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A movement theory of adjunct control

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It has recently been argued (Landau 2017) that control in temporal and rationale adjuncts may be either syntactic ‘Obligatory Control’ (OC) or non-syntactic ‘Non-Obligatory Control’ (NOC), in contrast to previous assumptions that adjunct control is strictly OC. Here I demonstrate that this OC/NOC duality does not extend to all adjuncts. I outline claims that Landau would have to make in order to accommodate the wider distribution of OC and NOC in adjuncts, but argue that the account still struggles. I offer an alternative within the Movement Theory of Control.

Keywords: syntax; control; adjuncts; movement

1 Introduction

Adjunct control is the referential relation between the null (PRO) subject of a non-finite adjunct and its understood antecedent, as in the temporal adjunct in (1) or the rationale clause (RatC) in (2).

(1) The window_i broke [after PRO_i being hit with a rock].

(2) This book_i was written [in order PRO_i to be read].

Adjunct control has received relatively little attention in the literature on control. Theories of the control dependency have been largely built around the properties of complement control, as exemplified in (3), and it has often been assumed (e.g. by Chomsky 1981; Farkas 1988; Hornstein 1999) that adjunct control will display the same properties, despite the fact that adjuncts and complements are quite different syntactically. For example, complements, but not adjuncts, are selected by the main verb, and adjuncts are islands to movement more often than complements are.

(3) Harry_i promised PRO_i to make himself/*oneself invisible.

Where adjunct control is discussed, it is often assumed to require strict syntactic obligatory control (OC), parallel to complement control (Mohanan 1983; Clark 1990; Hornstein 1999; Pires 2007). For example, because PRO in adjuncts such as those in (4) can only be controlled by the matrix subject, it is argued that adjunct control must involve a syntactic dependency between PRO and its closest c-commanding potential antecedent. Even theories that do not rely on a syntactic binding relation for complement control (e.g. Culicover & Jackendoff 2001) do presume that control into at least some adjuncts is determined syntactically.¹ Furthermore, many theories of control at least implicitly assume that OC

¹ Culicover & Jackendoff (2001) note that for some adjuncts semantic components may be important, but their discussion is limited mainly to RatCs. See also Farkas (1988).

and non-obligatory control (NOC), in which PRO is not bound by a syntactic antecedent, are in complementary distribution, NOC only obtaining if OC is blocked (Mohan 1983; Clark 1990; Hornstein 1999; Pires 2007; McFadden & Sundaresan 2016). If this is the case, then inasmuch as an OC dependency in adjunct control structures is possible, it should be the only option.

- (4)
- a. Ron_i talked to Harry_j [before PRO_{i/*j} leaving the room].
 - b. [PRO_{i/*j} Having washed himself/*herself], Harry_i talked to Ginny_j.
 - c. Harry_i grew up [PRO_{i/*j} to be a famous wizard].
 - d. The ball_i fell, [only PRO_{i/*j} to be picked up again].

However, Landau (2017) argues that RatCs and temporal adjuncts are not restricted to OC. Although the control relation in the examples in (4) may indeed be OC, the examples in (5) demonstrate that NOC is also possible, since here PRO is understood to refer to someone who is not represented by an argument that could syntactically bind PRO.² Temporal and rationale clauses are thus hybrid environments allowing both OC and NOC (see also Español-Echevarría 2000; Green in press).

- (5)
- a. All preparations were made [before PRO inviting the senator to the hearing].
 - b. The painting was on the wall [in order PRO to check how it would be received]. (Landau 2017: 98)

Still, OC and NOC are not always equally available; speakers often prefer OC. The main goal of Landau (2017) was to demonstrate how the voice of the adjunct affects the type of control seen. Landau argued that passive adjuncts are restricted to OC, and that when the adjunct is in active voice, NOC is only possible when OC would lead to “semantic deviance,” meaning that it would make the sentence denote a bizarre or impossible situation. In a more recent talk, Landau (2018) revised these generalizations, arguing that NOC is possible only if PRO and its potential OC antecedent mismatch in [init] features, where an argument is [+init] if it is the “initiator” who intentionally brings about a situation (see Farkas 1988). Green (in press) questions the validity of these claims for temporal adjuncts, arguing that NOC does not require an active adjunct, semantic deviance of OC, or a mismatch in [init] features. Instead, it is claimed that OC and NOC are freely available in temporal adjuncts, but that performance biases in comprehension lead to a preference for OC. This is most clearly seen in (6), which allows both OC and NOC, without, arguably, changing the structure of the sentence, and in which PRO and its potential OC controller are both [-init].

- (6) The pool_i was the perfect temperature [after PRO_{i/j} being in the sun all day].

Whatever the source of speakers’ preference for OC over NOC in adjuncts, it is clear that temporal and rationale adjuncts allow both in at least some contexts. This paper demonstrates that the same is true of many adjuncts, but that others are restricted to either OC or NOC. I outline assumptions that would have to be made in two frameworks, the Two-tiered Theory of Control (TTC) (Landau 2015) and the Movement Theory of Control (MTC) (Hornstein 1999; Boeckx, Hornstein & Nunes 2010a), to accommodate adjunct

² For simplicity, I will not generally distinguish between the labels of the null subject in OC and NOC, but their actual representation is hypothesized to differ in many theories.

control more fully. I argue that although both are able to partially explain the data, the MTC fares slightly better.

This paper proceeds as follows. In §2 I review and expand on the way Landau implements his hypothesis for RatCs and temporal adjuncts in the TTC. Section 3 discusses several other types of adjuncts, illustrating that only some display the same OC/NOC duality. Section 4 then outlines assumptions the TTC would have to make in order to explain the data, but argues that such assumptions are not justified. In §5, I propose an alternative explanation within the framework of the MTC that can account for some of the strict OC adjuncts that the TTC struggles with. Section 6 concludes.

2 The two-tiered theory of control

Landau situates his discussion of OC and NOC in adjuncts within the Two-tiered Theory of Control (TTC). This section provides a brief background on the theory, followed by an explanation of why temporal and rationale adjuncts allow both OC and NOC, while complements are restricted to OC.

2.1 Background on the TTC

The TTC rejects traditional formulations of OC and NOC, instead classifying control as either predicative or logophoric.³ In complements, logophoric control occurs with attitude predicates, and predicative control with non-attitude predicates. The term “predicative control” is used to describe the situation when a verb denotes a relation R between an individual x and a property p that entails $R^*(x, p(x))$, where R^* expresses essentially the same concept as R . For example, “ x managed p ” is true iff $\text{MANAGE}^*(x, p(x))$. Due to the nature of predication, this results in OC. Predicative complement control is said to have a structure like (7). PRO is taken to be simply a variable, and the FinP represents a predicate that is “applied” by mediation of the matrix verb to the closest c-commanding argument.

(7) Harry managed [_{FinP} λx [_{Fin'} Fin [_{TP} x to win]]].

Logophoric control, which appears only with attitude predicates, also involves a FinP predicate, but it is predicated of a *pro* situated in an additional layer of structure, as in (8).⁴ This *pro* represents a variable i , and logophoric control is instantiated as a relation between x and $p(i)$, where i is restricted to the AUTHOR or ADDRESSEE of the context of evaluation. In complement control, this context is restricted by the matrix verb and the embedded C to include only the matrix attitude holder and their addressee; *pro* must therefore be associated with one of them, resulting in OC.

(8) Harry intends [_{CP} *pro* C_{+log} [_{FinP} λx [_{Fin'} Fin [_{TP} x to win]]]].

Landau (2015), following E. Williams (1992), briefly suggests that adjuncts may also fall into these two categories. Landau (2017) furthers that suggestion, claiming that clausal adjuncts can adjoin with either a predicative or a logophoric structure, as illustrated in (9).

(9) a. OC adjuncts (predicative control):
 [_{pp} before/in order [_{FinP} λx [_{Fin'} Fin [_{TP} x ...]]]]

³ This is similar to the classification system of E. Williams (1992), which also distinguishes between predicative and logophoric control, but there are important differences.

⁴ The additional layer of structure is more complicated than illustrated in (8). There are also functional elements that ensure a logophoric interpretation of the *pro*. See Landau (2015).

b. *NOC adjuncts (logophoric control):*

$$[_{PP} \text{ before/in order } [_{CP} \text{ pro } C_{+log} [_{FinP} \lambda x [_{Fin'} \text{ Fin } [_{TP} x \dots]]]]]]$$

(modified from Landau 2017: 100)

Predicative structures give rise to what is traditionally called OC, although if Landau is assuming a theory of predication similar to semantic theories of control, where the embedding verb mediates the predication, then it is unclear how this would apply to adjuncts. In adjunct control there is no mediating verb, and a semantic approach where the predication is mediated by the relation between the two clauses is unlikely, as there is nothing in the meaning of *while*, for example, that suggests that the two concurrent events should share a participant, much less one named by the subjects of the clauses.⁵ So it must be the case that the λ is passed up the tree, either through movement or through a complex series of function composition. Assuming that the predication relation does obtain, the antecedent of the variable corresponding to PRO will be limited to the closest c-commanding DP, resulting in OC. When an adjunct attaches with a logophoric structure, on the other hand, “PRO” is bound by the intermediate *pro*. But unlike in complement control, because the adjunct is not selected by a matrix verb, there is no restriction on the context of evaluation of the embedded clause, so *pro* is free to refer to the AUTHOR or ADDRESSEE of any relevant context, resulting in logophoric NOC.

2.2 Complements are restricted to OC, but adjuncts are not

Under the TTC, whether complement control will involve a predicative or logophoric structure is determined based on selectional restrictions of the embedding predicate. OC is ensured in non-attitude complements because the embedded clause is simply a predicate whose argument is instantiated by the closest c-commanding argument of the matrix clause. NOC is ruled out because the predication relation must be satisfied locally. Attitude predicates, on the other hand, select a logophoric complement and set the context of evaluation of that complement as the attitude context of the matrix event. This ensures that the controller will either be that event’s AUTHOR or its ADDRESSEE. Because PRO must be controlled by an argument of the matrix clause, logophoric control in complements is OC.⁶

Although Landau (2015; 2017) does not directly address why adjunct control differs from complement control in not being restricted to OC, the only apparent difference between the two is that complements, but not adjuncts, are selected by the main clause predicate. Because complements are selected to have either a predicative or logophoric structure, they are restricted to OC. But adjuncts, being unselected, can have either structure. When an adjunct has a predicative structure, the λ associated with PRO is “applied” to the closest c-commanding argument, which for temporal and rationale clauses is the subject of the clause hosting the adjunct. Assuming that the λ does somehow “apply” to the matrix subject, it will result in OC due to the nature of predication. Logophoric adjuncts show NOC because there is no selecting predicate to enforce a restriction on the context of evaluation of the embedded clause. The *pro* in the specifier of C that binds PRO

⁵ Rothstein (2004) stipulates that depictive secondary predicates combine with their hosts by a semantic rule that enforces exactly this sort of sharing. Nonetheless, this stipulation is not one that follows from the concept of temporal concurrence.

