A Gapping analysis of
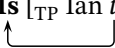# Across-the-Board T^0-to-C^0 movement

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1 Introduction

1.1 The Background

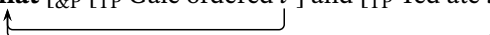• **T^0-to-C^0 Movement.** The standard transformational analysis of subject-auxiliary inversion in matrix question formation involves T^0-to-C^0 movement (Chomsky 1957, 1986, Williams 1974, et seq.).[1]

(1) $[_{CP}$ **Is** $[_{TP}$ Ian t sleeping $]]$

• **Across-the-Board Movement.** The standard transformational analysis of Coordinate Structure Constraint exceptions involves Across-the-Board (ATB) extraction (Ross 1967, Williams 1978, et seq.).[2]

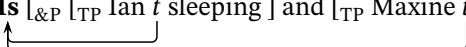(2)   I know $[_{CP}$ **what** $[_{\&P}$ $[_{TP}$ Gale ordered t $]$ and $[_{TP}$ Ted ate t $]]]$

1.2 The Issue

• **Mechanisms Problematized.** A significant amount of literature problematizes these standard transformational mechanisms for displacement.

– T^0-to-C^0 Problematized : Subject-auxiliary inversion is not obviously the output of a syntactic operation (e.g., Bruening 2017, Harizanov & Gribanova 2019, Arregi & Pietraszko 2021).

– ATB-Movement Problematized : ATB extraction has been questioned on conceptual, theoretical, and empirical grounds (e.g., Munn 1993, Bošković & Franks 2000, Zhang 2010, de Vries 2017).

• **Across-the-Board T^0-to-C^0 Movement.** The standard, and often implicit, transformational analysis for auxiliaries in conjoined interrogatives involves Across-the-Board T^0-to-C^0 movement.

(3) $[_{CP}$ **Is** $[_{\&P}$ $[_{TP}$ Ian t sleeping $]$ and $[_{TP}$ Maxine t reading $]]]$

1.3 The Outlook
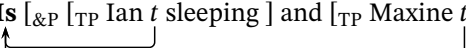
• **A Ban on ATB T^0-to-C^0.** Subject-auxiliary inversion is not the product of Across-the-Board T^0-to-C^0 movement of the fronted auxiliary (see also An 2007, Salzmann 2012).[3]

> **No Across-the-Board T^0-to-C^0**
> T^0-to-C^0 movement cannot apply Across-the-Board in English.

The string in question does not have the representation shown in (4).

(4)   ✘$[_{CP}$ **Is** $[_{\&P}$ $[_{TP}$ Ian t sleeping $]$ and $[_{TP}$ Maxine t reading $]]]$

• **A Dual-Source Gapping Approach.** Apparent ATB T^0-to-C^0 constructions are the outputs of the same mechanisms responsible for Gapping (e.g., Lin 2002, Potter et al. 2017).

> **Apparent ATB T^0-to-C^0 is Gapping**
> Gapping derivations omit auxiliaries from non-initial conjuncts in interrogative coordinations.

– Small Conjunct Gapping (SCG) : Auxiliaries "omitted" from non-initial conjuncts reflect shared auxiliary structure above coordinated v/VPs.

(5) $[_{CP}$ **Is** $[_{TP}$ Kendra t $[_{\&P}$ $[_{VP}$ t studying] and $[_{VP}$ Roger sleeping]]]]

– Large Conjunct Gapping (LCG) : Auxiliaries are omitted from non-initial conjuncts as part of an elided TP constituent under conjoined clauses.

(6) $[_{CP}$ **Is** $[_{\&P}$ $[_{CP}$ $[_{TP}$ Kendra t studying]] and $[_{CP}$ Roger sleeping $\langle_{TP}$ t **is** t $\rangle$]]]

• **The Diagnostic Utility of ATB Head Movement.** The source of scope ambiguities in apparent ATB head displacement configurations may diagnose the responsible mechanism.

> **Reconstruction by Coordination**
> "Reconstruction" that is a function of the scope of coordination diagnoses phonological head movement.

2   A Dual-Source Gapping Analysis

2.1   Gapping

• **Canonical Gapping.** The verb (phrase) of a non-initial conjunct can be omitted under identity with material in a preceding conjunct (Ross 1970, Johnson 2019).

(7)   a.   Some read a book to Melissa and others **read a book** to Paul.
       b.   Some read a book to Melissa and others Δ to Paul.   (Johnson 2019:573, (40))

• **Auxiliary Gapping.** Other instances of Gapping involve omission of auxiliaries, possibly along with the verb (phrase) (Siegel 1987).

(8)   a.   Jill will referee the hockey game and Jori **will** time the luge race.
       b.   Jill will referee the hockey game and Jori Δ time the luge race.   (Lin 2002:10, (3b))

• **A Dual-Source Gapping Approach.** Apparent ATB T^0-to-C^0 constructions are the outputs of the same mechanisms responsible for Gapping (e.g., Lin 2002, Potter et al. 2017).

> **Apparent ATB T^0-to-C^0 is Gapping**
> Gapping derivations omit auxiliaries from non-initial conjuncts in interrogative coordinations.

2.2   Small Conjunct Auxiliary Gapping

• **Low Coordination.**   Gapping may involve the coordination of v/VPs (Siegel 1987, Johnson 1996/2004, Lin 2002, Potter et al. 2017).

– <u>Variable Binding</u> : A quantificational subject in the first conjunct can bind variables in the subject of the second conjunct (McCawley 1993, Johnson 1996/2004, Lin 2002).

(9)   a.   **No woman$_1$** bought a hat and **her$_1$** brother a sweatshirt.
              "There is no student x such that x bought a hat and x's brother bought a sweatshirt."
       b.   **No woman$_1$** [$_{\&P}$ [$_{VP}$ t bought a hat] and [$_{VP}$ **her$_1$** brother ~~bought~~ a sweatshirt]]

– <u>Wide-Scope Operators</u> : Modal auxiliaries in the first conjunct can be interpreted above the coordination (Oehrle 1987, Siegel 1987, Potter et al. 2017).

(10)   a.   Ward **can't** eat caviar and Mary eat beans.
              $\neg\Diamond[P \wedge Q]$: "It's not possible that Ward eats caviar and Mary eats beans."
       b.   Ward **can't** [$_{\&P}$ [$_{VP}$ t eat caviar] and [$_{VP}$ Mary eat beans]]

• **Small Conjuncts Feed Aux-Inversion.**   Apparent ATB T^0-to-C^0 constructions may have Small-Conjunct Gapping structures as their source.

