

The Syntax of the English Comparative Clause

Chris Kennedy, Northwestern University

Lectures on the Syntax and Semantics of Gradability and Comparison
Kyushu University, August 2000

1 Comparatives in English

Comparative deletion (CD)

- (1) a. The galaxy contains more stars than the eye can see.
b. At that time, sea level was not as high as it later became.
c. My sister drives as carefully as I drive.

CD requires the entire compared constituent to be “missing” from the comparative clause:

- (2) a. *The galaxy contains more stars than the eye can see stars.
b. *At that time, sea level was not as high as it later became high.
c. *My sister drives as carefully as I drive carefully.

EXCEPTION: when the compared constituent is focused, it can stay (Chomsky 1977).

- (3) A: This desk is higher than that one is wide.
B: What is more, this desk is higher than that one is HIGH.
- (4) Watching the Cubs on his satellite dish has been almost as difficult for Beck as watching Beck close games has been difficult for the CUBS. (*Chicago Tribune* 6.8.99)

Comparative subdeletion (CSD)

- (5) a. [Michael Jordan] has more scoring titles than Dennis Rodman has __ tattoos. (*Chicago Tribune [CT]*, 7.17.98; s4, p7)
b. The shapes seem to be longer than they are thick.... (Bear, Greg, 1997, *Slant*, New York, Tor, p. 262)
c. Grace hit as poorly in this series as he hit __ well in the 1989 playoffs. (adapted from example in *CT*, 10.4.98; s3, p6)

CSD requires a degree word to be missing from the comparative clause:

- (6) a. *Michael has more scoring titles than Dennis has two/many tattoos.
b. *The shapes seem to be longer than they are 2 inches/thick.
c. *Grace hit as poorly in this series as he hit very/quite well in the '89 playoffs.

ASIDE: Following e.g. Napoli 1983, I assume that *comparative ellipsis* (CE) constructions like those in (7) involve CD plus (different kinds of) ellipsis (Napoli 1983).

- (7) a. The Cubs won more games last year than the Sox did __. *VP deletion*
b. The Cubs won more games last year than the Sox __. *Stripping*
c. The Cubs won more games last year than anyone expected __. *NCA*
d. The Cubs won more baseball games than they did __ coin tosses. *Pseudogapping*

The Question

Are CD and CSD derived in the same way? I.e., are the examples in (1) derived from representations like those in (5)?

- Similarities suggest that the answer is “yes”
- Differences suggest that the answer must be “no”

The Answer

Both CD and CSD involve movement of the compared constituent (DP or DegP), but:

- In CD movement is overt; and in CSD movement is covert.
- This difference follows from general constraints on movement and deletion in a model in which syntactic representations are evaluated against *ranked* & *violable* constraints.

The Bigger Picture

- How general are constraints on deletion?
- What is the relation between deletion in movement and deletion in other environments, specifically ellipsis.

2 The puzzle

2.1 Similarities between CD and CSD

2.1.1 SEMANTIC EQUIVALENCE

- (8) a. Michael has more scoring titles than Dennis has (tattoos).
b. *the number of scoring titles that Michael has > the number of scoring titles | tattoos that Dennis has*
- (9) a. Michael's hands are as wide as my feet are (long)
b. *the width of Michael's hands = the width | length of my feet*

2.1.2 ECP EFFECTS (Ross 1967, Bresnan 1975, Chomsky 1977, Postal 1998)

Complex NP islands

- (10) a. *Michael has more scoring titles than Dennis is a guy who has.
b. *Michael has more scoring titles than Dennis is a guy who has tattoos.

wh-islands

- (11) a. *The shapes were longer than I wondered whether they would be.
b. *The shapes were longer than I wondered whether they would be thick.

Adjunct islands

- (12) a. *My sister drives as carefully as I manage to avoid accidents when I drive.
b. *My sister drives as carefully as I end up getting into accidents when I drive carelessly.

2.1.3 CROSSOVER (Bresnan 1975, Chomsky 1977)

- (13) a. *More new students_i flunked than they_i expected __ to flunk.
b. *More new students flunked than they_i expected old students_i to flunk.
- (14) a. *More new students_i flunked than their_i advisors expected __ to flunk.
b. *More new students flunked than their_i advisors expected old students_i to flunk.

2.2 Differences between CD and CSD

2.2.1 PREPOSITION-STRANDING (Czech; see Corver 1990 for Dutch)

- (15) *Ktery!ch me&stech Václav bydlel ve?
 which city.PL.LOC Vaclav live.PAST.3SG in
 'Which city does Vaclav live in?'
- (16)a. *Bydlel jsem ve více me&stech nez& ty jsi bydlel v
 live.PAST.1SG aux in more city.PL.GEN than you aux live.PAST.2SG in
 'I have lived in more cities than you have lived in.'
- b. Chci bydlel ve více americky!ch me&stech nez& jsem
 want.1SG.PRES live.INF in more American city.PL.GEN than aux
 bydlel v europsky!ch me&stech
 lived.PAST.1SG in European city.PL.LOC
 'I want to have lived in more American cities than I have lived in European cities.'

2.2.2 COMP-TRACE EFFECTS (Grimshaw 1987)

- (17)a. More books were published than the editor said (*that) would be.
 b. More boys flunked than I predicted (*that) would pass.
- (18)a. More books were published than the editor said (that) articles would be.
 b. More boys flunked than I predicted (that) girls would pass.