⁶ NOC is actually possible in complements with a *wh*-phrase in their spec-CP, as in (i). Although Landau (2015) does not address this, perhaps it has to do with the fact that *wh*-infinitives have a modal interpretation, which in turn leads to a generic interpretation of PRO (Bhatt 1999).

(i) Jon asked [$_{i}$ *(how) PRO $_{i}$ to shave oneself].

is therefore free to refer to the AUTHOR or ADDRESSEE of any relevant context, including the utterance context (Landau 2015).

Landau (2017) discussed only RatCs and temporal adjuncts, and it was not his intent to give an argument about all types of adjunct control. But if the reason RatCs and temporal adjuncts allow both OC and NOC is that their structure is unselected by a matrix verb, then it seems logical that the same should be true of other adjuncts, since they, too, are unselected. With the exception of bare adjectives or participles, which Landau (2015: 97) mentions in a footnote may not project the functional structure needed to mediate NOC, any adjunct should be free to adjoin with either a predicative structure resulting in OC, or a logophoric one leading to NOC.

3 Other adjuncts

There are several types of adjuncts that exhibit control, each with distinct properties (see Huettner 1989; Landau 2013). This section briefly illustrates that although some adjuncts follow the pattern of RatCs and temporal adjuncts in allowing both OC and NOC, others are restricted to one or the other. The assumptions that would have to be made under the TTC to explain these differences will be discussed in §4.

3.1 Adjuncts allowing both OC and NOC

If RatCs and temporal adjuncts allow both OC and NOC because they are not selected, then all clausal control adjuncts, being similarly unselected, should exhibit the same duality. Here I discuss three adjuncts that confirm this prediction: response clauses, object-gap purpose clauses, and absolutive clauses. Although I provide evidence that both OC and NOC are possible, it is outside the scope of this paper to establish when speakers will prefer one over the other. For discussions on the contexts and constraints leading to OC and NOC in RatCs and temporal adjuncts, see Kawasaki (1993), Janke & Bailey (2017), Landau (2017), and Green (2018; in press).

3.1.1 Response clauses

One adjunct that has been largely ignored in the literature is illustrated in (10). Where mentioned, these adjuncts have been called reason clauses (Betancort, Carreiras & Acuña-Fariña 2006), rationale clauses (Hornstein 1999), justification clauses (Stromdahl 2018), or simply gerundival complements to *for* (A. Williams & Green 2017). For clarity, and to distinguish them from RatCs, which have also been called reason clauses (A. Williams 2015), I will call the adjuncts in (10) “response clauses.” The reason is that these adjuncts entail that the act of the main clause was meant as a response to what is described by the adjunct (A. Williams & Green 2017; see also Fillmore 1971; Fabricius-Hansen & Sæbø 2011).

- (10) a. Harry_i got a trophy [for PRO_i winning the tournament].
 b. They gave a trophy to Harry_i [for PRO_i winning the tournament].
 c. Mickey hugged Minnie_i [for PRO_i doing so well on the test].

Some response clauses may be understood as conceptual “arguments” of what I will call *blame*-class verbs, such as *blame*, *praise*, and *thank*, as in (11). The meaning of the verb *blame*, for example, requires that there is either an explicit or implicit offense associated with the blame (Fillmore 1971). This is not the case with the response clauses in (10). But although their conceptual relationship to the main clause predicate may differ, I assume that the response clauses in either case have the same syntactic status.

- (11) a. Harry blamed Snape_i [for PRO_i breaking in].
 b. Hermione praised Harry_i [for PRO_i being such a great wizard].
 c. Harry thanked Ron_i [for PRO_i teaching him chess].

There is good evidence that response clauses allow logophoric NOC. In the sentences in (12), for example, controller choice is not limited to c-commanding arguments, as PRO is coreferential with an embedded possessor. If control of response clauses were strictly predicative OC, this should be impossible, since there is no way to form the necessary predication dependency between PRO and a non-c-commanding argument.

- (12) a. I left them in her_i locker [for PRO_i being so kind to me]. (Stromdahl 2018)
 b. I put roses on the front porch of her_i house [for PRO_i being so kind to me].

In addition, response clauses allow implicit control, which has been argued to be NOC (Manzini 1986; Kawasaki 1993; Landau 2017). In (13a), PRO may refer to the implicit recipient of the medal. Example (13b) shows the same thing, but uses a pronoun to remove the possibility that the response clause adjoins within the object DP.⁷

- (13) a. They awarded a medal [for PRO winning the contest].
 b. They awarded it [for PRO winning the contest].

These examples illustrate that response clauses sometimes exhibit NOC. Importantly, there is also evidence that OC is sometimes possible. The ellipsis site in (14) includes a response clause. PRO in the elided clause requires “sloppy” interpretation (Ross 1967; 1969) under ellipsis, which is suggestive of OC (Pires 2007; Boeckx, Hornstein & Nunes 2010a).

- (14) Jack_i brought Sharon flowers [for PRO_i having worked so late], and David_j did, too.
 (‘and David_j brought Sharon flowers for his_{j/*i} having worked so late’)

OC is also seen in response clauses that allow inanimate controllers. It has been argued that NOC requires a [+human] interpretation for PRO (Clark 1990; Landau 2013), which, under the TTC, follows from the logophoric nature of NOC (Landau 2017). And yet PRO in each of the response clauses in (15) allows an inanimate controller, which can only be OC.

- (15) a. The book_i was praised [for PRO_i showing how, and under what circumstances, a religion grows].⁸
 b. I included this book_i in the book fair [for PRO_i being so well written].

In sum, control in response clauses must sometimes be OC, as evidenced by the fact that inanimate controllers are possible, and sloppy identity is at least sometimes required under ellipsis. But there is also evidence that response clauses allow NOC: implicit and non-c-commanding controllers are sometimes possible. This is consistent with the generalization that adjuncts allow both OC and NOC, and the explanation of the duality of temporal and rationale clauses given above based on Landau (2015; 2017) can easily be

⁷ Implicit control is not always possible for response clauses. In (i), PRO requires an explicit antecedent (Alexander Williams, p.c.).

(i) The dog barked *(at someone_i) [for PRO_i approaching the house too quickly].

I will not attempt an explanation of when implicit control is available, but note that it is not always possible for temporal adjuncts and RatCs either (see Landau 2017; Green 2018).

⁸ https://en.wikipedia.org/wiki/Jane_Shaw, October 18, 2018.

extended to response clauses. Because they are not selected by the matrix verb, response clauses are free to adjoin with either a predicative or a logophoric structure.

3.1.2 Object-gap purpose clauses

Another adjunct that allows both OC and NOC is the object-gap purpose clause (OPC). Purpose clauses contain one obligatory gap that is coreferential with the theme argument of the host clause (Jones 1991; Kawasaki 1993; Whelpton 1995). In OPCs, this gap is in a non-subject position.⁹ The subject may contain an additional empty category (PRO), which is often coreferential with the indirect object of the main clause, if one is present (16a), or with the matrix subject otherwise (16b). Lexical subjects are also possible (16c).¹⁰

- (16) a. Chandler bought Monica_i a frying pan_j [PRO_i to cook with *t_j*].
 b. Monica_i bought a frying pan_j [PRO_i to cook with *t_j*].
 c. Chandler bought a frying pan_j [for Monica to cook with *t_j*].

Several authors have claimed that the dependency between PRO in an OPC and its antecedent is OC (e.g. Nishigauchi 1984; Kawasaki 1993; Landau 2013; Hallman 2015). Evidence that OC is possible is that only sloppy identity is available under ellipsis in examples like (17a), which can only be used to say that Chandler got his frying pan with the intent of cooking with it himself. Also, PRO can only have a bound interpretation when controlled by an *only*-DP in (17b), which entails that no one else bought a frying pan with the intent that they themselves would cook with it; it is still true in a situation where both Monica and Chandler bought frying pans with the intent that Monica would cook with them. Here *one* is used as the antecedent in order to remove the possibility of a relative clause analysis (see footnote 10).

- (17) a. Speaking of new frying pans, Monica_i bought one [PRO_i to cook with *t*], and Chandler_k did, too.
 b. Only Monica_i bought one [PRO_i to cook with *t*].

Inanimate controllers are also possible (18), which again indicates OC.

- (18) a. Nathan got his computer_i a new graphics card_j [PRO_i to better display his games with *t_j*].
 b. Nathan got his computer_i one_j [PRO_i to better display his games with *t_j*].

But there is also strong evidence that NOC is sometimes possible. For example, PRO in an OPC can have a non-c-commanding or syntactically absent controller, as seen in (19), modified from Stromdahl (2018).

⁹ The obligatory gap is the result of empty operator movement to the CP, illustrated in (i) (Chomsky 1980; E. Williams 1980; 1992; Whelpton 2002).

(i) [_{CP} Op_i [_{TP} PRO to...*t_i*...]]

¹⁰ A reviewer suggests that these might in fact be non-finite relative clauses, since they sometimes behave as constituents with the controlling noun (i). Crucially, however, the same control properties obtain if the controller is replaced with a pronoun or with *one* (ii)–(iii), in which case a relative-clause analysis is impossible.

(i) A frying pan to cook with is what Chandler bought Monica.

(ii) a. Chandler bought Monica_i that_j [PRO_i to cook with *t_j*].
 b. *That to cook with is what Chandler bought Monica.

(iii) a. Chandler bought Monica_i one_j [PRO_i to cook with *t_j*].
 b. *One to cook with is what Chandler bought Monica.

- (19) a. I left it_i in [her_j mailbox] [PRO_j to look over t_i once she returned from the Bahamas].
 b. They_i're kept in the overhead compartment [PRO to use t_i in case of an emergency].

