

*De dicto omnibus*<sup>\*</sup>  
or  
How to control PRO

Dominique Sportiche<sup>†</sup>  
UCLA

March 2020

**Abstract**

A study of the behavior of obligatorily or non obligatorily controlled PRO yields the conclusion that PRO and its antecedent must be intensionally identical for the (unique) thinker whose attitude report is the smallest such report including the control relation, the *de dicto omnibus* requirement. This behavior is uniform in all cases of obligatorily and non obligatorily control. The mandatory *de te* and *de se* readings found in obligatory control constructions under attitude control predicates and, as shown, also in some non obligatory control cases, is argued not to be due to lexical properties of attitude predicates, unlike in all prevalent accounts, and is instead reduced to subcases of this *de dicto omnibus* requirement. The existence of these readings is attributed to “a third factor”, namely that there are particular descriptions that attitude holders must have, as a matter of cognitive necessity, of themselves and others in relation to the content of their thoughts. Finally, the *de dicto omnibus* property is directly attributed to the control relation defined as involving not just referential dependence but concept identity.

---

<sup>\*</sup>Thanks to Andrew Simpson, Audrey Li, Barry Schein, Carlo Geracci, Carolyn Anderson, Danny Fox, Dylan Bumford, Edward Keenan, Ethan Poole, Gennaro Chierchia, Hazel Pearson, Jeremy Kuhn, Jessica Rett, Ken Safir, Kyle Johnson, Massimo Piatelli-Palmarini, Noam Chomsky, Norbert Hornstein, Paul Egré, Paul Pietroski, Petr Kusliy, Philippe Schlenker, Pranav Anand, Rajesh Bhatt, Roger Schwarzschild, Richard Stockwell, Roumyana Pancheva, Sam Cumming, Seth Cable, Tim Hunter, Tim Stowell, Uli Sauerland, Vincent Homer, Yael Sharvit, the Institut Jean Nicod, USC, MIT and Umass Amherst audiences, the participants in the Harvard Ana-Log Worskhop, the Workshop ‘Generative Grammar at the speed of 90’ at the university of Arizona, Tucson, and the UCLA audiences in Tim Stowell’s and my UCLA Spring 2018 seminar and in the Syntax and Semantics seminar. Special thanks to Idan Landau and Isabelle Charnavel for their extensive comments on earlier drafts, gratefully incorporated here. This work was supported in part by the NSF under grants 1424054 and 1424336.

<sup>†</sup>Email contact: dominique.sportiche@ucla.edu

## Contents

<b>1</b>	<b>Central Ideas and Motivations</b>	<b>4</b>
1.1	Background on PRO . . . . .	4
1.2	Central Ideas . . . . .	4
1.3	Motivations quickly, and the logic of the reasoning . . . . .	5
<b>2</b>	<b>The observation: the control relation must be read <i>de dicto</i></b>	<b>7</b>
2.1	Preliminaries about Control . . . . .	7
2.2	Preliminary about Binding . . . . .	7
2.3	Non obligatory Control . . . . .	8
2.3.1	Introducing <i>de dicto omnibus</i> . . . . .	9
2.3.2	Summary . . . . .	13
2.4	How general is the <i>de dicto omnibus</i> requirement? . . . . .	13
2.4.1	<i>de dicto omnibus</i> with inanimate PROs in NOC . . . . .	14
2.4.2	<i>de dicto omnibus</i> with attitudinal PRO in OC . . . . .	15
2.4.3	<i>de dicto omnibus</i> with OC PRO in non attitudinal complements - Subject Control . . . . .	15
2.4.4	<i>de dicto omnibus</i> with OC PRO in non attitudinal complements - Object Control . . . . .	16
<b>3</b>	<b>Why must PRO be read <i>de se</i></b>	<b>17</b>
3.1	Introduction . . . . .	17
3.2	NOC <i>de se</i> subcases of <i>de dicto omnibus</i> . . . . .	17
3.3	Back to the simple case: <i>de se</i> and Descriptions . . . . .	19
3.4	How the <i>de se</i> reading arises . . . . .	20
3.4.1	Centered worlds: the intuition <sup>1</sup> . . . . .	21
3.4.2	Previous accounts of <i>de se</i> PRO in OC . . . . .	23
3.4.3	Why does <i>de se</i> reduce to <i>de dicto omnibus</i> . . . . .	26
3.4.4	Summary . . . . .	29
<b>4</b>	<b>Deriving "de te" as a special case of <i>de dicto omnibus</i></b>	<b>30</b>
<b>5</b>	<b>Mechanism for Control</b>	<b>33</b>
5.1	What is needed . . . . .	33
5.2	Neither OC nor NOC PRO need be bound . . . . .	33
5.3	Control is of concepts . . . . .	34
5.3.1	Anaphoric concepts . . . . .	34
5.3.2	Control and Movement . . . . .	36
<b>6</b>	<b>Going further?</b>	<b>37</b>
6.1	One more step: Centering as control? . . . . .	37
6.2	<i>de nunc</i> as a species of <i>de te</i> . . . . .	40
6.3	Still one more step: Immunity to Error <sup>2</sup> . . . . .	41
6.4	Properties or Propositions? . . . . .	41
6.5	Difficulties with Centering as Control, or as Raising . . . . .	42
<b>7</b>	<b>Conclusion</b>	<b>43</b>

