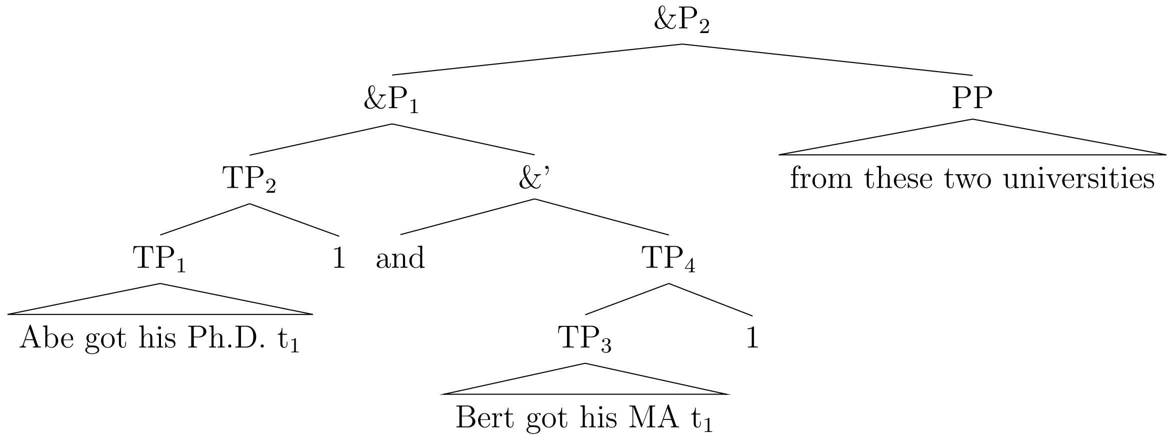
(Abels 2004, 9)

b. [[Abe got his Ph.D. t_1] and [Bert got his MA t_1]] [from **these two universities**]$_1$

- (14b) can mean that Abe got his Ph.D. from one of these two universities and Bert got his MA from the other university.

Hirsch and Wagner's analysis predicts that the RNR in (14) is limited to denoting a distributive reading, as shown in (15).

(15)



- ⟦PP⟧ = from-A⊕B'
- ⟦TP_1⟧ = 1 iff got'(his Ph.D.)(g(1))(Abe) =1
  (assumption: t_1 is a higher type trace)
- ⟦TP_2⟧ = λf_{et}.got'(his Ph.D.)(f)(Abe) =1
- ⟦TP_4⟧ = λf_{et}.got'(his MA)(f)(Bert) =1
- ⟦$\&P_1$⟧ = $\lambda f_{et}.\exists$P,Q[f = P⊕Q ∧ got'(his Ph.D.)(P)(Abe) ∧
  got'(his MA)(Q)(Bert)]
- ⟦$\&P_2$⟧ = 1 iff ∃P,Q[from-A⊕B' = P⊕Q ∧ got'(his Ph.D.)(P)(Abe) ∧
  got'(his MA)(Q)(Bert)]

Problem of Hirsch and Wagner's analysis:

- The shared item does not serve as a plural even if it *involves* a plural.[3]

Solution:

- We devise a mechanism by which a plurality (e.g., *these two university* in (14b)) "projects" to its embedding expression (e.g., *from these two university* in (14b)).
- Schmitt (2019) proposes such a mechanism.
- The next section presents a different analysis of cumulativity, following Schmitt (2019).

The analysis to be proposed adopts all the central tenets of Schmitt's analysis, but departs from her analysis in compositional details.

5 Analysis of cumulativity

This section presents a new analysis of cumulativity following Schmitt (2019). Given that cumulativity is a particular binary relation between two plurals, an analysis of cumulativity can be divided into:

[3]Any analysis of cumulativity which makes use of the non-Boolean *and* does not predict the availability of "long-distance" cumulativity (Schmitt 2019).

- an analysis of plurals (Section 5.1)
- how they compose together to yield cumulativity (Section 5.2)

5.1 Plural set derivation

This paper adopts:

- Intentional semantics (e.g., Lewis 1976)

  e.g., $[\![\text{sink}]\!] = \lambda \text{w}_s.\lambda \text{x}_e.\text{x sinks in w (= sink')}$

  $[\![\text{boil}]\!] = \lambda \text{w}_s.\lambda \text{x}_e.\lambda \text{y}_e.\text{y boils x in w (= boil')}$

- Hamblin semantics

  e.g., $[\![\text{Abe}]\!] = \{\text{Abe}\}$

  $[\![\text{sink}]\!] = \{\text{sink'}\}$

  $[\![\text{Abe sank}]\!] = \{\text{Abe sank}\}$

- Schmitt's cross categorical plurality[4]

  e.g., $[\![\text{Abe and Bert}]\!] / [\![\text{the two students}]\!] = \{\text{Abe, Bert}\}$

  when the contextually salient students are Abe and Bert.

