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(Non-)Identity Reading Factors of an English Canonical ATB Construction under the Box System

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ABSTRACT

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This study examines the formation processes and readings of lexically singular *wh*-arguments and argumental *wh*-adjuncts in a canonical Across-The-Board (ATB) *wh*-question construction. The central argument of this research is threefold: (i) Chomsky's (2023) Box System can offer a unified explanation for the formation processes of the construction; (ii) an identical reading arises from an internal merge of a *wh*-phrase within TP of each conjunct and c-command of a matrix C[Q]; and (iii) a non-identical reading arises from the position of & operator preceding or between two CPs.

KEYWORDS

across-the-board (ATB) construction, box system, internal merge, c-command configuration, & operator, (non-)identity reading

1. Introduction

The across-the-board (ATB) construction, which was originally proposed by Williams (1978), refers to one in which either (i) two identical constituents, initially generated within each conjunct clause, are unified into a single instance of these constituents outside of the conjuncts, as shown in example (1) below (Park (2006) dubs this ATB construction a canonical *wh*-question ATB construction); or (ii) two distinct constituents, each generated within separate conjuncts, are combined into a coordinated structure in a position outside the conjunct clauses, as shown in (2a, b) below (ATB construction with interwoven dependency) ((1) taken from Gotto and Ishii (2023), (2a) from Postal (1998 (109b)); (2b) consulted from native speakers).

(1) Canonical ATB construction
[Which boy]$_1$ did John meet e_1 and Mary like e_1?

(2) *wh*-argument/adjunct-ATB construction with interwoven dependency [1]
a. [[Which nurse]$_1$ and [which hostess]$_2$]$_3$ did Fred date e_1 and Bob marry e_2, (respectively)?
b. [[How loudly]$_1$ and [how softly]$_2$]$_3$ did John speak e_1 and Peter reply e_2?

With respect to the interpretation of the canonical ATB construction, an interesting fact is that, despite a *wh*-phrase being lexically singular, the construction can yield both identity and non-identity responses, as shown in (3), (4), (5), (6), and (7) ((3) is taken from Gotto and Ishii (2023) and consulted from native speakers; (4) from Munn (1999 (2a)) and Park (2024 (3)), (5) from Munn 1999 (2c); (6) from native speakers).

(3) Which boy did John meet and Mary like?
Identity reading: John met and Mary liked David.
Non-identity reading: John met Tom and Mary liked David.

(4) What did Mary sell and John buy?
Identity reading: Mary sold and John bought a car.
Non-identity reading: Mary sold a car and John bought a bicycle.

(5) Where did Mary vacation and Bill decide to live?
Identity reading: Mary vacationed and Bill (also) decided to live in Paris.
Non-identity reading: Mary vacationed in Paris and Bill decided to live in Toronto.

(6) When did your mother buy the book and you read it?
Identity reading: My mother bought the book and I read it yesterday.
Non-identity reading: My mother bought the book two days ago and I read it yesterday.

The purpose of the paper is to precisely reveal what factors cause lexically singular *wh*-arguments and argumental *wh*-adjuncts shared in [Spec, CP] in canonical or regular *wh*-question ATB construction to yield either

[1] Postal (1998) refers to the overlapping dependencies between these *wh*-chains as 'interwoven dependency', the sort of pattern observed in English *respectively* construction.

identity or non-identity readings under Chomsky's (2023) Box System. Section 2 will review previous approaches and their problems. Section 3 will propose Chomsky's (2023) Box System as an alternative framework and explain the underlying mechanisms of the two types of readings. Section 4 concludes the paper.

2. Previous Approaches and Their problems

2.1 Parallel Movement Approach

Ross (1967, p. 175-6), Williams (1978), and Blümel (2017) propose that the ATB *wh*-question construction is derived by the simultaneous movement of a single *wh*-phrase from both conjuncts to the [Spec, CP] position, as schematized in (7) below. Each of the gaps is related to the *wh*-movement.

(7) [Which boy$_i$ did [John meet t_i] and [Mary like t_i]]

2.2 Multi-dominance Approach

Citko (2005, 2011) proposes that the construction is derived by a single *wh*-phrase in the second conjunct merging into its corresponding position in the first conjunct (Parallel Merge) and subsequently merging to [Spec, CP] (Internal Merge), as schematized in (8) below.

(8) [$_{CP}$ _____ did [John meet t_i] and [Mary like t_i]]

which boy$_i$

The output yields a multi-dominance structure that is simultaneously associated with a gap in each conjunct, as indicated by the long dashed line.

2.3 Parasitic Gap (PG) Approach (1)

Goodall (1987), Mu'adz (1991), Grootveld (1994), and De Vries (2005) propose that PG construction is derived through the following series of processes: (i) *which book* first externally merges with *buying* and then it externally remerges with *read*, resulting in *which book* being shared by the two predicates. (ii) subsequently, to form an adjunct clause, *without* externally merges with *buying which book*. (iii) finally, *which book* is internally remerged in the highest position, as shown in (9).

(9) Which book$_i$ <

did Peter burn t_i

without reading PG$_i$ >

Meanwhile, Haïk (1985) and Williams (1990) treat PG construction as a coordinate structure and analyze it using an ATB extraction manner, as shown in (10) (taken from Williams (1990 (3)).

