

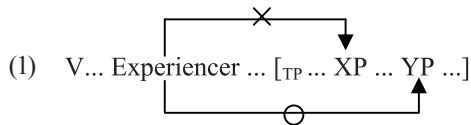
Article

Tree Adjoining Grammar and the Experiencer Paradox

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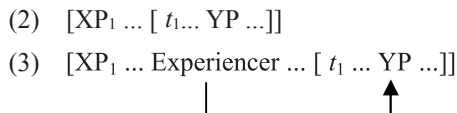
1. Introduction

This paper aims to account for a phenomenon called the “experiencer paradox” in raising constructions within the framework of Tree Adjoining Grammar (TAG)¹. This paradox refers to conflicting c-command relations established between the experiencer and the materials, XP and YP, in the embedded TP, as shown in (1).



Although a lot of attempts have been made to account for this paradox within the framework of the Minimalist Program (Chomsky (1995), Kitahara (1997), Epstein et al. (1998), Boeckx (1999, 2008), Collins (2005) among others), it still remains unsettled.

This paper proposes to account for this paradox by exploiting the TAG hypothesis, which allows the experiencer to appear in the structure after the subject raising (2) and to c-command only YP, as in (3), which circumvents the problematic c-command relations in (1).



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An important notion of the TAG-based account is to permit overt and counter-cyclic insertion of structures. Although it is usually assumed that overt and counter-cyclic Merge is prohibited by the Extension Condition (Chomsky 1993), TAG insertion of the experiencer is still tenable since it is assumed to be an adjunction operation. Moreover, the TAG account deals with the experiencer paradox without recourse to the overt/covert distinction and other unnecessary complex operations.

This article is organized as follows: Section 2 reviews Chomsky's (1995) analysis of the experiencer paradox and presents a central issue to be discussed in this article. Section 3 outlines the basic strategy of the TAG approach and proposes a TAG-based explanation of the issue. Section 4 revisits a couple of alternative approaches and points out their problems. Comparing my approach with these alternatives provides us with good pieces of evidence in favor of the former. Section 5 concludes this article.

2. A Preliminary View

It is useful to review Chomsky's (1995) analysis of this issue for the discussion below. Consider the following example:

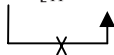
- (4) John_i T seems to her [_{TP} *t*_i to like Mary].

We assume that movement in general must obey the Minimal Link Condition (MLC), defined as follows:

- (5) α can raise to target K only if there is no legitimate operation Move β targeting K, where β is closer to K. (Chomsky 1995: 296)

The example (4) shows that the embedded subject *John* can be raised to the matrix clause across the experiencer *her*. A natural question to be asked is how and why *her* does not induce an MLC violation (henceforth MLC-insensitivity). Chomsky claims that *her*, in this case, is not a closer candidate for movement and *John* can move across it, satisfying the MLC. This claim depends on the assumption that *her* does not c-command *John*, depicted as follows:

- (6) T seems to her [_{TP} John to like Mary].




However, this assumption contradicts the construal under Condition C of the Binding Principle. The following example illustrates that *her* and *Mary* are interpreted as referentially disjoint (henceforth Condition C construal)².

(7) *John₁ seems to her₂ [_{TP} t₁ to like Mary₂].

This construal implies that *her* c-commands *Mary*.

(8) John₁ seems to her₂ [_{TP} t₁ to like Mary₂].



Thus, the c-command domain of the experiencer must exclude the embedded TP for the MLC-insensitivity and also includes the embedded TP for the Condition C construal, hence the paradox.

3. A TAG-Based Explanation

This section proposes a TAG-based account of the experiencer paradox. Let us start with outlining the TAG basics.

3.1 TAG Basics

TAG builds structures by combining some components of trees called ‘elementary trees’ via Substitution and Adjoining³.

3.1.1 Substitution

Substitution combines two elementary trees, A and B, by rewriting the node X_1 (a frontier node) of A with the node X_2 (the root node) of B, where the labels of X_1 and X_2 are identical to each other. This operation, for instance, combines the two elementary trees in (9), yielding the structure (10).