  $[\![\text{sink and fall}]\!] = \{\text{sink', fall'}\}$

  $[\![\text{Abe sank and Bert fell}]\!] = \{\text{Abe sank, Bert fell}\}$

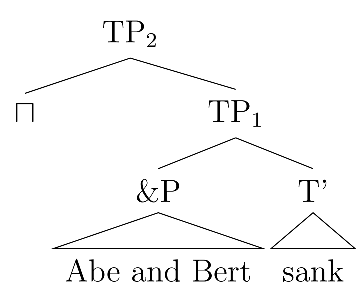
- The conjunctive effect of *and* is due to a separate operator that makes use of the alternatives in plural sets (see Winter 1995 for a related analysis).

5.2 Plural set composition

This section explains how sets in a Hamblin semantics undergo semantic compositions, deriving cumulativity in non-RNR sentences. Consider first the simple sentence with a DP conjunction in (16a) and its structure in (16b).

(16) a. Abe **and** Bert sank.

b.



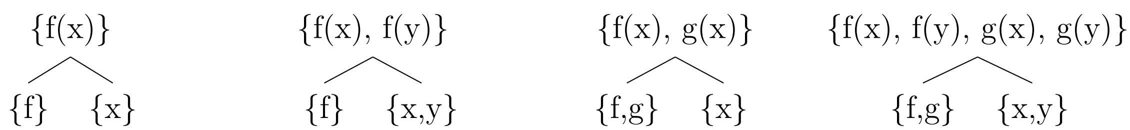
$[\![\text{\&P}]\!] = \{\text{Abe, Bert}\}$

$[\![\text{T'}]\!] = \{\text{sank'}\}$

[4]The ontology of pluralities other than plural individuals is proposed for different semantic types by several linguists (e.g., Landman 2000, Beck and Sharvit 2002, Schlenker 2004, Gawron and Kehler 2004).

$[\![\mathrm{TP}_1]\!]$ = {Abe sank, Bert sank} **PFA**
$[\![\sqcap]\!]$ = $\lambda p_{st}\{\lambda w_s.\forall p_{st}.[p \in [\![\beta]\!]^g \rightarrow p(w) = 1]\}$
$[\![\mathrm{TP}_2]\!]$ = $\{\lambda w_s.\forall p_{st}.[p \in \{\text{Abe sank, Bert sank}\} \rightarrow p(w) = 1]\}$

(17) **Point-wise Functional Application (PFA)**
If α is a branching node whose daughters are a β and γ, and $[\![\beta]\!]^g \subseteq D_\sigma$ and $[\![\gamma]\!]^g \subseteq D_{\sigma\iota}$, then $[\![\alpha]\!]^g = \{f(x)\text{: } f \in [\![\gamma]\!]^g \text{ and } x \in [\![\beta]\!]^g\}$
(adapted from Kratzer and Shimoyama 2017, 127)

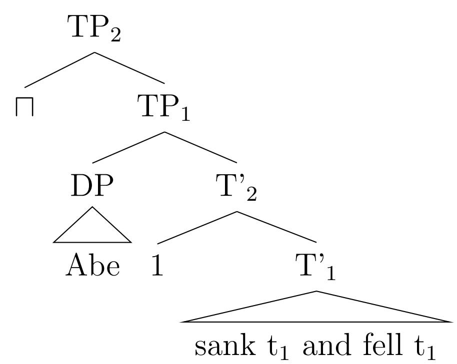


(f and g are functions of type <$\sigma\iota$> and x and y are their arguments of type <σ>.)

- PFA enables the plurality of an expression to be projected to its embedding expression.

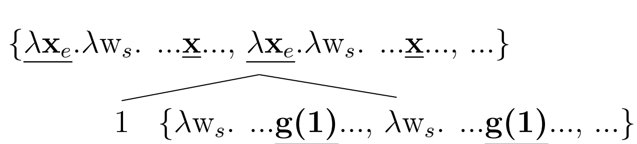
Next, we turn to the sentence with a predicate conjunction in (18).[5]

(18) a. Abe sank **and** fell.
b.



