Smuggling and Labeling Theory

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Abstract: This paper draws a deep connection between smuggling (Collins 2005) and labeling (Collins 2002, Chomsky 2013, 2015), showing that the movement of the smuggler in a smuggling derivation can be triggered by the labeling algorithm.

Keywords: passive, smuggling, labeling algorithm

1. Smuggling

Smuggling refers to an approach to passives pioneered by Collins (2005) and extensively developed in Collins (2024) (on smuggling more generally, see Belletti and Collins 2020, and much recent work). Axiomatic on this approach is the Merge-based approach to argument structure:

(1) Intuition: The only way to build argument structure is by external Merge.

Collins (2024) formalizes this intuition with the Argument Criterion:

(2) Argument Criterion
   a. Each argument is introduced by a single argument-introducing head.
   b. Each argument-introducing head introduces a single argument.

The Argument Criterion has interesting consequences for the analysis of the passive. Since the *by*-phrase is an argument, it must be externally merged into an argument position.

(3) The *by*-phrase of the passive is externally merged (set-Merge) into Spec vP.

Consider a passive sentence like (4) and its derivation (5).

(4) The book was read by Susan.

Within a smuggling approach the external argument EA=*by Susan* gets introduced into SPEC of vP; a Participle Phrase PartP dominates VP, see (5a). Moreover, Voice is introduced as a functional head above vP, see (5b). The internal argument IA=*the book* is smuggled over the EA by its containing PartP (we use <> around XPs which are lower copies) as in (5c). After the smuggling step T is Merged in (5d), and the IA is finally EPP-raised to SPEC of TP in (5e).

(5) a. [EA [$_{vP}$ v [$_{PartP}$ Part [$_{VP}$ V=*read* IA=*the book*]]]]
b. [Voice [EA [$_{vP}$ v PartP]]]
c. [PartP Voice [EA [$_{vP}$ v <PartP>]]]
d. [T [PartP Voice [EA [$_{vP}$ v <PartP>]]]]
e. [IA [T [PartP Voice [EA [$_{vP}$ v <PartP>]]]]]

In the following we show how specific aspects of a smuggling approach to passives can receive a deeper explanation when viewed from the perspective of labeling theory (Chomsky 2013, 2015).

2. Labeling Theory

Chomsky (2013), henceforth PoP, develops a theory of syntax in which the set-forming operation Merge is independent of projection of a category label (for precedents see Collins 2002, Seely 2006, see also Collins and Seely forthcoming). Merge involves application to two elements α and β yielding {α, β}; if Merge applies to α and β both of which are members of the Workspace, Merge is external (EM). If Merge applies to α which is a term of β (or a term of a term of β), Merge is internal (IM).

While projection is eliminated, the notion of a prominent element within a given set is retained. PoP states:

(6) "For a syntactic object SO to be interpreted, some information is necessary about it: what kind of object is it?" (PoP: 43)

(7) "…there is a fixed labeling algorithm LA that licenses SOs so that they can be interpreted at the interfaces, operating at the phase level along with other operations. The simplest assumption is that LA is just minimal search, presumably appropriating a third factor principle, as in Agree and other operations." (PoP: 43, footnote omitted)

Condition (6) states that a label needs to be found in every SO – it is a requirement by the interfaces (Conceptual Intentional/CI and Sensory Motor/SM) rather than a narrow syntactic requirement. It is arguably a language specific condition. (7) addresses how the label is found, namely by the most efficient procedure, Minimal Search. It is not a language specific condition but a third factor, and thus comes for free.

The LA works as follows: Suppose Merge applies to a lexical item X and a previously generated set {Y, …} so that we get {X, {Y, …}}=α. LA finds X as the label of α, because search of X's sister requires deeper search, which is hence blocked. This means that whenever we have what was traditionally called head-complement structures X-YP, these are labeled by X.

That leaves us with two other configurations: XP-YP and X-Y. We abstract away here from the latter case, concentrating on the former illustrated by an EA and vP shown in (8). In a language like English, the EPP holds, that is, EA needs to raise out of β and come to occupy "SPEC" of TP, see (9) and (10) (from here on we put SPEC in quotation marks, intended for exposition only. The notion is informulable in the symmetric Merge-framework).

(8) {EA, {v, VP}}=β

(9) Susan has read the book.

(10) (Bill claims that) *has Susan read the book

How is β labeled? PoP suggests this: First T and β EM forming {T, β} which we call TP for exposition.[1] Next, EA undergoes IM with TP, forming EA-TP. EA now is a discontinuous SO. This solves the labeling problem for β={EA, vP}, because, by assumption, the lower copy of EA is invisible whereas the topmost one in EA-TP is visible. That is, {<EA>, vP}=vP. Moreover, the labeling-based approach gives a partial account for the EPP: EA is forced to raise, otherwise labeling of β is impossible. We leave that picture intact.

3. Smuggling and Labeling Theory

How about smuggling? The representation (5c), repeated here as (11), is reminiscent of one of the subtler points PoP (2013: 44) adumbrates if in different context:

(11) [PartP Voice [$_{\alpha}$ EA [$_{vP}$ v <PartP>]]]

[1] This label will be found at the CP-phase level in accordance with (7). We also abstract away here from further issues the notion "weak T" introduces, cf. Chomsky (2015).

(12) The book was read by Susan.