(11)   [$_{ForceP}$ Is [$_{TP}$ Kendra t [$_{\&P}$ [$_{VP}$ t studying] and [$_{VP}$ Roger sleeping]]]]

(12)
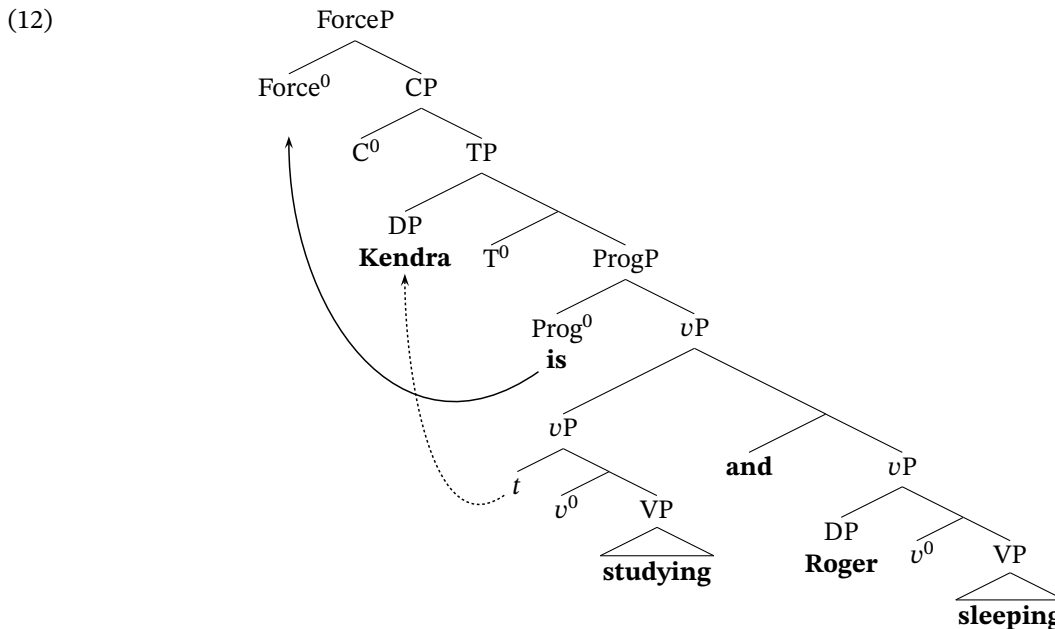
– <u>Low Coordination</u> : Coordination is at the level of the predicate, below any auxiliaries.

– <u>Omitted Auxiliaries</u> : Omission of an auxiliary reflects shared structure above the coordination.

– <u>Coordinate Structure Constraint</u> : A-movement of the subject out of the first conjunct is permitted under if the CSC is a constraint on LF representations (e.g., Ruys 1992, Fox 2000, Lin 2002).

– <u>Auxiliary Inversion</u> : The shared auxiliary is displaced to the left periphery.

2.3   Large Conjunct Auxiliary Gapping

• **High Coordination.**   Gapping may be coordination of clause-level constituents (Ross 1970, Potter et al. 2017).

- Distributed-Scope Operators : Modal auxiliaries can be interpreted below the scope of coordination, in each conjunct (Siegel 1987, Potter et al. 2017)

  (13)   a.   Ward **can't** eat caviar and Mary, beans.
             $\neg\Diamond P \wedge \neg\Diamond Q$: 'Ward can't eat caviar and Mary can't eat beans.'
         b.   [$_{\&P}$ [$_{CP}$ Ward **can't** eat caviar] and [$_{CP}$ Mary beans ~~t can't eat t~~]]

- *Wh*-Remnants : The remnants of gapping can be *wh*-elements, which presumably move to Spec,CP (Pesetsky 1982, Boone 2014; cf. López & Winkler 2003, Johnson 2019).

  (14)   a.   Which boy will bring rice and **which girl**, beans?
         b.   [$_{\&P}$ [$_{CP}$ Which boy will bring rice] and [$_{CP}$ **which girl** beans ~~t will bring t~~]]

• **A Large Conjunct Gapping Source.**   Apparent ATB T^0-to-C^0 constructions may be the output of the same mechanisms responsible for Large Conjunct Gapping.

(15)   [$_{ForceP}$ Is [$_{\&P}$ [$_{CP}$ [$_{TP}$ Kendra t studying]] and [$_{CP}$ Roger sleeping ~~$_{TP}$ t is t~~]]]

(16)
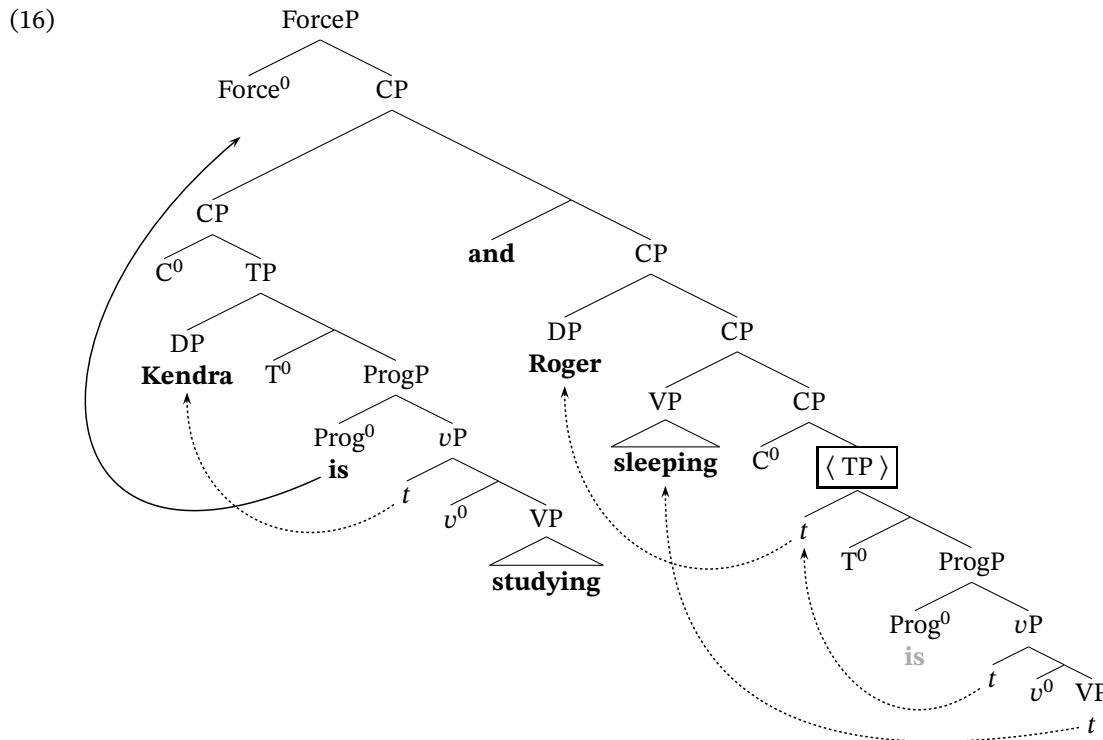
- High Coordination : Coordination is at the level of the clause, at the CP layer.

- Omitted Auxiliaries : Omission of auxiliaries reflect ellipsis of TP containing the missing auxiliary.

- Remnants : Constituents displaced to the left periphery of the second conjunct become remnants.

- Question Formation : The auxiliary in the first conjunct is displaced to the illocutionary force head.

- Coordinate Structure Constraint : Extraction of an auxiliary from the first conjunct is permitted under if the CSC is a constraint on LF representations (e.g., Ruys 1992, Fox 2000, Lin 2002).

3   Challenges for Across-the-Board T^0-to-C^0 Movement

• **A Ban on ATB T^0-to-C^0.**   Subject-auxiliary inversion is not the product of Across-the-Board T^0-to-C^0 movement of the fronted auxiliary.

> **No Across-the-Board T^0-to-C^0**
> T^0-to-C^0 movement cannot apply Across-the-Board in English.

3.1   Asymmetric Agreement

• **Asymmetric Agreement.**   An auxiliary fronted in a coordination structure may asymmetrically agree with the subject of the first conjunct, but not the second (An 2007, Salzmann 2012).