$[\![\mathrm{T'}_1]\!]^g$ = {g(1) sank, g(1) fell}
$[\![\mathrm{T'}_2]\!]^g$ = {sank', fell'} **PPA**
$[\![\mathrm{TP}_1]\!]$ = {Abe sank, Abe fell}
$[\![\mathrm{TP}_2]\!]$ = $\{\lambda w_s.\forall p_{st}.[p \in \{\text{Abe sank, Abe fell}\} \rightarrow p(w) = 1]\}$

(19) **Point-wise Predicate Abstraction (PPA)**[6]
If α is a branching node whose daughters are an index i and β, where $[\![\beta]\!]^g \subseteq D_\sigma$, then $[\![\alpha]\!]^g = \{f\text{: } f \in D_{<e\sigma>}\ \&\ \forall a\ [f(a) \in [\![\beta]\!]^{g[a/i]}]\}$
(Kratzer and Shimoyama 2017, 127)



[5] (18b) is one of the possible structures. For instance, it is possible that $\sqcap$ applies to &P instead of TP_1.
[6] See Shan (2004), Romero and Novel (2013), Charlow (2019) among others for discussion about the point-wise predicate abstraction defined in (19).

(20) **Composition of 1 and T'$_1$ in (18)**

$\{\underline{\lambda \mathbf{x}_e}.\lambda w_s.\underline{\mathbf{x}}$ sank in w, $\underline{\lambda \mathbf{x}_e}.\lambda w_s.\underline{\mathbf{x}}$ fell in w$\}/\{$sank', fell'$\}$

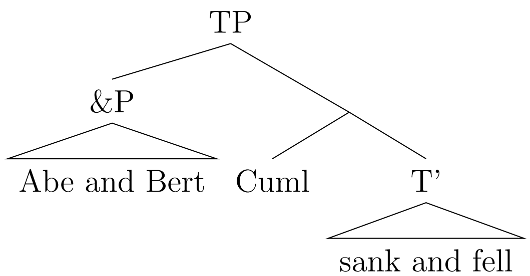
1 $\{\lambda w_s.\underline{\mathbf{g(1)}}$ sank in w, $\lambda w_s.\underline{\mathbf{g(1)}}$ fell in w$\}/\{$g(1) sank, g(1) fell$\}$

Finally, we turn to a non-RNR sentence with cumulativity (21).

(21) Abe and Bert sank and fell.
$[\![$Abe and Bert$]\!]$ = {Abe, Bert}
$[\![$sank and fell$]\!]$ = {sank', fell'} **See (18b)**

To derive a cumulation between {Abe, Bert} and {sank', fell'}, this paper assumes a Cuml operator which takes two plural sets and returns a singleton set of a proposition.

(22)



$[\![\text{Cuml}]\!] = \lambda X.\lambda Y.\{\lambda w_s.\forall x{\in}X\ \exists y{\in}Y\ x(y)(w) = 1\ \&\ \forall y{\in}Y\ \exists x{\in}X\ x(y)(w) = 1\}$

$[\![\text{TP}]\!] = \{\lambda w_s.\forall x{\in}\{\text{sank', fell'}\}\ \exists y{\in}\{\text{Abe, Bert}\}\ x(y)(w) = 1$
$\&\ \forall y{\in}\{\text{Abe, Bert}\}\ \exists x{\in}\{\text{sank', fell'}\}\ x(y)(w) = 1\}$

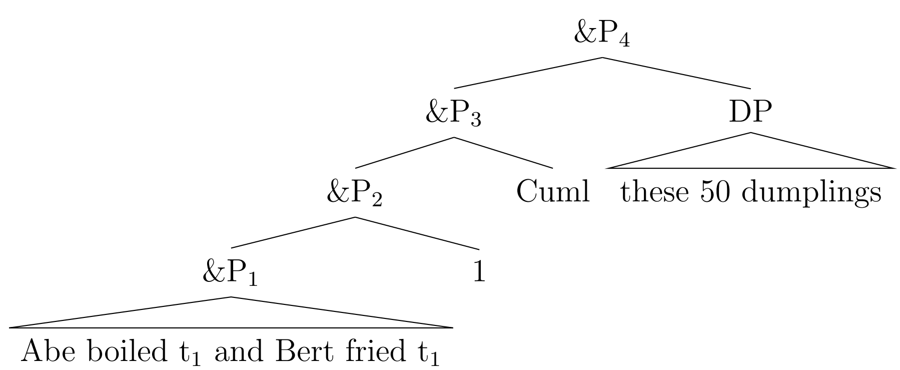
6 Cumulativity in RNR

This section demonstrate that the movement parse can derive any types of cumulativity in RNR we have observed so far based on the the analysis of cumulativity in Section 5.

We first adress the cumulativity in RNR with a shared DP in (23a).