We here directly carry over PoP's observation to the smuggling approach to passives shown in (11). EA is base generated in "SPEC"-vP. The EA=*by Susan* must not vacate {EA, vP}=α in an EPP-style, i.e., the derivation from PoP intended for EA's in active sentences cannot possibly apply:

(13) *By Susan was read the book.

Why is that so? Why isn't the EA in a passive forced to vacate α just as it is in the corresponding active structure? After all, EA occupies the same position within the approach to passives advocated by Collins (2005, 2024). How can labeling of α be accomplished in a passive without IM-ing EA? The partial derivation in (11) provides an answer without additional assumptions or postulates: PartP undergoes IM to "SPEC" of Voice. What this means is that in (11), the lower copy of PartP is invisible. Therefore, [v <PartP>] is labeled as v. As a consequence, LA only discovers {EA, v} when inspecting α. Therefore, α is labeled vP by Minimal Search. In effect, EA is the newly derived "complement" of v upon the smuggling step. The end result is that EA is not forced to move in the passive, because movement of PartP has resolved the labeling problem imposed by the structure [EA vP]. See Roberts forthcoming for a similar intuition, but a different implementation (vP movement instead of PartP movement).

Furthermore, this approach gives a novel motivation for the movement of the PartP phrase in the passive. If it were not moved, the [EA vP] would not be able to be labeled, failing to meet condition (6). In effect, movement of the PartP breaks the symmetry of the structure (see Roberts forthcoming on smuggling and symmetry breaking).

To summarize, we retain the trigger of IM EPP-style in active constructions along the lines of PoP. Both in active and passive structures, EAs are introduced by EM into the invariably thematic position "SPEC" of vP given the Argument Criterion (Collins 2024). The resulting thematic core in both active and passive sentences each receive an account in terms of labeling as far as the necessity or the impossibility of the EA to IM into the "SPEC" of TP-position is concerned. There is a "seesaw" effect involved in solving the labeling problem for {EA, vP}, solved differently in actives and passives:

(14) Active

a. {EA, vP}=α

b. {T, {EA, vP}}

c. {EA, {T, {<EA>, vP}}} LA finds vP as the label of α

(15) Passive

a. {EA, {v, PartP}}=α

b. {Voice, {EA, {v, PartP}}}

c. {PartP, {Voice, {EA, {v, <PartP>}}}} LA finds vP as the label of α

In both cases an XP must vacate α to ensure labeling of α. Simplifying somewhat, in both cases this XP targets the head that selects α (T in actives, Voice in passives).

This "seesaw" effect offers a completely new way to look at voice alternations. On this new perspective, voice alternations (such as the passive) involve a common underlying argument structure. But the structure is symmetric, and blocks the calculation of the label. As a result, either an argument undergoes movement (EA moves in the case of the passive), or there is a smuggling operation (PartP moves in the case of the passive). It remains to be seen how much voice alternations in general can be looked at in this new light (see Stegovec 2024 on a similar labeling analysis of the dative alternation).

4. Actives

Why isn't a smuggling derivation possible in the active? The derivation would look like the following:

(16) The book read John.

Intended meaning: 'John read the book.'

a. [EA [$_{vP}$ v [$_{VP}$ V=*read* IA=*the book*]]]

b. [Voice [EA [$_{vP}$ v VP]]]

c. [VP Voice [EA [$_{vP}$ v <VP>]]]

d. [T [VP Voice [EA [$_{vP}$ v <VP>]]]]

e. [IA [T [VP Voice [EA [$_{vP}$ v <VP>]]]]]

In this derivation, (16a) poses a labeling problem, since EA and vP are symmetric. The symmetry is broken in (16c) by the movement of VP, in exactly the same way as PartP moves in the passive derivation. So what is the problem with (16)?

A big difference between the passive and active derivation is the form of the external argument. In the passive the external argument is a *by*-phrase, but in the active the external

argument is a DP. Therefore, in the passive, the external argument does not require any kind of Case licensing, but in the active the EA still needs to be licensed.

The only Case licensers in (16) are T and v. T agrees with IA, and checks its Case. But v cannot check the Case of the EA, since it does not c-command it. Therefore, EA is unlicensed, and (16) is ruled out for Case reasons. See Collins 2003, Storment 2023, forthcoming for a detailed analysis of quotative inversion, where smuggling is allowed in the active. See also Shlonsky 2024 who shows that smuggling derivations in the active similar to (16) are possible in some Bantu languages.

A further question, which we will not address here, is why the derivation in (16) is blocked if EA is replaced by [by John]:

(17) *The book read by John.
Intended Meaning: 'John read the book.'

While various stipulations are possible to block (17), we leave the issue for future work.

5. Conclusion

In this short paper, we have established a link between smuggling derivations, as defined by Collins 2005, and the labeling algorithm of Chomsky 2013, 2015. We have shown that the labeling algorithm triggers movement of PartP in the passive, in order to resolve a labeling problem.

New questions arise, of course, as is common when reinterpreting established phenomena and analyses, like: How is {PartP, VoiceP} labeled? Is this a criterial configuration with shared features? To what category of movement does the smuggling step belong (A vs. A')? What is it that forces the IA to raise to "SPEC" of T? And why doesn't the smuggling step render the IA frozen (EPP-raising IA to "SPEC" of T is not just a possibility but required)? How is Case absorbed in the passive? We leave all of these questions for future work.

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