2.2.3 CONTRACTION (Grimshaw 1987)

- (19)a. I thought there was more meat than there is/**s.
 b. John was more upset then than he is/**s now.
 c. She was as happy about it then as she is/**s now.
- (20)a. There's more meat than there's rice.
 b. John was more upset then than he's angry now.
 c. She was as happy about it then as she's sad now.

2.2.4 PARASITIC GAPS (Grimshaw 1987)

- (21)a. I threw away more books than I kept without reading.
 b. Jerome followed more suspects than Arthur interrogated without arresting.
- (22)a. I threw away more books than I kept magazines (*without reading).
 b. Jerome followed more leads than Arthur interrogated suspects (*without arresting).

2.2.5 MULTIPLY-HEADED COMPARATIVES (Corver 1990, 1993, Hendriks 1995)

- (23)a. Christmas makes as many children as happy as it makes adults unhappy.
 b. Max persuaded more men to buy more cars than you persuaded women to buy trucks.
- (24) The number of children that Christmas makes happy equals the number of adults that it makes unhappy and the degree to which Christmas makes children happy equals the degree to which it makes adults unhappy. (see von Stechow 1984)
- (25)a. *Christmas makes as many children as happy as birthdays make.
 b. *Max persuaded more people to buy more cars than you persuaded to buy.

2.2.6 LEFT BRANCH CONSTRAINT (movement analyses)

- (26)a. Michael has [DP more [NP scoring titles]] than [Op_i Dennis has [DP e_i tattoos]
 b. *How many_i does Dennis have [DP e_i tattoos]?

- (27)a. Wittgenstein was as unusual as [CP Op_i Frege was [DegP e_i noble]]
 b. *How (much) was Frege [DegP e_i noble]?

2.3 Summary

	<i>interp</i>	<i>islands</i>	<i>x-over</i>	<i>p-strnd</i>	<i>comp-t</i>	<i>*cntrct</i>	<i>pgaps</i>	<i>mult.</i>	<i>LBC</i>
CD	=	YES	YES	YES	YES	YES	YES	NO	-
CSD	=	YES	YES	NO	NO	NO	NO	YES	*!

There are compelling semantic and syntactic reasons for believing that CD and CSD are derived in basically the same way, but any analysis that makes this claim also needs to provide an explanation of the differences documented above.

3 Overt vs. covert movement in comparatives

3.1 Overview of the proposal

- (28) *English Comparative Formation* (version 1)
 i. CD involves overt movement of the compared constituent plus deletion under identity with the head of the comparative (cf. Chomsky 1977).
 ii. CSD involves covert movement of the compared constituent.

This proposal assigns the structures in (29a-b) to (1a-b), where struck-through text indicates lexical material that is deleted from the PF representation.

- (29)a. The galaxy contains more stars than [CP [DP ~~stars~~]_i the eye can see t_i]
 b. Sea level was not as high as [CP [DegP ~~high~~]_i it later became t_i]

Since movement is overt, the LF and PF representations are the same (modulo deletion). Examples of CSD, on the other hand, differ at PF and LF:

- (30)a. Michael has more scoring titles than [CP Dennis has [DP tattoos]] PF
 b. Michael has more scoring titles than [CP [DP tattoos]_i Dennis has t_i] LF
- (31)a. The shapes are longer than [CP they are [DegP thick]] PF
 b. The shapes are longer than [CP [DegP thick]_i they are t_i] LF

CD and CSD are identical at LF (in the relevant respects), but differ at PF, predicting that:

- CD and CSD should behave the same with respect to LF constraints, and
- any differences should be localized to PF.

3.2 The similarities

CROSSOVER, ECP EFFECTS, SEMANTIC EQUIVALENCE: follow if LFs of CD and CSD are the same

- (32) Michael has more scoring titles than Dennis has (tattoos).

- (33)a. ... than [CP [DP D⁰_[comp] scoring titles]_i Dennis has e_i]
 b. ... than [CP [DP D⁰_[comp] tattoos]_i Dennis has e_i]

(34) Michael's hands are wider than my feet are (long).

- (35)a. ... than $[_{CP} [_{DegP} Deg^0_{[comp]} wide]_i$ my feet are e_j
 b. ... than $[_{CP} [_{DegP} Deg^0_{[comp]} long]_i$ my feet are e_j

For MANY a function from plural objects to amounts, P a (plural) NP meaning, Q a function from plural objects to truth values, and ι a maximality operator (see von Stechow 1984, Rullmann 1995, Kennedy 1997b):

- (36) $D^0_{[comp]} = \lambda P \lambda Q \iota d [\exists X [MANY(X) = d \& P(X) \& Q(X)]]$
 (37)a. $\iota d [\exists X [MANY(X) = d \& scoring-titles(X) \& have(dennis, X)]]$
 b. $\iota d [\exists X [MANY(X) = d \& tattoos(X) \& have(dennis, X)]]$

For G function from objects to degrees, and Q a function from properties to truth values:

- (38) $Deg^0_{[comp]} = \lambda G \lambda Q \iota d [Q \lambda x [G(x) = d]]$
 (39)a. $\iota d [wide(my-feet) = d]$
 b. $\iota d [long(my-feet) = d]$

3.3 The differences

3.3.1 COMP-TRACE EFFECTS, P-SRANDING EFFECTS, CONTRACTION: all insensitive to LF-movement

- (40)a. Which editor said (that) how many books would be published this year?
 b. Who predicted (that) how many boys would flunk?
 (41) Kdo bydlel ve kteryúh me&stech?
 who live.PAST.3SG in which city.PL.LOC
 'Who lives in which city?'
 (42)a. Who said there's how much rice?
 b. Who's how angry now?