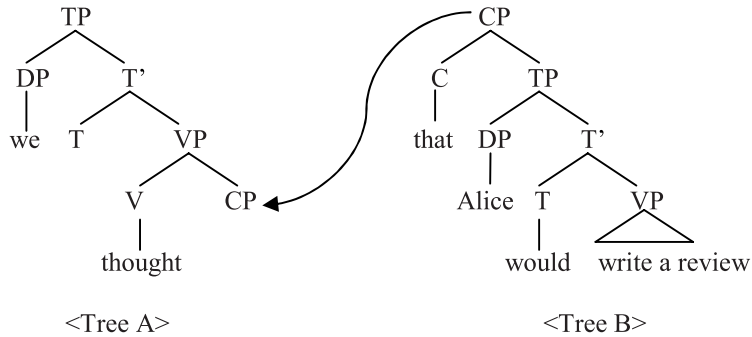
(9) a. [_{TP} we thought CP] (= Tree A)

b. [_{CP} that Alice would write a review] (= Tree B)

(10) [_{TP} we thought [_{CP} that Alice would write a review]]

The relevant parts of the structure are depicted below.

(11)



As in (11), the CP-node of the tree A is rewritten by the CP-node of the tree B⁴.

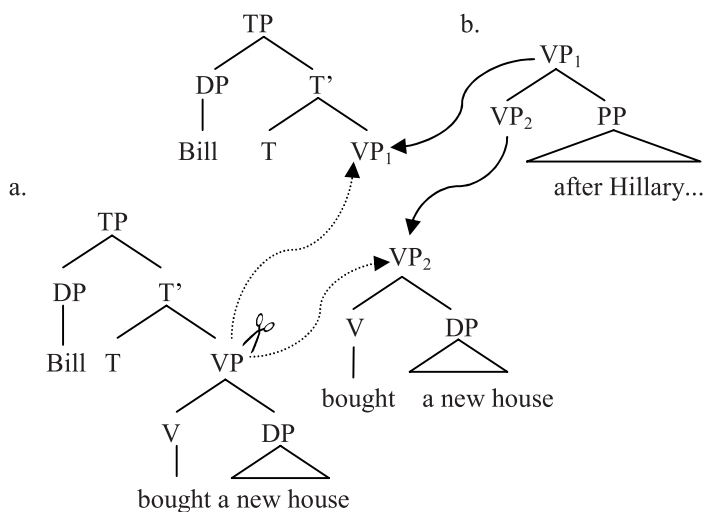
3.1.2 Adjoining

Adjoining combines two elementary trees, A and B, in the following way. At the outset, the node X of the tree A is divided into two separate nodes, X₁ and X₂. Inserted into this space is the tree B, whose root node (X₁') and a foot node (X₂') rewrite X₁ and X₂, respectively⁵. This operation, for instance, generates the structure (13) by combining the two elementary trees in (12).

- (12) a. [_{TP} Bill T [_{VP} bought a new house]]
 b. [_{VP} VP [_{PP} after Hillary decided to run]]
- (13) [_{TP} Bill T [_{VP} [_{VP} bought a new house] [_{PP} after Hillary decided to run]]]

The relevant parts of the structure are depicted below.

(14)



As illustrated above, the tree (14a) is divided into two sets of trees at the VP-node; one has VP₁ as a frontier node and the other has VP₂ as the root node. These newly created nodes are rewritten by VP₁ and VP₂ of the tree (14b), respectively.

3.1.3 Movement

Movement in TAG is restricted to the interior of a single elementary tree. This is hypothesized in Frank (2002) as follows:

(15) The fundamental TAG hypothesis

Every syntactic dependency is expressed locally within a single elementary tree.

(Frank 2002: 22)

Therefore, successive-cyclic long-distance movement is actually nothing other than local movement established within elementary trees. Under this assumption, the successive-cyclic results from recursive application of Adjoining. Specifically, the sentence (16) is produced by combining the two elementary trees in (17) by Adjoining.

(16) Eleanor seemed to know the answer.

(17) a. [_{TP} Eleanor_i [_{T'} to t_i know the answer]]

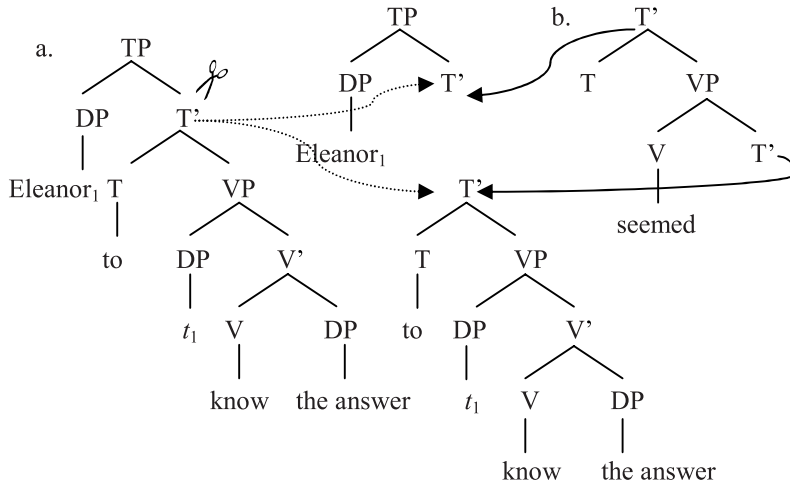
b. [_{T'} T [_{VP} seemed T']]