(17)   a.   Who **does** <u>he</u> like and <u>they</u> hate?

   b.   *Who **do** <u>he</u> like(s) and <u>they</u> hate?   (An 2007:8–9, (21)–(22))

(18)   Was **hast**   [<u>du</u> gekauft] und [<u>Peter</u> verkauft]?
       what have.2S   you bought   and   Peter sold   (Salzmann 2012:403, (9))

(19)   a.   ?**Is** <u>Kendra</u> studying and <u>the boys</u> sleeping?

   b.   ??**Are** <u>Kendra</u> studying and <u>the boys</u> sleeping?

• **No ATB Source.**   The contrast suggests that the fronted auxiliary does not (always) have a source in both conjuncts, contra expectations if the auxiliary undergoes ATB T^0-to-C^0 movement (e.g., Citko 2005).

(20)   ✘[$_{CP}$ [$_{\&P}$ [$_{TP}$ Kendra **is** studying] and [$_{TP}$ the boys **is** sleeping]]]

• **Agreement in Gapping.**   Gapping provides derivations in which the fronted auxiliary can be expected to agree with only the initial nominal constituent.

  – <u>Small Conjunct Gapping</u> : In low coordinations the auxiliary probes and agrees with the highest/closest external argument of the first conjunct.

   (21)   [$_{ForceP}$ [$_{TP}$ Kendra **is** [$_{\&P}$ [$_{VP}$ t studying] and [$_{VP}$ the boys sleeping]]]]

  – <u>Large Conjunct Gapping</u> : In high coordinations the pronounced and fronted auxiliary necessarily agrees with the sole argument of its clause.[4]

   (22)   [$_{ForceP}$ [$_{\&P}$ [$_{CP}$ [$_{TP}$ Kendra **is** studying]] and [$_{CP}$ the boys sleeping ⟨$_{TP}$ t **are** t⟩]]]

3.2   Anti-destressing

• **Anti-Destressing.**   A second conjunct cannot contain a destressed pronominal subject that is coreferent with the subject of the first conjunct (cf. Bjorkman 2014).

(23)   a.   *Is **Kendra$_1$** studying and **she$_1$** eating?

   b.   ?Is **Kendra$_1$** studying and **SHE$_2$** eating?

   c.   Is **Kendra** studying and **Roger** eating?

• **No ATB Source.** Anti-destressing is not an expected property given the acceptability of destressed coreferent pronominal subjects in declarative counterparts.

(24) **Kendra$_1$** is studying and **she$_1$** is eating.

(25) ✗[$_{CP}$ [$_{\&P}$ [$_{TP}$ **Kendra$_1$** is studying] and [$_{TP}$ **she$_1$** is eating]]]

• **Prosodic Conditions on Gapping.** Gapping is well-know to have specific information-structural properties that are reflected in its prosody (e.g., Kuno 1976, Winkler 2005, Toosarvandani 2016).

– Small Conjunct Gapping : Predicate-internal subjects positions appear to generally resist destressed coreferent nominals (Toosarvandani 2016).

(26) *[$_{ForceP}$ [$_{TP}$ **Kendra$_1$** is [$_{\&P}$ [$_{VP}$ t studying] and [$_{VP}$ **she$_1$/her$_1$** eating]]]]

(27) I saw [$_{\&P}$ [**Ramona$_1$** reading] and [*her$_1$/**HER$_2$** relaxing]]

– Large Conjunct Gapping : The information-structural status of remnants relative to their correlates requires specific prosodic contours (Winkler 2005).

(28) *[$_{ForceP}$ [$_{\&P}$ [$_{CP}$ [$_{TP}$ **Kendra**$_1$ is studying]] and [$_{CP}$ **she$_1$/her$_1$** eating $\langle_{TP}$ t are t $\rangle$]]]

(29) *Contrastive Focus Principle*
In gapping the deleted elements must be given. The remnants must occur in a contrastive relation to their correlates.

3.3 Undergeneration of Multiple Auxiliaries

• **Vanishing Auxilairies.** Auxiliaries can be omitted from conjuncts in the absence of auxiliary displacement in the first conjunct.

(30) Will Kendra **be** studying and Roger sleeping?

• **ATB Undergenerates.** ATB movement does not provide a means for removing auxiliaries from non-initial conjuncts that don't have displaced correlates.

(31) ✗[$_{CP}$ **Will** [$_{\&}$ [$_{TP}$ Kendra t **be** studying] and [Roger t | be | sleeping]]]

• **Gapping Omits Auxiliaries.** A Gapping analysis provides derivations that can omit auxiliaries from non-initial conjuncts without relying on displacement.

– Small Conjunct Gapping : Low coordination below any aspectual phrases will "omit" auxiliaries from the second conjunct.

(32) [$_{ForceP}$ [$_{TP}$ Kendra$_1$ **will be** [$_{\&P}$ [$_{VP}$ t studying] and [$_{VP}$ Roger sleeping]]]]

– Large Conjunct Gapping : High coordination in combination with TP-ellipsis will remove all auxiliaries from a non-initial conjunct.

(33) [$_{ForceP}$ [$_{\&P}$ [$_{CP}$ [$_{TP}$ Kendra$_1$ **will be** studying]] and [$_{CP}$ Roger sleeping $\langle_{TP}$ t **will be** t $\rangle$]]]

4 Support for Dual-Source Gapping

• **A Dual-Source Gapping Approach.**   Apparent ATB T^0-to-C^0 constructions are the outputs of the same mechanisms responsible for Gapping (e.g., Lin 2002, Potter et al. 2017).

> **Apparent ATB T^0-to-C^0 is Gapping**
>
> Gapping derivations omit auxiliaries from non-initial conjuncts in interrogative coordinations.

- Small Conjunct Gapping : Auxiliaries "omitted" from non-initial conjuncts reflect shared auxiliary structure above coordinated v/VPs.

  (34)   [$_{CP}$ **Is** [$_{TP}$ Kendra t [$_{\&P}$ [$_{VP}$ t studying] and [$_{VP}$ Roger sleeping]]]]

- Large Conjunct Gapping : Auxiliaries are omitted from non-initial conjuncts as part of an elided TP constituent under conjoined clauses.

  (35)   [$_{CP}$ **Is** [$_{\&P}$ [$_{CP}$ [$_{TP}$ Kendra t studying]] and [$_{CP}$ Roger sleeping ⟨$_{TP}$ t **is** t ⟩]]]

4.1 Disjunctive Interrogatives

• **An Interrogative Ambiguity.**   Disjunctions in questions show an ambiguity that is commonly associated with multiple structural representations (e.g., Han & Romero 2004, Pruitt & Roelofsen 2011).[5]

(36)   *Polar-Questions : Small Conjuncts*

   Q: Is Tracy drinking [↗ coffee or tea]?
       "Is it the case that that Tracy is drinking either coffee or tea?"

   A: Yes.

(37)   *Alternative-Questions : Large Conjuncts*

   Q: Is [↗ Tracy drinking coffee] or [↘ ~~Tracy drinking~~ tea]?
       "Which one of the following is Tracy drinking: coffee or tea?"

   A: Coffee.

• **Ambiguous Gapping.**   Interrogative disjunctions are ambiguous between a polar-question or alternative-question interpretation the correlate with the scope of modal operators (cf. Han & Romero 2004:sec. 5.2).