OPCs therefore allow both OC and NOC, similar to temporal and rationale adjuncts.

3.1.3 Absolutives

A final adjunct that allows both OC and NOC is the absolute clause, which adjoins as a bare participial phrase, as in (20).

- (20) [PRO_i Having come this far], I_i can't go back.

Pires (2007) argues that absolute adjuncts are OC based on several tests. For example, PRO's controller in (21a) must c-command it, and (21b) only allows a sloppy interpretation of the elided PRO.

- (21) a. [Peter_j's daughter]_i went on to college, [PRO_{i/*j} being the best student in the class].
 b. [PRO_i Having kissed Mary at the door], Peter_i left the party with some friends, and Bill did too.
 'and Bill_j left after he_j/*Peter kissed Mary' (Pires 2007 197)

Inanimate controllers are also possible (22), giving further evidence for OC.

- (22) [PRO_i Having only been purchased yesterday], the dishwasher_i is already broken.

However, non-c-commanding controllers are possible given the right context, which indicates NOC. In (23) and (24), PRO can refer to the speaker. This is especially true when the adjunct is left-adjoined, but it is also possible, if slightly more marginal, when it is right-adjoined.

- (23) a. [PRO Sitting in class that day], my eyes refused to stay open.
 b. ?My eyes refused to stay open, [PRO sitting in class that day].
 (24) a. [PRO Resting in the shade], the heat didn't feel as oppressive.
 b. ?The heat didn't feel as oppressive, [PRO resting in the shade].

Absolute clauses therefore also conform to the generalization that adjunct control allows both OC and NOC. Interestingly, though, Landau (2015: 97) mentions in a footnote that bare participles do not project the functional structure needed to support NOC. Although this was only mentioned in passing without additional support, if it is true that absolutives are too small to project a logophoric structure, then the NOC exhibited in (23)–(24) would be surprising. I will return to the issue of adjunct size and its interaction with OC/NOC in §4.2.

3.1.4 Summary of OC/NOC adjuncts

The evidence that response clauses, OPCs, and absolutives allow both OC and NOC is summarized in Table 1, along with a summary of evidence on RatCs and temporal adjuncts found in Landau (2017) and Green (2018). OC is seen when PRO in these adjuncts has an inanimate controller, and when sloppy readings under ellipsis or bound readings with control by an “only”-DP are required. NOC is found when these adjuncts allow PRO to

Table 1: Control properties in OC/NOC adjuncts.

Adjunct	OC		NOC	
	inanimate controllers?	sloppy/bound required?	non-c-comm. controllers?	implicit control?
RatCs	✓	✓		✓
Temporal	✓	✓		✓
Response	✓	✓	✓	✓
OPCs	✓	✓	✓	✓
Absolutives	✓	✓	✓	✓

co-refer with a non-c-commanding antecedent, or to refer to an entity not present in the sentence at all, in what I broadly term “implicit control”.

3.2 Adjunct restricted to NOC

The adjuncts discussed thus far pattern with RatCs and temporal adjuncts in allowing both OC and NOC, but the same is not true of other adjuncts, even though they too are unselected. I have found only one adjunct restricted to NOC: speaker-oriented adverbials (SOAs). SOAs represent the speaker’s evaluation of the proposition denoted by the main clause or the speaker’s degree of certainty about that proposition’s truth (Ernst 2009). They can surface as adverbs (25a), infinitive verb phrases (25b–c), or participial phrases (25d).

- (25) a. Honestly, Jon would be better off without Mary.
 b. [PRO To be clear/frank], Jon would be better off without Mary.
 c. [PRO To put it briefly], Jon would be better of without Mary.
 d. [PRO Judging from experience], Jon will be better off without Mary.

PRO in (25b–d) refers to the speaker of the utterance. It cannot be coreferential with an argument of the main clause, unless that argument also refers to the speaker.¹¹ These adjuncts must therefore be NOC. The same interpretation obtains if the adjuncts are adjoined to the right.

- (26) a. Jon would be better off without Mary, honestly.
 b. Jon would be better off without Mary, PRO to be honest.
 c. Jon will be better off without Mary, PRO judging from experience.

Since PRO in SOAs can only correspond to the speaker, SOAs must require a logophoric structure, resulting in strict NOC. These adjuncts therefore do not conform to the generalization that adjunct control allows both OC and NOC. However, according to Cinque (1999), evaluative and evidential adverbs attach high in the structure, to functional

¹¹ A reviewer suggests that the examples in (i) may be SOAs with OC, since PRO here can be coreferential with the main clause subject.

- (i) a. [PRO_i To be thrifty], Jon_i re-used the plastic container for leftovers.
 b. [PRO_i Judging from experience], the carpenter_i determined how many studs to use for the wall.

However, although they look similar to the SOAs in (25), their semantic properties suggest otherwise. While the SOAs in (25) represent an evaluation of the content of the main clause or a degree of certainty about its truth, the adjunct in (i) represents Jon’s reason for using plastic containers, and is better analyzed as a RatC. The adjunct in (ii) expresses how the carpenter determined how many studs to use, not his evaluation or certainty of that fact, and is better analyzed as a generic absolutive (see §3.1.3). Both RatCs and absolutives allow both OC and NOC.

projections well above the TP. If SOAs containing control structures also attach high, then no argument of the sentence would be in a position to c-command PRO, and predicative OC by an argument of the main clause would be impossible. The adjunct could in principle adjoin with either a predicative or a logophoric structure, but only logophoric NOC would lead to a convergent derivation. With a predicative structure, the predicate would have no argument to be applied to and would remain unsaturated. We will return to the TTC's account of SOAs and potential problems in §4.2 and §5.3.1.

3.3 Adjuncts restricted to OC

There are also some adjuncts that are strictly OC. This section discusses goal clauses, subject-gap purpose clauses, and telic clauses.¹²

3.3.1 Goal clauses

One adjunct that only allows OC is the goal clause (Huettnner 1989; Landau 2013), illustrated in (27).

- (27) a. Max_i works hard [PRO_i to stay out of jail]. (Huettnner 1989: 38)
 b. Max_i works hard [PRO_i to avoid doing any work].
 c. Sam_i always plays [PRO_i to win]. (Huettnner 1989: 24)
 d. We cultivated the plant_i [PRO_i to be more nutritious].

Although similar on the surface to RatCs such as (28), goal clauses differ in meaning. According to Huettnner (1989), the matrix clauses in (27) constitute doing, or attempting to do, what is in the adjunct. For example, under the goal clause interpretation of (27a), Max works hard at staying out of jail, even if he does not literally work hard. With the RatC in (28a), on the other hand, Max literally works hard at some unspecified job because otherwise he will end up in jail. This is further illustrated in the contrast between (27b) and (28b). If the infinitive is a goal clause, then Max puts great effort into avoiding work; but when the infinitive is a RatC, the sentence can only have the strange interpretation that Max literally works hard, because otherwise he would not be able to avoid work.

- (28) a. Max_i works hard [(in order) PRO_i to stay out of jail].
 b. #Max_i works hard [(in order) PRO_i to avoid doing any work].

Goal clauses adjoined to an intransitive matrix clause as in (27) only allow subject control of PRO. Neither (27a) nor (27b), for example, can be used to mean that Max worked hard at someone else staying out of jail or avoiding work. This suggests that OC is involved. Further evidence for OC in goal clauses is that they allow inanimate controllers, as illustrated in (27d) and (29), and that sloppy identity is required under ellipsis (30).

- (29) Those pants_i are working hard [PRO_i to hold in that man's flab].

- (30) Sam_i always plays [PRO_i to win], and his accomplice does, too.
 'and his accomplice_j always plays PRO_{j/*i} to win'

¹² In addition to these adjuncts, Huettnner (1989) discusses stimulus clauses (i-a), result clauses (i-b), and exchange clauses (i-c), claiming that they display the same syntactic properties as the adjuncts I argue here to be strictly OC. For reasons of space, I do not include discussion of these adjuncts, but they too appear to exhibit strict OC.

- (i) a. Mary_i smiled [PRO_i to think what a fool she had been].
 b. The damp_i seeped in [PRO_i to chill our bones].
 c. I paid Mary_i ten dollars [PRO_i to stand on her head].

In contrast to RatCs and temporal adjuncts, goal clauses appear not to allow NOC. As the examples in (31) make plain, even when subject control is ruled out, and when the preceding context establishes an available logophoric antecedent, conditions that facilitate NOC in RatCs and temporal adjuncts (Landau 2017; Green in press), OC by a c-commanding argument of the next clause up is the only possible reading.

(31) *Jon_j noticed that his_j pants_i were working hard [PRO_j not to burst out of them].

Implicit control by a passive agent, which Landau (2017) argues is NOC, is also impossible. The goal clauses in (32) are limited to subject control, in contrast to the RatC in (33), which allows implicit control. Because the *in order* in RatCs is optional, the string in (32b) is ambiguous between containing a RatC or a goal clause. Crucially, though, if PRO is understood to refer to the implicit agent, only a RatC interpretation is possible. The sentence can only be interpreted as the answer to the question of why the plant was cultivated in general (as opposed to being left uncultivated). This is in contrast to the goal clause reading of (32a), in which the plant is specifically cultivated toward the goal of being nutritious, in answer to a more specific question about which goal the plant was cultivated for (among other possible cultivation outcomes). The difference, though subtle, is important.

- (32) a. The plant_i was cultivated [PRO_i to be more nutritious].
 b. The plant_i was cultivated [PRO to gain more nutrition from it].
 *‘The plant was cultivated toward the goal of gaining more nutrition from it.’ (Goal)
 ‘The plant was cultivated generally because that might lead to more nutrition.’ (Rat)

(33) The plant_i was cultivated [in order PRO to gain more nutrition from it].

If temporal and rationale adjuncts allow both OC and NOC simply because their structure is not selected by the matrix predicate, and if goal clauses are similarly unselected, then the strict OC behavior of goal clauses is unexpected.

3.3.2 Subject-gap purpose clauses

The next adjunct restricted to OC is the subject-gap purpose clause (SPC). SPCs such as the one in (34) are similar to OPCs, but without the post-verbal gap.¹³

(34) Harry brought Hermione_i along [PRO_i to deal with the security guards].

