A movement theory of adjunct control

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Abstract Landau (2017; 2018) has recently argued 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 (Mohanan 1983; Clark 1990; Hornstein 1999; Pires 2007). Here I demonstrate that this this OC/NOC duality does not extend to all adjuncts, contrary to implicit predictions Landau’s theory makes. I outline assumptions that Landau would have to make in order to accommodate the wider distribution of OC and NOC in adjuncts, but argue that this is better accomplished within the Movement Theory of Control (Hornstein 1999) by relaxing the assumption that all adjuncts are phases.

Keywords: syntax, control, adjuncts, movement, phases

1 Introduction

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

(1) The window\textsubscript{1} broke [after PRO\textsubscript{1} being hit with a rock].
(2) This book\textsubscript{1} was written [in order PRO\textsubscript{1} to be read].

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

(3) Harry\textsubscript{1} promised PRO\textsubscript{1} to make himself/*oneself invisible.
Where adjunct control is discussed, it is often assumed to strictly require 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 is best explained with a syntactic dependency between it and PRO, it being PRO’s 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 adjuncts is syntactically based. Furthermore, many theories of control at least implicitly assume that OC and Non-Obligatory Control (NOC), in which PRO is not bound by a syntactic antecedent, are complementary, NOC only obtaining if OC is blocked (Mohanan 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$_1$ talked to Harry$_2$ [before PRO$_{1/2}$ leaving the room].  |
| b. [PRO$_{1/2}$ Having washed himself/*herself/*oneself], Harry$_1$ talked to Ginny$_2$. |
| c. Harry$_1$ grew up [PRO$_{1/2}$ to be a famous wizard]. |
| d. The ball$_1$ fell, [only PRO$_{1/2}$ to be picked up again]. |

However, Landau (2017; 2018) 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. Temporal and rationale clauses are thus hybrid environments allowing both OC and NOC (see also Español-Echevarría 2000; Green 2018). Still, OC and NOC are not always equally available, with OC often being strongly preferred.

(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]. |

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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).

2 Note that, for simplicity, I will not generally distinguish between the labels of the implicit subject in OC and NOC, labeling each ‘PRO’. Their actual representation is hypothesized to differ in many theories, including the Movement Theory of Control (Hornstein 1999), which theory I build upon in §4.
In this paper, I investigate some of the broader implications of Landau’s (2017) hypothesis. In §2 I review and expand on the way Landau implements this duality of control for RatCs and temporal adjuncts in the Two-tiered Theory of Control (TTC) (Landau 2015). As will be seen, his account leads to the prediction that all cases of adjunct control, not just RatCs and temporal adjuncts, should allow both OC and NOC given the right context. Section 3 therefore briefly discusses several other types of adjuncts, illustrating that this is true for some, but not others. I then discuss assumptions the TTC would have to make in order to explain these adjuncts, but argue that such assumptions are not always justified. In §4, I propose an alternative explanation within the framework of the Movement Theory of Control (MTC) (Hornstein 1999; Boeckx, Hornstein & Nunes 2010) that can better account for many strict OC adjuncts that the TTC struggles with. Section 5 concludes and discusses further implications of this research.

2 The two-tiered theory of control

Landau situates his discussion of the distribution of OC and NOC in adjuncts within the TTC (Landau 2015). This section provides a brief background on the theory, followed by an explanation of how it addresses the following questions: (i) why OC is preferred to NOC in RatCs and temporal adjuncts, but is not strictly required; and (ii) why complement control does not allow the same duality, being instead strictly OC. As will be seen, the answers to these questions lead to the incorrect prediction that all adjuncts, not just temporal and rationale clauses, should allow both OC and NOC in the right context.

2.1 Background on the TTC

The TTC rejects traditional formulations of OC and NOC. Instead, it classifies control as either predicative or logophoric, similar to the way E. Williams (1992) does. In complements, logophoric control occurs with attitude predicates, and predicative 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 (6). 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 matrix argument.

(6) Harry managed \[ \text{FinP } \lambda x [\text{Fin} x \text{ Fin TP } x \text{ to win}]].

Logophoric control, on the other hand, which appears only with attitude predicates, involves a relation between \( x \) and \( p(i) \), where \( i \) is a variable restricted to the AUTHOR or ADDRESSEE of the context of evaluation. In complement control, this context is restricted by the matrix verb, in combination with the embedded \( C \), to include only the matrix attitude holder of and their addressee; the variable must therefore be associated with one of them, resulting in OC. Logophoric control also involves a FinP predicate, but it is predicated of a \( pro \) situated in an additional layer of structure, as in (7).\(^3\)

(7) Harry intends \[ \text{CP } pro \text{ C+log } [\text{FinP } \lambda x [\text{Fin} x \text{ Fin TP } x \text{ to win}]].\]

Landau (2015; 2017) states that adjunct control also falls into these two categories. But unlike control complements, whose structure is restricted by the matrix verb, because adjuncts are not selected, they are free to adjoin with either a predicative structure or with a logophoric one, as illustrated in (8).

(8) a. \( OC \) adjuncts:
\[ [\text{PP before/in order } [\text{FinP } \lambda x [\text{Fin} x \text{ Fin TP } x \ldots]]] \]

b. \( NOC \) adjuncts:
\[ [\text{PP before/in order } [\text{CP } pro \text{ C+log } [\text{FinP } \lambda x [\text{Fin} x \text{ Fin TP } x \ldots]]]] \]

(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 at all 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.\(^4\) So it must be the case that the \( \lambda \) is passed up the tree, either through movement or through a

\(^3\) The additional layer of structure is more complicated than illustrated in (7). There are also functional elements that ensure a logophoric interpretation of the \( pro \). See Landau (2015).

\(^4\) Rothstein (2004) stipulates of depictive secondary predicates, which have a semantics like \( while\)-adjuncts, that they 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.
complex series of function composition. Assuming that the predication relation
does obtain, then the antecedent of the variable corresponding to PRO will
be limited to the closest c-commanding DP, resulting in OC. If the adjunct
attaches with a logophoric structure, on the other hand, “PRO” will be bound
by the intermediate pro. But unlike in complement control, because the adjunct
is not selected by a matrix verb, there will be no restriction on the context
of evaluation of the embedded clause, so this pro will be free to refer to the
author or addressee of any relevant context, resulting in logophoric NOC.

2.2 Why OC is preferred over NOC

Even though RatCs and temporal adjuncts may allow both OC and NOC, OC
is often strongly preferred. Following Grimshaw (1994); Bošković (1996), and
Speas (2006), Landau (2017) proposes a principle of economy of projection,
which favors the derivation with a less complex structure, all else being equal.
Because predicative (OC) adjuncts have a simpler structure than logophoric
(NOC) ones (see (8)), the more complex NOC will only be licensed if OC is
ruled out for semantic reasons.\footnote{See Green (2018) for evidence that ruling out OC is not actually always necessary for NOC to occur.}