(10) Who$_i$ [[would you warn t_i]$_s$ COORD [before striking PG$_i$]$_s$]$_s$

They handle derivation computation of PG construction in a similar manner to that of ATB construction.

The Parallel Movement, Multi-dominance, PG(1) approaches differ in their derivation processes; however, they are similar in that the gaps in each conjunct are directly associated with the *wh*-element located in the [Spec, CP] position of the first conjunct. In this respect, these approaches can be categorized as symmetrical.

2.4 Sideward Movement Approach

Hornstein and Nunes (2002) propose that the canonical ATB construction is derived through a series of processes: (i) a single *wh*-phrase out of the second conjunct moves sideways towards the first conjunct ('inter-arboreal' movement between workspaces; cf. Bobaljik and Brown (1997)), (ii) subsequently, the *wh*-phrase in the first conjunct is internally moved to [Spec, CP], and (iii) finally, the two original items undergo deletion at PF-deletion, as illustrated in (11) below, and as schematized in (12) below.

(11) a. Workspace 1: [$_{vP}$ Mary [$_{VP}$ like <which boy>]] ⇒

b. Workspace 2: [$_{VP}$ meet which boy] ⇒

c. [$_{\&P}$ [$_{vP}$ John [$_{VP}$ meet which boy]] & [$_{vP}$ Mary [$_{VP}$ like <which boy>]]] ⇒

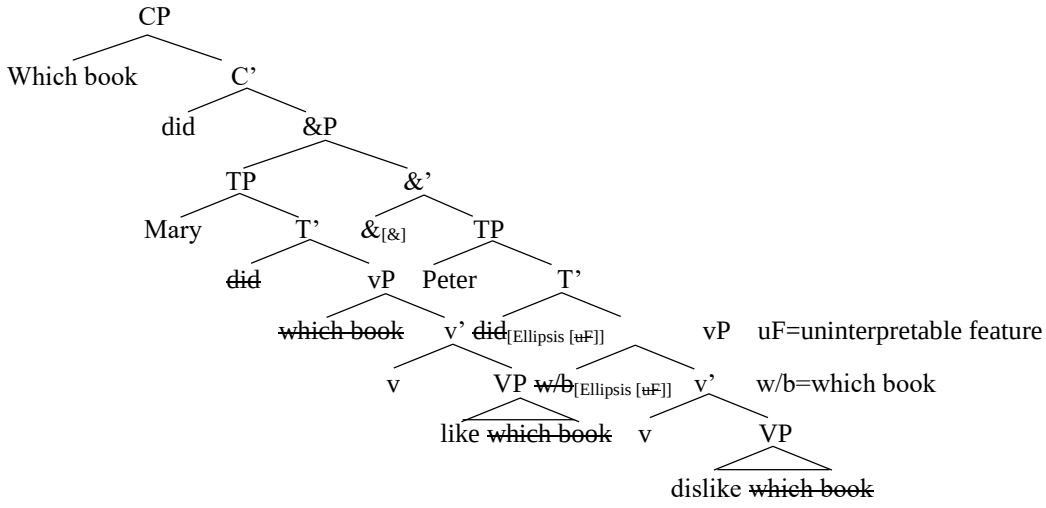
d. [$_{CP}$ which boy … [$_{\&P}$ [$_{vP}$ John [$_{VP}$ meet <~~which boy~~>]] & [$_{vP}$ Mary [$_{VP}$ like <~~which boy~~>]]]]

(12) [$_{CP}$ Which boy$_i$ did [John meet t_i] and [Mary like t_i]]

2.5 Asymmetric Extraction + Ellipsis Approach

Salzmann (2012a, b) proposes that the canonical ATB construction is formed through a series of processes like (13) (taken from Salzmann (2012b (29), (30), and (31)).

(13)



The derivation proceeds as follows: (i) once both conjuncts are merged, asymmetric extraction occurs from the first conjunct to satisfy the requirements of C. In detail, a single *wh*-phrase, *which book*, moves successive-cyclically to [Spec, CP], (ii) only the top copy is realized while the lower copies are deleted at phonological form (PF), (iii) in the second conjunct, the *wh*-phrase moves to [Spec, vP], and then elements bearing [Ellipsis [[uF]], *did* and *which book*, are checked by a matching feature on the ellipsis licensor, & (the ellipsis licensor & and an element bearing [Ellipsis [[uF]] enter into Agree relation] and are suppressed at PF, and (iv) the lower copies of the *wh*-phrase are regularly PF-deleted since the bottom and intermediate copies are generally not phonetically realized.

2.6 Parasitic Gap (PG) Approach (2)

Building on Chomsky's (1981) analysis of parasitic gaps, Munn (1999) proposes that the canonical ATB construction is derived through a series of processes by which, in the first conjunct, a single *wh*-phrase undergoes internal merge to [Spec, CP] and, in the second conjunct, a null operator undergoes empty operator movement to [Spec, CP], as represented schematically in (14) below.

(14) [$_{CP}$ Which boy$_i$] did [John meet t_i] and [$_{Opj}$ Mary like t_j]]

Sideward movement, asymmetric extraction + Ellipsis, and PG(2) approaches differ in their derivation processes; however, they are similar in that only one of the gaps in either conjunct is directly related to the *wh*-element in [Spec, CP] in the first conjunct. In this respect, these approaches can be categorized as asymmetrical.