In (17a), the subject is raised to the ‘matrix’ [Spec, TP] within this elementary tree. (17b) is an elementary tree headed by *seemed*, called the ‘Auxiliary Tree,’ whose root and foot nodes are both labeled as T’. Adjoining combines these two elementary trees and yields the following structure⁶:

(18) [TP Eleanor_{t1} [T’ T [VP seemed [T’ to t₁ know the answer]]]]

The whole picture of this derivation is shown schematically as follows:

(19)



The matrix tree (19a) is separated at T’ into the two sets of structures and the Auxiliary tree (19b) is inserted into this space, which superficially appears to be successive cyclic and long-distance ‘movement.’

3.2 Back to the Paradox

Now, let us turn to the explanation of the experiencer paradox. Consider the following example:

(20) John seems to her to like Mary.

As mentioned above, movement in TAG is fundamentally reduced to the elementary-tree-internal one. According to this assumption, the subject moves to the [Spec, TP] as follows:

(21) [TP John_{t1} [T’ to t₁ like Mary]].

Needless to say, nothing violates the MLC in this configuration, since no intervener exists here.

Therefore the MLC-insensitivity follows⁷. In the next step, Adjoining introduces the auxiliary tree (22), containing the experiencer, into the structure (21), yielding the structure (23).

(22) [_T T [_{VP} seemed [to her] T']]

(23) [_{TP} John_i [_T T [_{VP} seems [to her] [_T to *t*₁ like Mary]]]]].

Spell-Out is, then, applied to (23), and the Condition C construal shown in (24) follows, as expected⁸.

(24) *_{[TP} John_i [_T T [_{VP} seems [to her₂] [_T to *t*₁ like Mary₂]]]]].

Consequently, both the MLC-insensitivity and the Condition C construal are satisfied, and the experiencer paradox disappears.

4. Alternative Approaches

This section revisits alternative approaches to the experiencer paradox. The comparison between my TAG approach and these alternative approaches turns out to suggest that the former is advantageous over the latter.

4.1 Late C-Command

Kitahara (1997) and Epstein et al. (1998) are classified into this group. These analyses have the following characteristics in common; 1) The experiencer does not c-command the embedded clause prior to the subject raising since the PP-node intervenes, hence the MLC-insensitivity⁹; 2) The experiencer c-commands the embedded clause subsequent to the subject raising, hence the Condition C construal.

4.1.1 Kitahara (1997)

Kitahara (1997) assumes that the covert movement of FF[her] to the head of PP for checking purposes renders the experiencer available for c-commanding the embedded clause at LF, as in (25)¹⁰.

(25) [_{TP} John_i T seems [_{PP} FF[her]-to her] [_{TP} *t*₁ to like Mary]]

The PP-node c-commands the embedded TP, so the head P (and its subpart FF[her]) also c-commands the embedded TP. This results in the expected Condition C construal.

4.1.2 Epstein et al. (1998)

Epstein et al. (1998) proposes the remerger of the experiencer¹¹. Suppose that the P-head bears a phonetic feature and an uninterpretable Case feature but lacks a semantic feature. The Case feature is deleted as a result of feature-checking and the phonetic feature is stripped off by Spell-Out. Since the P-head has no semantic feature, all of its features are eliminated at this point of derivation. This renders the P-head and its projection PP vanished from the derivation and the experiencer [_{DP} her] is remerged into the position where PP has once occupied, as depicted in (26).

(26) [_{TP} John_i T seems [_{DP} her] [_{TP} t_i to like Mary]]

In (26), the problematic PP-node is eliminated from the structure, and [_{DP} her] fulfills c-commanding the embedded TP. Consequently, this results in the expected Condition C construal.

4.2 Early C-Command

Boeckx (1999, 2008) and Collins (2005) belong to this group¹². These analyses have the following characteristics in common; 1) The experiencer c-commands the embedded TP from the beginning, hence the Condition C construal. 2) The MLC-insensitivity is concerned with some mechanisms other than the absence of c-command.