2.3 Why complement control only allows OC

The fact that complements are selected and adjuncts are not is the basis of
the TTC’s explanation for why temporal and rationale clauses allow both OC
and NOC and complement control is strictly OC. Under the TTC, control can
involve either a predicative or logophoric structure. In complement control,
which type of control structure is used is determined based on selection by
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. Logophoric NOC is
also ruled out in non-attitude contexts because of the selectional restrictions of
the embedding verb.\footnote{NOC is actually possible in complements with a wh-phrase in their spec-CP (see (i)). Note that (i) involves an attitude predicate, and therefore would involve logophoric control. Although Landau (2015) does not address this question, perhaps this has to do with the fact that wh-infinities always have a modal interpretation, which in turn leads to generic interpretation of PRO (Bhatt 1999). How this is instantiated in the TTC, though, is not clear.}
Attitude predicates, on the other hand, select a logophoric complement and set the context of evaluation of the clausal complement as the attitude context of the matrix event. This ensures that the controller will be either the AUTHOR or the ADDRESSEE of the matrix event. It is important for Landau that the choice of AUTHOR or ADDRESSEE as controller is not lexically specified by the matrix verb, as this ensures that the property denoted by the FinP can apply to either, allowing for well-known cases of control shift such as in (9). In (9a), pro is bound by the ADDRESSEE of the matrix attitude, and in (9b), by the AUTHOR. However, this is still an instance of OC, since PRO in either case must be controlled by an argument of the matrix clause.\footnote{Although control shift is possible, there generally is a default controller based on the control verb. For example, persuade generally exhibits object control, and promise subject control, and it takes extra context to get control shift. Landau’s (2015) theory provides no explanation of the default.}

\begin{align*}
(9) & \quad \text{a. Jim asked Mary}_y \ [\text{CP } \text{pro}_y \ [\text{FinP PRO to leave}]]. \\
& \quad \text{b. Jim}_x \text{ asked Mary } [\text{CP } \text{pro}_x \ [\text{FinP PRO to be allowed to leave}]].
\end{align*}

Adjuncts differ from complements only in that they are not selected. Because of this, they are free to have either a predicative or a logophoric structure. With predicative adjuncts, the $\lambda$ associated with PRO is “applied” to the closest c-commanding argument, which for temporal and rationale clauses is the matrix subject. Putting aside the question of how this happens, and assuming that the $\lambda$ does somehow “apply” to the matrix subject, it will result in OC due to the nature of predication. Logophoric adjuncts will be NOC because there is no restriction on the context of evaluation of the embedded clause. The null pronoun in the specifier of C that binds PRO is therefore free to refer to the AUTHOR or ADDRESSEE of any relevant context.

3 Other adjuncts

Landau discusses only RatCs and temporal adjuncts, using them as evidence that both OC and NOC are possible in adjunct control. However, there are several different types of adjuncts that exhibit control, each with their own distinct properties (see Huettner 1989; Landau 2013). Therefore, although RatCs and temporal adjuncts may allow both OC and NOC, this does not immediately mean that all adjuncts will likewise. However, the TTC would seem to predict that this duality of control should extend to all adjuncts, although Landau (2015; 2017) does not explicitly make this claim. If RatCs
and temporal adjuncts allow both OC and NOC because their structure is unselected by a matrix verb, then the same should be true of all unselected adjuncts.

This section briefly discusses several types of adjuncts. Some of these will be shown to follow the pattern of RatCs and temporal adjuncts, allowing both OC and NOC. Others seem to be restricted to one or the other. For some of these, I note possible explanations for why they differ from other adjuncts within the framework of the TTC, but others present a genuine problem. The following section, §4, proposes an alternative account within the framework of the MTC.

3.1 Adjuncts allowing both OC and NOC

The TTC predicts that all adjuncts should exhibit the same duality of control as RatCs and temporal adjuncts, allowing both predicative OC and logophoric NOC. Here I discuss three adjuncts that confirm this prediction: the response clause, the telic clause, and the absolutive clause. Although I discuss the first in some detail, I will only give preliminary evidence for the others.

3.1.1 Response clauses

One adjunct that has been largely ignored in the literature is illustrated in (10). 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$_1$ got a trophy [for PRO$_1$ winning the tournament].
   b. Mickey baked Minnie$_1$ a cake [for PRO$_1$ doing so well on the test].
   c. Mickey hugged Minnie$_1$ [for PRO$_1$ doing so well on the test].

Some responses 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 an either explicit or implicit offense associated with the blame (Fillmore 1971). This is not the case with the response clauses in (10). Although their conceptual
relationship to the main clause predicate may differ, I will assume for now that the response clauses in either case have the same syntactic status.

(11) a. Harry blamed Snape₁ [for PRO₁ breaking in].  
b. Hermione praised Harry₁ [for PRO₁ being such a great wizard].  
c. Harry thanked Ron₁ [for PRO₁ teaching him to play chess].

PRO in response clauses can be coreferential with the matrix subject, as in (10a), or with the indirect or direct object, as in (10b–c) and each of the examples in (11). Response clauses also allow control shift, similar to what was seen for complements in (9). This is illustrated in (12) and (13). Example (12a) prefers object control, while (12b) exhibits subject control. And in (13), either subject or object control is possible, as long as Harry views Malfoy as ultimately responsible.

(12) a. The principal thanked Sara₁ [for PRO₁ chaperoning the dance].  
b. Sara₁ thanked the principal [for PRO₁ being allowed to chaperone the dance].

(13) Harry₁ blamed Malfoy₂ [for PRO₁/₂ losing the duel].

Control shift is also possible for response clauses not associated with a blame-class verb (A. Williams & Green 2017). In (14), PRO may be coreferential with either the main clause subject or object, depending on whether the flowers are viewed as an apology, in which case the subject controls PRO, or as a reward, in which case the controller is the object.

(14) Jack₁ brought Sharon₂ flowers [PRO₁/₂ for working so late].

The fact that PRO is able to be controlled by either argument of the matrix clause gives our first piece of evidence that NOC is possible. Under the TTC, control shift is only possible in logophoric control, which in adjuncts is always NOC. Logophoric control allows pro to correspond either to the AUTHOR or to the ADDRESSEE of the relevant context. In predicative control for both complements and adjuncts, PRO’s controller will always be the next highest c-commanding DP. Variable or shifting control should be impossible in predicative control, unless, of course, the adjunct has variable attachment sites.

There is, in fact, some evidence that response clauses have multiple possible attachment sites, and that attachment height can interact with controller choice. First, in (15), if the adjunct provides an explanation for the baking of the cake, then Minnie is the controller. But if it is an explanation for why Mickey had/got to do some activity, then Mickey is the controller. Therefore,
one could assume that response clauses exhibit OC by the object when the
adjunct attaches low, and OC by the subject when it attaches higher.

(15) Mickey\textsubscript{1} had/got to bake Minnie\textsubscript{2} a cake for PRO\textsubscript{1/2} doing so well on
the test.

It is standardly assumed that the phrase *do so* replaces a VP, and that
elements that cannot be stranded after *do so* are selected arguments of the
verb (see, e.g. Whelpton 1995; DeArmond & Hedberg 1998). For example, in
(16), ‘in the living/bedroom’ is an argument of the verb *put*, and therefore
cannot be stranded; it must be included in the interpretation of *did so* (the
intended content of *do so* is marked in bold).

(16)  

| a. *Mildred put three books in the living room, and Dwight did so in the bedroom. |
| b. Mildred put three books in the living room, and Dwight did so, too. |

VP adjuncts, on the other hand, can optionally be stranded. Since they
Chomsky-adjoin to the VP, as in (17), *do so* can either replace the lower VP,
leaving the adjunct stranded, or the higher VP, in which case the adjunct will
be included in the elided content. In (18), ‘in the living room/bedroom’ is a
VP adjunct and can therefore optionally strand.

(17) \textit{Chomsky-adjunction}

\begin{tikzpicture}
\node (v) {V (DP)};
\node (v') [above of=v] {VP Adjunct};
\node (v'') [above of=v'] {VP};
\draw (v') -- (v);\draw (v'') -- (v');
\end{tikzpicture}

(18)  

| a. Mildred read three books in the living room, and Dwight did so in the bedroom. |
| b. Mildred read three books in the living room, and Dwight did so, too. |

Based on the *do so* test, response clauses sometimes appear to behave as
verbal arguments. In (19), *do so* seems to obligatorily include the response
clause.