However, both symmetrical and asymmetrical approaches encounter limitations in explaining the above empirical findings of the availability of identity and non-identity readings. For instance, the non-identity reading of (3) can be interpreted as ‘for which x, x is a person, John met x and for which y, y is a person, Mary liked y’. In other words, the gap in each conjunct should be linked to a different *wh*-operator occupying SPEC-CP in each conjunct, where it takes scope. The symmetrical approaches face challenges in accounting for non-identity readings. Regarding the identity reading of (3), it can be interpreted as ‘for which x, where x is a person, John met x and Mary liked x’. In other words, the gaps in each conjunct should be linked to the same *wh*-operator occupying [Spec, CP] in the first conjunct, where it takes scope. Asymmetrical approaches face challenges in accounting for identity readings. In what follows, we will show that Chomsky’s (2023) Box System can account for the identity and non-identity reading of lexically singular *wh*-arguments and argumental *wh*-adjuncts shared in [Spec, CP] in canonical or regular *wh*-question ATB construction. Furthermore, we will reveal what underlies the two types of readings.

3. Alternative: Chomsky’s (2023) Box System

Chomsky (2023) makes the following statements: (i) internal merge (IM) creates an element that has no further interactions with the external merge (EM)-generated structures that constitute the propositional domain or with operations that apply there (in the second paragraph of page 8); (ii) the element E that is IM-ed to the phase edge is put in a box, separate from the ongoing derivation D, and the E must, however, be accessible to D at later phase

levels for interpretation at the interfaces (in the third paragraph of page 8) [2]; (iii) the boxed element will be accessed for instructions at later phases (in the third paragraph of page 9); and (iv) at each phase, WS is consulted to determine the next step, providing the instructions (in the first paragraph of page 14). These operations are called Box System (BS).

The BS implies the following points: (i) once a *wh*-element that is assigned a theta role undergoes IM to the "lowest phase" edge, movement of it virtually ceases in the narrow syntax, and (ii) successive cyclic *wh*-movement no longer occurs, resulting in IM never filling SPEC-CP, an A'-position with the *wh*-syntactic object (SO). Instead, C[Q] consults the *wh*-element and receives "instructions" from it for *wh*-scope interpretation at the Conceptual-Intentional (CI) interface and *wh*-spell-out under Externalization at the Sensory-Motor (SM) interface.

Meanwhile, Chomsky, in his (2021, p.18), notes that EM is associated with θ-roles and IM with discourse/ information-related functions. He refers to these associations as the Duality of Semantics and classifies the former into a propositional category and the latter into a clausal category in his (2023, p. 4-5). Let us apply the BS to a simple argument *wh*-question with one θ-marked *wh*-element.

3.1 Formation Processes of a Simple Question with One *wh*[+θ]-element

To begin with, let us consider how the BS derives a simple question with a *wh*-object argument, taking an example in (15). (15) can be assumed to undergo the processes of derivation as in (16) under the system.

(15) Which boy did John meet?

(16) WS_1=[{$_{VP}$ meet, which boy}]

WS_2=[{$_{v*P}$ …, {$_{v*P}$ which boy$_2$, {v*, {$_{VP}$ meet, which boy$_1$}}}}]

WS_3=[{$_{v*P}$ John, {$_{v*P}$ which boy$_2$, {v*, {$_{VP}$ buy, which boy$_1$}}}}]

WS_4=[{$_{CP}$ C[Q] "wh$_3$"… {$_{v*P}$ John, {$_{v*P}$ which boy$_2$, {v*, {$_{VP}$ meet, which boy$_1$}}}}}]

[C_Q ⇐ the formal features of *what*: Agree feature, a feature for labeling, semantic features for *wh*-scope interpretation, and so on]

To elaborate on (16), to begin with, the verb 'meet' and the *wh*-object 'which boy' will undergo an external merge each other, yielding a VP structure (Set-Merge), where the *wh*-object argument 'which boy' will be assigned a θ-role by the verb(WS_1). Following these steps, a phase head v* will externally merge with the VP, yielding a v*P structure, where the *wh*-object will be obligatorily put in a box upon merging internally into the inner [Spec, v*P] in accordance with the Duality of Semantics principle ((WS_2, Form Set)). The subject 'John' in turn will externally merge with the v*P structure, being assigned a θ-role (WS_3, Set-Merge). Later in the derivation, the phase head C[Q] will be introduced, and to receive feature instructions for interpretation at the interfaces, C[Q] will consult the boxed *wh*-object and take over features that the *wh*-object bears (henceforth, access is indicated

[2] IM may potentially enter into improper theta-relation via configurational theta role assignment. To preclude this improper theta-relation, the element E that is IM-ed to the phase edge undergoes box or syntactic insulation.

by a dotted line) (WS_4, Form Set).[3] It is important to note that since the boxed element is impervious to MERGE, only the relevant features of the *wh*-object should exist on C[Q]: the *wh*-object itself should never appear in the [SPEC, CP], as schematically represented in (17) below.