3.3.2 MULTIPLY-HEADED COMPARATIVES

Multiply-headed CSD constructions are analogous to multiple-*wh* questions in English: more than one *wh*-phrase can move at LF (Higginbotham & May 1981).

- (43)a. Christmas makes as many children as happy as it makes adults unhappy.
 b. Christmas makes as many children as happy as $[_{CP} [_{DP} adults]_i$ $[_{DegP} unhappy]_j$ it makes $t_i t_j$

Multiple overt A'-movement is generally impossible in English:

- (44)a. *The children $_i$ quite happy $_j$ Christmas will make $t_i t_j$
 b. *Which children $_i$ how happy $_j$ will Christmas make $t_i t_j$

It follows that multiply-headed CD should also be impossible:

- (45)a. *Xmas makes as many children as happy as birthdays make.
 b. *Xmas makes as many children as $[_{CP} [_{DP} children]_i$ $[_{DP} happy]_j$ birthdays make $t_i t_j$

"Mixed" multiply-headed comparatives are correctly predicted to be OK:

- (46)a. Christmas makes as many people as happy as it makes unhappy.
 b. Max persuaded more people to buy more cars than you persuaded to buy trucks.

- (47)a. Christmas makes as many people as happy as $[_{CP} [_{DP} people]_i$ it makes t_i $[_{DegP} unhappy]_j$
 b. Max persuaded more people to buy more cars than $[_{CP} [_{DP} people]_i$ you persuaded t_i to buy $[_{DP} trucks]_j$

3.3.2 PARASITIC GAPS

The movement postulated to occur in CD is exactly the same as in *how many* questions, so the fact that parasitic gaps are licensed in unsurprising:

- (48)a. I threw away more books than $[_{DP} books]_i$ I kept t_i without reading e_j
 b. $[_{DP} How\ many\ books]_i$ did you keep t_i without reading e_j

Covert A-bar movement doesn't license parasitic gaps, so neither should CSD:

- (49)a. *I threw away more books than $[_{CP} I$ kept $[_{DP} papers]_i$ without reading e_j
 b. *Who kept $[_{DP} how\ many\ papers]_i$ without reading e_j

However, as shown by Nissenbaum (1999), covert A'-movement can license a p-gap only if a first p-gap is already licensed by overt movement:

- (50)a. $[_{DP} Which\ senator]_i$ did you convince t_i to buy $[_{DP} which\ car]_j$ after getting an opponent of e_j to put a bomb in e_j
 b. * $[_{DP} Which\ senator]_i$ did you persuade t_i to buy $[_{DP} which\ car]_j$ after putting a bomb in e_j

CSD also license parasitic gaps in such contexts, providing further support for the claim that it involves covert A'-movement (many thanks to Jon Nissenbaum for noticing this fact):

- (51)a. I persuaded as many senators to buy as many cars as $[_{CP} [_{DP} senators]_i$ you persuaded t_i to buy $[_{DP} trucks]_j$ after getting opponents of e_j to put bombs in e_j
 b. *I persuaded as many senators to buy as many cars as $[_{CP} [_{DP} senators]_i$ you persuaded t_i to buy $[_{DP} trucks]_j$ after putting bombs in e_j

3.3.3 THE LEFT BRANCH CONSTRAINT REVISITED

Neither CD nor CSD actually involve movement of a left branch constituent, so no instantiation of the LBC comes into play.

- (52)a. Michael has more scoring titles than Dennis has tattoos.
 b. The shapes are longer than they are thick.
 (53)a. *How many $_i$ does Dennis have t_i tattoos?
 b. *How (much) $_i$ were the shapes t_i thick?
 (54)a. How many tattoos $_i$ does Dennis have t_i ?
 b. How thick $_i$ were the shapes t_i ?

3.4 Interim summary

PROPOSAL: CD involves overt A'-movement of the compared constituent; CSD involves covert A'-movement of the compared constituent.

PREDICTION: The two constructions behave the same with respect to LF-constraints; they differ with respect to PF constraints.

RESULT: Puzzle solved.

4 Optimality in comparatives

4.1 Deletion and movement

The proposed derivational distinction between CD and CSD does a nice job of accounting for the facts, but a big question remains: why should CD and CSD differ in this way?

- (55) a. *The galaxy contains more stars than the eye can see stars.
 b. *The galaxy contains more stars than [_{DP} planets]_i the eye can see *t_i*.

BRESNAN'S OBJECTION (Bresnan 1975:63; see also Borsley 1984:281):

"To guarantee that only the maximally recoverable constituent is moved, one would have to place a special identity condition in the rule itself.... [O]n this analysis, it becomes accidental that the moved constituents undergo deletion and that the elements moved just happen to be those which would be maximally recoverable if deleted."

► Why do we get deletion only when we have movement and identity, and why do we get neither movement nor deletion when we don't have identity?

The answer to Bresnan's objection is that deletion is good, and movement is bad, but it's better to delete than to avoid movement.

- (56) a. DELETE: Minimize the PF representation (Economy of Representation et al.).
 b. STAY: No overt movement (Economy of Derivation et al.; Grimshaw 1997).
 c. RECOVER: Deletions must be recoverable (undominated; Fiengo and Lasnik 1972).