¹³ SPCs are also similar to RatCs, especially when the latter does not include *in order*, but the meaning of the two adjuncts differs subtly. SPCs give the intended purpose for the theme of the matrix clause, whereas RatCs give the responsible party’s intended result of the event described. For example, the adjunct in (i) is ambiguous between an SPC and a RatC. On the SPC reading, Jack intends the car to be what makes Jill angry, not the fact that he bought it (suppose he wants her to be happy with the fact that he bought her something, but he wants her to be angry and knows the car itself will irritate her). On the RatC reading, Jack could intend the buying of the car to make Jill angry, even if he knows that the car itself will make her happy (Jill may love the car, but hate that Jack bought it for her).

(i) Jack bought Jill a car to make her angry.

SPCs also differ from transitive goal clauses as in (27d), in that an SPC gives the intended purpose of the theme, and a goal clause gives the intended purpose of the verb.

Jones (1991) categorizes SPCs as OC. And although he does not give a detailed analysis of them, Landau (2015) also states in passing that SPCs involve non-logophoric PRO, which can only be OC. Evidence that this is correct is that SPCs allow inanimate controllers (35), and that PRO requires a bound reading when controlled by an “only”-DP. Example (36) states that only that bookshelf was purchased with the intended purpose of its holding books; it is still true in a situation where the speaker bought other shelves, as long as they were not also meant to hold books.

- (35) a. I bought the shelf_i [PRO_i to hold books]. (E. Williams 1992: 317)
 b. I bought this blender_i [PRO_i to help me make split pea soup]. (Landau 2015: 22)

(36) I bought [only this shelf]_i [PRO_i to hold books].

SPCs do not allow implicit controllers, which would indicate the availability of NOC. The SPC in (37a) clearly allows control by the direct object of *donate*. But even though that object can be left implicit (37b), control by an implicit object is impossible; (37c) is ungrammatical as an SPC (although it could have a RatC interpretation, in which case *the slave driver* would control PRO).

- (37) a. The slave driver donated three slaves_i to the plantation [PRO_i to work in the fields].
 b. The slave driver donated to the plantation.
 c. *The slave driver donated to the plantation [PRO to work in the fields].

Implicit control could potentially be ruled out for other reasons, since even in adjuncts that allow implicit control in some instances, its availability can be restricted (Landau 2017; Green in press). However, non-c-commanding controllers are also ruled out, in contrast to what was seen for OPCs in (19), providing further evidence that NOC is impossible.

(38) *I brought the prisoner_i's finger home with me [PRO_i to impress his fellow prisoners].

Like goal clauses, SPCs appear to counter the hypothesis that unselected adjuncts should allow both OC and NOC.

3.3.3 Telic clauses

A final adjunct that is restricted to OC is the telic clause, illustrated in (39), which express the outcome of the event of the main clause (Whelpton 2001).

- (39) a. Harry_i opened the letter, [only PRO_i to discover it wasn't for him].
 b. The historic mansion_i remained untouched by the wildfire, [only PRO_i to be destroyed by an earthquake three months later].

These adjuncts, also known as “outcome” clauses, have received little attention in the literature. Where they have been discussed, they have been classified as requiring OC by the matrix subject (Huettner 1989; Whelpton 1995; Landau 2013). That OC is possible is made evident by (39b), which has an inanimate controller, as well as by (40), which requires sloppy identity under ellipsis.

(40) Harry_i hid in the alley, [only PRO_i to be found a minute later], and Dudley did, too. ‘and Dudley_j hid, only PRO_{j/*i} to be found, too’

That NOC is not permitted is demonstrated in (41). In each of these sentences, control by non-c-commanding arguments or implicit entities is impossible, despite the strange meanings subject control results in.

- (41) a. #The meal was devoured, [only PRO to discover it was poisoned].
 b. #The side-door on the plane was opened [only PRO to realize that my parachute wasn't fastened properly].
 c. #The sun rose, [only PRO to find that ice now covered the camp].
 d. #My parachute opened, [only PRO to realize that it was torn].

Since they allow inanimate controllers and require sloppy identity under ellipsis, and because they do not allow implicit or non-c-commanding controllers, telic clauses appear to require OC.

3.4 Interim summary

As summarized in Table 2, there is strong evidence that response clauses, OPCs, and absolutes follow the pattern of RatCs and temporal adjuncts in allowing both OC and NOC. However, SOAs are restricted to NOC, and goal clauses, SPCs, and telic clauses require OC.

4 The TTC and strict OC adjuncts

Landau (2017) demonstrates that RatCs and temporal adjuncts allow both OC and NOC, and I have argued that the same is true of response clauses, object-gap purpose clauses, and absolute adjuncts. Under the TTC, this is expected, since adjuncts are unselected and should be free to adjoin with either a predicative (OC) or logophoric (NOC) structure. However, I have also argued that SOAs only allow NOC, and that goal clauses, SPCs, and telic clauses are all restricted to OC, despite the fact that they too, as adjuncts, are unselected.

As suggested in §3.2; SOAs may adjoin too high in the structure for predicative control by any argument of the host clause. This section attempts to address the challenge of strict OC adjuncts. Strict OC is only predicted if the structure and/or context of evaluation of the adjunct is selected by some element of the matrix clause, or if a logophoric structure is ruled out for independent reasons. Otherwise, the adjunct should be free to adjoin with either a predicative or logophoric structure. Accordingly, here I consider and reject two potential explanations for strict OC adjuncts within the TTC. First, perhaps what appear

Table 2: Evidence for OC and NOC in adjuncts.

Adjunct	OC		NOC	
	inanimate controllers?	sloppy/bound required?	non-c-comm. controllers?	implicit control?
RatCs	✓	✓		✓
Temporal	✓	✓		✓
Response	✓	✓	✓	✓
OPCs	✓	✓	✓	✓
Absolutives	✓	✓	✓	✓
SOAs	×	(×)	✓	✓
Goal	✓	✓	×	×
SPCs	✓	✓	×	×
Telic	✓	✓	×	×

to be OC adjuncts are actually complements of the matrix verb. Second, perhaps strict OC adjuncts are too small to project the structure necessary for logophoric NOC. As neither of these solutions prove sufficient, I propose an alternative within the MTC in §5.

4.1 Strict OC “adjuncts” actually complements?

One way to explain the strict OC status of goal clauses, SPCs, and telic clauses is to say that they are in fact complements of the matrix verb, selected to have a predicative structure. Although tests of argumenthood are not infallible, if these clauses were complements of the verb, then we would expect them to sit lower in the structure than true adjuncts that allow both OC and NOC.

One diagnostic for attachment height is whether the adjunct can be stranded after a *do so* anaphor in ellipsis, which is standardly assumed to replace a *vP* (Aelbrecht & Harwood 2015). If strict OC “adjuncts” are actually complements, then they should not be able to be stranded when the *vP* is elided (Whelpton 1995; DeArmond & Hedberg 1998). Example (42) demonstrates that this is the case for goal clauses. Here, the goal clause must be included in the interpretation of *do so*.¹⁴ The intended interpretation of (42) is that Max puts great effort into avoiding work, and Billy puts great effort into avoiding confrontation.

(42) *Max **works hard** [to avoid work] and Billy does so [to avoid confrontation].

This is distinct from the similar (43), which contains a RatC and has the meaning that Max literally works hard, and so does Billy. Unlike the goal clause in (42), the RatC in (43) adjoins outside the *vP*, and can therefore be excluded from the *do so* anaphor’s interpretation.

(43) Max **works hard** (in order) to earn a living, and Billy does so (in order) to use up excess energy.

SPCs have also been argued to be VP-internal (Jones 1991; Whelpton 1995; Landau 2013) and cannot be stranded outside *do so* without taking on a RatC interpretation (44).

(44) a. *Jon **bought a shelf** [to hold books], and Bill did so [to hold trophies].
b. *Jon **bought one** [to hold books], and Bill did so [to hold trophies].

This contrasts with most adjuncts that allow both OC and NOC (henceforth ‘OC/NOC adjuncts’). RatCs, temporal adjuncts, response clauses, and absolutes may all be stranded after *do so*. This is illustrated for RatCs in (43) and the remaining adjuncts in (45).

(45) a. Harry **left the classroom** [before starting the exam], but Hermione only did so [after finishing it].
b. Last month Billy’s mom **washed the car for him** [for working so hard in school], and yesterday his dad did so [for passing his exams].
c. Peter **got into Harvard**, [having been the best student in school], and, surprisingly, Bill did so, too, [having been the worst].

However, there are several problems with claiming that strict OC adjuncts are actually complements. First, this cannot be true of telic clauses, which are also strictly OC. In contrast to goal clauses and SPCs, telic clauses can be stranded after a *do so* anaphor (46).

¹⁴ In this and following examples, the intended antecedent to *do so* is in bold.

Whelpton (1995) argues that this is because telic clauses adjoin at the level of IP, which is well outside the selectional domain of the verb, making it impossible for telic clauses to actually be verbal complements.

- (46) ?Ute **cooked beef for the dinner party**, only to realize that her guests were vegetarian, and Nick did so too, only to realize that they were Hindu. (Whelpton 1995: 117)

Furthermore, even the claim that goal clauses and SPCs are complements is untenable, in large part because these clauses are always optional, as (47) demonstrates.

- (47) a. Sam_i plays (PRO_i to win). *Goal*
 b. I bought this shelf_i (PRO_i to hold books). *SPC*
 c. Harry_i opened the letter (only PRO_i to discover it wasn't for him). *Telic*

Still, perhaps these are simply *optional* complements, similar to the complement of verbs like *eat* in (48) (Fillmore 1986).

- (48) I've already eaten (breakfast).

This is still doubtful, though, since unlike *eat*, which implies a complement even when none is pronounced, there is no implication of a silent complement in any of the examples in (47) when the clause in question is absent. In addition, these clauses can appear with a wide range of matrix predicates, and it is unlikely that all of them take these clauses as optional complements, especially since a single matrix predicate can appear with more than one. If these adjuncts were actually complements, the verb *bought* in (49), for example, would have to select both an optional OPC and an optional telic clause. The same would have to be true for any verb that takes one or more of these clauses, which leads to positing a large number of otherwise unmotivated silent arguments.

- (49) I bought that shelf (to hold books) (only to return it the next day).

On the other hand, it was noted in §3.1.1 that response clauses *are* sometimes understood as conceptual “arguments” of *blame*-class predicates. And yet response clauses still allow both OC and NOC. Therefore, stating that goal clauses, SPCs or telic clauses are strictly OC because they are conceptual arguments of the verb leads one to question why response clauses are not also strictly OC.