(17) a. WS=*[{$_{CP}$ which boy$_3$ C[Q] … {$_{v*P}$ John, {$_{v*P}$ which boy$_2$, {v*, {$_{VP}$ meet, which boy$_1$}}}}}]

b. WS= [{$_{CP}$ C[Q] … {$_{v*P}$ which boy$_2$, {$_{v*P}$, {v*, {$_{VP}$ meet, which boy$_1$}}}}}]

Finally, externalization will be activated, which will involve the following processes: (i) the phonological features of "what$_3$" will be spelled out at [SPEC, CP] (this says that the apparent displacement effect of a *wh*-phrase arises not due to syntactic Internal Merge, but due to PF Externalization), and (ii) the two copies-*which boy*$_1$ at the object position of 'meet' and *which boy*$_2$ at the phase edge position of the inner v*P-will undergo PF-deletion, yielding (15). Through this sequence of operations, the BS derives a simple question with a *wh*-object argument without assuming successive cyclic *wh*-movement.

Next, let us examine how a simple question containing an argumental *wh*-adjunct is derived, using an example in (18) below. The derivation of (18) will proceed as in (19).

(18) Where did Mary vacation?

(19) WS_1= [{$_{VP}$ vacation, {$_{PP}$ {∅,{$_{NP}$ where}}}]

WS_2= [{$_{vP}$ Mary,{$_{vP}$ where$_2$, {v, {$_{VP}$ vacation, {$_{PP}$ {Ø,{$_{NP}$ where$_1$}}}}}}}]

WS_3= {$_{CP}$ C[Q] … [{$_{vP}$ Mary, {$_{vP}$ where$_2$, {v, {$_{VP}$ vacation, {$_{PP}$ {Ø,{$_{NP}$ where$_2$}}}}}}}]

To elaborate on the analysis in (19), we first adopt Huang's (1988, p. 530) 'where' analysis. He notes the following: 'where' and 'when' are dominated by NP in the position [$_{PP}$ P [$_{NP}$ __]], where the P may or may not be phonetically realized. 'where' and 'when', then, are complements of prepositions. The distinction between 'where', 'when' and 'why', 'how' may be that between NP and non-NP, or that between argument and adjunct.[4] Subsequently, the verb 'vacation' will externally merge with the PP to form a VP structure, where the verb 'vacation' will assign a θ-role to PP (WS_1). A light verb v then will externally merge with the resulting VP to form the vP structure, where the *wh*-adjunct 'where' will be internally merged to the outer [Spec, vP], getting boxed upon merging internally because it belongs to a clausal domain. Subsequently, the subject 'Mary' will externally merge with the vP structure, being assigned a θ-role by the light verb (Set-Merge). Later in the derivation, the phase head C[Q] will be introduced, and to receive instructions for interpretation at the interfaces, C[Q] will consult the *wh*-adjunct and take over features that the *wh*-object bears (WS_3).

In what follows, we will examine how the BS gives rise to identity and non-identity readings of lexically singular

[3] See Lee (2024: (18) and (21)) concerning the eligibility and accessibility of an element.

[4] E. Kiss (1993, p. 94) notes that 'where' and 'when' do carry a specificity feature.

argument *wh*-phrases and argumental *wh*-adjuncts shared in [Spec, CP] in canonical or regular *wh*-question ATB construction. We will also elucidate what underlies a non-identity reading in a non-ATB construction.

3.2 Formation Processes and an Identity Reading Factor of a Lexically Singular *wh*-argument in a Canonical ATB Construction

To obtain an identical reading, (i) structurally identical inscriptions must be internally merged (Chomsky et al. 2023, p. 46), and C[Q] must c-command a *wh*-phrase within each conjunct. To meet these conditions for an identical reading, (3), repeated in (20), will involve derivation as in (21), where TP and TP are coordinated (vP-coordination can hold).

(20) Which boy did John meet and Mary like?
Identity reading: John met and Mary liked David.

(21) WS_1=[{$_{VP}$ meet, which boy}, {$_{VP}$ like, which boy}]
WS_2=[{&,{$_{TP}$ John, {T, {$_{v*P}$ John, {$_{v*P}$ which boy$_4$, {v*, {$_{VP}$ meet, which boy$_3$}}}}}},
{$_{TP}$ Mary, {T, {$_{v*P}$ Mary, {$_{v*P}$ which boy$_2$, {v*, {$_{VP}$ like, which boy$_1$}}}}}}}]
WS_3=
<{$_{CP}$, {C[Q] "wh$_5$" … {&, {$_{TP1}$ John, {T, {$_{v*P}$ John, {$_{v*P}$ which boy$_4$, {v*, {$_{VP}$ meet, which boy$_3$}}}}}},
{$_{TP2}$ Mary, {T, {$_{v*P1}$ Mary, {$_{v*P}$ which boy$_2$, {v*, {$_{VP}$ like, which boy$_1$}}}}}}}>

To elaborate on (21), in each conjunct, a verb and a *wh*-object will undergo an external merge each other, yielding a VP structure, where the *wh*-object will be assigned a thematic role of theme by the transitive verb with which it has been externally merged (WS_1). Following these steps, in each conjunct, a phase head v*will undergo EM, yielding a v*P structure. The *wh*-elements that have been assigned a thematic role will be obligatorily put in a box upon merging internally into their respective SPEC-v*Ps, as indicated by wh_4 and wh_2. Each subject will then be externally merged with the v*P structure and assigned a θ-role by its light verb *v*, internally merging into its [Spec, TP]. Susequently, coordinator '&' will be introduced (WS_2). C[Q] will then be introduced at the matrix position in the first conjunct and will access the boxed wh_2 and wh_4 for interpretation instructions at the interfaces. The C[Q] with relevant feature instructions is indicated by "wh_5". Finally, '< >' indicating linear orders will be introduced (WS_3).[5] The WS_3 will be sent to SM. Next, let us examine what occurs at SM through (22) below.