(23) a. Abe boiled and Bert fried these 50 dumplings.

b.



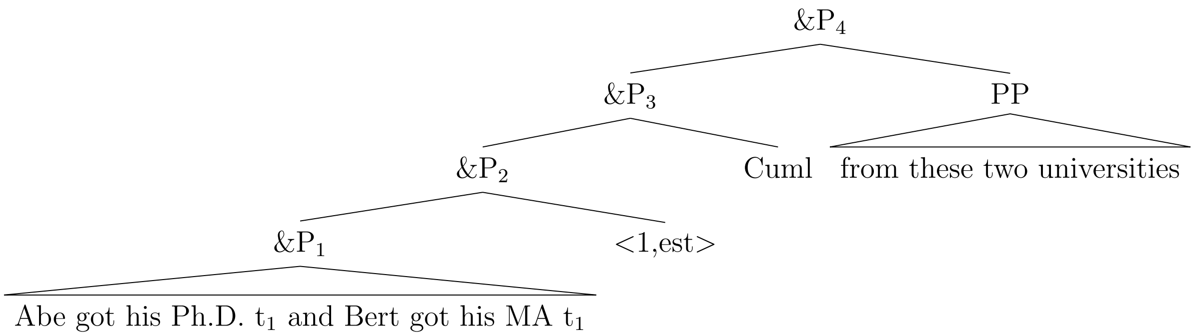
$[\![\&P_1]\!]^g$ = {Abe boiled g(1), Bert fried g(1)}
$[\![\&P_2]\!]^g$ = {Abe-boiled', Bert-fried'}
$[\![$these 50 dumplings$]\!]$ = $\{D_1, ..., D_{50}\}$
$[\![\&P_4]\!]^g = \{\lambda w_s.\forall x{\in}\{\text{Abe-boiled', Bert-fried'}\}\ \exists y{\in}\{D_1, ..., D_{50}\}\ x(y)(w) = 1$
$\&\ \forall y{\in}\{D_1, ..., D_{50}\}\ \exists x{\in}\{\text{Abe-boiled', Bert-fried'}\}\ x(y)(w) = 1\}$

As for the distributive reading of (23a), we can derive it by composing &P_2 and DP in (23b) by the PFA, and applying $\sqcap$ to the resulting set.

Next, we turn to the cumulativity in RNR with a shared T', which Hirsch and Wagner's analysis of cumulativity in RNR could not derive.

(24) a. [[Abe got his Ph.D. t_1] and [Bert got his MA t_1]] [from these two universities]$_1$

b.



Suppose that *these two universities* refers to two universities A and B.

$[\![\text{PP}]\!]^g$ = {from-A', from-B}

$[\![\&\text{P}_1]\!]^g$ = {got'(his Ph.D.)(g(1))(Abe), got'(his MA)(g(1))(Bert)}
(assumption: t_1 is a higher type trace)

$[\![\&\text{P}_2]\!]^g$ = {$\lambda f_{<e,st>}.\lambda w_s$. got'(his Ph.D.)(f)(Abe)(w), $\lambda f_{<e,st>}.\lambda w_s$. got'(his MA)(f)(Bert)(w)} **Revised PPA**
= {Abe-got-his-Ph.D.', Bert-got-his-MA'} **Abbreviation**

$[\![\&\text{P}_4]\!]^g$ = {$\lambda w_s.\forall$x$\in${Abe-got-his-Ph.D.', Bert-got-his-MA'} $\exists$y$\in${from-A', from-B'} x(y)(w) = 1 & $\forall$y$\in${from-A', from-B'} $\exists$x$\in${Abe-got-his-Ph.D.', Bert-got-his-MA'} x(y)(w) = 1}

(25) **Revised Point-wise Predicate Abstraction (Revised PPA)**
If α is a branching node whose daughters are an $<n,\sigma>$, where n is a natural number and σ is a semantic type, and β, where $[[\beta]]^{w,g} \subseteq D_\iota$, then $[[\alpha]]^{w,g} = \{f\text{: } f \in D_{<\sigma\iota>} \ \& \ \forall a \ [f(a) \in [[\beta]]^{w,g^{[a/<n,\sigma>]}}]\}$

In this way, under this paper's analysis of cumulativity, the movement parse can derive cumulativity in (24) as well.

7 Conclusion

- The movement parse must be a possible structure for RNR.
  - Among the three parses of RNR, only the movement parse can derive the cumulativity.
  - The movement parse can also derive distributive readings of RNR which the other two parses derive.
- Based on Schmitt's analysis of cumulativity, I proposed a more straightforward analysis, which can still derive the same range of data as her analysis.