(19)  

| a. ??Jill sent Justin to his room for spilling water everywhere, and later Peter did so for refusing to clean up. |
b. Jill sent Justin to his room for spilling water everywhere, and later Peter did so, too.

Response clauses in other instances appear to act as VP adjuncts. In contrast to (19), which indicated that the response clause was within the minimal VP (i.e. that it was behaving like a verbal argument), in (20) the do so test passes whether the response clause is included in the elided content or not.

(20) a. Jack\textsubscript{1} brought Sharon flowers [for PRO\textsubscript{1} working so late], and David\textsubscript{2} did so [for PRO\textsubscript{2} leaving work early].
   b. Jack\textsubscript{1} brought Sharon flowers [for PRO\textsubscript{1} working so late], and David\textsubscript{2} did so, too.

It is tempting to conclude from (15), (19), and (20) that object-controlled response clauses are always situated lower in the tree than subject-controlled response clauses, and that therefore place of attachment can determine controller choice. Such a hypothesis would be consistent with response clauses being predicative OC. However, such a conclusion would be premature. As (21) and (22) make plain, even object-controlled response clauses sometimes behave as VP adjuncts with respect to the do so-test.

(21) Jack brought Sharon\textsubscript{1} flowers [for PRO\textsubscript{1} working so late],
   a. and David did so [for PRO\textsubscript{1} finishing the project early].
   b. and David did so, too.

(22) The car was always getting dirty and it was Billy’s job to wash it. Last month his mom washed it for him\textsubscript{1} [for PRO\textsubscript{1} working so hard in school]
   a. and yesterday his dad did so [for PRO\textsubscript{1} passing his biology exam].
   b. and yesterday his dad did so, too.

Even response clauses associated with blame-class verbs sometimes behave as VP adjuncts, not as arguments, whether PRO is controlled by the main clause object, as in (23), or whether control shifts to the subject, as in (24).

(23) Peter thanked/praised Justin\textsubscript{1} [for PRO\textsubscript{1} eating all of his dinner],
   a. and Jill did so [for PRO\textsubscript{1} cleaning up after himself].
   b. and Jill did so, too.

(24) Sara\textsubscript{1} thanked the principal [for PRO\textsubscript{1} being allowed to go to the dance],
a. and Tyler\textsubscript{2} did so [for PRO\textsubscript{2} being allowed to read in the library instead].

b. and Tyler\textsubscript{2} did so, too.

Interestingly, both (20) and (24) require sloppy identity under ellipsis, which is suggestive of OC (Pires 2007; Boeckx, Hornstein & Nunes 2010). Landau (2017) claims that OC in adjuncts is always predicative. Therefore, at least these response clauses must be exhibiting predicative OC. But once again, if response clauses were strictly predicative OC, then we would expect attachment site to strictly determine controller, which is not the case.

Further evidence that response clauses cannot be strictly predicative OC is the fact that controller choice is not limited to c-commanding arguments. First, response clauses allow implicit control, which Landau (2017) (following Manzini 1986; Kawasaki 1993) has argued is NOC. In (25a), PRO may refer to the implicit recipient of the medal. Example (25b) shows the same thing, but uses a pronoun to remove the possibility that the response clause adjoins within the object DP.\textsuperscript{8}

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

Second, in at least some contexts, response clauses allow non-commanding controllers, as (26) demonstrates. If control of response clauses were strictly predicative, then there would be no way for the embedded possessor to control PRO.

(26) a. I left them in her\textsubscript{1} locker [for PRO\textsubscript{1} being so kind to me].

   (Stromdahl 2018)

   b. I put roses on the front porch of her\textsubscript{1} house [for PRO\textsubscript{1} being so kind to me].

The fact that sloppy identity was required under ellipsis (see (20) and (24)) is evidence for OC in at least some response clauses, but we have seen that this cannot be strict predicative OC. It is also in principle possible under the TTC for logophoric control to be OC, but even if control in response clauses were strict logophoric OC, the account would face several problems. First, this

\textsuperscript{8} Note that 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\textsubscript{1}) [for PRO\textsubscript{1} approaching the house too quickly].

I will not attempt an explanation of when implicit control will be available.
would require the adjuncts to be selected by some element of the matrix clause. Under the TTC, this is the only way for the author and addressee of the embedded context to be fixed as the matrix attitude holder and their audience. Although one could argue that this is the case for blame-class predicates, it cannot be the case that all response clauses are selected. Furthermore, (23) and (24) provide evidence that even for the blame-class, response clauses may behave syntactically as adjuncts.

A second major problem for positing strict logophoric OC in response clauses is illustrated in (27). It has been argued that NOC requires an [+human] interpretation for PRO (Clark 1990; Landau 2013). Under the TTC, this is because only human entities can be logophoric centers. And yet PRO in response clauses allows inanimate controllers, which under the TTC can only be predicative OC.

(27)  

a. The book$_1$ was praised [for PRO$_1$ showing how, and under what circumstances, a religion grows].

b. I included this book$_1$ in the book fair [for PRO$_1$ being so well written].

Because there is evidence that control in response clauses must sometimes be predicative and sometimes logophoric (assuming a TTC framework), we are left with the conclusion that response clauses allow either, consistent with the generalization that adjuncts allow both OC and NOC.

I conclude my discussion of response clauses with a brief note about the effects of attachment site. We saw above that the height of the response clause can affect controller choice. This may be in part because it determines which predicative controllers are possible, but it also may have an effect on the interpretation of logophoric control. It may be the case that attachment site is not determining a syntactic controller, but what the coherence relation between the two clauses will be. If the adjunct in (15), repeated in (28) is attached high, then it will be understood to be giving an explanation for why Mickey got to do something. If it attaches low, then it will be an explanation for why the cake was baked for Minnie. These coherence relations would then determine who the understood referent of PRO is, similar to the way coherence can determine interpretation of overt pronouns (Hobbs 1979; Kehler et al. 2008).

(28)  

Mickey$_1$ had/got to bake Minnie$_2$ a cake for PRO$_{1/2}$ doing so well on the test.

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9 https://en.wikipedia.org/wiki/Jane_Shaw
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This explanation is even more likely given the fact that overt pronouns have the same interpretive restrictions as PRO in response clauses (A. Williams & Green 2017), as seen in (29) and (30).

(29) a. #Abe₁ married Sue for PRO₁/his₁ writing nice poems.
   b. Sue married Abe₁ for PRO₁/his₁ writing nice poems.

   (A. Williams & Green 2017: 242)

(30) Jack₁ brought Sharon₂ flowers for PRO₁/₂/his₁/₂ her₂ working so late.

3.1.2 Object-gap purpose clauses

Another adjunct that allows both OC and NOC is the object-gap purpose clause (OPC). Purpose clauses (PCs) contain one obligatory gap that is coreferential with the theme argument of the matrix clause (Jones 1991; Kawasaki 1993; Whelpton 1995). In OPCs, the obligatory gap is in the object position of the embedded clause. 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 (31a), or otherwise with the main clause subject (31b). Lexical subjects are also possible (31c).

(31) a. Chandler bought Monica₁ a new frying pan₂ [PRO₁ to cook with t₂].
   b. Monica₁ bought a new frying pan₂ [PRO₁ to cook with t₂].
   c. Chandler bought a new frying pan₂ [for Monica to cook with t₂].

Several authors have claimed that the dependency between the PRO subject of an OPC and its antecedent is OC (e.g. Nishigauchi 1984; Kawasaki 1993; Landau 2013; Hallman 2015). Evidence in support of OC being possible is that only sloppy identity is available under ellipsis in examples like (32a), which can only be used to say that Chandler got his new frying pan with the intent of cooking with it himself. Also, PRO can only have a bound interpretation when controlled by an only-DP. Example (32b) entails that no one else bought a frying pan to cook with themselves; it is still true in a situation where both Monica and Chandler bought frying pans intended for Monica’s cooking.