[5] When it comes to the definition of a phase, we follow Chomsky (2015, p. 5) below.
"Languages have unvalued features, assigned values in certain structural positions. These features mark phases, a particular execution of strict cyclicity, well-motivated on grounds of computational efficiency (see Chomsky (2015, p. 8) for the assumption that when C(that) is deleted, T inherits phasehood from C, and T-complement undergoes Transfer". See Ihm (2023, p. 177-178) for more details.

Narrow syntax ⇔ **SM interface**

(22) a. {$_{CP}$, {C[Q] "wh$_5$" … {$_{TP1}$ John, {T, {$_{v*P}$ John, {$_{v*P}$ which boy$_4$, {v*, {$_{VP}$ meet, ~~which boy$_3$~~}}}}}}} and {$_{TP2}$ Mary, {T, {$_{v*P1}$ Mary, {$_{v*P}$ ~~which boy$_2$~~, {v*, {$_{VP}$ like, ~~which boy$_1$~~}}}}}}}

b. Externalization(EXT): which boy C ...

Concretely, (i) the coordinator '&' will be realized phonetically as 'and' (Winter 2017, p. 41); (ii) given feature instructions of "*wh*$_5$", wh$_{5,4,3}$ and *wh*$_{5,2,1}$ are in a cc-configuration. Consequently, *wh*$_{5,4,3,2,1}$ are all interpreted as identical copies, so the lower copies *wh*$_{4\sim1}$ will be deleted. These processes of derivation will generate (20).

Narrow syntax ⇔ **CI interface**

The matrix C c-commands the two TPs, so all the *wh*-elements are interpreted as identical copies. Concretely, (28) is interpreted as 'for which x, x is a person, John met x and Mary liked x': identity reading. The gaps in each conjunct are linked to the same *wh*-operator occupying [SPEC, CP] in the first conjunct clause, where it takes scope.

To recapitulate, the establishment of an IM-derived relation between two identical inscriptions yields an identical reading.

3.3 Formation Processes and a Non-identity Reading Factor of a Lexically Singular *wh*-argument in a Canonical ATB Construction

In this subsection, we will explore how a non-identity reading of a lexically singular *wh*-argument arises in a canonical ATB construction. We propose that, in contrast to TP (or vP) coordination, which yields an identity reading, CP and CP are coordinated. A non-identity reading in (3), repeated in (23), will involve derivation as in (24).

(23) Which boy did John meet and Mary like?
Non-identity reading: John met Tom and Mary liked David.

(24) WS$_1$=[{$_{VP}$ meet, which boy}, {$_{VP}$ like, which boy}]
WS$_2$=[{$_{TP1}$ John, {T, {$_{v*P1}$ John, {$_{v*P}$ which boy$_4$, {v*, {$_{VP}$ meet, which boy$_3$}}}}}},
{$_{TP2}$ Mary, {T, {$_{v*P2}$ Mary, {$_{v*P}$ which boy$_2$, {v*, {$_{VP}$ like, which boy$_1$}}}}}}]
WS$_3$=
<{&,{$_{CP}$, {C[Q] "wh$_6$" …{$_{TP1}$ John, {T, {$_{v*P}$ John, {$_{v*P}$ which boy$_5$, {v*, {$_{VP}$ meet, which boy$_4$}}}}}}},
{$_{CP}$, C[Q] "wh$_3$" …{$_{TP2}$ Mary, {T, {$_{v*P}$ Mary, {$_{v*P}$ which boy$_2$, {v*, {$_{VP}$ like, which boy$_1$}}}}}}}>

The derivation from WS_1 to WS_2 follows the same procedure as that from WS_1 to WS_2 in (21) described above. Later in the derivation, CPs are coordinated, and C[Q] is introduced at the matrix position in each conjunct. The C[Q] in the first conjunct accesses the boxed wh_5, and the C[Q] in the second conjunct accesses the boxed wh_2, respectively, getting features relevant for interpretation at the interfaces. The C[Q] in the first conjunct with relevant feature instructions is indicated by "wh_6", and the C[Q] in the second conjunct with relevant feature instructions is indicated by "wh_3". The & operator which plays the role of coordinating two conjuncts is placed before the two CPs, which means that the operator will operate in only one direction and combines the two CPs, to put it differently, the operator overviews the two CPs simultaneously and combines them (WS_3). WS_3 will then be sent to SM. Let us now examine what occurs at SM through (25) below.

Narrow syntax ⇔ **SM interface**

(25)

a. <{&, {$_{CP}$, {C[Q] "wh$_6$" … {$_{TP1}$ John, {T, {$_{v*P}$ John, {$_{v*P}$ which boy$_5$, {v*, {$_{VP}$ meet, ~~which boy$_4$~~}}}}}}}},

{$_{CP}$, C[Q] "~~wh$_3$~~" … {$_{TP\ 2}$ Mary, {T, {$_{v*P}$ Mary, {$_{v*P}$ ~~which boy$_2$~~, {v*, {$_{VP}$ like, ~~which boy$_1$~~}}}}}}}}}>

b. EXT: which boy C ...

