

Disentangling CED effect under MERGE

Toward a Genuine Explanation in Linguistic Theory

Keio Colloquium

08/01/2021

Yushi Sugimoto
(yushis@umich.edu)
University of Michigan

1 MERGE framework

1.1 MERGE

MERGE (Chomsky 2019, 2020, 2021)

- (1) $\text{MERGE}(P, Q, WS) = WS' = \{\{P, Q\}, x_1 \dots x_n\}$
 - a. MERGE applies to P, Q, and WS.
 - b. A member of WS is accessible in WS'
 - c. "MERGE will always add one new element to the workspace."
 - d. "an element a can be accessible to MERGE even if it's not part of the workspace"
 - i. a term of: "a term of some element x is a member of x or a member of a term of x ."
 - e. Accessibility for MERGE: A term of x might be inaccessible by
 1. Phase impenetrability Condition
 2. Minimal search

1.2 EM and IM

- | | |
|---|---|
| <ol style="list-style-type: none">(2) External Merge (EM)<ol style="list-style-type: none">a. $WS_1 = [a, b]$b. $\text{MERGE}(a, b, WS_1) = [\{a, b\}] = WS_2$ | <ol style="list-style-type: none">(3) Internal Merge (IM)<ol style="list-style-type: none">a. $WS_1 = [\{a, b\}]$b. $\text{MERGE}(b, \{a, b\}, WS_1) = [\{b, \{a, b\}\}] = WS_2$ |
|---|---|

1.3 Search?

- (4) Search Procedure: Find accessible elements for MERGE
 - a. Find P (a member of WS)
 - b. Find Q
 - i. a member of WS (EM), or
 - ii. a term of P (IM) via Minimal search

- See Ke (2019) for details on search procedure.

2 Consequences of MERGE

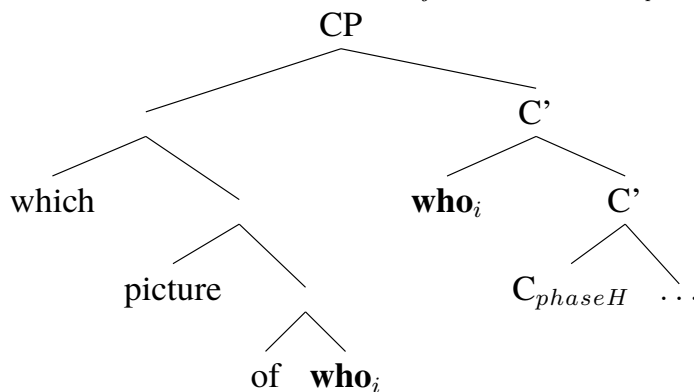
- (5) Head movement?
 a. pair-MERGE analysis (Chomsky 2019)
 b. An unformulable operation (Chomsky 2021)

2.1 PBC Effect

- (6) Proper Binding Condition (Fiengo 1977, Saito 1989)
 Traces must be bound.
 a. *Downward and sideward movement (RR violation)
 b. *Head movement (*an unformulable operation*)
 c. *Remnant Movement (cf. Müller 1996, Kitahara 1997, Takano 2000, Hiraiwa 2010)
- (7) Remnant Movement (cf. Epstein et al. 2018)
 a. * [which picture of t_1]₂ does wonder who₁ Mary likes t_2 ? (Saito 1992:80)
 b. [_{CP} [_{PreD} t_i How proud of Bill]_j is [_{TP} John_i t_j]]? (Takano 1995:332)

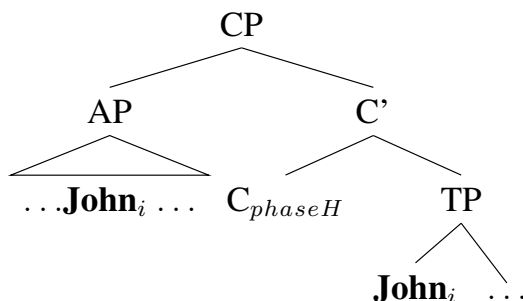
2.1.1 RR + MS + PIC = PBC effect: Epstein et al. (2018, 2021), Kitahara and Seely (2021)

- (8) a. [_{CP} [which [picture [of who_i]]]_j [_{C'} [who_i [_{C'} C_{phaseH} ... [... who_i ...]]]]]]
 b.