(57) DELETE >> STAY (PF interface)

4.2 Subdeletion

The optimal derivation in examples in which the compared XP is not identical to the head of the comparative is the one in which it remains in situ.

Tableau 1	RECOVER	DELETE	STAY
a. Michael has more scoring titles than [_{CP} [_{DP} tattoos] _i Dennis has <i>t_i</i>]		*	*!
b. Michael has more scoring titles than [_{CP} [_{DP} tattoos] _i Dennis has <i>t_i</i>]	*!		
c. Michael has more scoring titles than [_{CP} Dennis has [_{DP} tattoos]]		*	
d. Michael has more scoring titles than [_{CP} Dennis has [_{DP} tattoos]]	*!		

Why doesn't this analysis predict that English is a *wh*-in situ language?

- (58) a. The flooding was less than what we had thought it would be.
 b. *The flooding was less than we had thought it would be what.

Movement in comparatives that do not involve lexical *wh*-XPs is more like QR than question formation: it is motivated by the need to generate a definite description of a degree in the comparative clause (cf. Kennedy 1997a).

- Q-SCOPE: *wh*-XPs must c-command the constituent corresponding to the proposition (Ackema & Neeleman 1998; cf. Grimshaw's (1997) *OP*SPEC).

Tableau 2	Q-SCOPE	DELETE	STAY
a. The flooding was less than [_{CP} what _i we had thought it would be <i>t_i</i>]		*	*
b. The flooding was less than [_{CP} we had thought it would be what]	*!	*	

4.3 Comparative deletion

We want the optimal derivation in examples in which the compared XP is identical to the head of the comparative to be the one in which it moves and deletes...

Tableau 3	DELETE	STAY
a. The galaxy contains more stars than [_{CP} [_{DP} stars] _i the eye can see <i>t_i</i>]		*
b. The galaxy contains more stars than [_{CP} [_{DP} stars] _i the eye can see <i>t_i</i>]	*!	*
c. The galaxy contains more stars than [_{CP} the eye can see [_{DP} stars]]	*!	

...but why isn't deletion without movement the best?

d. The galaxy contains more stars than [_{CP} the eye can see [_{DP} stars]]		
--	--	--

English doesn't allow deletion of nominals *unless they are members of movement chains*.

- (59) a. Kim could see stars, but I couldn't see [_{DP} any [_{NP} stars]]
 b. *Kim could see stars, but I couldn't see [_{DP} stars].
 c. [_{DP} How many stars] can you see [_{DP} how many stars]?

- Candidate (d) is ruled out by a higher ranking constraint (*recoverability?*; see below).

(60) The galaxy contains more stars than [_{CP} [_{DP} stars]_i the eye can see [_{DP} stars]_i]

► Because the members of the movement chain are identical to the head of the comparative, both copies can be deleted: CD is the optimal output of A'-movement.

The analysis correctly predicts that identity without deletion should be unacceptable:

(61) The galaxy contains more stars than the eye can see (*stars).

It also explains the acceptability of of lexically identical but contrastively focused material: deletion of the focus feature would violate RECOVER.

- (62) A: My desk is longer than your desk is wide.
 B: More than that, your desk is longer than my desk is LONG!
 (63) A: My desk is longer than your desk is wide.
 B: *More than that, your desk is longer than LONG_i my desk is e_j.

4.5 Summary

- (64) *English Comparative Formation* (final)
 Move the compared constituent to the specifier of the complement of *than*.

(64) can be motivated semantically: the interpretation of the complement of *than* must be a definite description of a degree (Russell 1905, Stechow 1984, Rullmann 1995, etc.).

Whether movement is overt or covert is determined by the ranking of DELETE and STAY.

- ➔ There is no special operation of comparative (sub)deletion: the syntax of comparatives in English can be accounted for in terms of the copy+delete theory of movement and the competition between constraints on movement and deletion.

5 Movement and deletion

5.1 Varieties of deletion

There are at least two environments in which deletion applies: movement and ellipsis. Are they the same (Chomsky 1995), or are they different? If they are different, then do we need to assume a family of DELETE constraints, or can we get by with just one?

- Deletion in movement and deletion in ellipsis are different in at least four (three) ways.

I. LOCALITY (Kennedy 1998, 1999)

In ellipsis, deletion may be licensed non-locally; in comparatives, deletion must be licensed locally:

- (65) a. The marbles are supposed to be near the books. If you see any, let me know.
 (*If you see any marbles/books...*)
 b. Smith said she would launch the rocket before she ate her lunch, but I don't know if she has yet. (*... if she has eaten her lunch/launched the rocket.*)
 (66) a. The marbles are supposed to be near the books. If you see more marbles than you see, let me know. (*If you see more marbles than you see marbles/*books...*)
 b. Now that the remodeling has been completed, the space station is longer than it used to be, and it's even wider than it is. (*...it's even wider than it is wide/*long.*)

Hypothesis: Locality of copy deletion ≈ locality of movement (Ross 1967!).

II. IDENTITY (Bach, Bresnan and Wasow 1974)

CD resists sloppy identity; ellipsis does not.

- (67) a. Jones lost more of his hair than Smith lost. [*?? Smith lost Jones' hair*]
 b. Jones lost more of his hair than Smith (did). [*Smith lost his own hair*]

(67a) involves deletion of a movement copy:

- (68) Jones_i lost more of his_i hair than [_{CP} [_{DP} ~~much of his_i~~ /_y hair]_k than Smith_j lost t_k]

(67b) has an analysis in which the compared constituent remains in situ and is captured by VP-deletion (Kennedy and Merchant 1999; as we will see below, this is in fact the *only* analysis). Since ellipsis allows sloppy identity, the sloppy reading of (67b) is expected.