Concretely, (i) the coordinator '&' will be realized phonetically as 'and'; (ii) given the feature instructions of "wh_6" and "wh_3", $wh_{6,5,4}$ and $wh_{3,2,1}$ are in a cc-configuration. Consequently, $wh_{6,5,4}$ and $wh_{3,2,1}$ are each interpreted as identical copies at the SM interface, and their lower copies $wh_{5\sim4}$ and $wh_{2\sim1}$ are deleted at the SM interface (see Gotto and Ishii (2024)). What is crucial here is that since the chain of $wh_{6,5,4,}$ and the chain of $wh_{3,2,1}$ are not in a cc-configuration, they are not interpreted as identical copies; (iii) since, in the situation in which & operator overview the two CPs simultaneously, formal features and form of wh_6 in the first conjunct are the same as those of wh_3 in the second conjunct, the overlapped latter, i.e., wh_3, will undergo deletion due to economy principle. These processes of derivation will generate (23). In the end, let us look into how the WS_3 is interpreted.

Narrow syntax ⇔ **CI interface**

The chain of $wh_{6,5,4}$ and the chain of $wh_{3,2,1}$ are not in a cc-configuration. In other words, TP_1 and TP_2 in (25) are each c-commanded by their respective C[Q]s, so *wh*-elements are interpreted as non-identical at the CI interface. The non-identity reading can be interpreted as 'for which x, x is a person, John met x and for which y, y is a person, Mary liked y'. This implies that the gap in each conjunct should be linked to a different *wh*-operator occupying [SPEC, CP] in each conjunct, where it takes scope.

Meanwhile, (26) below is a non-ATB construction showing that 'which boy' is spelled out in the matrix [SPEC, CP] in each conjunct, giving rise to a non-identical reading. We propose that the non-identical in this construction is yielded through processes of derivation as in (27).

(26) Which boy did John meet and which boy did Mary like?

(27) WS_1=[{$_{VP}$ meet, which boy}, {$_{VP}$ like, which boy}]

WS_2=[{$_{TP1}$ John, {T, {$_{v*P1}$ John, {$_{v*P}$ which boy$_4$, {v*, {$_{VP}$ meet, which boy$_3$}}}}}},

{$_{TP2}$ Mary, {T, {$_{v*P2}$ Mary, {$_{v*P}$ which boy$_2$, {v*, {$_{VP}$ like, which boy$_1$}}}}}}]

WS_3=

<{{$_{CP}$, {C[Q]"wh$_6$" …{$_{TP}$ John, {T, {$_{v*P}$ John, {$_{v*P}$ which boy$_5$, {v*, {$_{VP}$ meet, which boy$_4$}}}}}}} &

{$_{CP}$, C[Q]"wh$_3$" …{$_{TP}$ Mary, {T, {$_{v*P}$ Mary, {$_{v*P}$ which boy$_2$, {v*, {$_{VP}$ like, which boy$_1$}}}}}}}>

The difference between WS_3 in (24) and that in (27) is that, in the case of the former, the & operator operates in only one direction and combines the two CPs, whereas in the case of the latter, the operator is placed between the two CPs, in other words, it combines the two CPs from both directions. Let us now examine what occurs at SM through (28) below.

Narrow syntax ⇔ **SM interface**

(28) a. <{$_{CP}$ which boy, {C…{$_{TP1}$ John, {T, {$_{v*P1}$ John, {$_{v*P}$ ~~which boy$_5$~~, {v*, {$_{VP}$ meet, ~~which boy$_4$~~}}}}}}} and

{$_{CP}$ which boy, {C …{$_{TP2}$ Mary, {T, {$_{v*P1}$ Mary, {$_{v*P}$ ~~which boy$_2$~~, {v*, {$_{VP}$ like, ~~which boy$_1$~~}}}}}}}>

b. EXT: which boy C ... and which boy …

Concretely, (i) the coordinator '&' will be realized phonetically as 'and'; (ii) $wh_{6,5,4}$ and $wh_{3,2,1}$ are in a cc-configuration. Consequently, $wh_{6,5,4}$ and $wh_{3,2,1}$ are each interpreted as identical copies, and their lower copies $wh_{5\sim4}$ and $wh_{2\sim1}$ will be deleted. What is crucial here is that since the chain of $wh_{6,5,4}$ and the chain of $wh_{3,2,1}$ are not in a cc-configuration, they are not interpreted as identical copies. Thus, 'which boy' will be realized in the matrix [SPEC, CP] in each conjunct. These processes of derivation will generate (26). In the end, let us look into how the WS_3 is interpreted.

Narrow syntax ⇔ **CI interface**

The chain of $wh_{6,5,4}$ and the chain of $wh_{3,2,1}$ are not in a cc-configuration. In other words, TP_1 and TP_2 are each c-commanded by their respective C[Q]s, so *wh*-elements are interpreted as non-identical, yielding a non-identical reading. The non-identity reading can be interpreted as 'for which x, x is a person, John met x and for which y, y is a person, Mary liked y'. This implies that the gap in each conjunct should be linked to a different *wh*-operator occupying [SPEC, CP] in each conjunct, where it takes scope.

3.4 Formation Processes and an Identity Reading Factor of a Lexically Singular Argumental *wh*-adjunct in a Canonical ATB Construction

In this subsection, we will discuss how an identity reading of a lexically singular argumental *wh*-adjunct arises in a canonical ATB construction. We assume that an identity reading available in (29) below arises from the processes of derivation as in (30) below, where TPs are coordinated.