(38)   *Context : Due to construction in their building, I wonder if it will be possible for Kendra to study and for Roger to sleep.*

   Q: Can [↗ Kendra study or Roger sleep]?   ?$\Diamond[P \lor Q]$
       Polar-Question : "Is it possible that Kendra studies or that Roger sleeps?"
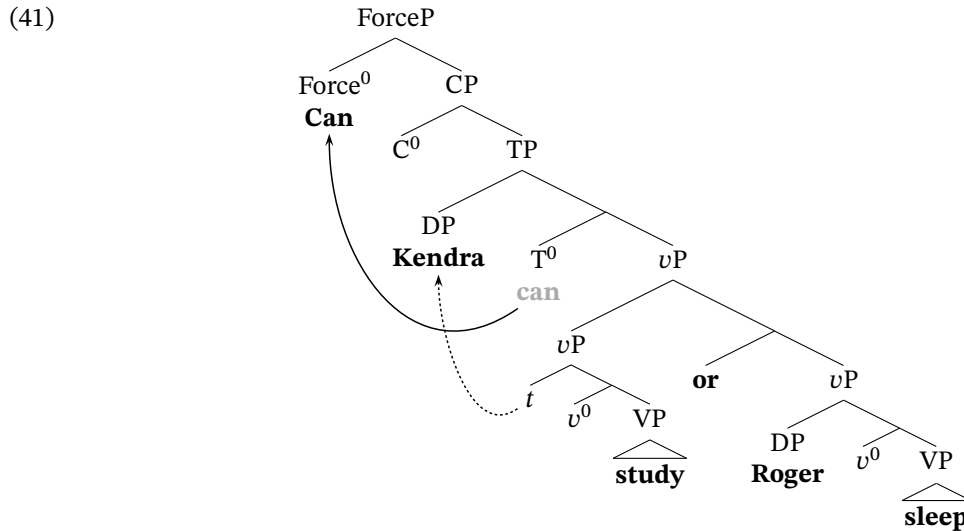
   A: Yes, they'll both be fine.

(39)   *Context : Kendra needs to study and Roger needs to sleep. Knowing that one of them will not be able to do so, I wonder if Kendra will be able to study or if Roger will be able to sleep.*

   Q: Can [↗ Kendra study] or [↘ Roger sleep]?   ?$[\Diamond P \lor \Diamond Q]$
       Alternative-Question : "Which of the following is the case: Kendra can study or Roger can sleep?"

   A: Roger can sleep but Kendra has to work.

• **The Scope of Coordination.**   Gapping, but not ATB, provides derivations for polar-questions and alternative-questions that correlate with the scope of sentential operators.
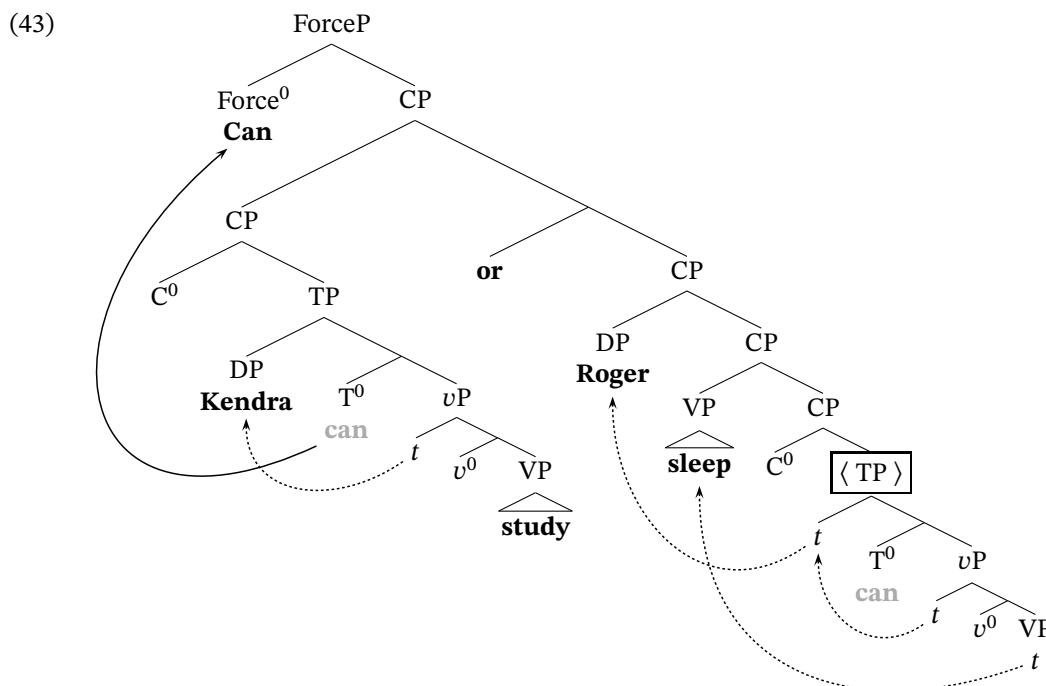
– <u>Small Conjunct Gapping</u> : Low coordination configurations are responsible for Polar-Questions and are expected to necessarily assign sentential operators wide-scope.

(40)   [$_{ForceP}$ **Can** [$_{TP}$ Kendra$_1$ t [$_{\&P}$ [$_{VP}$ t study] or [$_{VP}$ Roger sleep]]]]
          Polar-Question : "Is it possible that either Kendra study or that Roger eat?"

(41)

ForceP
Force^0 **Can**
CP
C^0 TP
DP **Kendra**
T^0 *can*
vP
vP **or** vP
t v^0 VP **study**
DP **Roger** v^0 VP **sleep**

– <u>Large Conjunct Gapping</u> : High coordination structures are responsible for alternative-questions and are expected to necessarily assign sentential operators distributed-scope (contra Siegel 1987).

(42)   [$_{ForceP}$ **Can** [$_{\&P}$ [$_{CP}$ [$_{TP}$ Kendra t_1 study]] or [$_{CP}$ Roger sleep ⟨$_{TP}$ *t* **can** *t* ⟩]]]
          Alternative-Question : "Which of the following is possible: Kendra studies or Roger eats?"

(43)

ForceP
Force^0 **Can**
CP
CP **or** CP
C^0 TP
DP **Kendra**
T^0 *can*
vP
t v^0 VP **study**
DP **Roger** CP
VP **sleep** CP
C^0 ⟨ TP ⟩
t T^0 *can* vP
t v^0 VP t

4.2   Bound-Variable Interpretations

• **Bound Variables in Interrogatives.**   A bound-variable interpretation disambiguates a conjoined interrogative in favor of a polar question interpretation.

(44)   *Context : Walking by an apartment building, I see, unexpectedly, that the television is on in every apartment. Expecting that students would be studying and that others would be sleeping, I ask if this isn't the case.*

    Q: Is [↗ **no student**$_1$ studying or **her**$_1$ roommate sleeping]?
        Polar-Question : "Is it the case that no student is studying or the roommate is sleeping."

    A: No, everyone is watching television.

(45)   *Context : Walking by an apartment building, I see, unexpectedly, that the light is off in every apartment. I inquire about which of two things could explain this.*

    Q: *Is [↗ **no student**$_1$ studying] or [↘ **her**$_1$ roommate sleeping]?
        Alternative-Question : "Which of the following is happening: no student is studying or the roommate is sleeping."

    A: #No student is studying.

• **Bound Variables Bleed LCG.**   Gapping provides derivations for polar-questions and alternative-questions, but bound-variable interpretations are incompatible with alternative-question interpretations.

  • <u>Small Conjunct Gapping</u> : Low coordination structures are responsible for polar-questions and support a bound-variable interpretation.

(46)   [$_{ForceP}$ Is [$_{TP}$ **no student**$_1$ t [$_{\&P}$ [$_{VP}$ t studying] or [$_{VP}$ **her**$_1$ roommate sleeping]]]]

  • <u>Large Conjunct Gapping</u> : High coordination structures are responsible for alternative-questions and omitting auxiliaries, but cannot support a bound-variable interpretation.