→ no c-command relation between two copies
 ⇒ RR violation

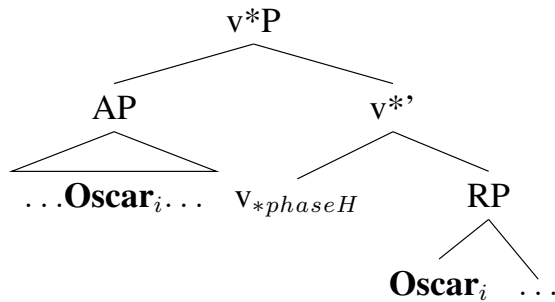
- (9) a. [_{CP} [John_i [how [proud [of Bill]]]_j [C_{phaseH} [C' John₁ [TP John_i ...]]]]]]]
 b.



→ no c-command relation between two copies, but the lower copy is inaccessible by PIC
 ⇒ no RR violation

(10) Raising-to-object + Remnant Movement

- a. Max asked [how likely to win t_i the race] $_j$ John {expected, believed} Oscar $_i$ to be t_j
 b. [v^*P [AP Oscar $_i$ [how [likely [to [win the race]]]]]] $_j$ [v^* v^*_{phaseH} [RP Oscar $_i$ [R' ...] $_j$]]]
 c.



- d. v^* phase: the raised-object is in PIC domain
 → no ambiguity for further operation

A generalization

- Phase-internal movement (e.g., A-movement) + remnant movement (to the phasal edge) is grammatical (cf. Hiraiwa 2010)

- How about movement out of remnant phrases?

- (11) a. Max asked [how likely t_j to win the race] $_i$ Oscar $_j$ was t_i ?
 b. ?? Which race $_k$ did [Max ask [[how likely t_j to win t_k] $_i$ [Oscar $_j$ was t_i]]]?
 c. * Oscar was asked how [[how likely t_j to win] $_i$ [it was t_i]]

(Sakai 1996:124, (5))

A note

- As long as search domain is restricted and multiple copies do not cause a problem, the core system can proceed further derivations.

2.2 Typology of Movement

(12) Müller-Takano Generalization

A configuration of the form “[XP ... t_{YP}] ... TP ... t_{XP}]” is allowed only if the movements targeting XP and YP are of different types. (Müller 1996, Takano 1995)

(13) Freezing Effect (cf. Wexler and Culicover 1980)

A moved constituent is frozen for extraction.

(Haegeman et al. 2015:77, (3))

(14) Ban on Improper Movement

A' -movement of a constituent X cannot be followed by movement of X to an A -position. (Safir 2019:288,(10))

- How to capture these generalizations?

→ A/A' -distinction?

3 Revisiting the CED effect

Condition on Extraction Domain (Huang 1982:505, (118)), (cf. Cattell 1976)

A phrase A may be extracted out of a domain B only if B is properly governed.

- (15) a. * Who_i did [_{subject} stories about t_i] terrify John? (Chomsky 1977:106)
 b. * Which celebrity_i did Mary eat an ice cream [_{adjunct} before she saw t_i] (Huang 1982:503)

- Extraction from non-complements (e.g., subjects and adjuncts) may be impossible.

3.1 Subject Islands

- (16) Freezing Effect in English
 a. * Which candidate_i were [posters of t_i] all over town?
 b. Which candidate were there [posters of t_i] all over town? (Merchant 2001:87)
 c. ?* Who_i was [a friend of t_i] arrested? (Stepanov 2007:85, (11))
- (17) The edge position and sub-extraction
 a. * Of which car_i did [the driver t_i] cause a scandal? (Chomsky 2008:147, (6b))
 b. Of which car_i is [the driver t_i] likely [t_i to [t_i cause a scandal]]]? (Chomsky 2008:153,(18b))
 c. Of which car_i did they believe [the driver t_i] to have caused a scandal? (Chomsky 2008:153, (19))

A generalization (Chomsky 2008, Gallego and Uriagereka 2007)