(29) Where did Mary vacation and Bill decide to live?
Identity reading: Mary vacationed and Bill (also) decided to live in Paris.

(30) WS_1=[{$_{VP}$ vacation, {$_{PP}$ {∅,{$_{NP}$ where}}}, {$_{VP}$ live, {$_{PP}$ {∅,{$_{NP}$ where}}}]
WS_2= [{$_{TP}$ Mary, {T, {$_{vP}$ Mary, {$_{vP}$ $\boxed{where_4}$, {v, {$_{VP}$ vacation, {$_{PP}$ {Ø,{$_{NP}$ where$_3$}}}}}}}}},
{$_{TP}$ Bill, {T, …{$_{vP}$ Bill, {$_{vP}$ $\boxed{where_2}$, {v, {$_{VP}$ live, {$_{PP}$ {∅,{$_{NP}$ where$_1$}}}}}}}}]
WS_3=
<{$_{CP}$,{{$_{CP}$ C[Q] "wh$_5$" …{&, {$_{TP}$ Mary, {T, {$_{vP}$ Mary, {$_{vP}$ $\boxed{where_4}$, {v, {$_{VP}$ vacation, {$_{PP}$ {Ø,{$_{NP}$ where$_3$}}}}}}}}},
{$_{TP}$ Bill, {T, …{$_{vP}$ Bill, {$_{vP}$ $\boxed{where_2}$, {v, {$_{VP}$ live, {$_{PP}$ {∅,{$_{NP}$ where$_1$}}}}}}}}}>

To elaborate on (30), in each conjunct, a verb and PP will undergo an external merge each other, yielding a VP, where PP will be assigned a thematic role of place by the verb with which it has been externally merged (WS_1). Following these steps, in each conjunct, a light verb *v* will undergo EM, yielding a vP structure. The *wh*-elements that have been assigned a thematic role will be obligatorily put in a box upon merging internally into their inner [SPEC-vP]s, as indicated by wh_4 and wh_2. Each subject will then externally merge with its vP structure and assigned a θ-role by its light verb *v*, internally merging into its [Spec, TP] (WS_2). Later in the derivation, C[Q] will be introduced at the matrix position in the first conjunct and will access the boxed wh_2 and wh_4 for interpretation instructions at the interfaces. The C[Q] with relevant feature instructions is indicated by "wh_5". Finally, coordinator '&' and '< >' indicating linear orders will be introduced, respectively (WS_3). The WS_3 will be sent to SM and CI. Computations in these modules will proceed in the same manner as those for the identity reading of a canonical *wh*-argument ATB construction.

3.5 Formation Processes and a Non-Identity Reading Factor of a Lexically Singular Argumental *wh*-adjunct in a Canonical ATB Construction

In this subsection, we will discuss how a non-identity reading a lexically singular argumental *wh*-adjunct is yielded in a canonical ATB construction. We assume that a non-identity reading in (31) below arises from the processes of derivation as in (32) below, where CPs are coordinated.

(31) Where did Mary vacation and Bill decide to live?

Non-identity reading: Mary vacationed in Paris and Bill decided to live in Toronto.

(32) WS_1=[{$_{VP}$ vacation, {$_{PP}$ {∅,{$_{NP}$ where}}}, {$_{VP}$ live, {$_{PP}$ {∅,{$_{NP}$ where}}}]

WS_2= [{$_{TP}$ Mary, {T, {$_{vP}$ Mary, {$_{vP}$ where$_4$, {v, {$_{VP}$ vacation, {$_{PP}$ {Ø,{$_{NP}$ where$_3$}}}}}}}}},

{$_{TP}$ Bill, {T, …{$_{vP}$ Bill, {$_{vP}$ where$_2$, {v, {$_{VP}$ live, {$_{PP}$ {∅,{$_{NP}$ where$_1$}}}}}}}}]

WS_3=

<{&,{$_{CP}$, { C[Q] "wh$_6$" …{$_{TP}$ Mary, {T, {$_{vP}$ Mary, {$_{vP}$ where$_5$, {v, {$_{VP}$ vacation, {$_{PP}$ {Ø,{$_{NP}$ where$_4$}}}}}}}}}},

{$_{CP}$, {C[Q] "wh$_3$" …{$_{TP}$ Bill, {T, …{$_{vP}$ Bill, {$_{vP}$ where$_2$, {v, {$_{VP}$ live, {$_{PP}$ {∅,{$_{NP}$ where$_1$}}}}}}}}}>

The derivation from WS_1 to WS_2 follows the same procedure as that from WS_1 to WS_2 in (30) described above. Later in the derivation, CP and CP will be coordinated, and C[Q] will be introduced at the matrix position in each conjunct. The C[Q] in the second conjunct accesses the boxed wh_2, and the C[Q] in the first conjunct accesses the boxed wh_5, getting features relevant for interpretation at the interfaces, respectively. The C[Q] with relevant feature instructions in the first conjunct is indicated by "wh_6", and the C[Q] with relevant feature instructions in the second conjunct is indicated by "wh_3". The & operator which plays the role of coordinating two conjuncts is placed before the two CPs, which means that the operator will operate in only one direction and combines the two CPs, to put it differently, the operator overviews the two CPs simultaneously and combines them. WS_3 will then be sent to SM and CI. Computations at SM and CI modules for WS_3 will proceed in the same manner as those for the non-identity reading of a canonical *wh*-argument ATB construction discussed in the subsection 3.3.