(47)   *[$_{ForceP}$ Is [$_{\&P}$ [$_{CP}$ [$_{TP}$ **no student** t studying]] or [$_{CP}$ **her**$_1$ roommate sleeping [$_{TP}$ ~~t is t~~]]]]

4.3   Massive Conjunction Reduction

• **A Polarity/Alternative Question Ambiguity.**   Alternative question interpretations with distributively interpreted operators are available in massively reduced conjuncts.

(48)   Q: Should [↗ **there not be** any students eating or any professors sleeping]?
        Polar-Question : "Is it the case that there should be no students eating and no professors sleeping?"
    A: No, of course not.

(49)   Q: Should [↗ **there not be** any students eating] or [↘ any professors sleeping]?
        Alternative-Question : "Which of the following is the case: no students should be eating or no professors should be sleeping?"
    A: There shouldn't be any professors sleeping.

• **ATB Undergenerates.**   The ATB analysis does not provide a means for understanding how the two interpretations can be achieved while also permitted conjunction reduction.

(50)   ✘Should [**there** t **not be** any students eating] or [there t not be any professors sleeping]

(51)   ✘Should [**there** t **not be** any students eating] or [any professors t not be sleeping]

• **Auxiliary Gapping.**   The proposed Gapping analysis provides reduced conjunct constructions that can generate each interpretation.

– Small Conjunct Gapping : Low coordination generates a polarity-question interpretation and precludes from the second conjunct any material outside the predicate.

(52)   [$_{ForceP}$ [$_{TP}$ **There** should **not be** [$_{\&P}$ [$_{VP}$ any students eating] or [$_{VP}$ any professors sleeping]]]]

– Large Conjunct Gapping : High coordination generates an alternative-question interpretation and elides sentential operators in the second conjunct.

(53)   [$_{ForceP}$ [$_{\&P}$ [$_{CP}$ [$_{TP}$ **There** should **not be** any students eating]] or
           [$_{CP}$ any professors sleeping ⟨$_{TP}$ ~~**there should** *t* **not be** *t*~~⟩]]]

4.4   Overgeneration of Multiple Auxiliaries

• **Spurious Auxiliaries.**   Auxiliaries that do not have a displaced correlate are unexpectedly unable appear in a non-initial conjunct (cf. Lin 2002:42, (20)).

(54)   a. ??**Will** Kendra **be** studying and/or Roger **be** sleeping?
        b.   **Will** Kendra **be** studying and/or Roger sleeping?

• **ATB Overgenerates.**   The ATB analysis does not provide a means for understanding why unmoved auxiliaries cannot appear in their base-generated position.

(55)   ✗**Will** [Kendra *t* **be** studying] and/or [Roger *t* **be** sleeping]

• **Auxiliary Gapping.**   We can appeal to constraints on structure sharing and verbal category fronting in Gapping configurations and predicts only a distributive interpretation.

• Small Conjunct Gapping : Spurious auxiliaries in low coordinations should be a function of the ability to coordinate midfield categories and the polar/alternative interpretation of disjunctions (cf. Potter et al. 2017).

(56) ??[$_{ForceP}$ [$_{TP}$ Kendra$_1$ **will** [$_{\&P}$ [$_{AuxP}$ **be** *t* studying] and/or [$_{AuxP}$ Roger **be** *t* sleeping]]]]

• Large Conjunct Gapping : The unacceptability of spurious auxiliaries in high coordinations is a function of the ability of Aux+VP to be fronted (e.g., Ott 2018, Thoms & Walkden 2019) or escape ellipsis (e.g., Weir 2014)

(57)   *[$_{ForceP}$ [$_{\&P}$ [$_{CP}$ [$_{TP}$ Kendra$_1$ **will be** studying]] and/or
           [$_{CP}$ Roger [$_{XP}$ **be** sleeping] ⟨$_{TP}$ *t* **will** *t*⟩]]]

(58)   a.   **Sitting on the table** will be a bottle of wine.
        b.   ***Be sitting on the table** will a bottle of wine.

(59)   Will Kendra be running?
        a.   No, **studying** ~~Kendra will be~~.
        b.   *No, **be studying** ~~Kendra will~~.

5   Asymmetric Phonological Head Dispalcement

• **The Diagnostic Utility of ATB Head Movement.**   The source of scope ambiguities in apparent ATB head displacement configurations may diagnose the responsible mechanism.

> **Reconstruction by Coordination**
> "Reconstruction" that is a function of the scope of coordination diagnoses phonological head movement.

5.1   Asymmetric T^0-to-C^0 Displacement

• **The Dual-Source Gapping Approach.**   Apparent ATB T^0-to-C^0 constructions are the outputs of the same mechanisms responsible for Gapping (e.g., Lin 2002, Potter et al. 2017).

- Small Conjunct Gapping (SCG) : Auxiliaries "omitted" from non-initial conjuncts reflect shared auxiliary structure above coordinated v/VPs.

    (60)   [$_{CP}$ **Is** [$_{TP}$ Kendra t [$_{\&P}$ [$_{VP}$ t studying] and [$_{VP}$ Roger sleeping]]]]

- Large Conjunct Gapping (LCG) : Auxiliaries are omitted from non-initial conjuncts as part of an elided TP constituent under conjoined clauses.

    (61)   [$_{CP}$ **Is** [$_{\&P}$ [$_{CP}$ [$_{TP}$ Kendra t studying]] and [$_{CP}$ Roger sleeping ⟨$_{TP}$ t **is** t⟩]]]

• **Unavailable "Symmetric" Alternatives.**   Alternative analyses that would conjoin CPs and not posit asymmetric extraction should be dispreferred.

- First Conjunct T^0-to-C^0 Movement : If T^0-to-C^0 displacement is triggered by the properties internal to the first conjunct, we lose the intuition that the conjunction has scope under interrogation.

    (62)   a.   ✗[$_{\&P}$ [$_{CP}$ **Is** [$_{TP}$ Kendra t_1 studying]] and/or [$_{CP}$ Roger sleeping ⟨$_{TP}$ t **is** t⟩]]

        b.
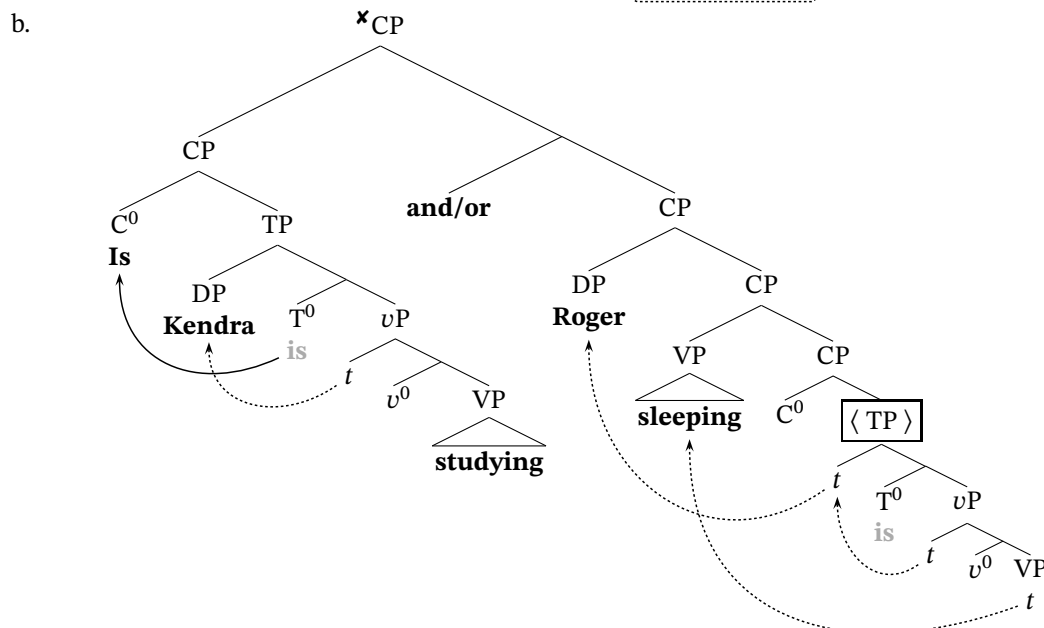
- Symmetric T^0-to-C^0 Movement : If T^0-to-C^0 displacement occurs in both conjuncts, we are forced to rely on a relatively rare instance of CP-ellipsis.