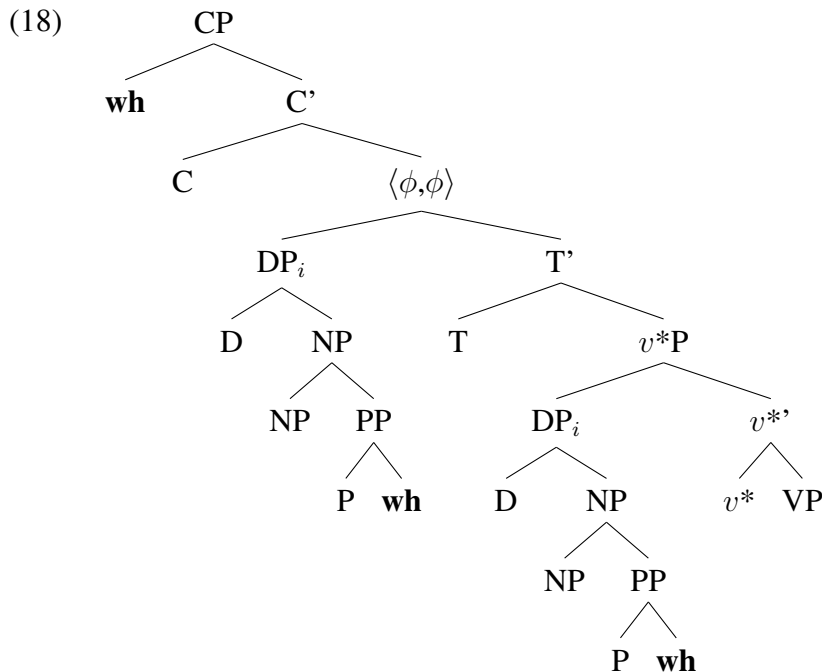
Syntactic Objects in phasal edges become internally opaque

→ How do we capture this generalization?

- Chomsky (2015): no asymmetry between subjects and objects

3.1.1 MERGE

- Under MERGE, freezing effect cannot be derived (Sugimoto 2019).
- The subject in [spec,v*P] is inaccessible; it's a lower copy (*pace* Goto and Ishii 2020).



3.1.2 Exceptions in Subject Islands

- (non-restrictive) relativization, *of*-phrase topicalization, and unaccusative verbs examples are relatively acceptable (McInnerney and Sugimoto 2021).

- (19) a. (...) ran a documentary featuring a young Auckland family [of which]_i [[the father t_i] earned \$70,000 a year (...)] (Chaves and Dery 2019:482,(11c), attributed to NOW corpus)
 b. Of the suspects_i, [few t_i] have good alibis.
 c. [Of which car]_i did [the driver t_i]_j collapse t_j? (Zyman 2019:8,(15))

- (20) non-systematic exceptions (Chaves 2021)
 a. What car_i did some pictures of t_i cause a scandal? (Jimeénez-Fernández 2009:111)
 b. Which president_i would the impeachment of t_i cause more outrage? (Chaves 2012:467)

3.1.3 Cross-linguistic variation

- Stepanov (2007) points out that the unified approach of the subject islands and adjunct islands cannot hold considering the cross-linguistic variation.
- Stepanov (2007): Some languages lack the subject island effect, but show the adjunct island effect.
 1. Subjects are opaque; adjuncts are opaque [e.g., English, French, etc.]
 2. Subjects are transparent; adjuncts are opaque [e.g., Japanese, Turkish, Russian, etc.]
 3. Subjects are transparent; adjuncts are transparent [doesn't exist]
 4. Subjects are opaque; adjuncts are transparent [doesn't exist] (Stepanov 2007:88,(18))

3.1.4 On non-syntactic approaches

- (21) Focus-background conflict (FBC) constraint: Abeillé et al. (2020), cf. Goldberg (2006)
A focused element should not be part of a backgrounded constituent.

Predictions

1. *wh*-movement from subjects becomes less acceptable
2. relativization becomes relatively acceptable.

However. . .