Furthermore, regardless of (non-)argumenthood, attachment height on its own cannot be the determining factor for whether an adjunct demonstrates strict OC. Although two of the strict OC adjuncts adjoin within the *vP* and most of the OC/NOC adjuncts adjoin above it, strict OC telic clauses adjoin above the *vP* (46), and as (50) demonstrates, OPCs, which allow both OC and NOC, adjoin low, within the *vP*.

- (50) *Chandler **bought Monica_i a frying pan_j** [PRO_i to cook with *t_j*], and Ross did so [PRO_i to hit people with *t_j*].

As summarized in Table 3, due to OPCs and telic clauses, there is no clean distinction between attachment height and control status. Even disregarding these anomalies, there would be no good explanation for why low attachment should result in strict OC under the TTC.

Table 3: Control status and attachment height.

Adjunct	Status	Height
RatCs	OC/NOC	above vP
Temporal	OC/NOC	above vP
Response	OC/NOC	above vP
OPCs	OC/NOC	below vP
Absolutives	OC/NOC	above vP
SOAs	strict NOC	above TP
Goal	strict OC	below vP
SPCs	strict OC	below vP
Telic	strict OC	above vP

In sum, since telic clauses adjoin so high, they cannot be optional arguments of the verb. Low adjoining strict OC adjuncts also are unlikely to actually be verbal arguments, since they can appear with such a wide variety of matrix predicates, and because such “arguments” are not implied in the meaning of the predicate when it appears without one of these clauses. And even if the TTC had a reason why it should matter, attachment site on its own also cannot be the determining factor for strict OC.

4.2 Strict OC adjuncts too small for logophoric control?

Since strict OC adjuncts cannot be complements, the TTC requires some other explanation for why they are restricted to predicative control. Landau (2015: 97) hints in a footnote at one possibility, suggesting that nonclausal adjuncts including participles “do not project the functional structure needed to mediate NOC.” Perhaps the structure of strict OC adjuncts is simply too small to allow logophoric control, and they are restricted to the FinP structure in (51a). Adjuncts that allow both OC and NOC, on the other hand, would need to be able to optionally project a logophoric CP level, as in (51b).

- (51) a. $[_{FinP} \lambda x [_{Fin'} Fin [_{TP} x \dots]]]$ (OC)
- b. $[_{CP} pro C_{+log} [_{FinP} \lambda x [_{Fin'} Fin [_{TP} x \dots]]]]$ (NOC)

Of the adjuncts that allow both OC and NOC, there is strong evidence that OPCs and RatCs can project a CP.¹⁵ In OPCs, the object gap has been argued to be the result of empty operator movement to the CP, as in (52) (Chomsky 1980; E. Williams 1980; 1992; Whelpton 2002).

- (52) I left t_i in [her_i mailbox] $[_{CP} Op_j [PRO_i$ to look over $t_j]]$.

In addition, an overt complementizer is possible in OPCs, at least when there is also a lexical subject (53). The same is true of RatCs (54), suggesting that they, too, have a full CP structure.

- (53) I left t_i in the mailbox $[_{CP}$ for her to look over $t_i]$.

- (54) Harry had to go to school [in order $[_{CP}$ for him to become a great wizard]].

¹⁵ For space reasons, the size of temporal adjuncts and response clauses is not discussed here.

In contrast, goal clauses and SPCs, two of the strict OC adjuncts, do not allow overt complementizers or lexical subjects (55). Although it does not result in ungrammaticality, including an overt complementizer and lexical subject forces the adjunct to take on a RatC interpretation. Perhaps, then, these adjuncts are indeed restricted to predicative OC simply because they do not project the necessary structure to support logophoric NOC.

- (55) a. Max works hard [for his family to have food to eat]. (*Goal)
 b. I bought this blender [for it to help me make soup]. (*Purpose)

However, the same cannot be true of telic clauses. Because telic clauses allow an overt complementizer (56), they must be able to project a full CP. Because of this, the TTC would need some other explanation for why logophoric control is not allowed here, even though it is possible in other adjuncts that project CPs.

- (56) Harry hid in the alley, [only for the Dementors to find him a minute later].

Another problem for using clause size alone to determine control properties is found in absolutive adjuncts and some SOAs, as neither allows an overt complementizer without changing the meaning of the adjunct (57). Because absolutives adjoin as bare participles, and SOAs can as well, they are exactly the kind of adjunct that should be restricted to predicative OC. However, NOC is possible with absolutives, and is required with SOAs.

- (57) a. [(**For/with me*) sitting in class the day after the party], my eyes refused to stay open.
 b. [(**For/with me*) judging from experience], Jon would be better off without Mary.

As stated above, SOAs may adjoin too high in the structure for predicative control, which requires c-command by the controller. However, if SOAs, as well as absolutives, do not project a CP level, then it is unclear how they would be able to support a logophoric NOC structure, regardless of whether OC is possible. Furthermore, if these adjuncts do allow NOC despite their small structure, then it is unclear why a small clause size should restrict goal clauses and SPCs from similarly permitting NOC.

The clause size evidence discussed in this section is summarized in Table 4. Because some smaller adjuncts (absolutives and SOAs) allow NOC, and some larger adjuncts (telic clauses) are restricted to OC, using clause size alone to determine whether logophoric control will be possible is problematic. If RatCs and temporal adjuncts can project a CP and therefore permit both OC and NOC, what restricts telic clauses from doing likewise?

Table 4: Control status and adjunct size.

Adjunct	Status	CP?
RatCs	OC/NOC	✓
OPCs	OC/NOC	✓
Absolutives	OC/NOC	✗
SOAs	strict NOC	✗
Goal	strict OC	✗
SPCs	strict OC	✗
Telic	strict OC	✓

And if NOC occurs only when a logophoric CP is projected, how is it that absolutes and SOAs arrive at logophoric interpretations with smaller structures?

4.3 Summary

Although Landau (2017) only discussed RatCs and temporal adjuncts, if extended to other adjuncts, his analysis of adjunct control predicts that all adjuncts should allow both OC and NOC. This account can therefore, of course, easily account for adjuncts where this is true. Difficulties arise, however, with adjuncts exhibiting only OC. These adjuncts cannot feasibly be selected as arguments of the matrix verb, and a claim that they simply have too small a structure to support a logophoric CP falls apart when considering telic clauses, which are strictly OC despite their larger structure, and absolutes and SOAs, which allow NOC despite their small structure.¹⁶

The following section discusses an alternative account of adjunct control within the MTC.

5 The movement theory of control

5.1 Background on the MTC

The Movement Theory of Control (MTC) (Hornstein 1999; Boeckx, Hornstein & Nunes 2010a) is prototypical of many syntactic theories of control in that it establishes a specific syntactic dependency (in this case movement) between PRO and its antecedent in OC structures. OC differs from NOC in that in the former, what is traditionally labeled PRO is the trace of movement of the controller from the embedded to the matrix clause, while in the latter, PRO is the null pronominal *pro*.

A simplified derivation of OC in complements is given in (58). In this example, *Jon* moves from the subject position of the embedded *buy* to the subject position of the matrix *want*, receiving the θ -feature of both verbs. In this way, *Jon* is understood as both the wanter and the buyer.

(58) Jon_i wants [~~Jon~~_i to buy a car].

OC in adjuncts is handled similarly, the only difference being that adjunct control requires sideward movement (Nunes 1995), in which an element moves from one syntactic object to the root of another within a single derivation, as illustrated in (59).

(59) *Derivation of adjunct control*

(simplified from Boeckx, Hornstein & Nunes 2010a: 88)

a. *Applications of select, merge, and copy:*

PP = [after John eating lunch]

VP = [saw Mary]

b. *Copying of John:*

PP = [after John eating lunch]

VP = [saw Mary]

N = John

c. *Merger of John and VP:*

PP = [after John eating lunch]

VP = [John saw Mary]

d. *Applications of select, merge, and copy, plus deletion in phonological component:*

TP = [John [_{vp} [_{vp} ~~John~~ saw Mary][_{pp} after ~~John~~ eating lunch]]]

¹⁶ See Boeckx, Hornstein & Nunes (2010a: Chapter 7) for a broader discussion on problems with selectional theories of control such as the TTC.

The MTC as originally formulated does not distinguish between predicative and logophoric control in complements, the distinction that provided the major motivation for the TTC.¹⁷ As there is growing evidence for (at least) two different types of complement control, several approaches have argued for a hybrid theory involving complement control via movement in some cases, and via other mechanisms such as restructuring in others (see, e.g. Cinque 2006; Grano 2015; Sheehan 2018). Because control via restructuring is unlikely to be involved in adjuncts, I will put aside the issue of how the MTC can account for the different types of OC in complements, instead focusing on the derivation of OC via movement versus NOC via pronominalization in adjuncts.

5.1.1 OC preferred over NOC

According to Hornstein (1999; 2001; 2003), pronominalization resulting in NOC is more “costly” than OC by movement, and is only possible as a last-resort option when movement is blocked. However, the last-resort status of pronominalization as originally formulated is too strong, as it would rule out any case of NOC in adjuncts in favor of OC by the matrix subject, which could arise through sideward movement. Boeckx & Hornstein (2007) acknowledge a similar problem. If pronominalization were strictly last-resort, then (60a) should be ruled out due to the availability of (60b), which Hornstein & Kiguchi (2003) argue arises through movement.

- (60) a. John_i said that [*pro*_i washing himself_i delighted Mary].
 b. John said that [PRO_i washing herself_i delighted Mary_i].

To allow both sentences, Boeckx & Hornstein (2007) propose that pronominalization is only ruled out when movement could not establish the same interpretation (see also Boeckx, Hornstein & Nunes 2010a). Thus, NOC is allowed even when OC is available, as long as NOC results in an interpretation that OC could not have.¹⁸ However, OC may also be preferred more generally. Boeckx & Hornstein assume that parsers are transparent with respect to grammars, meaning that if a grammar has a preference, then the parser will respect that preference. When a comprehender reaches a gap in the incremental processing of a sentence with a control structure, they will prefer to posit a trace of movement if possible rather than a null pronoun, all things being equal. The pronominalization and interpretation in (61b) is not ruled out by the grammar, but because parsers would prefer to posit a trace as the null subject of the adjunct, resulting in (61a).