Many authors agree that the object gap in an OPC is the result of empty operator movement to the CP, illustrated in (i) (Chomsky 1980; E. Williams 1980; 1992; Whelpton 2002).

(i) \[
\text{CP} \quad Op₁ \quad [\text{TP} \quad \text{PRO} \quad \text{to} \ldots t₁ \ldots]
\]

For simplicity, I do not include this operator in the examples in the main text.
(32)  

a. Monica$_1$ bought a new frying pan [PRO$_1$ to cook with $t$], and Chandler$_3$ did, too.

b. Only Monica$_1$ bought a new frying pan [PRO$_1$ to cook with $t$].

But there is also strong evidence that NOC is sometimes possible. For example, the PRO subject of an OPC can have a non-c-commanding or syntactically absent controller ((33a) and (33b), respectively).

(33)  

a. I left it$_1$ in [her$_2$ mailbox] [PRO$_2$ to look over $t_1$ once she returned from the Bahamas].  

(modified from Stromdahl 2018)

b. They$_1$'re kept in the overhead compartment [PRO to use $t_1$ in case of an emergency].  

(modified from Stromdahl 2018)

OPCs therefore allow both OC and NOC, similar to other adjuncts seen.

3.1.3 Absolutives

A final adjunct that appears to allow both OC and NOC is the absolutive clause. These adjuncts adjoin as bare participial phrases, as in (34).

(34)  

[PRO$_1$ Having come this far], I$_1$ can’t go back.

Pires (2007) argues that absolutive adjuncts are OC based on several tests. For example, PRO's controller in (35a) must c-command it, and (35b) only allows a sloppy interpretation of the elided PRO.

(35)  

a. [Peter$_2$'s daughter]$_1$ went on to college, [PRO$_{1/2}$ being the best student in the class].

b. [PRO$_1$ having kissed Mary at the door], Peter$_1$ left the party with some friends, and Bill did too.

‘and Bill$_2$ left after he$_2$/*Peter kissed Mary’ (Pires 2007: 197)

However, non-c-commanding controllers are possible given the right context, which under the TTC is indicative of NOC. In (36), PRO can refer to the speaker. This is especially true when the adjunct is left-adjointed, but it is also possible, if slightly more marginal, when it is right-adjointed. Absolutive clauses therefore also appear to conform to the generalization that adjunct control allows both OC and NOC.

(36)  

a. [PRO Sitting in class the day after the party], my eyes refused to stay open.

b. ?My eyes refused to stay open, [PRO sitting in class the day after the party].
3.2 Adjuncts with only NOC: Speaker-oriented adverbials

The previous adjuncts pattern with RatCs and temporal adjuncts, but the same is not true of other adjuncts, in seeming contrast to the predictions of the TTC. Here I discuss speaker-oriented adverbials, which seem to be restricted to NOC. Speaker-oriented adverbials represent the speaker’s evaluation of the proposition denoted by the matrix clause or the speaker’s degree of certainty about that proposition’s truth (Ernst 2009). These adverbials can surface as an adverb, as in (37a), an infinitive verb phrase, as in (37b), or a participial phrase, as in (37c).

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

PRO in (37b–c) 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. These adjuncts must therefore be NOC. The same interpretation obtains if the adjuncts are adjoined to the right.

(38) 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.

However, although these adjuncts do not conform to the generalization that adjunct control allows both OC and NOC, they do not pose a serious challenge to the predictions of the TTC. According to Cinque (1999), evaluative and evidential adverbs attach high in the structure, to functional projections well above the TP. If speaker-oriented adverbials containing control structures also attach high, then no argument of the sentence would be in a c-commanding position to bind PRO, and predicative OC by an argument of the main clause would be impossible. Under the TTC, 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.

3.3 Adjuncts with only OC

There also appear to be some adjuncts that are strictly OC. This again seems to contrast with the predictions of the TTC, and, unlike speaker-oriented
adverbials, this poses a genuine challenge to the theory, as will be seen. Under the TTC, 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. Otherwise, it should be able to freely adjoin with either a predicative or a logophoric structure with a free context of evaluation. The only way for strict OC to obtain would be if what appeared to be an adjunct were actually a (perhaps optionally) selected argument of the matrix verb. Although this may be the case for some OC “adjuncts,” for others it is highly unlikely that they are selected by any element of the matrix clause, and yet they appear to display strict OC.

### 3.3.1 Goal clauses

One adjunct that may be strictly OC is the goal clause (Landau 2013), illustrated in (39). To the best of my knowledge, these adjuncts do not allow NOC. If this is true, then in order to get strict OC, the TTC would require them to be selected complements of the matrix verb.

(39) a. Max\textsubscript{1} works hard [PRO\textsubscript{1} to stay out of jail]. (Landau 2013: 221)
b. Max\textsubscript{1} works hard [PRO\textsubscript{1} to avoid doing any work].

There is some evidence that this might be the case. First, goal clauses do appear to adjoin within the VP. In (40), the goal clause must be included in a do so anaphor. The intended interpretation of (40) is that Max puts great effort into avoiding confrontation, and Billy puts great effort into avoiding exerting himself. Note that this is distinct from the similar (41), which contains a RatC and has the meaning that Max literally works hard, and so does Billy. Unlike the goal clause in (40), the RatC in (41) adjoins outside the VP, and can therefore be excluded from a do so anaphor’s interpretation.

(40) *Max \textbf{works hard} [to avoid confrontation] and Billy does so [to avoid exerting himself].

(41) Max \textbf{works hard} (in order) to earn a living, and Billy does so (in order) to use up excess energy.

It is not implausible that the goal clause adjoins within the VP because it is selected as an (optional) argument of the matrix verb. Goal clauses are compatible with only a small number of matrix predicates (such as \textit{work hard} and \textit{labor diligently}), and the interpretation is similar to cases generally analyzed as complement control, such as (42).
Max tried hard [PRO to stay out of jail].

If goal clauses are arguments of the matrix verb, merged within the VP, then the TTC could allow strict OC. The main clause predicate would select the goal clause with a predicative structure, being a non-attitude predicate. This is in contrast to unselected adjuncts adjoining higher in the structure, like RatCs and temporal adjuncts, which can adjoin with either a predicative or logophoric structure.

3.3.2 Result clauses and stimulus clauses

Two other adjuncts that may be strictly OC are result clauses (43) and stimulus clauses (44) (Huettner 1989; Landau 2013).

(43) a. The damp seeped in [PRO to chill our bones].
   (Huettner 1989: 26)
   b. Harry grew up [PRO to be a famous wizard].
   c. Ron awoke [PRO to find the fire had gone out].

(44) a. Ginny smiled/shuddered [PRO to think what a fool she had been].
   b. Hermione blushed [PRO to recall her flirtations with Ron].
   c. Fudge gnashed his teeth [PRO to think of Sirius’s escape].

If these really are strictly OC, the TTC would have to say that they, too, are not really adjuncts, but (optional) selected arguments of the main verb. Intuitively, this seems less likely for these clauses than for goal clauses, since they can appear with a much wider range of matrix predicates. But like goal clauses, result and stimulus clauses must be included in the interpretation of a do so anaphor, which generally is taken as an indication of argumenthood.

(45) a. *Harry grew up [to be a famous wizard], and Dudley did so [to be a nice guy].
   b. *Ginny smiled [to think what a fool she had been], and Hermione did so [to think how smart she had been].
   c. *Ginny shuddered [to think what a fool she had been], and Hermione did so [to think how silly she must have looked].