**8 Appendix: non *de se* in NOC?**

**45**

# 1 Central Ideas and Motivations

## 1.1 Background on PRO

I take PRO to be the silent subject found in obligatorily controlled constituents in French and English, and, as a consequence of what will be discussed here, as the silent subject of non obligatorily controlled constituents as well, or at least these non obligatorily controlled cases I will discuss. A theory of the syntax and semantics of PRO should answer at least the following questions:

1. Why does PRO have such a restricted distribution?
2. What determines what controls PRO?
3. How is PRO interpreted relative to its controller(s)?

I will not discuss why PRO has such a limited distribution, but this observation imposes boundary conditions on how to answer the third question and I will make occasional remarks capitalizing on this fact when relevant. I will not discuss the second question either, taking its answer as given by an independent theory (e.g. something along the lexico-semantic lines of [Farkas, 1988](#), for Obligatory Control) of what the controller(s) is or are. I will focus on the third question documenting the *de dicto omnibus* requirement and concluding control involves concept identity for a particular attitude holder.

## 1.2 Central Ideas

In this section I briefly describe the main ideas of this article without argument in order to provide a roadmap. There are three ideas. The first is that a control relation must function in a certain way based on a new observation regarding how control relations (obligatory or not) must be interpreted. The second is how these observations relate to the mandatory *de se* readings in obligatory control under attitudes that the literature discusses. The third is about how to characterize the control relation.

1. The first idea is discussed in section 2. It is based on a new observation about PRO. The observation is that PRO is like reflexives in being anaphoric but its anaphoricity is satisfied differently. It suffices that there be some thinker(s) (in simple cases the speaker) for whom a reflexive and its local antecedent have the same semantic value - this is discussed further in [Sportiche \(2019\)](#). PRO however must have the same semantic value as its controller for a particular thinker, namely:
  - (1) Call  $R$  the smallest constituent containing a controller and its controllee PRO, then PRO has the same semantic value as its controller for the thinker  $\alpha$  such that
    - a. the report of  $\alpha$ 's attitude is a constituent  $S_P$  such that  $R \subseteq S_P$
    - b. there is no thinker  $\beta (\neq \alpha)$ , where the report of  $\beta$ 's attitude is a constituent  $S_Q$  such that  $R \subseteq S_Q \subsetneq S_P$

Intuitively, take the smallest clause which both contains PRO and its controller and is an attitude report: the relevant thinker  $\alpha$  is this attitude's holder. This requirement

on PRO yields what I will call the *de dicto omnibus* requirement: because of (1), PRO and its controller will be reported as having the same semantic value for  $\alpha^3$  by any thinker  $\beta$  whose attitude report  $S_Q, S_Q \supsetneq S_P$ .

For example in simple cases as in sentence (23a) where  $R (= Oedipus \rightarrow PRO)$  is unembedded,  $\alpha$  is the speaker.<sup>4</sup> If we embed (23a) once under *John thinks that ...*,  $\alpha$  is John and control is read *de dicto*, that is as a relation holding for John. And if we embed (23a) twice, as in *Mary believes that John thinks that ...* or *According to Mary, John thinks that ...*,  $\alpha$  is still John and control is read *de dicto*, that is as holding for John according to Mary, and as holding for John according to Mary according to the speaker.