- (61) a. John_i kissed Mary_j without PRO_{i/*j} getting embarrassed.
 b. John_i kissed Mary_j without *pro*_{*i/j} getting embarrassed.

There is therefore a difference between a derivation being ungrammatical because the grammatical system cannot produce it, and one that is unacceptable because parsers would never choose that derivation over a preferred alternative. The strong preference for OC in adjunct control is due in part to a grammatical constraint requiring OC if it is possible for a given interpretation, and in part due to a parsing preference for positing traces over null pronouns in incremental processing. This combination results in a general preference for OC over NOC.

¹⁷ For other criticisms of the MTC, see Landau (2003; 2007), and Bobaljik & Landau (2009). But see Boeckx, Hornstein & Nunes (2010b) and Drummond & Hornstein (2014) for replies.

¹⁸ This idea is similar to a proposal from Reinhart (1983), which states that if the same meaning can be expressed using either a bound variable or a free pronoun, the bound variable will be preferred by both speakers and hearers. See Lasnik (1991); Heim (1998; 2009); Fox (2000); Reinhart (2006); Roelofs (2008); Drummond (2011); a.o., for alternative theories and discussions on problems with Reinhart’s (1983) proposal.

Boeckx & Hornstein (2007) and Boeckx, Hornstein & Nunes (2010a) argue that parsers are *completely* transparent to grammatical constraints, and that if it is possible to posit a trace in a given position, parsers must do so. This would explain why examples such as (62) only allow OC by the matrix subject, even when it results in a strange interpretation. Upon encountering the empty category in the adjunct, it is possible to posit a trace linked to the matrix subject, so parsers must do so.

- (62) #The bank_i was robbed [while PRO_{i/*j} being smart not to raise the alarm]. (Landau 2017: 7)

However, this does not explain why the same is not true in any of the examples in (63). Evidently, parsers are able to override the preference for a trace in at least some circumstances, even when a trace in the relevant position would be possible. This cannot be due to structural properties of the sentence alone, since the sentences in (63) permit either a trace (OC) or a pronominal (NOC) without changing the structure (see Green in press). Instead, structural, discourse, and processing factors all compete in determining the probability of OC or NOC.

- (63) a. The president_i was elected [without PRO_{i/j} considering his competence]. (Roeper 1987: 297)
 b. The pool_i was the perfect temperature [after PRO_{i/j} being in the hot sun all day].
 c. The potatoes_i were tastier [after PRO_{#i} eating carrots].

An example of the interaction of such constraints is given in Boeckx & Hornstein (2007), where it was argued that NOC is available in (60a) despite the availability of OC in (60b) because at the point where the empty category is encountered, if parsers posited a trace, they would not yet be able to assign it a referent; the only positions that something could have moved to from that position come later in the sentence. The preference to quickly assign reference to dependent elements (Nicol & Swinney 1989; Badecker & Straub 2002) is in competition with the preference for a trace, resulting in the possibility of either a trace or a pronominal. Similar competition may be involved in NOC cases of adjunct control.

5.1.2 Difference between complements and OC/NOC adjuncts

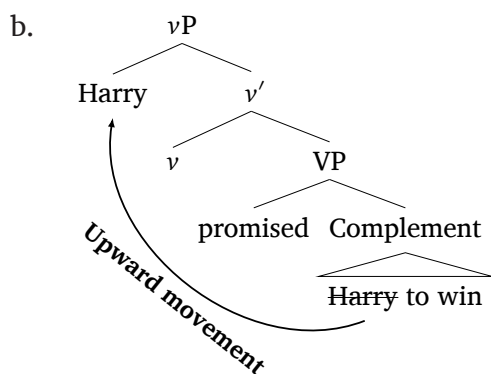
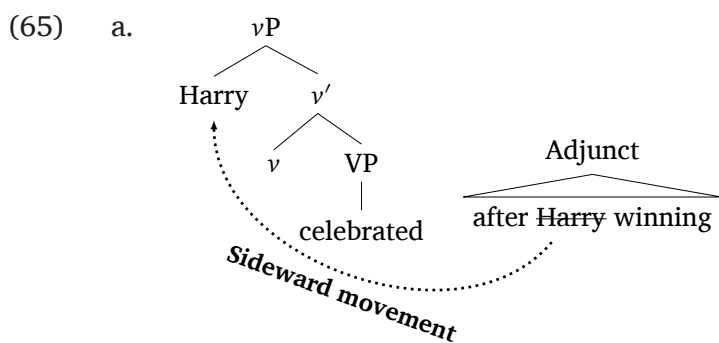
The MTC assumes that OC is preferred over NOC due to a grammatical constraint that rules out NOC for any interpretation that could have arisen through movement, and to a parsing preference rules out NOC in general when OC is available. For some adjuncts, this preference can be overridden in the proper context. But the same is not true for complements. Why should complements and adjuncts differ in this respect under the MTC? The only difference in the derivation of complement control and adjunct control is that the former involves upward movement and the latter sideward movement. I propose that adjuncts are more likely to permit NOC than complements because sideward movement is for some reason more “costly” than upward movement. This would lead to the preference scale for the derivation of control represented in (64).¹⁹

- (64) *Preference scale for derivations of control:*
 upward OC >> sideward OC >> NOC via pronominalization

¹⁹ Under the TTC, logophoric control involves *pro* even in complements, where it is OC. The preference scale in (64) is specific to the MTC, although Landau (2017) also argues that logophoric control involving *pro* will be less preferred than predicative control, but because of its more complex structure, not because of the pronominalization *per se*.

The additional cost of sideward movement reduces the parser’s preference for traces over *pros*, which in turn makes it more likely that NOC will be permitted if contextual or other constraints favor it. But what is the source of the preferences in (64)? Why would sideward movement be more costly than upward movement? As discussed above, the preference for OC over NOC is in large part due to processing. This accounts for why NOC is lowest on the scale. Might the preference for upward versus sideward movement also be the result of processing biases? Perhaps sentences involving sideward movement are simply more difficult to process than sentences with upward movement. One reason why this might be the case begins with the fact that adjuncts are optional. Because they are optional, they may be less predictable. And if they are less predictable, a comprehender will have less of an expectation, at the matrix verb, of needing to form a control dependency, than when the verb selects a control complement. But even if this is true, why should online predictability have anything to do with what interpretations are licit or available offline? There is no logical connection here, so the effect would simply have to be stipulated. Unlike the preference for OC over NOC, this effect cannot be reduced to other known parsing preferences, such as the preference for local versus distant antecedents or the preference for syntactic versus discourse dependencies. Therefore, stating that (64) is due exclusively to processing preferences is tenuous.

It is also not immediately clear what grammatical constraints would result in (64). Both upward and sideward movement involve copy and re-merger of an element of the growing syntactic structure. Neither involves more steps or even different underlying operations that could lead to a greater cost. There is only one real difference between the two that could cause a cost difference: sideward movement involves copying an element from one tree and moving it to the root of another (65a), while upward movement involves copying from and re-merging to the same tree (65b).



Perhaps sideward movement incurs a derivational penalty akin to the one that has been posited for moving out of islands (Chomsky 1972; Lasnik 2001). This could,

perhaps, simply be the result of the fact that sideward movement requires forming a syntactic dependency between two separate workspaces, so to speak, in the derivation. Or it could have something to do with constraints on proper movement. Although I do not speculate further on the exact nature or source of this penalty, let us simply suppose by hypothesis that there is a penalty for moving an element from within one tree to the root of another, unconnected tree. Suppose, furthermore, that this penalty is weak,²⁰ and does not cause the derivation to crash, but instead results in a lower “degree of grammaticality” or acceptability (Epstein 1990; see also Chomsky 1965; 1986; Lasnik & Saito 1984). Because both upward and sideward movement can lead to convergent derivations, both may result in grammatical strings; those involving sideward movement are simply lower on the scale between completely acceptable by the parser and completely unacceptable.

If this hypothesis is on the right track, the preference for upward OC versus sideward OC is due to a weak grammatical constraint against movement to a non-c-commanding position. Assuming there is some performance penalty associated with this grammatical violation, the lower grammatical status of sideward OC makes its appeal relative to NOC weaker than upward movement’s. This in turn leads to a greater probability of both OC and NOC being accepted in OC/NOC adjuncts than in complements, since adjuncts involve sideward movement, while in complements, movement is upward.

Admittedly, positing that sideward movement is more costly than upward movement is somewhat stipulative. But something like it as part of the scale in (64) would be required in order to capture the differing availability of NOC in complement and adjunct control under the MTC. And interestingly, the idea that sideward movement results in a greater likelihood of NOC has independent support in the examples from Boeckx & Hornstein (2007) in (60), repeated in (66). This structure allows both OC and NOC, and importantly, Boeckx & Hornstein argue that the OC derivation in (66b) involves sideward movement. This is consistent with the idea that OC derived from sideward movement is less strongly preferred to NOC than OC derived from upward movement is, and that this contributes to NOC also being possible.

- (66) a. John_i said that [*pro*_i washing himself_i delighted Mary].
 b. John said that [PRO_i washing herself_i delighted Mary_i].

Finally, Hornstein (2001) assumes an Uriagereka (1999)-style adjunction in which adjuncts are linearized and therefore become islands before being merged with the main clause (see also Nunes 2001). If this is the case for all adjuncts, then all cases of OC in adjuncts will necessarily involve sideward movement. And because sideward movement is “costly”, NOC through pronominalization should be possible in the right context. Under these assumptions, the MTC makes the incorrect prediction that all adjuncts should allow both OC and NOC. The MTC therefore does just as well as the TTC on adjuncts that allow both OC and NOC, while struggling with strict OC adjuncts. In the following section, I outline a proposal for how the MTC can deal with low-adjoining strict OC adjuncts.

²⁰ See Chomsky (1965) and Epstein (1990) for discussions on different types of violations resulting in penalties of differing strength.

5.2 The MTC and strict OC adjuncts

Goal clauses (67a), SPCs (67b), and telic clauses (67c) all exhibit strict OC.

- (67) a. Max_i works hard [PRO_i to stay out of jail].
 b. I bought this blender_i [PRO_i to help me make split pea soup].
 c. Harry_i opened the letter_i [only PRO_i to discover it wasn't for him].

Under the version of the MTC outlined above, strict OC is only expected if upward movement from the “PRO” position to the controller position is possible. For adjuncts, upward movement requires two conditions. First, the adjunct must not (yet) be an island to movement, and second, it must adjoin lower than the base position of the controller. I will discuss each of these in turn.