- (69) Jones_i lost more of his_i hair than [_{CP} Smith_j did [_{VP} lost [_{DP} ~~much of his_j~~ hair]]]

Hypothesis: Copy deletion requires identity of indices; ellipsis requires “identity of sense”.

III. (APPARENT) OPTIONALITY

Deletion in ellipsis appears to be optional; deletion in movement is not.

- (70) a. Dennis has more tattoos than Michael has (*tattoos).
 b. How many tattoos does Dennis have (*how many tattoos)?
 (71) a. Dennis has more tattoos than Michael (does/has).
 b. Dennis has seven tattoos, and Michael has three (tattoos).

Constituents targeted for ellipsis are explicitly marked as such in the numeration with an “E-feature” (Merchant 1999, Kennedy & Merchant 2000), which requires the identification of an antecedent at LF. (This can be implemented in different ways: see e.g. Merchant’s (1999) E-givenness, Fiengo & May’s (1994) reconstruction; Sag’s (1976) alphabetic variance, etc.)

Optionality in ellipsis can be reduced to the presence/absence of E-marking:

- Deletion of a constituent that does not bear the E-feature violates recoverability, because there would be no instruction to find an antecedent
- Deletion of a constituent that bears the E-feature *is obligatory*.

Tableau 4		RECOVER	DELETE
(a)	... [_{XP[E]} X YP] ...		*!
(b)	☞ ... [_{XP[E]} X YP] ...		
(c)	☞ ... [_{XP} X YP] ...		*
(d)	... [_{XP} X YP] ...	*!	

IV. DISTRIBUTION

Languages differ in terms of the set of constituents that may be deleted, and in terms of the environments in which particular constituents can be deleted.

- MOVEMENT
 - α (all languages; ECP?)
- ELLIPSIS
 - IPs (sluicing, gapping, stripping) (all languages; specific environments)
 - VPs et al. (English, ...?; /Aux __)
 - NPs (English, Japanese; /certain Ds __)

Hypothesis: “copy+delete” is part of Gen; the distribution of the E-feature is Ig-specific.

CONCLUSIONS

- i. Deletion in ellipsis and deletion in movement are subject to different licensing conditions (which may stem from the copy/non-copy distinction).
- ii. For any language, we need to be able to regulate the range of possible deletions (possibly in terms of the distribution of the E-feature).
- iii. We do not appear to need more than one general (violable) DELETE constraint: DELETE = “minimize the PF-representation”.

5.2 “Hidden” subdeletion

A PREDICTION: If the compared constituent is part of a larger constituent that is a possible target of ellipsis, then a candidate in which movement does not occur should be optimal:

(72) Dennis has more tattoos than Michael does.

Tableau 5	DELETE	STAY
a. Dennis has more tattoos than [_{CP} [_{DP} tattoos] _i M. does [_{VP} have t_i]]		*!
b. ☞ Dennis has more tattoos than [_{CP} M. does [_{VP} have [_{DP} tattoos]]]		

Two contexts provide evidence for “hidden” subdeletion.

5.2.1 MULTIPLY-HEADED COMPARATIVES

- (73)a. *Max persuaded more people to buy more cars than you persuaded to buy.
- b. *Christmas doesn’t make as many children as happy as birthdays make.

Multiple CD is possible only if the compared constituents are contained in a larger deleted XP, an observation made by Izvorski (1995) but as yet unexplained (see also Andrews 1985):

- (74)a. Max persuaded more people to buy more cars than you did.
- b. Christmas doesn’t make as many children as happy as birthdays do.

This follows if VP-deletion in (74) forces a hidden subdeletion analysis:

- (75)a. Max persuaded more people to buy more cars than you did [_{VP} persuaded [_{DP} ~~people to buy [_{DP} cars]]]~~
- b. Christmas doesn’t make as many children as happy as birthdays do [_{VP} make [_{DP} ~~children [_{DP} happy]]]~~

5.2.2 PARASITIC GAPS REVISITED

VP-deletion and other types of ellipsis can bleed otherwise acceptable parasitic gaps (see Kennedy and Merchant 2000, fn. 5):

- (76)a. Mo interviewed more suspects than Art interviewed without arresting e_i.
- b. *Mo interviewed more suspects than Art did without arresting e_i.

- (77)a. I actually liked more of the films that came out this year than I expected to enjoy before seeing e_i.
- b. *I actually liked more of the films that came out this year than I expected to before seeing e_i.

This is not a property of VP-deletion in general:

- (78) I don’t know which films_j Hillary enjoyed t_j after seeing e_i, but I know which books_i she did after reading e_i.

If VP-deletion forces a hidden subdeletion analysis, then there is no overt movement of the compared constituent in (76b) and (77b), and the parasitic gaps are not licensed.

- (79)a. *Mo interviewed more suspects than Art did [_{VP} interview [_{DP} suspects]_i] without arresting e_i
- b. *I actually liked more of the films that came out this year than I expected to [_{VP} like [_{DP} films]_j] before seeing e_i

Conclusion: When the compared XP can be deleted without movement, it does not move.

- This is a direct consequence of an OT analysis.
- A non-OT analysis allows movement as an option, predicting that p-gaps should be OK.

5.3 Overt movement in subdeletion

What’s going on in “more N than N” comparatives?