- It remains to be seen if an ellipsis or multi-dominance parse is still needed given that RNR is not subject to certain movement constraints (e.g., McCloskey 1986, Bachrach and Katzir 2009b) (see Abels 2004, Sabbagh 2007, Hirsch and Wagner 2015 for some discussions)

References

Abels, K. (2004). Right node raising: Ellipsis or across the board movement? GLSA.

An, D.-H. (2007). *Syntax at the PF interface: Prosodic mapping, linear order, and deletion.* Ph. D. thesis, University of Connecticut Storrs, CT.

Bachrach, A. and R. Katzir (2009a). Right-node raising and delayed spellout. *InterPhases. Oxford University Press, Oxford*.

Bachrach, A. and R. Katzir (2009b). Right-node raising and delayed spellout. *InterPhases. Oxford University Press, Oxford*.

Beck, S. and Y. Sharvit (2002). Pluralities of questions. *Journal of Semantics 19*(2), 105–157.

Bresnan, J. W. (1974). The position of certain clause-particles in phrase structure. *Linguistic Inquiry 5*(4), 614–619.

Charlow, S. (2019). ∃-closure and alternatives. *Linguistic Inquiry*.

Gawron, J. M. and A. Kehler (2004). The semantics of respective readings, conjunction, and filler-gap dependencies. *Linguistics and Philosophy 27*(2), 169–207.

Grosz, P. G. (2015). Movement and agreement in right-node-raising constructions. *Syntax 18*(1), 1–38.

Ha, S. (2008). *Ellipsis, right node raising, and across-the-board constructions.* Ph. D. thesis, Boston University Boston, MA.

Hartmann, K. (2001). *Right node raising and gapping: Interface conditions on prosodic deletion.* John Benjamins Publishing.

Hirsch, A. and M. Wagner (2015). Right node raising, scope, and plurality. In *Proceedings of the 20th Amsterdam Colloquium*, pp. 187–196.

Jackendoff, R. (1977). X syntax: A study of phrase structure. *Linguistic Inquiry Monographs Cambridge, Mass* (2), 1–249.

Kratzer, A. and J. Shimoyama (2017). Indeterminate pronouns: The view from japanese. In *Contrastiveness in information structure, alternatives and scalar implicatures*, pp. 123–143. Springer.

Krifka, M. (1986). *Nominalreferenz und Zeitkonstitution: Zur Semantik von Massentermen, Pluraltermen und Aspektklassen.* Ph. D. thesis, Universität München.

Landman, F. (2000). Events and plurality: The jerusalem lectures. vol. 76. *Boston, MA: Kluwer Academic Pub. doi 10*, 978–94.

Lewis, D. (1976). General semantics. In *Montague grammar*, pp. 1–50. Elsevier.

Link, G. (1983). *The logical analysis of plurals and mass terms: A lattice- The logical analysis of plurals and mass terms: A lattice- theoretical approach*, pp. 302–323. https://doi.org/10.1515/9783110852820: de Gruyter.

McCloskey, J. (1986). Right node raising and preposition stranding. *Linguistic Inquiry 17*(1), 183–186.

Postal, P. M. (1998). *Three investigations of extraction*, Volume 29. mit Press.

Romero, M. and M. Novel (2013). Variable binding and sets of alternatives. In *Alternatives in semantics*, pp. 174–208. Springer.

Ross, J. R. (1967). Constraints on variables in syntax.

Sabbagh, J. (2007). Ordering and linearizing rightward movement. *Natural Language & Linguistic Theory 25*(2), 349–401.

Scha, R. J. (1981). *Distributive, collective and cumulative quantification*, Volume 2, pp. 483–512. Amsterdam: Mathematisch Centrum.

Schlenker, P. (2004). Conditionals as definite descriptions. *Research on language and computation 2*(3), 417–462.

Schmitt, V. (2019). Pluralities across categories and plural projection. *Semantics and Pragmatics 12*, 17.

Shan, C.-c. (2004). Binding alongside hamblin alternatives calls for variable-free semantics. In *Semantics and Linguistic Theory*, Volume 14, pp. 289–304.

Wexler, K. and P. W. Culicover (1980). *Formal principles of language acquisition.* MIT Press (MA).

Wilder, C. (1999). Right node raising and the lca. In *Proceedings of WCCFL*, Volume 18, pp. 586–598. Cascadilla Press Somerville MA.

Winter, Y. (1995). Syncategorematic conjunction and structured meanings. In *Proceedings of SALT*, Volume 5, pp. 387–404.