However, Whelpton (1995) suggests that do so does not target the verb and its arguments directly, but simply the VP node, and furthermore, that while some adjuncts may Chomsky-adjoint to the VP, as in (46a), others, crucially, may adjoin to a V’ level, as in (46b). Adjuncts Chomsky-adjointed to the
VP may be optionally included in the interpretation of *do so*, as the elided constituent could be either the lower or higher VP. *V*-adjoined adjuncts, on the other hand, would obligatorily be included in *do so*, despite their being adjuncts.\(^\text{11}\)

\[(46)\]

\begin{align*}
&\text{a. Chomsky adjunction} & &\text{b. } V\text{' adjunction} \\
&\quad \quad \text{VP} & &\quad \quad \text{VP} \\
&\quad \quad \quad \text{VP} & &\quad \quad \quad \text{Spec} \\
&\quad \quad \quad \quad \text{Adjunct} & &\quad \quad \quad \quad \text{V'} \\
&\quad \quad \quad \quad \quad \text{Spec} & &\quad \quad \quad \quad \quad \text{V'} \\
&\quad \quad \quad \quad \quad \quad \text{V'} & &\quad \quad \quad \quad \quad \text{Adjunct} \\
&\quad \quad \quad \quad \quad \quad \quad \text{V} & &\quad \quad \quad \quad \quad \text{V} \\
\end{align*}

If result or stimulus clauses are true adjuncts adjoined with the structure in (46b), then the TTC would have no explanation for why they exhibit strict OC. Despite their being located within the VP, they would be unselected by the verb, and there should be no restriction on their adjoining with either a predicative or a logophoric structure.

### 3.3.3 Subject-gap purpose clauses

Subject-gap purpose clauses (SPCs), such as the one in (47), are similar to OPCs, but the obligatory gap coreferring with the theme of the matrix clause is in subject position, and there are no other gaps.\(^\text{12}\)

\[(47)\]  Harry brought Hermione\(_1\) along [PRO\(_1\) to deal with the security guards].

SPCs allow inanimate controllers, in contrast to OPCs, which is indicative of OC.

\(^\text{11}\) A similar distinction could also be made even in Bare Phrase Structure (Chomsky 1995; see also Hornstein 2008), since in (46a), the adjunct adjoins higher than the specifier, and in (46b), it is lower.

\(^\text{12}\) Many discussions of SPCs (e.g. Jones 1991; Whelpton 2002) maintain that the empty category in an SPC is an operator that raises to Spec-CP, just like the object gap in an OPC (see footnote 10). I continue to use PRO here for convenience, but neither the MTC nor the TTC posit that PRO is a distinct syntactic entity. Under the TTC, it is in fact something like a variable bound by an empty operator in Spec-FinP. Under the MTC, OC PRO will be a trace of movement, and according to Nunes (2001), the same is true of variables bound by a null operators.
Like the OC adjuncts discussed above, SPCs adjoin within the minimal VP (Jones 1991; Whelpton 1995), as illustrated in (49).

(49)  

Once again, though, it seems unlikely that all SPCs are selected by some element of the matrix clause. Therefore, control in SPCs under the TTC is predicted to be either OC if the adjunct is adjoined with a predicative structure or NOC if a logophoric structure is used instead. It is clear that OC is possible, but I have no evidence that NOC is as well. If they are indeed strictly OC, then the TTC has no satisfactory explanation of why that would be so.

### 3.3.4 Telic clauses

A final adjunct that is restricted to OC is the telic clause. Telic clauses, illustrated in (50), express the outcome of the event denoted by the modified verb.\(^{13}\)

(50)  

These adjuncts, also known as “outcome” clauses, have received little attention in the literature. Where they have been discussed, they have been classified as OC by the matrix subject (Huettner 1989; Whelpton 1995; Landau 2013). That

\(^{13}\) See Whelpton (2001) for a detailed discussion of telic clauses and their semantic properties.
OC is possible is made evident by (50b–c), which have inanimate controllers. In addition, (51) demonstrates that implicit control is not possible, which provides further, albeit not conclusive, evidence for strict OC.14

(51) a. *The meal was devoured, only PRO to discover it was poisoned.  
   b. The side-door on the plane was opened [only *(for me) to realize  
      that my parachute wasn’t fastened properly].

But, to reiterate, strict OC is unexpected under the TTC, unless the structure of the adjunct is selected by some element in the matrix clause, which seems highly unlikely. If the adjunct is not selected, the TTC predicts that NOC be should possible given the right context.

The challenge that telic clauses present for the TTC is even greater than it was for result, stimulus, and subject-gap purpose clauses. These adjuncts were shown to adjoin within the VP, behaving syntactically as pseudo-arguments and making the claim somewhat more feasible (albeit not conclusively) that their structure is selected by the matrix verb, as would be required by the TTC for strict OC. However, telic clauses can adjoin to a huge variety of predicates, and are unlikely to be included as an optional argument of each. Furthermore, they adjoin too high in the structure to be considered verbal arguments, as shown by the impossibility of fronting them with the VP. Example (52) demonstrates that temporal PPs such as on Monday are Chomsky-joined to the VP; they can either be stranded outside of a do so anaphor, or included in its interpretation. Whelpton (1995) uses VP fronting as an additional diagnostic for elements being associated with the VP. In (53), the temporal modifier can be fronted along with the VP and its arguments.

(52) a. Rachel [VP [VP prepared some pasta] on Monday], and Monica did so on Tuesday.  
   b. Rachel [VP [VP prepared some pasta] on Monday], and Monica did so, too.

(53) Rachel asked Monica to prepare her some salmon on Monday, so prepare her some salmon on Monday, Monica did.

Telic clauses, however, cannot front with the VP, as (54c) makes plain. Based on this kind of evidence, Whelpton argues that telic clauses adjoin outside the VP, at the IP level, well beyond the selectional domain of the verb.

14 This kind of evidence cannot be taken as conclusive because the implicit control in these examples could potentially be ruled out for other reasons. As noted above, even adjuncts that allow implicit control in some instances do not always. It may be the case that other examples diagnostic of NOC are eluding me.
(54) a. Chandler asked Monica to prepare him some spaghetti, so she made him spaghetti, only to realize that he actually wanted linguine.
b. ...so make him some spaghetti, she did, only to realize that he actually wanted linguine.
c. *...so make him some spaghetti, only to realize that he actually wanted linguine, she did.

Because telic clauses cannot be feasibly selected by the matrix verb, they remain a striking problem case. Although the TTC predicts that they should allow both OC and NOC, only OC appears to be possible. But even some low-adjoining clauses (i.e. SPCs and result and stimulus clauses) are problematic for the TTC, since they, too, would have to be optionally selected arguments of the matrix verb, which is unlikely to be the case.

4 The movement theory of control

Landau’s (2017) analysis of control of RatCs and temporal adjuncts, situated within the TTC, predicts that all adjuncts should allow both OC and NOC. This account can therefore, of course, be easily extended to adjuncts where this is true. The TTC struggled, however, with certain clauses that appear to exhibit only OC, but are unlikely to be selected as arguments of the matrix verb, and are therefore true adjuncts. This section demonstrates that the duality of adjuncts with respect to OC and NOC distribution is not contingent on Landau’s (2015; 2017) implementation of control. With minimal assumptions, the Movement Theory of Control (MTC) does just as well as the TTC. In fact, when phase theory is taken into account, the MTC does better than the TTC at explaining some cases of strict OC.15

4.1 Background on the MTC

The MTC (Hornstein 1999; Boeckx, Hornstein & Nunes 2010; a.o.) is prototypical of many syntactic theories of control in that it establishes a specific syntactic dependency (in this case movement) between PRO and a its antecedent in OC structures. In short, 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. This is implemented as follows.