4.2.1 Boeckx (1999, 2008)

Boeckx (1999, 2008) propose V-P reanalysis. In default cases, the V-P reanalysis renders the PP-node invisible and makes it possible for the feature communication between the matrix T and the experiencer to go through the PP. This is involved in experiencer-raising constructions, exemplified in (27)-(28), in which the experiencer is attracted by the matrix T¹³.

- (27) Þeim hafði virst [_{TP} Ólafur vera gáfaður]. (Icelandic)
 them has seemed Olaf be intelligent
 ‘Olaf seemed to them to be intelligent.’ (Boeckx 2008: 144)
- (28) Nos parece [_{TP} este taxista estar cansado]. (Spanish)
 us seems this taxi-driver be tired
 ‘This taxi-driver seems to us to be tired.’ (ibid.)

On the contrary, it is assumed that the V-P reanalysis is prohibited in English. In this case, the PP-node, which intervenes between the matrix T and the experiencer, interrupts the direct feature communication between them. As a result, the experiencer is no longer a closer candidate for Attract and, instead, the embedded subject is attracted by the matrix T. This accounts for the MLC-

insensitivity.

4.2.2 Collins (2005)

Collins (2005) proposes an operation called “smuggling,” shown as follows:

- (29) a. Z ...W ... [YP XP ...]
 b. Z ... [YP XP ...] ... W ... t_{YP}
 c. XP Z ... [YP t_{XP} ...] ...W ... t_{YP}

As mentioned above, in (29a), the experiencer W c-commands YP (and the embedded subject XP) from the beginning. Raising XP directly to the Spec of Z across W is prohibited by the MLC. However, there is another route to raise XP across W without violating the MLC. If YP, containing XP, moves across W as in (29b), XP can move from this new position to the Spec of Z as in (29c), since XP is no longer c-commanded by W. Specifically, the whole steps of derivation of the example (30) are illustrated in (31)-(35).

- (30) John seems to her to like Mary.
 (31) Step 1: Raising the subject to the Spec of *seem*
 a. [_{TP} John to like Mary]
 b. [_V seem [_{TP} John to like Mary]]
 c. [_{VP} John [_V seem [_{TP} t_{John} to like Mary]]]
 (32) Step 2: Remnant movement of TP to the Spec of X
 a. [_X X [_{VP} John [_V seem [_{TP} t_{John} to like Mary]]]]
 b. [_{XP} [_{TP} t_{John} to like Mary] [_X X [_{VP} John [_V seem] t_{TP}]]]
 (33) Step 3: Inserting the experiencer into the Spec of Appl(icative)
 a. [_{Appl} Appl [_{XP} [_{TP} t_{John} to like Mary] [_X X [_{VP} John [_V seem] t_{TP}]]]]
 b. [_{AppIP} her [_{Appl} Appl [_{XP} [_{TP} t_{John} to like Mary] [_X X [_{VP} John [_V seem] t_{TP}]]]]]
 (34) Step 4: Smuggling the VP to the Spec of *v*
 a. [_v v [_{AppIP} her [_{Appl} Appl [_{XP} [_{TP} t_{John} to like Mary] [_X X [_{VP} John [_V seem] t_{TP}]]]]]]]
 b. [_{VP} [_{VP} John [_V seem] t_{TP}] [_v v [_{AppIP} her Appl [_{XP} [_{TP} t_{John} to like Mary] [_X X t_{VP}]]]]]]]
 (35) Step 5: Raising the subject to the Spec of T
 a. [_T T [_{VP} [_{VP} John [_V seem] t_{TP}] [_v v [_{AppIP} her Appl [_{XP} [_{TP} t_{John} to like Mary] [_X X t_{VP}]]]]]]]
 b. [_{TP} John [_T T [_{VP} [_{VP} t_{John} [_V seem] t_{TP}] [_v v [_{AppIP} her Appl [_{XP} [_{TP} t_{John} to like Mary] [_X X t_{VP}]]]]]]]]]

In (33), the experiencer c-commands the embedded TP, which results in the Condition C construal. In (34), the smuggling of VP enables the embedded subject to climb over the intervening experiencer. Consequently, the subject raising in (35) meets the MLC, hence the MLC-insensitivity.