- (22) a. The family_{*i*}, of which [the father *t_i*] has just been arrested, . . .
b. *The family_{*i*}, which [the father of *t_i*] has just been arrested, . . .
. . . The difference cannot be captured by FBC.
- When PP is fronted, PPs lacks a potential extraction site (Akmajian and Lehrer 1976).
- (23) a. Of the stories about Watergate, only yesterday's was truly surprising.
b. The stories about Watergate, of which only yesterday's was truly surprising, were ignored by Congress.
- PP *wh*-phrases are base-generated in [spec,CP] (McInnerney and Sugimoto 2021)

3.2 Adjunct Islands

3.2.1 Syntactic Positions of Adjunct Islands

- (24) a. * What does John dance [whistling *t_i*]? (Truswell 2007:1357, (4a))
b. * What_{*i*} did John die [after he kicked *t_i*]? (Borgonovo and Neeleman 2000:203, (12b))
c. * What_{*i*} was John photographed [during *t_i*]?(Borgonovo and Neeleman 2000:203, (12f))
- (25) a. what_{*i*} did John arrive [whistling *t_i*]? (Truswell 2007:1357, (4b))
b. Who did John get upset [after talking to *t_i*]? (Truswell 2011:129, (1b))
c. % Which play did John fall asleep [during *t_i*]? (Truswell 2011:171, (83))

A generalization

Extraction from adjuncts becomes transparent when adjuncts are in lower positions (L-marked positions/VP adjunction, not *v*P adjunction) (e.g., borgonovoneeleman2000 2000, Narita 2014, Brown 2015, Brown 2017, Bode 2020).

- However, this point is not so clear.
- (26) a. John didn't talk [after any of our meetings]
b. * What meetings_{*i*} didn't John talk [after any of *t_i*]? (Boeckx 2012:146, fn14)
- Not anti-locality (Truswell 2011)
- (27) a. ?? What_{*i*} did John drive Mary crazy [fixing *t_i*]?
b. What_{*i*} did John drive Mary crazy [trying [to fix *t_i*]]? (Truswell 2011:33, (56))
- (28) a. What_{*i*} did John drive Mary crazy [to fix *t_i*]?
b. * What_{*i*} did John drive Mary crazy [beginning] to fix *t_i*]? (Truswell 2011:34, (58))

3.2.2 Single Event Condition

- (29) a. What_i did John arrive [whistling t_i]?
 b. * What_i did John work [whistling t_i]?

Single Event Condition (Truswell 2011:232, (1), see also pp157-158)

- (30) An instance of *wh*-movement is legitimate only if the minimal constituent containing the head and the foot of the chain can be construed as describing a single event.

3.2.3 Form Sequence

Form Sequence: Chomsky (2019, 2020, 2021)

- (31) form sequence:
 a. $\langle (\&), x_1, \dots, x_n \rangle$
 b. Matching condition (cf. ATB, CSC, PG, etc.)

- (32) a. $WS_n = \{ \{ wh_i, \{ C, \{ subject, \{ T, \{ (\&), \{ vP \dots \}, \{ adjunct \dots wh_i \dots \} \} \} \} \} \} \}$
 b. form sequence:
 $WS_{n+1} = \{ \{ wh_i, \{ C, \{ subject, \{ T, \langle (\&), \{ vP \dots \}, \{ adjunct \dots wh_i \dots \} \} \} \} \} \}$
 c. Matching Condition... Single Event Condition?
- (33) Parallelism Condition on ATB movement (Kasai 2004:181, (42))
 ATB movement must take place from syntactically parallel positions.

3.2.4 Internal structures of adjuncts

1. Finiteness (Michel and Goodall 2013)

- (34) a. ??I wonder who John went home [after kissing t_i]
 b. * I wonder who John went home [after he kissed t_i]

2. PP vs. CP

- (35) a. ?Which book_i do you think that [_{CP} if John reads t_i], he'll abandon linguistics?
 (Etxepare (1996): 490, cf. Hornstein (2001))
 cf. *Which book did you say that Ricardo would abandon linguistics if he ever read t_i?
 b. *Which book_i do you think that [_{PP} after John reads t_i], he'll abandon linguistics?

3.2.5 Cross-linguistic variation: Exceptions of adjunct islands across languages

- (36) a. Italian (e.g. di Ricerca 2020)
 b. Norwegian (e.g. Bondevik et al. 2020)
 c. Russian (e.g. Tiskin 2017)
 d. Swedish (e.g. Müller 2017)

... Adjuncts are strong islands in Dutch (Browning 1987), French (Postal 1998), German (Truswell 2011), etc.