2. The second idea is discussed in section 3 and deals with is how to reduce mandatory *de se*-ness to the *de dicto omnibus* requirement. This is done by modifying how to think about what modal (e.g. doxastic) alternatives attitude predicates quantify over. In current approaches, these alternatives are specified in the lexical entries of attitude predicates as being centered worlds where the center of a world is the *de se* coordinate of the attitude holder in this world. I argue that this property should not be lexical. Instead, I propose that (i) attitude predicates say nothing about the identity of the center of a centered world; (ii) That the center of a centered world is the *de se* coordinate of the attitude holder in this world comes from a cognitive bias, a description of themselves that thinkers have: a thinker T always takes himself (*de se*) to be the center of his modal alternatives. This description of himself that a thinker must have yields a concept  $\tau$ . If  $\tau$  holds of T,  $\tau$  will, because of (1), hold of the denotation of PRO controlled by T and this will derive why PRO must be read *de se* when it does (namely both in some OC cases and in some NOC cases).

Section 4 applies the same general idea (but this time to world center addressees rather to world centers) to derive why mandatory *de te* readings arise as a subcase of the *de dicto omnibus* requirement.

Section 5 explores the possibility that the identity of the world centers and their addressees is itself encoded, and thus derived, syntactically through a relation of Control.

3. Why do control relations function as in (1)? The third idea discussed in section 6 addresses this question and attributes the crucial property to the **control relation**. Thus PRO (or mandatorily controlled overt pronouns as e.g. in Hungarian) do not have special interpretive property, the control relation does: the control relation is an intensional relation: it mandates not merely identity of denotation but identity of concepts for the thinker  $\alpha$  mentioned in (1).

### 1.3 Motivations quickly, and the logic of the reasoning

PRO can occur in obligatory control contexts without any overt attitude predicate present (e.g. *John deserves PRO to be rewarded*) or controlled by inanimates (e.g. *This book deserves PRO to be nicely bound*); PRO can also occur in a variety of non obligatory control contexts,

<sup>3</sup> This characterization does not take into account the existence of partial or split control, which I will basically ignore unless directly relevant. I will thus discuss cases of exhaustive control only, see footnote 11.

<sup>4</sup> To simplify, I will use PRO to refer either to the sign PRO, or its referent, unless the distinction matters, in which case I will use *PRO* for the sign and *PRO* for its denotation.

controlled by animates or inanimates without any (overt) attitude predicates present (e.g. *After PRO being damaged, the house was repaired, After PRO having smoked, John went back in*).

One new observation reported here is that when the structures just mentioned are embedded in an attitude report (e.g. *Mary **thinks** that this book deserves PRO to be nicely bound*), the *de dicto omnibus* requirement must be met by the control relation between PRO and its antecedent, whether or not the attitude holder antecedes PRO, and in particular whether PRO is animate or not. In this example, this means that Mary must think that what PRO and *the book* are intensionally identical, their denotations rigidly covary. I take the existence of this requirement to mean that PRO and its antecedent enter in a certain kind of pre-existing relation - the control relation - the nature of which gets revealed by the embedding.

PRO can also occur in non obligatory control contexts. Another observation reported here, motivating our proposal regarding *de se*-ness, is that mandatory *de se* readings are also found in such contexts when PRO is controlled by an attitude holder, regardless of the syntax of the construction.

By itself this *de dicto omnibus* requirement that the control relation must meet does not derive the mandatory *de se* requirement found with attitude control verbs or the mandatory *de te* requirement found with object control communication verbs (covaluation for the communicator), or *de nunc* requirement, the temporal counterpart of *de se*, see e.g. [Anand \(2006\)](#), or, finally, the mandatory *de se* cases with NOC we discuss. I will nevertheless argue these cases all are subcases of the *de re omnibus* requirement: the *de se* cases arise because PRO shares with its controller a particular implicit description that every attitude holder has of herself - something **in fact** assumed, but in different forms, under any other attempted account of *de se* reading I know of - and of other thinkers. Similarly, the *de te* reading arises because of descriptions that attitude holders must have of their own, or of other people's addressees qua addressees.

Plan: I will discuss in order:

1. Cases in which an infinitive is not in a local attitude context (not a complement of an attitude predicate), and illustrate the *de dicto omnibus* requirement.
2. Cases in which a *de se* reading is mandatory in non obligatory control cases.
3. Why the *de se* requirement found with attitude control verbs, as well as other cases in non obligatory control contexts can be derived.
4. Why the *de te* requirement arises and how this could be extended to the *de nunc* requirement.
5. How the control relation should be analyzed to account for the reported observations.
6. Why these requirements arise, in the context of the *de re omnibus* requirement, because certain thoughts are immune to error.
7. Why we can think of the relation between an attitude holder and the center of her modal alternatives as a relation of obligatory control.