- (80) In the final two games of the ALCS, the Red Sox tallied more errors than runs.

There is semantic evidence that (80) should be derived from (81) (Keenan 1987):

- (81) ...the Red Sox tallied more errors than [_{CP} [_{DP} runs]_i] [_{VP} they tallied e_i]

“more N than N” comparatives look like CSD with overt movement of the compared XP, but we have already seen that overt movement in CSD is otherwise impossible:

- (82)a. ... the Red Sox tallied more errors than they tallied runs.
- b. *... the Red Sox tallied more errors than runs they tallied.

Why is overt movement possible if IP is deleted?

In fact, overt movement is *optimal* if IP is deleted: when IP is targeted for ellipsis, failure to move the compared constituent would incur a violation of RECOVER.

Tableau 6	RECOVER	DELETE	STAY
a. ... more errors than [_{CP} [_{IP} they tallied [_{DP} runs]]]	*!		
b. ☞ ... more errors than [_{CP} [_{DP} runs] _i] [_{VP} they tallied t _i]		*	*

NB: (81) and (82a) are not in competition with each other. Since the deleted IP in the former bears the E-feature, but the overt IP in the latter does not, they represent different inpus.

- This analysis can be extended to explain why movement only goes as far as it needs to:

- (83)a. *... the Red Sox tallied more errors than runs they (did). *pseudogapping*
 b. ... the Red Sox tallied more errors than they did runs.
- (84)a. *... the Red Sox tallied more errors than runs, the Yankees. *gapping*
 b. ... the Red Sox tallied more errors than the Yankees, runs.

If *STAY* is evaluated w.r.t. length of chain links (Ackema and Neeleman 1998), then the compared XP will move far enough to avoid being caught up in ellipsis, and no farther.

6 Typological variation

- (85) *MOVE-X* >> *STAY* (where *MOVE-X* targets the compared constituent.)

- Overt movement in subdeletion

Castilian Spanish (Rivero 1981, Knowles 1984; data from Price 1990:43)

- (86)a. Mi padre vende más libros que discos compra mi madre.
 b. *Mi padre vende más libros que mi madre compra discos.
 'My father sells more books than my mother buys records.'
- (87)a. La mesa es más large que ancha es la puerta.
 b. *La mesa es más large que la puerta es ancha.
 'The table is longer than the door is wide.'
- (88)a. El crío gatea más cuidadosamente que descuidadamente anda su hermana.
 b. *El crío gatea más cuidadosamente eque su hermana anda descuidadamente.
 'The baby crawls more carefully than his sister walks carelessly.'

Possible values for *MOVE-X*: *ALIGN-FOCUS* (REFs; Norbert Corvser, p.c.), "C-SCOPE/C-MARKING"

- (89) *DELETE* >> *STAY* >> *Q-SCOPE*

- A *wh*-in situ language in which CD shows properties of overt movement.

Japanese (Kikuchi 1989, Ishii 1991)

- (90) Tom-wa [John-ga {__}*sore/*sorera/(hon)-o yonda yorimo] hon-o takusan yonda.
 T-TOP J-NOM {__}it /them /book}-ACC read than book many read
 'Tom read more books than John read {__}/*it/*them/*the books.'
- (91) [|[John-ga __ yonda to] iwarete iru to] minna-ga omotte iru yorimo] Mary-wa
 J-NOM __ read C| is-said ASP C| everyone-nom think ASP than] M-TOP
 takusan hon-o yonde ita
 many book-ACC read ASP
 'Mary has read more books than everyone thinks that it is said that John read.'
- (92) *[John-ga __ yonde ita tokini] zisin-ga okita yorimo] Paul-wa harukani
 J-NOM __ read ASP when earthquake-NOM happened than P-TOP far
 takusanno hon-o yonde ita
 many book-ACC read ASP
 'Paul has read more books than an earthquake happened whn John was reading.'

- (93) *[zibun-tati-ga_i rakudaisita koto-ga] __ odorokasita yorimo] harukani takusanno
 self-PL-NOM flunked fact-NOM surprised than far many
 gakusei-o Bill-ga rakudaisita koto-ga odorokasita
 students-ACC B-NOM flunked fact-NOM surprised
 'The fact that Bill flunked surprised far more students than the fact that they_i
 flunked surprised ___i.'
- (94) ronbun-nituite ieba Bill-wa John-ga; London-de __pg kaita ato Paris-de __
 happyousita
 article-ABOUT say B-TOP J-NOM London-AT __pg wrote after Paris-AT __ published
 yorimo ookuno ronbun-o America-de kaite ita
 than many article-ACC America-AT write ASP
 'As for the articles, Bill wrote more articles in America than John had published __
 in Paris after he wrote __ in London.'

CD in Japanese needs a gap (90), it is unbounded (91), it is sensitive to islands (92) and crossover (93), and (in particular) it licenses p-gaps (94).

- ➔ Can an OT approach provide insight on the broader typological variety observed in comparatives?

7 Derived head analyses

Lechner 1999 (see also Rivero 1981): CD is movement of the compared constituent into the head position of the comparative (cf. Schachter 1973, Vergnaud 1974, Kayne 1994, etc.).

- (95)a. Michael has [DP more [NP scoring titles]_i] than [CP Dennis has e_i]
 b. Michael's feet are [DegP [AP wide]_i] er than [CP my feet are e_i]

Lechner does not discuss CSD, but presumably it would involve base structures like (96) plus some kind of covert movement.