First, according to Uriagereka (1999), Hornstein (2001), and Nunes (2001), the non-finite clauses in (67), as adjuncts, should be atomized (made a single syntactic atom) prior to or upon adjunction. If this is the case, upward movement after adjunction should be impossible. But there is evidence that immediate atomization does not automatically occur with adjunction: CED island effects (Huang 1982) in adjuncts are often weak or nonexistent (Truswell 2007; Sheehan 2013). This is true not only of strict OC adjuncts (68), but also of at least some OC/NOC adjuncts (69). Because movement out of adjuncts is sometimes possible, it cannot be the case that they are always atomized prior to adjunction.

- (68) a. What_i did Max work hard [to do t_i]?
 b. What_i did you buy this blender [to help you make t_i]?

- (69) a. What_i did you go to the store [in order to buy t_i]?
 b. What_i did you give Jake flowers [for doing t_i]?

Second, if adjuncts allow extraction, then upward movement for control may be possible as long as the base position of the controller in the matrix clause is higher than the adjunction point. SPCs and goal clauses each were demonstrated above to adjoin within the vP based on their obligatory inclusion in the interpretation of *do so* anaphors (telic clauses are an exception, and will be discussed in §5.3). Relevant examples are repeated in (70), each of which can only have a RatC interpretation, and is ungrammatical otherwise.

- (70) a. Max **works hard** [to avoid work] and Billy does so
 [to avoid confrontation]. (*Goal clause)
 b. Jon **bought a shelf** [to hold books], and Bill did so
 [to hold trophies]. (*SPC)

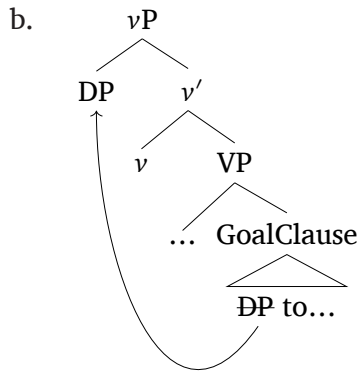
This places goal clauses clearly under the merge position of the subject in spec-vP, whether they adjoin to an intermediate projection of v, as in (71a), or whether they adjoin to or within the VP, as in (71b).

- (71) a.
-
- ```

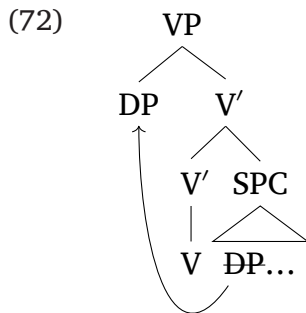
graph TD
 vP --> DP1[DP]
 vP --> v_prime[v']
 v_prime --> dots[...]
 v_prime --> GoalClause[GoalClause]
 GoalClause --> DP2[DP to...]
 DP2 --> DP1

```





As for the SPC in (67b), which has control by the object, the controller is not base-generated in the *vP*, but as an object of *V*. Kratzer (1996), following Larson (1988), proposes that objects of verbs are base-generated as specifiers of *V*. If that is the case, and if adjuncts may still adjoin to the *V'* level, as Whelpton (1995) argues, then these adjuncts too may adjoin lower than the base position of the controller, as in (72).



Assuming that goal clauses and SPCs adjoin with structures similar to (71) and (72) and that adjuncts are not always atomized prior to adjunction, these clauses are in a position where upward movement from the controllee position to the controller position is possible.<sup>21</sup> Because upward movement is possible, it will be strongly preferred to pronominalization, and NOC will be ruled out.

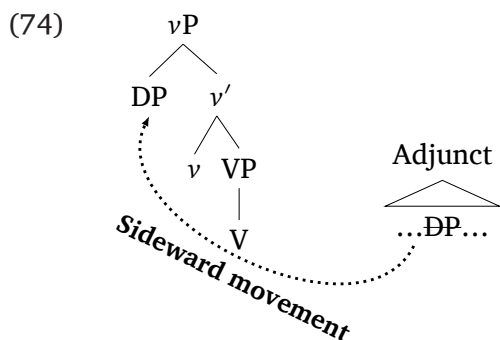
In contrast, OC in adjuncts that allow both OC and NOC involves sideward movement. RatCs, temporal adjuncts, response clauses, and absolutes all adjoin higher than strict OC adjuncts, outside the *vP*, as demonstrated by the fact that they can be stranded after *do so*.

- (73)
- a. Malfoy **took off on his broom** [in order to show off] and Harry did so [in order to help Neville].
  - b. Harry **left the classroom** [before starting the exam], but Hermione only did so [after finishing it].
  - c. Last month Billy’s mom **washed the car for him** [for working so hard in school], and yesterday his dad did so [for passing his exams].
  - d. Peter **left the party** [having danced with many partners], and Paul did so [having been rejected by everyone].

Because these adjuncts adjoin outside the *vP*, they are positioned higher than the base position of the matrix arguments. Therefore, the only way for movement to occur between

<sup>21</sup> Hornstein (1999) follows Nunes (1995) in assuming that the Extension Condition (Chomsky 1995) applies to adjuncts. If this is true, then an alternative derivation, whereby the subject sideward moves out of the adjunct into the matrix clause followed by low, late adjunction, is impossible.

the adjunct and the base position of the controller, whether the subject or the object, is through sideward movement, as illustrated in (74) for subject control. Because of this, the preference for OC is reduced, and NOC is also available in the right context.



But as mentioned above, attachment height cannot be the sole determining factor. OPCs allow both OC and NOC, but cannot be stranded outside *do so* (75). They therefore adjoin lower than other OC/NOC adjuncts, in the same domain as the low-adjoining strict OC adjuncts.

- (75) \*Chandler bought Monica<sub>i</sub> a frying pan<sub>j</sub> [PRO<sub>i</sub> to cook with *t<sub>j</sub>*], and Ross did so [PRO<sub>i</sub> to hit people with *t<sub>j</sub>*].

However, unlike the strict OC adjuncts, OPCs may be linearized before adjunction and therefore act as islands to movement afterwards. That this is the case is suggested by the fact that CED effects are strong in OPCs.

- (76) a. Chandler bought Monica a knife [to cut something with].  
 b. \*What<sub>i</sub> did Chandler buy Monica a knife [to cut *t<sub>i</sub>* with]?

One possible reason for this is that OPCs have a larger structure than low-adjoining strict OC adjuncts (see §4.2), and may therefore be atomized as CP phases (Chomsky 2001) prior to adjunction. Strict OC adjuncts that are smaller than CPs are only linearized upon merger of the next phase head.

This proposal derives the strict OC status of goal clauses and SPCs. These adjuncts are strictly OC because they permit upward movement from the adjunct to the base position of the controller, and therefore the preference for OC over NOC is strong. This is in contrast to OC/NOC adjuncts, which require sideward movement for OC, either because they are atomized prior to adjunction, as is the case with OPCs, or because they adjoin too high, as is true of the other OC/NOC adjuncts. Although OC may still be preferred, this preference is weaker than in strict OC adjuncts due to the fact that it is derived via sideward movement, resulting in the possibility of NOC.

Table 5 summarizes how the type of movement involved in the control dependency interacts with the control status of the adjunct. RatCs, temporal adjuncts, response clauses, and absolutes all involve sideward movement because of their attachment height above the base position of the verb's arguments. OPCs also involve sideward movement, not because of attachment height, but because they are linearized prior to adjunction, possibly due to their larger clause size. In each case, sideward movement leads to both OC and NOC being possible. In contrast, goal clauses and SPCs both adjoin low and are not linearized prior to adjunction. Upward movement is therefore possible, resulting in strict OC.

In what follows, I will discuss SOAs and telic clauses, which present challenges to this proposal.

**Table 5:** Summary of adjunct properties.

| Adjunct     | Status     | Height   | CP? | Movement |
|-------------|------------|----------|-----|----------|
| RatCs       | OC/NOC     | above vP | ✓   | sideward |
| Temporal    | OC/NOC     | above vP |     | sideward |
| Response    | OC/NOC     | above vP |     | sideward |
| OPCs        | OC/NOC     | below vP | ✓   | sideward |
| Absolutives | OC/NOC     | above vP | ✗   | sideward |
| SOAs        | strict NOC | above TP | ✗   |          |
| Goal        | strict OC  | below vP | ✗   | upward   |
| SPCs        | strict OC  | below vP | ✗   | upward   |
| Telic       | strict OC  | above vP | ✓   |          |

**5.3 Remaining challenges**

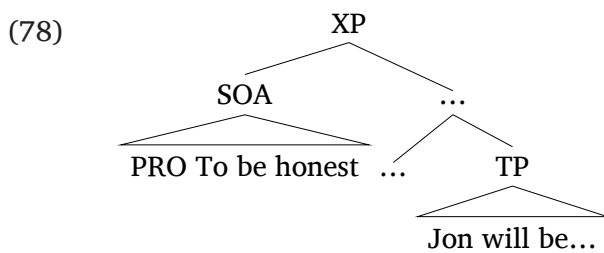
The MTC is able to account for OC/NOC adjuncts, as well as low-adjoining strict OC adjuncts. However, there are at least two potential problem cases for the current proposal: SOAs, which are strictly NOC, and telic clauses, which require OC but adjoin too high for upward movement.

**5.3.1 Speaker-oriented adverbials**

It was noted above that PRO in SOAs such as those in (77) can only refer to the speaker, which is evidence for their being restricted to logophoric NOC.

- (77) a. [PRO To be honest], Jon would be better off without Mary.
- b. [PRO Judging from experience], Jon will be better off without Mary.

The explanation offered for the TTC was that since SOAs adjoin high in the clause, above the position of the matrix subject, as in (78), the adjunct is too high for a sentential argument to predicatively control PRO. Logophoric control is therefore the only option. However, if having a small clause size results in strict OC, as briefly suggested in Landau (2015) and as explored above, then SOAs still present a problem for the TTC, since they can adjoin as bare participials and still exhibit strict NOC.