A brief summary of this article then is that we will look in more detail at how PRO functions in cases of non obligatory control (NOC) and of obligatory control (OC). This will suggest a view of PRO that provides a way to derive why the *de se* reading must arise in such cases in some cases (the most prominent of which are like in [\(23a\)](#)), or why so called

*de te* readings arise with certain verbs, as subcases of a more general requirement, the *de dicto omnibus* requirement.

## 2 The observation: the control relation must be read *de dicto*

### 2.1 Preliminaries about Control

Descriptively, control comes in two kinds: Obligatory Control and non Obligatory Control. As Landau, 2013 shows, there is a fairly clear signature for what constitutes Obligatory Control (henceforth OC). While there is controversy about how to precisely analyze the control relation in OC cases (is it movement or not?), there is agreement that the controlled position is a silent ordinary DP occupying a standard argument DP position. Call this DP  $PRO_{OC}$  (taking no stand on whether it is a trace or not). Major OC cases are cases in which  $PRO_{OC}$  is the subject of complement clauses and requires some designated dependent(s) of the embedding control predicate to be a (possibly partial) controller, cf. Landau, 2013, chapters 1, 6 and 7. Non obligatory control (henceforth NOC) cases are the complement cases: cases involving a silent DP (with a restricted distribution) that can be anteceded by some other DP in the same sentence, or be a case of arbitrary control. It is not clear that NOC cases form a natural class and if not, how to break down the set of such cases in smaller coherent subsets. In particular, the question arises as to whether the NOC silent DP, call it  $PRO_{NOC}$  has the same internal structure as the OC silent subject, that is, a  $PRO_{OC}$ , or something else (e.g. a silent pronoun *pro*). I will not take a **general** stand on this point either.

What the following will show is that  $PRO_{OC}$  and **some** instances of  $PRO_{NOC}$  behave similarly from an interpretive standpoint. To simplify, I will simply notate all of them PRO. I do think this extends to **all** instances of PRO but only a systematic investigation of all case types, something I will not do here, would establish this.

Since I am going to be concerned with interpretive properties of PRO, note that all the judgments that I will report should be considered judgments about both French and English, the only two languages for which native speakers were systematically consulted. As some judgments about English have been reported differently by some authors from what is reported here, possibly due to potential confounds or possible variation (particularly the fact that French uses bare infinitives which do not tolerate lexical subjects, in cases in which English uses gerunds which may), I discuss some such judgments in part in appendix 8.

### 2.2 Preliminary about Binding

Consider the following well formed sentences, with indexing as indicated:

- (2) a. Charles thinks that Flora<sub>k</sub> saw herself<sub>k</sub>
- b. Charles thinks that Flora<sub>k</sub> saw her<sub>k</sub> mother

Coindexing is interpreted as the reflexive and its antecedent having the same semantic value, an identity relation between the denotations of the coindexed elements. The words used are the speaker's. In such simple cases, a speaker not believing that this identity relation held

would use a pronoun instead. So such sentences always conveys identity of semantic value according to the speaker. But this does not say who, according to the speaker, covaluation holds for. The key notion that binding conveys is that there is covaluation **for someone**. This person can be the speaker himself only. This would arise in the following situation #1: Suppose that Flora was watching TV and saw someone X. Charles thinks that X is Lydia, when in fact X is Flora herself. Charles could not truthfully report his thoughts as ‘Flora saw herself’. But I could truthfully use sentence (2a) to report Charles’ thinking.<sup>5</sup> In this case, the meaning of (2a) is consistent with the interpretation: Charles thinks that Flora saw a person who he thinks is not Flora but who in fact is Flora. So *herself* and *Flora* have the same semantic value for me only, not for Charles. Call this sameness of semantic value for the speaker *de re* covaluation.