4.3 Problems with the Alternative Approaches

Kitahara (1997) has at least two problems. First of all, the covert movement of FF[her] is incompatible with Single Cycle Hypothesis (Bobaljik (1995), Groat and O'Neil (1996), Pesetsky (1998, 2000), Chomsky (2000)), which argues for the elimination of overt/covert distinction in syntax. In addition, the covert movement of FF[her] and the alleged c-command effects encounter the problematic cases in (36)-(37), showing that Move-F does not affect LF-interpretations as discussed in Lasnik (1995).

- (36) a. Some applicants seem to each other to be eligible for the job.
 b. *There seem to each other to be some applicants eligible for the job.
- (37) a. No applicants seem to any of the deans to be eligible for the job.
 b. *There seem to any of the deans to be no applicants eligible for the job.

Epstein et al. (1998) has at least two problems. First of all, the reemergence of the experiencer after Spell-Out violates the Extension Condition (Chomsky 1993). Moreover, it is incompatible with Single Cycle Hypothesis, as well. It is generally assumed that Spell-Out is applied to the complement of a phase head under the Phase Impenetrability Condition (PIC), defined as follows:

- (38) In a phase α with head H, the domain of H is not accessible to operations outside α , only H and its edge are accessible to such operation. (Chomsky 2000: 108)

Provided that, as often assumed (Chomsky 2000, 2001), raising constructions in English lack phase-heads (v^* and C). This implies that the sentence (39), as a whole, is sent to Spell-Out altogether at the final point of derivation.

- (39) [_{TP} John_i T seems [_{PP} to [_{DP} her]] [_{TP} t_i to like Mary]]

This would be tantamount to assuming an additional level for reemergence subsequent to Spell-Out and prior to LF exceptionally. This falls into a situation similar to the overt/covert distinction, incompatible with Single Cycle Hypothesis.

Boeckx (1999, 2008) have the following problems. First, the notion of feature communication is not defined clearly. Specifically, it is not clear how and why the PP-node interrupts the feature communication between the matrix T and the experiencer. It is also unclear why V-P reanalysis is

prohibited in raising constructions in English. As the following fact shows, English often permits and, indeed, requires V-P reanalysis to take place.

(40) His picture was looked at by everyone.

Collins (2005) raises the following problems. In the first place, the proposed derivations are too complex to be optimal. In particular, the raising of TP to the Spec of X in (32) and the raising of VP to the Spec of *v* in (34) are deemed to be the implementation derived from unclear factors. Moreover, it is unclear why none of these phrasal movements are prohibited by the Proper Binding Condition.

4.4 The TAG Approach

The TAG approach resolves the problems discussed above. The TAG approach assumes that the insertion of the experiencer is completely overt, which eliminates the overt/covert distinction in derivation and is fully compatible with Single Cycle Hypothesis. Moreover, the overt merger of the experiencer in TAG does not violate the Extension Condition. As discussed in Chomsky (1993, 1995), the application of the Extension Condition is restricted to substitution operations¹⁴. In this sense, Adjoining in TAG is an adjunction operation, hence it meets the Extension Condition vacuously. In addition to this, in the TAG approach, there is no reason to assume the complex operations such as feature communication through V-P reanalysis and smuggling movement insensitive to the Proper Binding Condition.

5. Conclusion

Summarizing this article, I have argued that the experiencer paradox, showing that the conflicting requirements of the MLC-insensitivity and the Condition C construal must be both satisfied, can be resolved by the TAG hypothesis. It has also been suggested that the TAG hypothesis dissolves the problems with the alternative approaches to this issue, namely the overt/covert distinction in derivation, the Extension Condition and other deficiencies of complex operations. This conclusion, after all, turns out to suggest that the TAG approach has an advantage over the other approaches to understanding the nature of raising constructions.

Notes

1 See Frank (1992), Frank (2002), Frank, Kulick, and Vijay-Shanker (2000), Frank and Kroch (2008), Joshi (1987), Joshi, Levy, and Takahashi (1975), Kulick (2000) and Abeillé and Rambow (2000), among others for detailed discussions.

2 The following examples also suggest that the experiencer *c*-commands the embedded clause.

(i) a. That dog seems to every boy_i to like all of his_i toys.

b. That dog seems to no boy_i to like any of his_i toys.

c. *Who₂ does John seem to who₁ to like *t*₂?

(Barss and Lasnik 1986)

3 Elementary trees are formed by the recursive application of Merge. This process is constrained by the Condition on Elementary Tree Minimality, defined as follows:

(i) The syntactic heads in an elementary tree and their projections must form an extended projection of a single lexical head. (Frank 2002: 54)

See Frank (2002) for more details. See also Grimshaw (1991) for a notion “extended projection.”