15 See Boeckx, Hornstein & Nunes (2010: ch. 7) for a broader discussion on problems with selectional theories of control.
The MTC allows a DP chain to receive more than one $\theta$-role, in contrast to previous theories assuming a traditional $\theta$-criterion (Chomsky 1981) limiting DP chains to a single role. OC is the result of movement from one $\theta$-position to another. A DP-trace is called ‘PRO’ when it occurs in the lower $\theta$-position, but the term ‘PRO’ has no other theoretical significance. In (55), for example, $Jon$ moves from the subject position of the embedded $buy$ to the subject position of the matrix $want$, receiving the $\theta$-feature of both verbs. In this way, $Jon$ is understood as both the wanter and the buyer in the sentence.

(55) $Jon_1$ wants $[\textit{Jon}_\text{want} \text{ to buy a car}].^{16}$

OC in adjuncts is handled with the same mechanism, i.e. the controlled element and the controller are two links in an A-chain. The only difference is that adjunct control requires what has been called sideward movement (Nunes 1995), in which an element can move from one syntactic object to the root of another within a single derivation, as illustrated in (56).^{17}

(56) Derivation of adjunct control
(simplified from Boeckx, Hornstein & Nunes 2010: 88)

a. Applications of select, merge, and copy:
\[\text{Num} = \text{John}_0, \text{T}^{\phi+1}_0, \text{saw}_0, \text{Mary}_0, \text{after}_0, \text{T}^{\phi-}_0, \text{eating}_0, \text{lunch}_0\]
\[\text{PP} = \text{[after John T}^{\phi+}_0 \text{ eating lunch]}\]
\[\text{VP} = \text{[saw Mary]}\]

b. Copying of John:
\[\text{PP} = \text{[after John T}^{\phi+}_0 \text{ eating lunch]}\]
\[\text{VP} = \text{[saw Mary]}\]
\[\text{N} = \text{John}\]

c. Merger of John and VP:
\[\text{PP} = \text{[after John T}^{\phi+}_0 \text{ eating lunch]}\]
\[\text{VP} = \text{[John saw Mary]}\]

d. Applications of select, merge, and copy, and deletion in phonological component:
\[\text{Num} = \text{John}_0, \text{T}^{\phi+}_0, \text{saw}_0, \text{Mary}_0, \text{after}_0, \text{T}^{\phi-}_0, \text{eating}_0, \text{lunch}_0\]
\[\text{TP} = \text{[John [T}^{\phi+}_0 \text{ [VP John saw Mary][PP after John T}^{\phi-}_0 \text{ eating lunch]}]}\]

\[^{16}\text{This derivation has been greatly simplified. }\text{Jon} \text{ would be merged as the specifier of a little } v \text{ in the embedded clause, receiving the external } \theta\text{-role of } buy. \text{ It would then move to the embedded spec-TP for EPP reasons, then to the matrix } v, \text{ receiving the external } \theta\text{-role of } want, \text{ and finally to spec-TP of the matrix clause, for Case and EPP.}\]

\[^{17}\text{These derivations use machinery of the Minimalist Program (Chomsky 1995). ‘Num’ refers to the Numeration.}\]
NOC interpretations arise under the MTC when the null subject of the controlled clause is not a trace of movement, but is instead the null pronoun *pro* more commonly seen in *pro*-drop languages.

### 4.1.1 Why OC is preferred over NOC, but not required

Under the MTC, movement resulting in OC and pronominalization resulting in NOC are constrained by principles of economy. According to Hornstein (1999; 2001; 2003), pronominalization is more “costly” than 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 (57a) should be ruled out due to the availability of (57b), which Hornstein & Kiguchi (2003) argue arises through movement.

\[(57) \quad \begin{align*}
  \text{a. John}_1 \text{ said that } [\text{pro}_1 \text{ washing himself}_1 \text{ delighted Mary}_1]. \\
  \text{b. John said that } [\text{PRO}_1 \text{ washing herself}_1 \text{ delighted Mary}_1].
\end{align*}\]

In order to allow both (57a,b), Boeckx & Hornstein (2007) propose that pronominalization is only ruled out when movement could not establish the same interpretation (see also Boeckx, Hornstein & Nunes 2010). Thus, NOC is not always ruled out by the grammar when OC is available, as long as NOC results in an interpretation that OC could not have.\(^{18}\) However, OC interpretations 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 (58b) 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 (58a).

\[\text{This idea is similar to the proposal from Reinhart (1983) discussed in Heim & Kratzer (1998), in which it is stated that if the same meaning can be expressed by two minimally different LFs, one of which has a bound variable and the other a free pronoun, then the form with a bound variable will be preferred by both speakers and hearers. See Lasnik (1991); Fox (2000); Reinhart (2006); Roelofsen (2008); Heim (1998; 2009); Drummond (2011); a.o., for alternative theories and discussions on problems with Reinhart’s (1983) proposal.}\]
(58) a. John₁ kissed Mary₂ without PRO₁/₂ getting embarrassed.
    b. John₁ kissed Mary₂ without pro₁/₂ getting embarrassed.

The strong preference for OC interpretations in adjunct control is therefore due to in part to a grammatical constraint requiring OC if it is possible for a given interpretation,¹⁹ and in part due to a parsing preference (resulting from the grammatical constraint) for positing traces over null pronouns in incremental processing. This combination results in a general preference for OC over NOC.

Boeckx & Hornstein (2007) and Boeckx, Hornstein & Nunes (2010) argue that parsers are completely transparent to grammatical constraints, and that if positing a trace in a given position is possible, parsers must do so. This would explain why examples such as (59) only seem to 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, and so parsers must do so.

(59) #The bank₁ was robbed [while PRO₁/*₂ 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 (60). 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.

(60) a. The president₁ was elected [without PRO₁/₂ considering his competence]. (Roepner 1987: 297)
    b. The pool₁ was the perfect temperature [after PRO₁/₂ being in the hot sun all day].
    c. The potatoes₁ were tastier [after PROₙ₁ eating carrots].

Structural properties of the sentence alone cannot fully determine when NOC will be possible (see Green 2018). Instead, structural, discourse, and processing factors may all compete in determining the probability of OC or NOC. An example of the interaction of such constraints is given in Boeckx & Hornstein (2007), where it was argued that NOC is available in (57a) despite the availability of OC in (57b), because at the point where the empty category is encountered, if parsers posited a trace, they would not yet be able to assign

¹⁹ This explanation has the consequence that all cases of subject control in adjuncts must be OC, inasmuch as sideward movement from the adjunct to the subject position of the matrix clause is licit, but that any non-subject control interpretation must be NOC.
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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 (see, e.g. Nicol & Swinney 1989; Badecker & Straub 2002) is in competition with the preference for a trace. This competition results in the possibility of either a trace or a pronominal being posited, depending on which preference is favored. Similar competition may be involved in NOC cases of adjunct control.

4.1.2 Why complement control differs

The MTC assumes that OC is preferred over NOC in complements for the same reason that it is in adjuncts. A grammatical constraint rules out NOC for any interpretation that could have arisen through movement, and since parsers are transparent to the grammar, a parsing preference will rule out any NOC interpretation when an OC one is available. However, for adjuncts, but not for complements, this preference can be overridden in the proper context. Why should complements and adjuncts differ in this respect under the MTC? One possibility is that sideward movement, which is involved in the derivation of adjuncts, may for some reason be more “costly” than upward movement, which takes place in complement control. If that is true, then the additional cost of sideward movement may be enough to reduce the parser’s preference for traces over pros in adjuncts. This would lead to the preference scale for the derivation of control represented in (61).