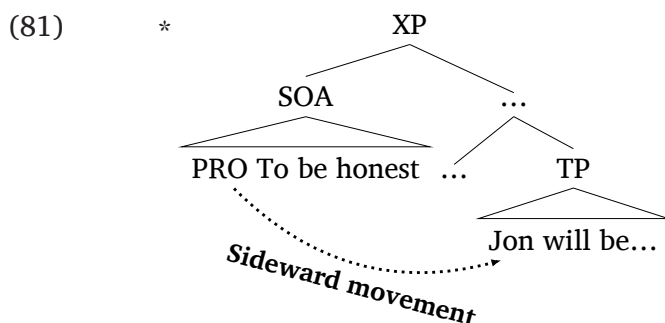
Intuitively, it seems that a height-based explanation of the strict NOC status of SOAs should be able to apply to the MTC. With the structure in (78), PRO is not c-commanded by any matrix argument. Movement out of that position to the main clause would then result in an ill-formed chain, since the head of the chain would not c-command the tail (Chomsky 1995). Although the same is true initially for all cases of sideward movement, here the problem is more serious, since even at the end of the derivation, the final position of the moving element does not c-command the trace in the adjunct.

However, Hornstein & Kiguchi (2003) argue that c-command is not required for sideward movement. They argue that examples like (79) involve OC via sideward movement, and yet PRO's controller does not c-command it, even on the surface. And this is not limited to psych-verbs, as might be assumed based on theories such as that of Belletti & Rizzi (1988), since PRO in (80) is also not c-commanded by its OC antecedent (Norbert Hornstein, p.c.).

(79) John said [that [PRO<sub>i</sub> washing herself] delighted Mary<sub>i</sub>].

(80) [PRO<sub>i</sub> Brushing her teeth] made Mary<sub>i</sub> late for the movie.

If OC does not actually require c-command, then it is not clear why in SOAs the matrix subject should not be able to sideward move from the adjunct into the main clause, as in (81).

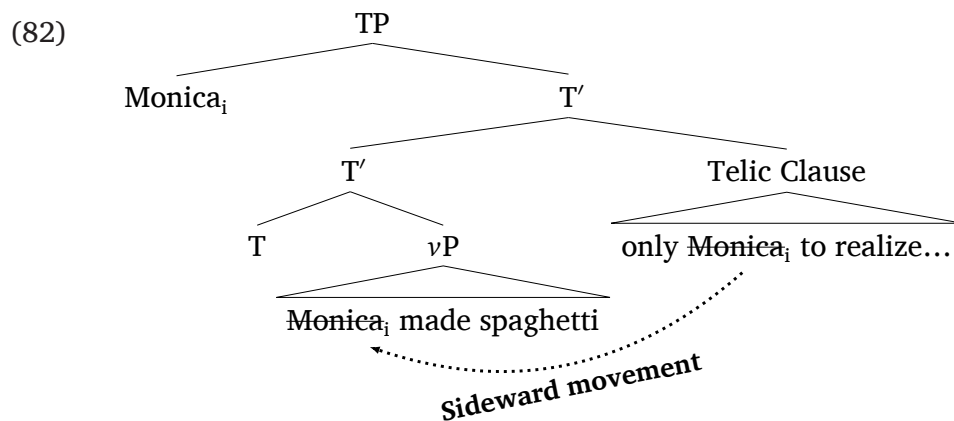


Importantly, however, it is also unclear how the TTC would explain the OC properties of (79) and (80). If predication requires c-command, then predicative OC should be impossible. Logophoric OC would also be insufficient, since it is unclear what would restrict the logophoric context of the non-finite clause to one representing Mary's perspective. In fact, the sentence could easily be representing the opinion of a separate individual, such as John in (79). Therefore, if Hornstein & Kiguchi's arguments are right, and (79) and (80) do exhibit OC, then the TTC must also admit that OC does not require c-command, leaving no good explanation of SOAs. If, on the other hand, Hornstein & Kiguchi are incorrect, and these examples do not involve OC, then the same explanation proposed for the TTC will work in the MTC, namely that SOAs adjoin too high for OC to occur.

Under either account, the restriction of SOAs to NOC may also be due to other factors. One possibility is that there is a functional head high in the structure where SOAs adjoin that requires the adjunct to represent the perspective of the speaker (Cinque 1999). Unless the matrix subject is also the speaker, this would require NOC in order to satisfy the demands of that functional head.

### 5.3.2 Telic clauses

Finally, telic clauses likely involve sideward movement, and yet appear to be restricted to OC. Strict OC in an adjunct is only expected under the MTC if that adjunct attaches lower than the base position of the controller and is not linearized prior to adjunction, thus allowing control via upward movement. But as discussed in §4.1, Whelpton (1995) provides evidence that telic clauses adjoin at the IP level, well outside the merge position of the subject within the  $\nu$ P. Because of this, the only way for OC to occur would be through sideward movement, as in (82).



Because sideward movement is required, the account presented here predicts that NOC should be possible in telic clauses given the right context. In order to account for the strict OC status of telic clauses, the MTC would either have to say that they attach lower than Whelpton (1995) thought, claim that NOC is ruled out for some other reason, or provide evidence that has eluded me that NOC is possible. Importantly, though, the TTC account in §4 is also unable to account for telic clauses, since there is no way that they could be arguments of the matrix predicate, and they appear to be at least as large as a CP, which should be sufficient to allow a logophoric structure. I leave further investigation of telic clauses to future research.

## 6 Conclusion

Landau (2017) provided good evidence that RatCs and temporal adjuncts allow both OC and NOC (see also Green in press). A simple hypothesis would be that the same is true for all other adjuncts as well. This paper has shown that such a hypothesis is too general. Some adjuncts are restricted only to one type of control, either OC or NOC. Although an explanation within the TTC for strict NOC adjuncts is possible due to their adjunction height, strict OC adjuncts present a more serious challenge. I have proposed an alternative within the MTC which is better able to account for the strict OC status of low-adjointing adjuncts.

Although Landau (2017) only deals with RatCs and temporal adjuncts, extending his account leads to the prediction that an adjunct will only be restricted to OC if it is too small to support a logophoric CP, or if it is not an adjunct at all, but a complement. Neither of these conditions can suitably explain strict OC adjuncts. As demonstrated in §4, strict OC adjuncts cannot actually be complements. Incorporating the idea that control properties are due to the size of the adjunct does better, but the account then faces issues with absolutes, SOAs, and telic clauses. If strict OC adjuncts were restricted to OC simply because their structure is too small for NOC, then absolutes and SOAs, which adjoin as bare adverbials, should also demonstrate strict OC. Under the TTC, it is unclear why these would allow NOC, while other small adjuncts that adjoin lower do not. It is also unclear why telic clauses, which have a full CP structure, would be restricted to OC.

The MTC is able to explain all of the OC/NOC adjuncts, including absolutes, as well as most of the strict OC adjuncts, although like the TTC it still struggles with telic clauses. For strict OC adjuncts, if the adjunct adjoins low enough, it will allow upward movement from the controllee to the controller position, unless it is atomized prior to adjunction, as is the case with OPCs. Because upward movement makes OC more strongly preferred than sideward movement does, possibly due to sideward movement incurring a weak grammatical penalty, these adjuncts are expected to require OC just as strongly as complement control does. As for why absolutes allow both OC and NOC despite their small structure, this account argues that they adjoin higher than the base position of the matrix subject

and therefore require sideward movement for OC. This reduces the preference for OC, which increases the availability of NOC. Low-adjointing strict OC adjuncts permit upward movement, preventing pronominalization and NOC.

Importantly, this account is able to explain the correlation between adjunction height and control properties. Under the TTC, the fact that most strict OC adjuncts adjoin lower than OC/NOC adjuncts should not matter, since they all adjoin low enough to be predicated of the matrix subject in its final position. Unless these adjuncts were actually complements, which I have argued is not the case, the low adjunction of strict OC adjuncts would be a coincidence. But under the MTC, this property, in conjunction with their small structure, is what derives their strict OC status. The only strict OC adjunct that the MTC struggles with is the telic clause, but the TTC also had no good explanation for it.

The study of control has most frequently focused on cases where the controlled clause is the complement of a main clause verb. Theories of the control relation and of controller choice have been built largely on the properties of complement control, and adjuncts have often been ignored. In many syntactic theories of control such as the predominant version of the MTC, it is assumed that adjunct control will display the same properties as complement control (Hornstein 1999; Boeckx, Hornstein & Nunes 2010a). Even some semantic control theories make the same assumption. For example, Farkas (1988) argued that controller choice is determined by a responsibility relation in complement control as well as in adjuncts, although her discussion of the latter is limited to RatCs. Other semantic theories of control such as that of Sag & Pollard (1991) do admit that the mechanism of controller choice in adjuncts may differ from the one involved in complement control, since they are not selected by any element of the main clause, but the discussion of adjuncts is stated as an aside, with no detailed analysis. This paper has provided evidence that adjuncts do not all behave in the same way as complements, in line with Landau (2017); while complements require OC, some adjuncts allow both OC and NOC. It is also not the case, though, that all adjuncts uniformly behave differently from complements; several adjuncts permit both OC and NOC, while others are restricted to one or the other.

In addition, it is not the case that syntactic OC and non-syntactic NOC are in complementary distribution, contrary to the assumptions of many previous theories (e.g. Manzini 1983; Boeckx & Hornstein 2007; McFadden & Sundaresan 2016). NOC can sometimes appear where OC is also possible (see also Green in press). But although both are possible in some instances, OC is still strongly preferred, all else equal. I have argued that this is due to processing preferences: under the MTC, parsers may prefer to posit a trace rather than a null pronoun when they encounter a gap (Boeckx & Hornstein 2007; Boeckx, Hornstein & Nunes 2010a). But the preference for OC is not dependent on the MTC. Under the TTC, parsers may prefer OC because of its simpler structure (Landau 2017). In addition to or instead of these, OC may also be preferred to NOC due to a more general preference for bound variable readings (Reinhart 1983; 2006), or for local (Cunnings & Sturt 2014) or recent (Cunnings, Patterson & Felser 2014) antecedents. Factors favoring NOC may include the availability of a non-local perspective-holding potential antecedent, whether OC would result in a strange interpretation (Landau 2017), attachment site of the adjunct (Landau 2013), or other factors (Green 2018).

Although this paper represents an important step toward understanding adjunct control, further work is necessary. Especially useful will be investigations of the relation between parsing preferences and grammatical distinctions in determining controller choice. This will further our knowledge of how syntactic and non-syntactic processes and sources of information interact in control and in anaphora resolution more generally.



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## Competing Interests

The author has no competing interests to declare.

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