- (96)a. Michael has [DP more [NP scoring titles] than [CP Dennis has tattoos]]
 b. Michael's feet are [DegP [AP wide] er than [CP my feet are long]]

The end result would be the same kind of derivational distinction that I have argued for here, but it would not need to postulate constraint ranking/violation. There are at least three arguments against a this approach, however.

1. MULTIPLY-HEADED CD

Recall from the discussion above that VP-deletion licenses multiply-headed CD:

- (97)a. Christmas doesn't make as many children as happy as birthdays do.
 b. Christmas doesn't make as many children_i as happy_j as birthdays do [~~VP-make-t_i-t_j~~]

This is completely unexpected in a derived head analysis, since such an analysis makes no derivational distinction between (93) and (94).

- (98) *Christmas doesn't make as many children as happy as birthdays make.

II. PARASITIC GAPS

The fact that VP-deletion bleeds parasitic gaps raises a similar problem. In the derived head analysis, there is no structural or derivational difference between e.g. (99) and (100).

- (99) a. *Mo interviewed more suspects than Art did without arresting e_i
b. Mo interviewed more suspects $_i$ than Art did [_{NP} interviewed t_j] without arresting e_i
- (100) Mo followed more suspects $_i$ than Art interviewed t_j without arresting e_i

III. DISJOINT REFERENCE EFFECTS

Lechner 1999 presents examples like (101a) as evidence in favor of the derived head approach, claiming that they involve Condition C violations.

- (101)a. *Louise is prouder of Frank $_i$ than he $_j$ is.
b. Louise is [_{DegP} [_{AP} prouder of Frank $_i$] $_x$] than he $_j$ is [_{DegP} [_{AP} proud of Frank $_j$] $_x$]

The acceptability of (102) suggests that (101) involves a *Condition B* violation, however.

- (102) Louise is prouder of Frank $_i$ than he $_j$ thinks she is.

A derived head analysis runs into problems here:

- (103) *Louise is [_{DegP} [_{AP} prouder of Frank $_i$] $_x$] than he $_j$ thinks she is [_{DegP} [_{AP} proud of Frank $_j$] $_x$]

These facts can be accommodated within the analysis I have proposed here if names and pronouns count as identical for the purposes of deletion of copies, but names/pronouns and reflexives do not (cf. Fiengo and May 1994, Safir 1999):

- (104) Louise is prouder of Frank $_i$ than [[_{DegP} proud of him $_j$] $_x$] he $_j$ thinks she is [_{DegP} proud of him $_j$] $_x$
- (105)a. *Louise is prouder of Frank $_i$ than [[_{DegP} proud of himself $_j$] $_x$] he $_j$ is [_{DegP} proud of himself $_j$] $_x$
b. *Louise is prouder of Frank $_i$ than [[_{DegP} proud of him $_j$] $_x$] he $_j$ is [_{DegP} proud of him $_j$] $_x$

8 Conclusion

To the extent that this analysis of comparatives succeeds in accounting for the full range of facts where others have failed, and in uncovering and explaining new data (in particular, “hidden” subdeletion), we have a strong case for an OT approach.

The next step is to look beyond comparatives to other “null operator” constructions: relative clauses, parasitic gaps, etc.

- (106) In all, the Bears got rid of 19 players, including third-down back Ronnie Harmon and linebacker Shont'e Peoples, meaning the Bears have the same number of guys with apostrophes in their names as they have sacks in the preseason. (*CT*, 8.25.98; s4, p1)
- (107) *The Bears have guys with apostrophes in their names as/that they have sacks in the preseason.

References

- Andrews, Avery. 1985. *Studies in the Syntax of Relative and Comparative Clauses*. New York: Garland.
- Bach, Emmon, Joan Bresnan, and Thomas Wasow. 1974. “Sloppy identity”: An unnecessary and insufficient criterion for deletion rules. *Linguistic Inquiry* 5.4:609-614.
- Borsley, R. 1984. *Wh*-movement and unbounded deletion in Polish equatives. *Journal of Linguistics* 17:179-392.
- Bresnan, J. 1975. Comparative deletion and constraints on transformations. *Ling. Analysis* 1.1:25-74.
- Bresnan, J. 1973. Syntax of the comparative clause construction in English. *LI* 4:275-343.
- Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge: MIT Press.
- Chomsky, Noam. 1993. A minimalist program for linguistic theory. MITWPL.
- Chomsky, Noam. 1977. On *wh*-movement. In P. Culicover et al. (eds.), *Formal Syntax*. Academic Press: New York.
- Chomsky, Noam. 1965. *Aspects of the Theory of Syntax*. Cambridge: MIT Press.
- Chomsky, Noam and Howard Lasnik. 1977. Filters and control. *Linguistic Inquiry* 8.3.
- Corver, Norbert. 1990. *The Syntax of Left Branch Constructions*. Doctoral dissertation, Tilburg Univ.
- Corver, Norbert. 1993. A note on subcomparatives. *Linguistic Inquiry* 24:773-781.
- Donati, C. 1998. Another way to build *wh*-structures. Talk at the Workshop on Comparatives, ZAS, Berlin, November 27-28, 1998.
- Fiengo, Robert and Howard Lasnik. 1972. On nonrecoverable deletion in syntax. *Linguistic Inquiry* 3.4:528.
- Fiengo, Robert, and Robert May. 1994. *Indices and Identity*. Cambridge: MIT Press.
- Gazdar, Gerald. 1981. A phrase structure syntax for comparative clauses. In T. Hoekstra, J. van der Hulst, and M. Morgan (eds.), *Lexical Grammar*. Oxford: Blackwell.
- Grimshaw, Jane. 1987. Subdeletion. *Linguistic Inquiry* 18:659-669.
- Grimshaw, Jane. 1997. Projection, heads, and optimality. *Linguistic Inquiry* 28.3.
- Hankamer, Jorge. 1971. Constraints on deletion in syntax. Doctoral dissertation, Yale University.
- Hazout, I. 1995. Comparative ellipsis and Logical Form. *Natural Language and Linguistic Theory* 13:1-37.
- Heim, Irene. 1985. Notes on comparatives and related matters. Ms., University of Texas, Austin.
- Hendriks, P. 1995. *Comparatives in categorial grammar*. Doctoral dissertation, University of Groningen.
- Higginbotham, James and Robert May. 1981. Questions, quantifiers, and crossing. *The Linguistic Review* 1:41-79.
- Honegger, Mark. 1996. A phonological account of the “adverb effect” and *that-t* violations. *Proceedings of the 1996 Mid-America Linguistics Conference*.
- Ishii, Yasuo. 1991. *Operators and Empty Categories in Japanese*. Doctoral dissertation, University of Connecticut.
- Izvorski, Roumyana. 1995. A solution to the subcomparative paradox. In *The Proceedings of WCCFL XIV*. Stanford: CSLI Publications.
- Johnson, Kyle. 1997. When verb phrases go missing. Ms., University of Massachusetts, Amherst.
- Kayne, Richard. 1994. *The Antisymmetry of Syntax*. Cambridge: MIT Press.
- Keenan, E. 1987. Multiply-headed noun phrases. *Linguistic Inquiry* 18.3:481-490.
- Kennedy, Christopher. 1997a. Antecedent-contained Deletion and the Syntax of Quantification. *Linguistic Inquiry*.