4 Notice that TAG Substitution conceptually differs from Minimalist Merge. As the tree A of (11) shows, the foot node CP is merged with V without any terminals.

5 The labels of X₁ and X₁’, as well as those of X₂ and X₂’, are identical to each other.

6 See Frank (2002) for details of the way to exclude superraising (i).

(i) *Eleanor seemed [it was certain [to know the answer]]

In short, the structure (i) cannot be built since the complex Auxiliary tree (iib) to be inserted into (iia) is illegitimate.

(ii) a. [_{TP} Eleanor [_T to know the answer]]

b. [_T T seemed [_{TP} it was certain T’]]

Specifically, the Auxiliary tree (iib) must be built by combining the two Auxiliary trees, *seem*-tree and *certain*-tree, as shown below.

(iii) a. [_T T seemed T’]

b. [_{TP} it was certain T’]

The former (iiia) has T’-nodes as its root and foot and the latter (iiib) contrastively has TP-node as its root because of the existence of expletive *it* as its specifier. In consequence, the *certain*-tree cannot be combined with the *seem*-tree, hence the ungrammaticality of (i). Another possibility is substituting the tree (ivb) into the tree (iva), whose foot is TP in this case, and forming the Auxiliary tree (iib).

(iv) a. [_T T seemed TP]

b. [_{TP} it was certain T’]

This would be excluded as a violation of the Markovian condition, under which the daughter structure to be inserted into the T’-node of the mother structure (iia) must be T’-recursive in itself, hence the ungrammaticality of (i).

7 This implies that the MLC is a derivational constraint as assumed in Chomsky (1995).

8 We assume that, in (23), the experiencer *her* does *c*-command *Mary* in this configuration. See Boeckx (1999, 2008) and Collins (2005) for this view.

9 The late *c*-command approach assumes the following definition of *c*-command:

(i) A *c*-commands B iff every branching node dominating A dominates B and neither A nor B dominates the other.

10 Kitahra (1997) assumes the Larsonian shell structure for raising constructions. I will not address this matter here. See Boeckx (2008) for relevant discussion.

11 Boeckx (2009) suggests that this remerger operation can be seen as an instance of Reprojection advocated by Hornstein and Uriagereka (2008)

12 Chomsky’s (2000) analysis is another instance of this approach. Chomsky assumes that the experiencer is inherently Case-marked, which renders the experiencer inert/invisible for attraction. See Boeckx (2008) for a criticism of this account.

13 In English, the experiencer raising, as illustrated in (27) and (28), is not allowed.

- (i) *Bill_i seems to t₁ [_{TP} John to be honest]

In contrast, subject raising from the embedded clause is not allowed in Italian, Icelandic and Spanish.

- (ii) a. *Gianni_i sembra a Maria [_{TP} t_i essere stanco].

Gianni seems to Maria to be ill

'Gianni seems to Maria to be ill.'

(Boškovic 2011: 4)

- b. *Ólafur_i hafði virst þeim [_{TP} t_i vera gáfaður].

Olaf has seemed them be intelligent

'Olaf seemed to them to be intelligent.'

(Boeckx 2008: 144)

- c. *Este taxista_i nos parece [_{TP} t_i estar cansado].

this taxi-driver us seems be tired

'This taxi-driver seems to us to be tired.' (ibid.)

Following Frank (2002), I assume that these contrasts between English and other languages are derived from the difference in structure building among languages.

In short, the experiencer raising such as (27) and (28) is allowed since it applies within a single/matrix elementary tree (iiia) followed by TP-substitution by (iiib).

- (iii) a. [_{TP} þeim_i hafði virst t_i TP]

them has seemed

- b. [_{TP} Ólafur vera gáfaður]. (Icelandic)

Olaf be intelligent

On the contrary, subject raising from the embedded clause in these languages is prohibited by a ban against the movement across distinct elementary trees.

- (iv) *[Ólafur_i hafði virst þeim [_{TP} t_i vera gáfaður]].

Olaf has seemed them be intelligent

In contrast, the English case (i) is not allowed since (i) cannot be generated by Adjoining (vb) into the structure (va).

- (v) a. [_{TP} John_i [_{T'} to t_i be honest]].

- b. [_{T'} T [_{VP} seemed [to Bill] T']]

14 More details must be investigated on the nature of Adjoining and its association with the Extension Condition. I will leave this matter for future research.

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