(63)   a.   ✗$[_{\&P}$ $[_{CP}$ **Is** $[_{TP}$ Kendra t_1 studying]] and/or $[_{CP}$ Roger sleeping $\langle_{CP}$ ~~is~~ $t\ t\ t$ $\rangle$]]

          b.
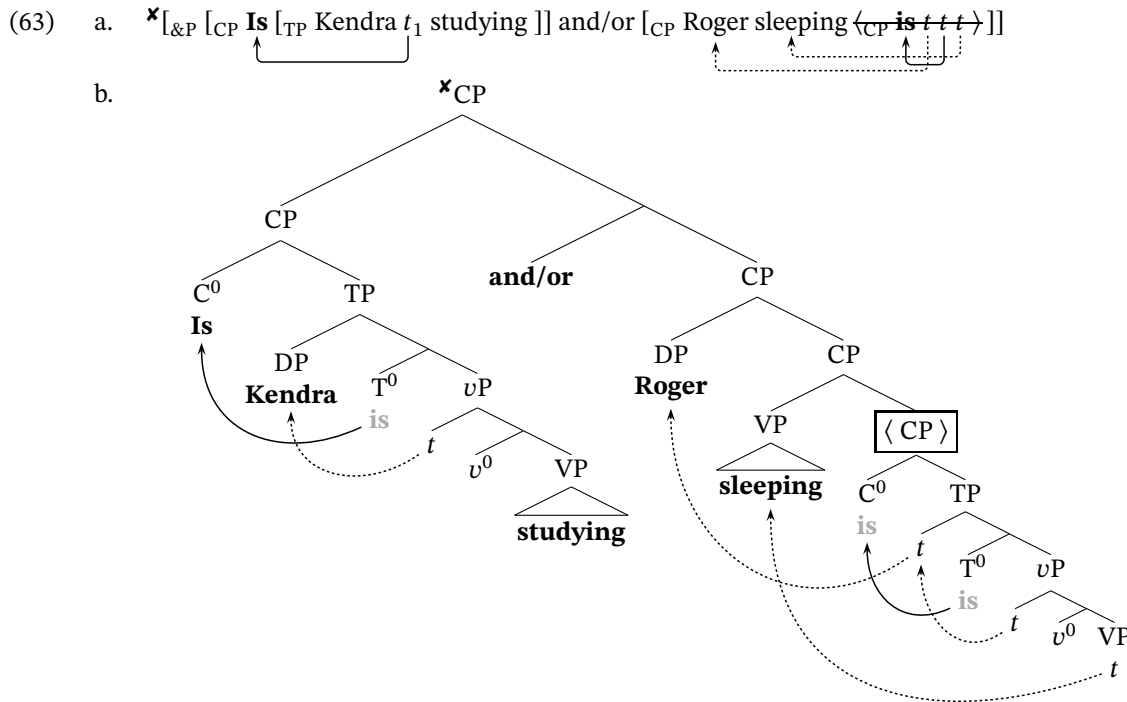
- **Coordination below Force^0.**   The distribution of force-encoding complementizers suggests that coordination is below the head that is responsible for illocutionary force (see also Johnson 2014, 2019).

(64)   I wonder **if** Kim will be studying or ***(if)** Roger sleeping.

(65)   I wonder $[_{ForceP}$ **if** $[_{\&P}$ $[_{CP}$ $[_{TP}$ Kendra will be studying]] or $[_{CP}$ Roger sleeping $\langle_{TP}$ ~~t will be t~~ $\rangle$]]]

- **Overtly Asymmetric Head Movement.**   Observably non-ATB displacement of heads out of coordinations provides further support for the asymmetric displacement of heads.

(66) $[_{CP}$ **Should** $[_{\&P}$ $[_{TP}$ we t support Anne] and $[_{TP}$ she **were** to win]]],

                                                  she would let us drive her Ferrari.

                                                     (Flor & Zompí 2021:1, (4))

5.2   Phonological Head Displacement

- **Semantically Active Head Movement.**   Wide-scope of a displaced head with respect to coordination can diagnose semantically active (narrow-syntactic) head movement (e.g. Lechner 2017).

(67)   *Indicator of semantically active head movement*

        LF : $\mathbf{X^0_1}$ $[_{\&P}$ [... $\mathbf{t_1}$ ...] and/or [... $\mathbf{t_1}$ ...]] $(X^0 > \&, \& > X^0)$

(68)   *Uninformative regarding semantically active head movement*

        LF : $\mathbf{X^0}$ $[_{\&P}$ [...] and/or [...]] $(X^0 > \&)$

• **Post-syntactic Head Movement.**   Obligatory distributed-scope of a displaced head with respect to coordination diagnoses semantically *inactive* (post-syntactic) head movement.

(69)   *Indicator of semantically inactive head movement*

LF : $<X^0 > [_{\&P} [... X^0 ...]$ and/or $[... X^0 ...]]$ ($\& > X^0$)

• **The Scope of Coordination in Gapping.**   The relative scope of operators in conjoined interrogatives is not a function of reconstruction (cf. (67)); it is necessarily a function of the scope of coordination.

  • <u>Small Conjunct Gapping</u> : Wide-scope interpretations of sentential operators are the result of are low coordination configurations; they are uninformative regarding head movement.

(70) $[_{ForceP}$ **Can** $[_{TP}$ Kendra$_1$ t $[_{\&P} [_{VP} t$ study] or $[_{VP}$ Roger sleep $]]]]$ (see (68))

  • <u>Large Conjunct Gapping</u> : Distributed-scope interpretations of sentential operators are the result of high coordination configurations; they indicate semantically *inactive* head movement.

(71) $[_{ForceP}$ **Can** $[_{\&P} [_{CP} [_{TP}$ Kendra t_1 study]] or $[_{CP}$ Roger sleep $\langle_{TP} t$ **can** $t \rangle]]]$ (see (69))

• **CSC "Violating" Head Movement.**   Configurations with asymmetric head displacement are permitted on the promise of "reconstruction" (Ruys 1992, Fox 2000, Lin 2002).