But the speaker could convey that there is sameness of semantic value for someone else only, e.g. the attitude holder. This can be illustrated as follows. Suppose that Charles thinks that unicorns exist (but I don’t) and he says: ‘A unicorn grooms itself every morning’. I can say:

- (3) Charles thinks that a unicorn<sub>k</sub> grooms itself<sub>k</sub> every morning

In (3), sameness of semantic value cannot mean covaluation for the speaker since *a unicorn* has no value for the speaker. Rather, this is expressing that in Charles’s thoughts, *a unicorn* and *itself* have the same semantic value. What the speaker conveys then is identity of semantic value for Charles. Call this *de dicto* covaluation or *de dicto* covaluation relative to Charles.

In the terms of this section, the main observation I will document is that covaluation of PRO and its controller must be read *de dicto* for all in a sense I will make precise, the *de dicto omnibus* requirement, and explore some consequences of this observation.<sup>6</sup>

## 2.3 Non obligatory Control

The following sentences with temporal adjunct clauses illustrate non obligatory control structures:

- (4) a. Après PRO<sub>p</sub> les avoir bouillies, Hector<sub>p</sub> goûta les pommes de terre  
 After PRO<sub>p</sub> them having boiled, Hector tasted the potatoes  
 ‘After having boiled them, Hector tasted the potatoes’  
 b. Après PRO<sub>p</sub> les avoir bouillies, les pommes de terre sont plus molles  
 After PRO<sub>p</sub> them having boiled, potatoes are softer  
 ‘After having boiled them, potatoes are softer’  
 c. Les pommes de terre sont plus molles après PRO<sub>p</sub> les avoir bouillies  
 Potatoes are softer after PRO<sub>p</sub> them having boiled  
 ‘Potatoes are softer after having boiled them’

Such temporal adjunct infinitives structures, whether clause initial or clause final, are clas-

<sup>5</sup> Some speakers find this degraded, some (including me) do not. This difference may be due to a preference for a “*de dicto*” construal of the sameness of semantic value (reminiscent of the preference for *de se* construal of pronouns reported in Pearson (2015a)).

<sup>6</sup> *De dicto* covaluation recalls the behavior of logophors - see Charnavel (2013), Charnavel (2019b) and reference therein, or reflexives in Free Indirect Discourse, which unlike indirect discourse, require co-valuation for the thinker whose thoughts are being reported. This is further discussed in Sportiche (2019).



sified as non obligatory control (NOC) (cf. Landau, 2013) because they allow control as in the first sentence but do not require it as shown by the other two sentences which are acceptable without visible control.

Furthermore, the use of the control relation is the speaker's choice: when there is (exhaustive) control as in the first example, the speaker expresses the fact that PRO and its controller have the same semantic value for someone, here for the speaker himself.

### 2.3.1 Introducing *de dicto omnibus*

Assume we are within the Greek mythology story about Oedipus:

- (5) Oedipus Scenario:
- a. Oedipus, raised as King Polybus's only son, kills someone he does not know, Laius his real father, whose only son he in fact is. Having solved the sphinx's riddle, he becomes king of Thebes, Laius being reputed to be childless.  
Later, an oracle reveals that, to end a god sent plague on Thebes, Laius's killer must be punished.  
Oedipus, king of Thebes, searches for Laius's killer, expecting to find him and to punish him in order to satisfy the gods and end the plague.
  - b. Antigone, (one of) Oedipus's daughters, is in the same epistemic state as Oedipus. I, the speaker of sentences, as well as my hearers, know the actual truth and that we all know it.

Assume that nobody is mistaken about names: *Oedipus* means Oedipus, that very person, for all, and that names are rigid designators as in Kripke (1972). Now consider the following, with PRO controlled by *Oedipus*:

- (6) a. Oedipus says/thinks: I will have satisfied the gods after the killer of Laius is punished  
I can truly report this in any of the following ways:
- b. Après qu' il<sub>k</sub> aura été puni, Oedipe<sub>k</sub> aura satisfait les dieux  
After he<sub>k</sub> has been punished, Oedipus<sub>k</sub> will have satisfied the gods
  - c. Après PRO<sub>k</sub> avoir été puni, Oedipe<sub>k</sub> aura satisfait les dieux  
After PRO<sub>k</sub> having been punished, Oedipus<sub>k</sub> will have satisfied the gods
  - d. Oedipe<sub>k</sub> aura satisfait les dieux après PRO<sub>k</sub> avoir été puni  
Oedipus<sub>k</sub> will have satisfied the gods after PRO<sub>k</sub> having been punished

All of (6b), (6c) and (6d) are true in this context because it is true of the actual killer Oedipus, that once he is punished, he will have satisfied the gods.