4 Conclusion

- (37) Empirical consequences from MERGE(RR) + MS + PIC (Epstein et al. 2018, 2021, Kitahara and Seely 2021)
- a. No counter-cyclic movement
 - *head movement
 - extension condition (Epstein et al. 2018)
 - b. Proper Binding Condition effect, namely remnant movement cases
 - Movement of elements that include trace/lower copy
 - RR violation + legitimate derivation is fine in some cases of remnant movement, but does not hold for parallel Merge cases.
- (38) CED effect revisited
- a. Subject islands: No Freezing Effect under MERGE?
 - b. Adjunct islands: Form Sequence (matching condition)
 - {non-syntactic, non-uniform} analysis of CED effect
 - How to capture cross-linguistic variation?

References

- Abeillé, A., B. Hemforth, E. Winckel, and E. Gibson (2020). Extraction from subjects: Differences in acceptability depend on the discourse function of the construction. *Cognition* 204, 104293.
- Akmajian, A. and A. Lehrer (1976). NP-like quantifier and the problem of determining the head of an NP. *Linguistic Analysis* 2(4), 395–413.
- Bode, S. (2020). *Casting a Minimalist Eye on Adjuncts*. New York: Routledge.
- Boeckx, C. (2012). *Syntactic Islands*. Cambridge: Cambridge University Press.
- Bondevik, I., D. Kush, and T. Lohndal (2020). Variation in adjunct islands: The case of Norwegian. *Nordic Journal of Linguistics*, 1–32.
- Borgonovo, C. and A. Neeleman (2000). Transparent adjuncts. *Canadian Journal of Linguistics/Revue canadienne de linguistique* 45(3-4), 199–224.
- Brown, J. M. (2015). Blackholes and subextraction from adjuncts in English and Norwegian. In *Proceedings of CLS51*, pp. 67–81.
- Brown, J. M. (2017). *Heads and adjuncts: An experimental study of subextraction from participials and coordination in English, German and Norwegian*. Ph. D. thesis, University of Cambridge.
- Browning, M. (1987). *Null operator constructions*. Ph. D. thesis, MIT.
- Cattell, R. (1976). Constraints on movement rules. *Language* 52(1).
- Chaves, R. (2012). On the grammar of extraction and coordination. *Natural Language and Linguistic Theory* 49(2), 285–327.
- Chaves, R. (2021). *Island phenomena and related matters*. Berlin: Language Science Press.
- Chaves, R. and J. E. Dery (2019). Frequency effects in subject islands. *Journal of Linguistics* 55(3), 475–521.
- Chomsky, N. (1977). On wh-movement. In *Formal Syntax*, pp. 71–132. Academic Press.
- Chomsky, N. (2008). On phases. In R. Fredin, C. P. Otero, and M. L. Zubizarreta (Eds.), *Foundational issues in Linguistic Theory*, Chapter 3, pp. 133–166. The MIT Press.