- Kennedy, Christopher. 1997b. On the quantificational force of the comparative clause. In Austin, J and A. Lawson (eds.), *Proceedings of ESCOL '97*. Ithaca: CLC Publications.
- Kennedy, Christopher. 1998. Local dependencies in comparative deletion. In *The Proceedings of WCCFL XVII*. Stanford: CSLI Publications.
- Kennedy, Christopher. 1999. *Projecting the adjective: The syntax and semantics of gradability and comparison*. New York: Garland.
- Kennedy, Christopher and Jason Merchant. 1999. Case and identity in comparative deletion. Paper to be presented at the 1999 Annual Meeting of the ISA.
- Kennedy, Christopher and Jason Merchant. 2000. Attributive comparative deletion. *Natural Language and Linguistic Theory* 18.1.
- Kikuchi, Akira. 1989. Comparative deletion in Japanese. Ms., Yamagata University.
- Klein, E. 1980. A semantics for positive and comparative adjectives. *Linguistics & Philosophy* 4:1-45.
- Knowles, John. 1984. Structural choice in Spanish clausal comparison. *Canadian Journal of Linguistics* 29:1-19.
- Lechner, Winfried. 1999. *Comparatives and DP Structure*. Doctoral dissertation, University of Massachusetts, Amherst.
- Lees, Robert. 1961. Grammatical analysis of the English comparative construction. *Word* 17.2:171-185.
- Moltmann, Friederike. 1992. *Coordination and Comparatives*. Doctoral dissertation, MIT.
- Napoli, Donna Jo. Comparative Ellipsis: A Phrase Structure Analysis. *Linguistic Inquiry* 14.4:675-694.
- Pinkham, Jesse. 1982. *The Formation of Comparative Clauses in French and English*. Doctoral dissertation, Indiana University.
- Price, Susan. 1990. *Comparative Constructions in Spanish and French Syntax*. New York: Blackwell.
- Prince, Alan and Paul Smolensky. 1993. *Optimality Theory: Constraint Interaction in Generative Grammar*. Ms., Rutgers University and the University of Colorado, Boulder.
- Rivero, María-Luisa. 1981. Wh-movement in comparatives in Spanish. In Cressey, William and Donna Jo Napoli (eds.), *Linguistic Symposium on Romance Languages 9*. Washington: Georgetown University Press.
- Ross, John R. 1967. *Constraints on variables in syntax*. Doctoral dissertation, MIT.
- Rudin, Catherine. 1984. Comparing comparatives. In Drogo, Joseph, Veena Mishra, and David Tester (eds.), *Papers for the 20th Regional Meeting of the Chicago Linguistic Society*. Chicago: Chicago Linguistic Society.334-343.
- Rullmann, Hotze. 1995. *Maximality in the semantics of WH-constructions*. Doctoral dissertation, University of Massachusetts at Amherst.
- Russell, B. 1905. On denoting. *Mind* 14:479-493.
- Safir, Ken. 1998. Vehicle change and reconstruction in A'-chains. Ms., Rutgers University.
- Smith, Carlotta. 1961. A class of complex modifiers in English. *Language*37:342-365.
- Stassen, Leon. 1985. *Comparison and Universal Grammar*. Oxford: Basil Blackwell.
- von Stechow, Arnim. 1984. Comparing semantic theories of comparison. *Journal of Semantics* 3:1-77.
- Vergnaud, Roger. 1974. *French Relative Clauses*. Doctoral dissertation, MIT.

Contact Information

Department of Linguistics
Northwestern University
2016 Sheridan Road
Evanston, IL 60208

kennedy@northwestern.edu