(72)   *Assymetric Phonological Head Displacement*

PF : $X^0 [_{\&P} [... t_1 ...]$ and/or $[... X^0 ...]]$

(73)
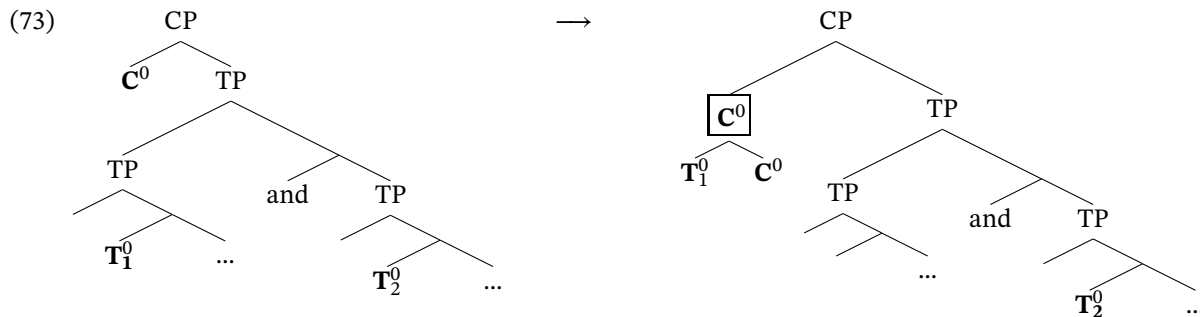
• **Across-the-Board V2?**   Future work will ask if possible scope ambiguity is a function of reconstruction or a function of the scope of coordination in Across-the-Board V2 configurations across the rest of Germanic (den Besten 1983).

(74)   Hans$_1$ **kann** $[_{\&P} [t_1$ seine Zeugnisse einreichen t] und [Maria eine Prüfung ablegen t]]
       Hans   can   his   certificates submit   and Maria an   exam   take
       'Hans can submit his certificates and Mary take an exam.'

                                                        ($\diamondsuit > \&$, $\& > \diamondsuit$; Lechner 2017:4, (26))

• **Previous Arguments for SAHM?**   Future work will have to understand how this fits with the range of arguments for the syntactic nature of head movement (e.g., McCloskey 1996, Lechner 2017, Landau 2020, and references therein).

6 Conclusion

• **A Ban on ATB T^0-to-C^0.**   Subject-auxiliary inversion is not the product of Across-the-Board T^0-to-C^0 movement of the fronted auxiliary.

> **No Across-the-Board T^0-to-C^0**
> T^0-to-C^0 movement cannot apply Across-the-Board in English.

The string in question does not have as (75).

(75)   *[$_{CP}$ **Is** [$_{\&P}$ [$_{TP}$ Ian t sleeping] and [$_{TP}$ Maxine t reading]]]

• **A Dual-Source Gapping Approach.**   Apparent ATB T^0-to-C^0 constructions are the outputs of the same mechanisms responsible for Gapping (e.g., Lin 2002, Potter et al. 2017).

> **Apparent ATB T^0-to-C^0 is Gapping**
> Gapping derivations omit auxiliaries from non-initial conjuncts in interrogative coordinations.

– <u>Small Conjunct Gapping (SCG)</u> : Auxiliaries "omitted" from non-initial conjuncts reflect shared auxiliary structure above coordinated v/VPs.

(76)   [$_{CP}$ **Is** [$_{TP}$ Kendra t [$_{\&P}$ [$_{VP}$ t studying] and [$_{VP}$ Roger sleeping]]]]

– <u>Large Conjunct Gapping (LCG)</u> : Auxiliaries are omitted from non-initial conjuncts as part of an elided TP constituent under conjoined clauses.

(77)   [$_{CP}$ **Is** [$_{\&P}$ [$_{CP}$ [$_{TP}$ Kendra t studying]] and [$_{CP}$ Roger sleeping [$_{TP}$ t **is** t]]]]

• **The Diagnostic Utility of ATB Head Movement.**   The source of scope ambiguities in apparent ATB head displacement configurations may diagnose the responsible mechanism.

> **Reconstruction by Coordination**
> "Reconstruction" that is a function of the scope of coordination diagnoses phonological head movement.

(78)   [$_{ForceP}$ **Can** [$_{\&P}$ [$_{CP}$ [$_{TP}$ Kendra can study]] or [$_{CP}$ Roger sleep [$_{TP}$ t **can** t]]]]

Acknowledgements

Notes

[1]See Bruening (2017) and the references therein for a discussion of Subject-Auxiliary Inversion.

[2]See de Vries (2017) and the references therein for a discussion of Across-the-Board phenomena.

[3]For attempts to recast Across-the-Board $\overline{\text{A}}$-movement see Munn 1993, Bošković & Franks 2000, Nunes 2004, Citko 2005, Zhang 2010, Salzmann 2012, among others.

[4]Note that there is independent evidence for morphological mismatches being permitted under ellipsis.

(i)   John said that he is going to the store and the girls did ⟨ ~~say that they are going to the store~~ ⟩ too.

[5]See also Schwarz (1999), Wu (2021), and references therein for discussions of declarative disjunctions.

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Appendix A : Spuriousness in Multiple-Auxiliary Constructions

• **The Verbal Hierarchy.**   The hierarchy of verbal elements in English is as follows:

(79)   *The Verbal Hierarchy*
        Mod < Perf < Prog < Pass < V

• **The Full Paradigm.**   Examining the full paradigm of two-auxiliary constructions perhaps shows more variability than the simple hypothesis of section would have predicted. (Judgements have been surpressed.)

(80)   a.   **Should** Kendra **have** studied and/or Roger **have** slept?
        b.   **Will** Kendra **be** studying and/or Roger **be** sleeping?
        c.   **Must** Kendra **be** questioned and/or Roger **be** arrested?

(81)   a.   **Has** Kendra **been** studying and/or Roger **been** sleeping?
        b.   **Has** Kendra **been** questioned and/or Roger **been** arrested?

(82)   **Is** Kendra **being** questioned and/or Roger **being** arrested?

(83)   **Will** Kendra **be** happy and/or Roger **be** upset?

Appendix B : Gapping v. Stripping

• **Stripping in Disjunctions.**   Wu (2021) has argued recently that *either ... or* constructions involve stripping (cf. Schwarz 1999, Han & Romero 2004).

(84)   [$_{\&P}$ Either [Tracy is drinking coffee] or [tea ~~Tracy is drinking *t*~~]]

• **Stripping in Interrogatives?**   One could imagine that LCG configurations are derived via Stripping, but not Gapping.

(85)   [$_{CP}$ Is [$_{\&P}$ [$_{CP}$ [$_{TP}$ Kendra *t* studying]] and [$_{CP}$ [$_{XP}$ Roger sleeping] ⟨$_{TP}$ ~~is *t*~~ ⟩]]]

Gapping, but not Stripping.   A Stripping derivation, in which a single remnant is extracted to the left periphery, seems less available than the proposed alternative.

(86)   *Kendra is studying but not [$_{CP}$ [$_{XP}$ Roger eating] ⟨ ~~is *t*~~ ⟩]

Appendix C : Upward Bounding and Islands

• **Constraints on Gapping.**   Gapping resists recovering an embedded antecedent (Hankamer 1979, Johnson 2019) and remnants are sensitive to island boundaries (Neijt 1979).

(87)   *Upward Bounding Constraint*
        The antecedent for a gap must include the highest term in the verbal sequence of the first conjunct.

(88)   *Sylvia will ask [**if Luke is bringing rice**] or

    a.   Louise ~~is bringing~~ beans.
        "Sylvia will ask if Luke is bringing rice or Louise is bringing beans."

    b.   Louise ~~will ask [**if Bill is bringing**]~~ beans.
        "Kendra will ask if Bill is bringing rice or Louise will ask if Bill is bringing beans."

(89)   Sylvia will ask [if Luke is bringing rice or Louise ~~is bringing~~ beans]
    "Sylvia will ask if Luke is bringing rice or if Louise is bringing beans."

• **Upward Bounding and Islands in Interrogatives.**   Gapping interrogatives are subject to the Upward Bounding Constraint and the remnants are sensitive to island boundaries.