First a clarification: there are (at least) two distinct notions used in the syntactic and semantic literature.

- (i) One's awareness that PRO is self.
- (ii) One's awareness that PRO is self **within one's attitude report**.

What I assume when talking about *de se* ascriptions is the second notion, not the first.<sup>7</sup>

<sup>7</sup> This notion is the notion used in some works, e.g. Safir (2010), Sundaresan (2010) cited in Landau (2013), and Landau (2013) to conclude that some PROs need not be read *de se* or for some other reason (e.g. Reuland, 2018). A priori, there is no reason why this notion of awareness is not linguistically

Note that sentence (6c) is true in this context even though Oedipus is not aware of who PRO is but by (ii), this does not mean that controlled PRO<sub>NOC</sub> need not be read *de se*.

Recall we assume Antigone is in the same epistemic state as Oedipus.<sup>8</sup> Suppose now that I report:

- (7) a. Antigone pense qu' Oedipe<sub>k</sub> aura satisfait les dieux après qu'il<sub>k</sub> aura été puni  
 Antigone thinks that Oedipus<sub>k</sub> will have satisfied the gods after he<sub>k</sub> has been punished  
 b. Antigone pense qu' Oedipe<sub>k</sub> aura satisfait les dieux après PRO<sub>k</sub> avoir été puni  
 Antigone thinks that Oedipus<sub>k</sub> will have satisfied the gods after PRO<sub>k</sub> having been punished

Sentence (7a) is true.

Sentence (7b) however, is false. It wrongly reports that Antigone has the following thought: 'Oedipus<sub>k</sub> will have satisfied the gods after he<sub>k</sub> is punished', that is that she takes Oedipus to be the killer of Laius. PRO controlled by *Oedipus* behaves differently from *he* covalued with *Oedipus*.

Let us make explicit what is happening by controlling how Oedipus is thought about by me and others. Assume that I do not know that Oedipus and Antigone think of him as the son of Polybus. Such a description yields Oedipus for Oedipus or Antigone. I believe that Polybus had no son, but I understand that they have someone in mind (I am not sure who) when they use this description. Truth or falsity will arise only if this description is read *de dicto*. If it was read *de re*, it would yield a presupposition failure. Now consider:

- (8) Suppose Antigone says:  
 'The son of Polybus will have satisfied the gods after the killer of Laius is punished.'  
 Suppose I reported it as:  
 a. Antigone pense qu' après qu'il<sub>k</sub> aura été puni, le fils de Polybe<sub>k</sub>,  
 Antigone thinks that after he<sub>k</sub> has been punished, the son of Polybus<sub>k</sub>,  
 qui qu' il soit, aura satisfait les dieux  
 whoever he is, will have satisfied the gods  
 b. Antigone pense qu' après PRO<sub>k</sub> avoir été puni, le fils de Polybe<sub>k</sub>,  
 Antigone thinks that after PRO<sub>k</sub> having been punished, the son of Polybus<sub>k</sub>,  
 qui qu' il soit, aura satisfait les dieux  
 whoever he is, will have satisfied the gods

Given that I have no idea who the son of Polybus might be for Oedipus or Antigone (and I in fact believe that there is no actual individual meeting this description), I take the pronoun or PRO to mean *whoever Antigone takes the son of Polybus to be*. Both sentences would thus convey that according to me, the speaker, for Antigone, the son of Polybus is both the person satisfying the gods and the killer. Both sentences would be true if Antigone means that the son of Polybus is the killer, and both would be false otherwise: in such a case where

---

significant but I do not know of any convincing evidence that it is.

<sup>8</sup> We switch to Antigone to alleviate potential concern about Condition C which could arise if the reports were *Oedipus pense...* in (8a) and (8b).

the description is read *de dicto*, PRO and a pronoun behave the same.