- Chomsky, N. (2015). Problems of projection extensions. In S. M. Elisa Di Domenico, Cornelia Hamann (Ed.), *Structures, Strategies and Beyond: Studies in honour of Adriana Belletti*, Chapter 1, pp. 3–16. John Benjamins Publishing Company.
- Chomsky, N. (2019). Lecture at UCLA. ms, transcript available at LingBuzz.
- Chomsky, N. (2020). Minimalism where we are now, and where we are going. Invited talk at the 161st meeting of the Linguistic Society of Japan at Tohoku Gakuin University (online).
- Chomsky, N. (2021). Genuine explanation. talk at the 39th of West Coast Conference on Formal Linguistics, University of Arizona.
- di Ricerca, T. (2020). *To be or Not to be an island*. Ph. D. thesis, Università Ca' Foscari.
- Epstein, S. D., H. Kitahara, and T. D. Seely (2018). Can “Determinacy + PIC” explain descriptions of remnant movement asymmetries? In *Proceedings of the 158th meeting of the Linguistic Society of Japan*, pp. 264–269.
- Epstein, S. D., H. Kitahara, and T. D. Seely (2021). Some concepts and consequences of 3rd factor-compliant simplest WS merge. ms, in Epstein, Kitahara and Seely (forthcoming).
- Etxepare, R. (1996). On null complementizer in Spanish. *International Journal of Basque Linguistics and Philology* 32(2), 469–496.
- Fiengo, R. (1977). On trace theory. *Linguistic Inquiry* 8(1), 35–61.
- Gallego, Á. and J. Uriagereka (2007). Sub-extraction from subjects: A phase theory account. In J. C. et al. (Ed.), *Romance Linguistics 2006*, pp. 146–162. John Benjamins Publishing Company.
- Goldberg, A. (2006). *Constructions at work: The Nature of Generalization in Language*. Oxford: Oxford University Press.
- Goto, N. and T. Ishii (2020). Some consequences of merge and determinacy. ms, available at Lingbuzz.
- Haegeman, L., Á. L. Jiménez-Fernández, and A. Radford (2015). Deconstructing the subject condition in terms of cumulative constraint violation. *The Linguistic Review* 31(1), 73–150.
- Hiraiwa, K. (2010). Scrambling to the edge. *Syntax* 13(2), 133–164.
- Hornstein, N. (2001). *Move! A minimalist Theory of Construal*. Blackwell.
- Huang, C.-T. J. (1982). *Logical Relations in Chinese and the theory of grammar*. Ph. D. thesis, MIT.
- Jiménez-Fernández, Á. (2009). On the composite nature of subject island: A phase-based approach. *SKY Journal of Linguistics* 22, 91–138.
- Kasai, N. (2004). Two notes on atb movement. *Language and Linguistics* 5(1), 167–188.
- Ke, H. (2019). *The Syntax, Semantics and Processing of Agreement and Binding Grammatical Illusions*. Ph. D. thesis, University of Michigan, Ann Arbor. available at Lingbuzz.
- Kitahara, H. (1997). *Elementary Operations and Optimal Derivations*. MIT Press.
- Kitahara, H. and T. D. Seely (2021). Structure building under MERGE. Poster presented at WCCFL39.
- McInnerney, A. and Y. Sugimoto (2021). Subject island in a simplest Merge system. poster presentation at LSA annual meeting.
- Merchant, J. (2001). *The Syntax of Silence: Slicings, Islands, and the Theory of Ellipsis*. Oxford: Oxford University Press.
- Michel, D. and G. Goodall (2013). Finiteness and the nature of island constraints. In N. Goto, K. Otaki, A. Sato, and K. Takita (Eds.), *Proceedings of GLOW in Asia IX*, pp. 187–197.
- Müller, C. (2017). Extraction from adjunct islands in Swedish. *Norsk Lingvistisk Tidsskrift* 35(1), 67–85.
- Müller, G. (1996). A constraint on remnant movement. *Natural Language and Linguistic Theory* 14, 335–407.
- Narita, H. (2014). *Endocentric Structuring of Projection-free Syntax*. John Benjamins Publishing Company.

- Postal, P. (1998). *Three Investigations of Extraction*. Cambridge, MA: MIT Press.
- Safir, K. (2019). If all merge is pair-merge. ms, available at Lingbuzz, Rutgers University.
- Saito, M. (1989). Scrambling as semantically vacuous a'-movement. In *Alternative Concepts of Phrase Structure*, pp. 182–200. University of Chicago Press.
- Saito, M. (1992). Long distance scrambling in Japanese. *Journal of East Asian Linguistics* 1(1), 69–118.
- Sakai, H. (1996). *Derivational Uniformity: A Study of Syntactic Derivation in Parametric Setting*. Ph. D. thesis, University of California, Irvine.
- Stepanov, A. (2007). The end of CED?: Minimalism and extraction domains. *Syntax* 10(1), 80–126.
- Sugimoto, Y. (2019). On minimal search and (in)accessible copies. ms, University of Michigan.
- Takano, Y. (1995). Predicate fronting and internal subjects. *Linguistic Inquiry* 26(2), 327–340.
- Takano, Y. (2000). Illicit remnant movement: An argument for feature-driven movement. *Linguistic Inquiry* 31(1), 141–156.
- Tiskin, D. (2017). Movement out of adjunct clauses in Russian: Evidence from semantics. *Comparative Slavic Syntax and Semantics* 9(1), 33–43.
- Truswell, R. (2007). Extraction from adjuncts and the structure of events. *Lingua* 117(8), 1355 – 1377.
- Truswell, R. (2011). *Events, Phrases, and Questions*. Oxford University Press.
- Wexler, K. and P. W. Culicover (1980). *Formal Principles of Language Acquisition*. Cambridge, MA: MIT Press.
- Zyman, E. (2019). Antilocality at the phase edge. ms, University of Chicago.