(90)   *Will Sylvia ask [**if Kendra is studying**] or

    a.   Roger ~~be~~ sleeping?
        "Will Sylvia ask if Kendra is studying or will Roger be sleeping?"

    b.   Roger ~~ask [**if Kendra is**]~~ sleeping?
        "Will Sylvia ask if Kendra is studying or will Roger ask if Kendra is sleeping?"

(91)   Will Sylvia ask [if Kendra is studying or Roger ~~is~~ sleeping] ?
    "Will Sylvia will ask if Kendra is studying or if Roger is sleeping?"

• **Long-Distance Remnant Movement.**   So long as Upward Bounding is respected, remnants can be displaced across (non-finite) clause boundaries.

(92)   Will Kendra want [to be **studying**] or

    a.   *Roger ~~be~~ sleeping?
        "Will Kendra want to be studying or will Roger be sleeping?"

    b.   Roger [~~want to be~~] **sleeping**?
        "Will Kendra want to be studying or will Roger want to be sleeping?"

Appendix D : Gapping Feeds ATB *Wh*-Movement

• **Constituent Questions.**   Gapping derivations are expected to generate constituent questions.

> **Gapping in Constituent Questions**
> Gapping derivations feed the formation of constituent questions.

• **Wh-Gapping.**   If Gapping derivations necessarily feed auxiliary fronting, then one or both of the proposed Gapping derivations necessarily feed constituent questions.

(93)   Which dish can Tony afford and Sally eat?

(94)   [$_{\text{ForceP}}$ **Which dish$_1$** can [$_{\text{TP}}$ Sally$_1$ t [$_{\&\text{P}}$ [$_{\text{VP}}$ t afford x_1] and [$_{\text{VP}}$ Tony eat x_1]]]] ?

(95)   [$_{\text{ForceP}}$ **Which dish$_1$** can [$_{\&\text{P}}$ [$_{\text{CP}}$ [$_{\text{TP}}$ Sally$_1$ t afford x_1]] and [$_{\text{CP}}$ Tony [eat x_1] ~~[$_{\text{TP}}$ t can t]~~]]] ?

• **An Expected Ambiguity.**   If both structures are available, constituent questions should show the expected scope ambiguities for sentential operators.

(96)   *Context : Tony has a bad habit of eating Sally's food. So, she buys dishes that he won't eat.*

     Q: Which dish won't Sally buy and Tony eat?
         Wide-Scope : "For which dish x will it not be the case that Sally buys x and Tony eats x?"

     A: Liver and onions.

(97)   *Context : Sally refuses to buy a certain dish for the potluck. But, it's for the best anyway because Tony would refuse to eat it.*

     Q: Which dish won't Sally buy and Tony eat?
         Distributed-Scope : "For which dish x will it not be the case that Sally buys x nor will it be the case that Tony eats x?"

     A: Liver and onions.

• **Selective Freezing Effects?**   Future work must investigate why *wh*-extraction out of certain remnants is not possible (Yoshida 2005).

(98)   a.   I wonder if Sally talked about **the rice** and Mary ~~talked~~ about **the beans**.

     b.   *I wonder **which dish$_1$** Sally talked about t_1 and Mary ~~talked~~ about t_1.

(99)   ?I wonder **which person** Sally talked ABOUT and Mary TO.

Appendix E : Why No ATB T^0-to-C^0 Movement?

• **A Constraint on Head Movement.**   Each application of head movement must have a unique target (e.g., Kayne 1994); multiple head-adjunction is prohibited.

(100)
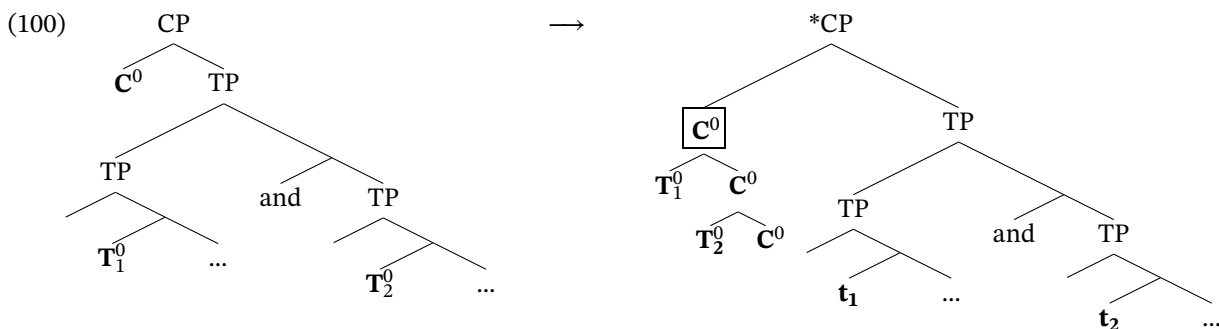
• **The Scope Criterion.**   Independent support may come from the fact that some languages prevent weak pronominal object clitics from take scope outside of coordinations (see Miller 1992).

(101)   a.   el [$_{\&P}$ [**o**   dorea] și [**o**   căuta   ]].
         he   CL.ACC.3FS desires   and   CL.ACC.3FS looks.for
         'He desires her and looks for her.'

     b.   *el **o**   [$_{\&P}$ [dorea   ] și   [căuta   ]].
         he CL.ACC.3FS   desires   and   looks.for
         'He desires her and looks for her.'   (*Romanian*; Monachesi 1998)

• **Morphological Lowering Succeeds ATB.**   Morphological Lowering into multiple conjuncts avoids multiple head-adjunction structures:

(102)
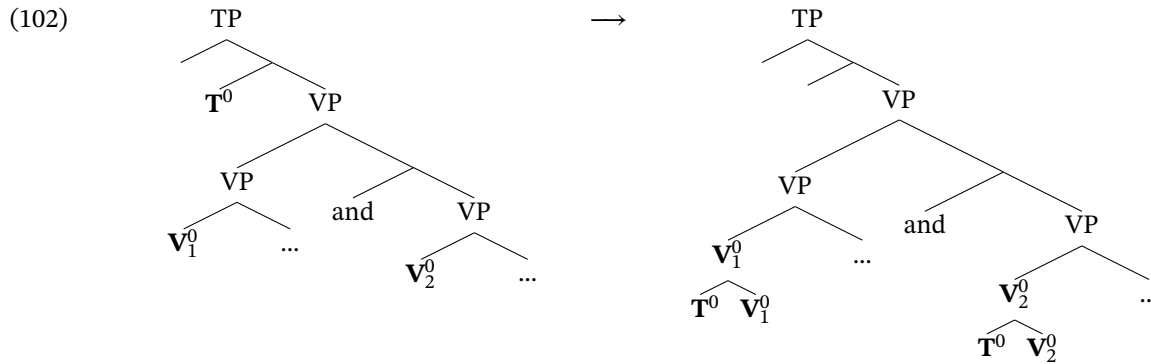
• **English Affix Hopping.**   Morphological Lowering of tense in English can legitimately target each conjunct.

(103)   Steven T^0 [$_{\&P}$ [studi**ed**] and [napp**ed**]].

• **CSC "Violating" Head Movement.**   Configurations with asymmetric head displacement are permitted on the promise of "reconstruction" (Ruys 1992, Fox 2000, Lin 2002).

(104)   *Assymetric Phonological Head Displacement*
         PF : $\mathbf{X^0}$ [$_{\&P}$ [... $\mathbf{t_1}$ ...] and/or [... $\mathbf{X^0}$ ...]]

(105)