Meanwhile, (33) below is a non-ATB construction showing that 'where' is spelled out in the matrix [SPEC, CP] in each conjunct, giving rise to a non-identical reading. We propose that the non-identical reading in this construction is yielded from processes of derivation as in (34).

(33) Where did Mary vacation and where did Bill decide to live?

(34) WS_1=[{$_{VP}$ vacation, {$_{PP}$ {∅,{$_{NP}$ where}}}, {$_{VP}$ live, {$_{PP}$ {∅,{$_{NP}$ where}}}]

WS_2= [{$_{TP}$ Mary, {T, {$_{vP}$ Mary, {$_{vP}$ where$_4$, {v, {$_{VP}$ vacation, {$_{PP}$ {Ø,{$_{NP}$ where$_3$}}}}}}}}},

{$_{TP}$ Bill, {T, …{$_{vP}$ Bill, {$_{vP}$ where$_2$, {v, {$_{VP}$ live, {$_{PP}$ {∅,{$_{NP}$ where$_1$}}}}}}}}]

WS_3=

<{{$_{CP}$, { C[Q] "wh$_6$" …{$_{TP}$ Mary, {T, {$_{vP}$ Mary, {$_{vP}$ where$_5$, {v, {$_{VP}$ vacation, {$_{PP}$ {Ø,{$_{NP}$ where$_4$}}}}}}}}}}&

{$_{CP}$, {C[Q] "wh$_3$" …{$_{TP}$ Bill, {T, …{$_{vP}$ Bill, {$_{vP}$ where$_2$, {v, {$_{VP}$ live, {$_{PP}$ {∅,{$_{NP}$ where$_1$}}}}}}}}}>

The difference between WS_3 in (32) and that in (34) is that, in the case of the former, the & operator operates in only one direction and combines the two CPs, whereas in the case of the latter, the operator is placed between the two CPs, in other words, it combines the two CPs from both directions. Let us now examine what occurs at SM through (35) below.

Narrow syntax ⇔ **SM interface**

(35) a. <{$_{CP}$ where, { C, {$_{TP}$ Mary, {T, {$_{vP}$ Mary, {$_{vP}$ where$_5$, {v, {$_{VP}$ vacation, {$_{PP}$ {Ø,{$_{NP}$ where$_4$}}}}}}}}} and

{$_{CP}$ where, {C, {$_{TP}$ Bill, {T, …{ $_{vP}$ Bill, {$_{vP}$ where$_2$, {v, {$_{VP}$ live, {$_{PP}$ {∅,{$_{NP}$ where$_1$}}}}}}}}}>

b. EXT: where C ... and where …

Concretely, (i) the coordinator '&' will be realized phonetically as 'and'; (ii) $wh_{6,5,4}$ and $wh_{3,2,1}$ are in a cc-configuration. Consequently, $wh_{6,5,4}$ and $wh_{3,2,1}$ are each interpreted as identical copies, and their lower copies $wh_{5\sim4}$ and $wh_{2\sim1}$ will be deleted. What is crucial here is that since the chain of $wh_{6,5,4}$ and the chain of $wh_{3,2,1}$ are not in a cc-configuration, they are not interpreted as identical copies. Thus, 'where' will be realized in the matrix [SPEC, CP] in each conjunct. These processes of derivation will generate (33). In the end, let us look into how the WS_3 is interpreted.

Narrow syntax ⇔ **CI interface**

The chain of $wh_{6,5,4}$ and the chain of $wh_{3,2,1}$ are not in a cc-configuration. In other words, TP_1 and TP_2 are each c-commanded by their respective C[Q]s, so *wh*-elements are interpreted as non-identical. A non-identical reading is yielded. The non-identity reading can be interpreted as 'for which x, x is a place, Mary vacationed in x and for which y, y is a place, Bill vacationed in y'. This implies that the gap in each conjunct should be linked to a different *wh*-operator occupying [SPEC, CP] in each conjunct, where it takes scope.

To recapitulate, (i) the coordination of TP and TP, and (ii) c-command by C[Q] at the matrix results in an identical reading. In contrast, (i) the coordination of CP and CP coordination, and (ii) the position of & operator preceding or between the two CPs give rise to a non-identical reading.

4. Conclusion

This study was initiated to identify factors that cause a lexically singular *wh*-phrase shared in [Spec, CP] in canonical or regular *wh*-question ATB construction to yield either identity or non-identity readings under Chomsky's (2023) Box System. The following conclusions have been reached: both symmetrical approaches (parallel movement, multi-dominance, PG(1) approaches) and asymmetrical approaches (sideward movement, asymmetric extraction+Ellipsis, and PG(2) approaches) cannot provide a principled explanation for factors that yield identical and non-identical readings of a lexically singular *wh*-phrase shared in [Spec, CP] in canonical or regular *wh*-question ATB construction. We demonstrated that Chomsky's (2023) Box System as an alternative to

these approaches can offer a unified explanation for the relevant factors. Specifically, an identical reading is yielded from (i) an internal merge derivation of a *wh*-phrase within TP of each conjunct, and (ii) the c-command of a matrix C[Q]. In contrast, a non-identical reading arises from (i) the c-command of C[Q] in each conjunct, and (ii) the position of & operator preceding or between the two CPs.

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Examples in: English
Applicable Languages: English
Applicable Level: All