(61) Preference scale for derivations of control:
    upward OC $\gg$ sideward OC $\gg$ NOC via pronominalization

But what is the source of the preferences in (61)? 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 preferences. 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, perhaps they are 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 then again, 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 antecedent over distant ones or the preference for syntactic versus discourse dependencies. Therefore, stating that (61) is due exclusively to processing preferences is tenuous.

It is also not immediately clear what grammatical constraints would result in (61). In terms of the Minimalist Program, 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, so therein must be found the cost difference: sideward movement involves copying an element from one tree and moving it to the root of another, as in (62a), while upward movement involves copying from and re-merging to the same tree, as in (62b).

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 here 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, and does not cause the derivation to crash, but instead results in a lower “degree of grammaticality” (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 would simply be lower on the scale between fully grammatical and fully ungrammatical.

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-commanding position. If there is some performance penalty associated with this grammatical violation, then the lower grammatical status of sideward OC would make its appeal relative to NOC weaker than upward movement’s. This in turn would lead to a greater probability of both OC and NOC being accepted in adjuncts involving sideward movement than in complements, in which movement is upward.

Admittedly, positing that sideward movement is grammatically more costly than upward movement is somewhat stipulative. But something like it as part of the scale in (61) would be required in order to capture the differing availability of NOC in complement and adjunct control under the MTC. Interestingly, sideward movement is also involved in the examples from Boeckx & Hornstein (2007) in (57), repeated in (63), that allow both OC and NOC derivations. 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.

(63)  

a. John$_1$ said that [pro$_1$ washing himself$_1$ delighted Mary$_1$].

b. John said that [PRO$_1$ washing herself$_1$ delighted Mary$_1$].

4.2 The MTC and other adjuncts

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

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See Chomsky (1965); Epstein (1990) for a discussion on different types of violations resulting in penalties of differing strength.
the MTC makes the same prediction that the TTC made: namely, that all adjuncts should allow both OC and NOC. For the MTC, this will be because all cases of OC of adjuncts will necessarily involve sideward movement. Because this is more costly than upward movement, NOC should be available for all adjuncts given the right context. The MTC will therefore do just as well as the TTC on adjuncts that allow both OC and NOC. And just like the TTC, the MTC as outlined so far struggles with adjuncts that allow only OC. In this section, I outline a proposal for how the MTC can deal with strictly OC adjuncts that adjoin low.

Above it was seen that goal clauses (64a), result clauses (64b), stimulus clauses (64c), and SPCs (64d) all exhibit strict OC.

(64)  
a. Max₁ works hard [PRO₁ to stay out of jail].  
b. Harry₁ grew up [PRO₁ to be a famous wizard].  
c. Ginny₁ shuddered/smiled [PRO₁ to think what a fool she had been].  
d. I bought this blender₁ [PRO₁ to help me make split pea soup].

Under the TTC, strict OC would have to be explained by positing that these clauses are not actually adjuncts, but optionally selected arguments of the matrix verb. If they are actually complements, then the MTC need not say anything more. But this seems unlikely, especially for SPCs.

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. There are two requirements that must be satisfied for this to be possible. First, the adjunct must adjoin lower than the base position of the controller, and second, the adjunct must not (yet) be an island to movement. We will look at each of these in turn.

Each of the adjuncts in (64) was demonstrated above to adjoin to the VP. For the adjuncts in (64a,c), this places the adjunct clearly under the merge position of the subject in spec-vP, as illustrated in (65).
But what if the controller is not base-generated in the vP, but as an object of V, as is the case with (64b), which has an unaccusative subject controller, and (64d), which has control by the object? Kratzer (1996), following Larson (1988), proposes that direct objects of verbs are base-generated as the specifier of V. If that is the case, and if adjuncts may adjoin to the V′ level, as Whelpton (1995) argues, then these adjuncts too may adjoin in a position lower than the base position of the controller, as in (66).

If these adjuncts adjoin with the structures in (65) and (66), they are in a position where upward movement from the controllee to the controller positions should be possible. However, we are still left with the problem that these are adjuncts, and, according to Hornstein (2001), Nunes (2001), and Uriagereka (1999), they should become islands prior to or upon adjunction. But in phase theory (Chomsky 2001), this is not necessarily the case. Let us make the standard assumption that C and v are phase heads. If an adjunct is smaller than a CP, then it should remain active, even after being adjoined, until the
next highest phase. Its subject should then be able to upward move out of the adjunct into the matrix clause before the adjunct becomes an island.

I assume that this is the case for the adjuncts in (64). Goal clauses, for example, are smaller than a CP, as evidenced by the fact that a lexical subject is impossible, in contrast to RatCs and temporal adjuncts (see (67)).

(67)  
   a. *Harry grew up [for him to be a great wizard].
   b. Harry went to school [before he became a great wizard].
   c. Harry had to go to school [in order for him to become a great wizard].

Therefore, the subject of a goal clause can upward move after adjunction. And because the goal clause adjoins lower than the base position of the matrix subject (see (65)), OC by the matrix subject is possible.21

This proposal may also work in a convergence-based approach to phasehood (Felser 2004), in which a constituent is spelled-out only once it has no more unvalued/uninterpretable features. Under the MTC, the subject DP in the adjuncts in (64) have unvalued case features, which motivates their movement to the matrix clause. Therefore, the adjunct will not become an island directly upon adjunction, since it has not yet converged, and upward movement will still be possible.

Additional evidence that these adjuncts do not immediately become islands is the fact that CED island effects (Huang 1982) in them are weak or nonexistent.

(68)  
   a. What$_1$ did Max work hard [to do $t_1$]?
   b. What$_1$ did Harry grow up [to be $t_1$]?
   c. Who$_1$ did Ginny smile/shudder [to think the poison would kill $t_1$]?
   d. What$_1$ did you buy this blender [to help you make $t_1$]?

If, as I propose, upward movement is allowed in these adjuncts, leading to strict OC, they must be distinguished from adjuncts in which both OC and NOC are possible. There are two ways this could be done. First, if the adjunct adjoins higher than the base position of the subject, sideward movement will be required, regardless of the when the adjunct is spelled-out, since the adjunct will never be in a position in the tree low enough to allow upward movement. Second, low adjuncts with structures at least as big as a CP will also not allow

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21 Note that 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.
upward movement to the matrix subject position, since the CP adjunct will be spelled-out upon merger of the matrix \(v\).\(^{22}\) It must therefore be the case that all of the adjuncts discussed above that allow both OC and NOC have one of these two properties. This is at least true for OPCs, which have a CP structure (Chomsky 1980; E. Williams 1980; 1992; Whelpton 2002), as illustrated in the examples repeated in (69). I leave it to future research to verify that this is the case for other adjuncts.

\[(69)\]  
\begin{enumerate}[a.]  
\item Chandler bought Monica\(_1\) a new frying pan\(_2\) \([CP\ Op\_2\ [PRO\_1\ to\ work\ with\ \(t_2\)]].\)
\item I left it\(_2\) in \([\text{her}_1\ mailbox]\) \([CP\ Op\_2\ [PRO\_1\ to\ look\ over\ \(t_2\)\ once\ she\ returned\ from\ the\ Bahamas]]\).
\end{enumerate}

### 4.3 Remaining challenges

The MTC is able to account for adjuncts allowing both OC and NOC, as well as for low adjuncts allowing strict OC—something that that TTC struggled with. However, there are at least two potential problem cases for the version of the MTC proposed here: telic clauses, which display strict OC, but may adjoin higher than would be required for upward movement, and speaker-oriented adverbials, which display strict NOC.

#### 4.3.1 Telic clauses

Strict OC is unexpected under the MTC, unless the adjunct attaches lower than the base position of the controller and is small enough to be included in the same phase, thus allowing control via upward movement. But as discussed in §3.3.4, Whelpton (1995) provides evidence from VP fronting that telic clauses adjoin to the IP level, well outside the merge position of the subject within the \(vP\). The relevant examples are repeated in (70).

\[(70)\]  
\begin{enumerate}[a.]  
\item Chandler asked Monica to prepare him some spaghetti, so she made him spaghetti, only to realize that he actually wanted linguine.
\item \ldots so make him some spaghetti, she did, only to realize that he actually wanted linguine.
\item *\ldots so make him some spaghetti, only to realize that he actually wanted linguine, she did.
\end{enumerate}

\(^{22}\) Although under a convergence-based theory of phasehood, even CPs may allow upward movement if they still contain elements with unvalued features.
Whelpton argues that because telic clauses cannot be fronted with the VP, they must be higher than the (extended) verbal projection, i.e. at the IP level, as illustrated in (71). Because of this, the only way for OC to occur would be through sideward movement.

(71)

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 telic clauses, the MTC would either have to say that they attach lower than Whelpton (1995) thought, or provide evidence that has eluded me that NOC is possible. Again, I leave further investigation of telic clauses to future research.

4.3.2 Speaker-oriented adverbials

Finally, speaker-oriented adverbials like those in (72) present something of a challenge for the MTC. It was noted above that PRO in these adjuncts appears only to be able to refer to the speaker, which is evidence for their being strictly logophoric NOC.

(72)  
   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 TTC can explain this if speaker-oriented adverbials adjoin high in the clause, above the position of the matrix subject, as in (73). In this position, the adjunct is too high for a sentential argument to predicatively control PRO, and therefore, logophoric control is the only option.
Intuitively, it seems that a similar explanation should be able to apply to the MTC. With the structure in (73), PRO is not c-commanded by any other element of the sentence. Movement out of that position to any position in 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 demonstrate that in examples like (74), which involve sideward movement, PRO’s controller does not c-command it, even on the surface, and yet the example demonstrates all the characteristics of OC. 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 (75) is also not c-commanded by its OC antecedent (Norbert Hornstein, p.c.).

(74) John said [that [PRO₁ washing herself] delighted Mary₁].
(75) [PRO₁ Brushing her teeth] made Mary₁ late for the movie.

It is therefore not clear why in speaker-oriented adverbials the matrix subject should not be able to sideward move from the adjunct into the main clause, as in (76).

(76) *

```
(73) XP
     SOA
     PRO To be honest ... TP
     Jon will be...
```

```
SIDeward MOVEMENT
```
If we assume that these do adjoin to a position high in the structure in the domain of evaluative adverbs and evidentials, then there may be a functional head that requires them to represent the perspective of the speaker (Cinque 1999). In this case, OC by the subject would be ruled out simply due to its incompatibility with the requirements of that functional head, unless the subject also refers to the speaker. If this is the case, then speaker-oriented adverbials would not present a real problem for the account offered here.

5 Conclusion

Landau (2017; 2018) provided good evidence that RatCs and temporal adjuncts allow both OC and NOC (Green 2018). If RatCs and temporal adjuncts allow both OC and NOC, a simple hypothesis would be that the same is true for all adjuncts. This is in fact what the discussion in Landau (2017) implies, though the claim is not made directly. This paper has shown that this hypothesis is too general. Some adjuncts seem to only allow one type of control. Certain adjuncts appear to be strictly OC, while very high ones may be strictly NOC. For the TTC, the strict OC adjuncts can only be accounted for by claiming that they are in fact not adjuncts, but complements. If such is the case, then the matrix verb may select a predicative structure for the adjunct, resulting in strict predicative OC. This claim has some merit for adjuncts like goal clauses, but it is far less plausible for SPCs and telic clauses.

The MTC, on the other hand, combined with phase theory, is able to handle most of the strict OC adjuncts without having to claim that they are complements. If the adjunct adjoins low enough and is not a phase, then it will allow upward movement from the controlled to the controller position. If upward movement makes OC more strongly preferred than sideward movement does, possibly due to sideward movement incurring a weak grammatical penalty that does not ensue with upward movement, then these adjuncts would be expected to require OC just as strongly as complement control does.

To conclude, I will discuss some of the broader implications this research has on the study of control. 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 to a significant extent. In 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. Even some semantic theories of control make the same assumption. For example, Farkas (1988) argued that controller choice
is determined by a Responsibility relation (RESP)-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, contrary to what Hornstein (1999) and Boeckx, Hornstein & Nunes (2010) assume; 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, as is implicitly predicted by Landau (2017); several adjuncts require strict OC.

This paper also has implications for what we mean by the terms “obligatory” and “non-obligatory” control. E. Williams (1980) applied the term “OC” to any case of control having the properties in (77). Sentences with “NOC” were argued to have none of these properties.

(77) OC1. Lexical NP cannot appear in the position of PRO.
OC2. The antecedent precedes the controlled PRO.
OC3. The antecedent c-commands the controlled PRO.
OC4. The antecedent is thematically or grammatically uniquely determined.
OC5. There must be an antecedent.

In short, “OC” was used to define any case of control where a control dependency was required between an obligatory PRO and a unique antecedent.

The definition of “OC” and “NOC” in the MTC is different. According to Hornstein (1999), OC simply entails that the relation between PRO and its antecedent is syntactic—specifically, that it is a movement relation. NOC entails that PRO’s interpretation is not determined syntactically. A similar definition just for adjuncts is given in Landau (2017), but with OC entailing a predicative relation and NOC a logophoric one. Under these definitions, a sentence that can exhibit OC would not necessarily require that its antecedent be uniquely determined or that it c-command PRO. Nor do these definitions strictly require PRO in such sentences to have an antecedent, if NOC is also available for the same sentence (although according to Boeckx & Hornstein (2007), “parsers” will rarely allow both OC and NOC).

These more modern versions of the notions of OC and NOC are what I have used. I have assumed that OC involves some sort of grammatical dependency (e.g. movement) between PRO and its antecedent, while in NOC,
PRO’s interpretation is determined without a grammatical dependency. This definition of OC does not require that there be an antecedent in every case. In other words, OC does not preclude NOC, contrary to what (77) suggests; some adjuncts allow but do not require OC antecedents, permitting NOC as well.

However, there is some merit in maintaining a E. Williams-style concept of OC and NOC. In complements and in some adjuncts, the antecedent is both required and uniquely determined. In other words, OC is the only option. I have labeled this “strict OC.” Some adjuncts allow both syntactic OC and non-syntactic NOC. And others still require strict NOC. Landau (2015) also noted that traditional notions of OC and NOC did not adequately capture distinctions in the types of control that are possible. In the terms of the TTC, complement control is strictly OC, which can be instantiated as either a predicative or a grammatically-determined logophoric relation. Some adjuncts require strict predicative OC and others strict NOC, while others allow both predicative OC and logophoric NOC. Instead of a binary OC/NOC distinction, we need at least a three-way categorization, including strict OC, strict NOC, and optional OC/NOC.

Within the third category, even though both types of control are possible, OC is strongly preferred, all else equal. I have argued that this is due to processing preferences, and this may hold independent of what theory of control is chosen. Parsers may prefer OC because of its simpler structure, if the TTC (Landau 2015) is correct. Or, under the the MTC, parsers may prefer to posit a trace when they encounter a gap, resulting in OC, rather than a null pronominal for NOC (Boeckx & Hornstein 2007; Boeckx, Hornstein & Nunes 2010). In addition to or instead of these, OC may be more preferred to NOC to a more general preference for bound variable readings (Reinhart 1983; 2006), or a preference 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.

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