But pronouns and PRO diverge in the reverse case in which the description of Oedipus can only truthfully be read *de re*, that is as a description holding true of a particular person for the speaker only. Let us modify these sentences by making one *de re* description explicit as below. Suppose:

- (9) Antigone says/thinks: ‘Oedipus will have satisfied the gods after the killer of Laius is punished.’  
I report her belief as follow:
- a. Antigone pense qu’ après qu’il<sub>k</sub> aura été puni, le fils de Laios<sub>k</sub>  
Antigone thinks that after he<sub>k</sub> has been punished, the son of Laius<sub>k</sub>  
aura satisfait les dieux  
will have satisfied the gods
  - b. Antigone pense qu’ après PRO<sub>k</sub> avoir été puni, le fils de Laios<sub>k</sub>  
Antigone thinks that after PRO<sub>k</sub> having been punished, the son of Laius<sub>k</sub>  
aura satisfait les dieux  
will have satisfied the gods

Here, the description *the son of Laius* cannot meaningfully be read *de dicto* as for Antigone, Laius was childless. But it can of course be read *de re*: this is one of the ways \*I\* think of Oedipus.

The judgments are as in (7).

Sentence (9a) is true, as (7a) was. It is interpreted as meaning that there is a person, namely the son of Laius, who is such that Antigone thinks of this person: ‘after he<sup>1</sup> is punished, he<sup>2</sup> will have satisfied the gods’ where *he*<sup>1</sup> and *he*<sup>2</sup> refer to the same person but Antigone does not realize it.

Sentence (9b) is false, as (7b) was. It says that there is a person, namely the son of Laius, who is such that Antigone thinks: ‘this person is such that after he is punished, he will have satisfied the gods’, however she identifies this person for herself. This is false as Antigone has no such thought.

The same holds if we explicitly remove the description from the scope of the intensional predicate (as a hanging topic, thus in such a way that it cannot reconstruct in the scope of the attitude verb): (10a) is true but (10b) is false.

- (10) a. Quant au fils de Laios<sub>k</sub>, Antigone pense qu’ après qu’il<sub>k</sub> aura été puni,  
As for the son of Laius<sub>k</sub>, Antigone thinks that after he<sub>k</sub> has been punished,  
il<sub>k</sub> aura satisfait les dieux  
he<sub>k</sub> will have satisfied the gods
- b. Quant au fils de Laios<sub>k</sub>, Antigone pense qu’ après PRO<sub>k</sub> avoir été  
As for the son of Laius<sub>k</sub>, Antigone thinks that after PRO<sub>k</sub> having been  
puni, il<sub>k</sub> aura satisfait les dieux  
punished, he<sub>k</sub> will have satisfied the gods

What is it about PRO that makes (9b) or (10b) false? It can’t be because PRO and its antecedent have the same semantic value for me, the speaker, as this happens in (9a) and (10a), which are both true. Instead, unlike a pronoun and its antecedent, PRO and its antecedent must be understood to have the same semantic value **for Antigone**: covaluation must be a *de dicto* property relative to Antigone. This is what leads to the truth values we

observe.<sup>9</sup>

So according to the speaker, PRO and its antecedent must have the same semantic value for Antigone, the report of whose attitude (what she thinks, here the embedded clause) is more embedded, although not for the speaker herself (the report of whose attitude, here the entire sentence, is less embedded).<sup>10</sup>

This observation generalizes to more complex cases.

Suppose Tiresias, the blind prophet, knows the truth, just like me, and thus could truthfully utter (6c). Now consider the following (I use English only to simplify presentation):

- (11) Tiresias (knowing that Oedipus is the killer) tells Antigone ‘after the killer has been punished, Oedipus will have satisfied the gods’ and Antigone reports to me ‘Tiresias thinks that after the killer has been punished, Oedipus will have satisfied the gods’. I report:
- a. (i) Antigone believes that [<sub>P</sub> Tiresias thinks that after he<sub>k</sub> has been punished, Oedipus<sub>k</sub> will have satisfied the gods].
  - (ii) As for the son of Laius<sub>k</sub>, Antigone believes that [<sub>P</sub> Tiresias thinks that after he<sub>k</sub> having been punished, he<sub>k</sub> will have satisfied the gods].
  - b. (i) Antigone believes that [<sub>P</sub> Tiresias thinks that after PRO<sub>k</sub> having been punished, Oedipus<sub>k</sub> will have satisfied the gods].
  - (ii) As for the son of Laius<sub>k</sub>, Antigone believes that [<sub>P</sub> Tiresias thinks that after PRO<sub>k</sub> having been punished, he<sub>k</sub> will have satisfied the gods].

Both sentences in (11a) are true, as the pronoun can be read *de re* only, as meaning Oedipus. But the sentences in (11b) are false. There could be two reasons:

Reason #1: it could be because these sentences entail that according to Antigone, PRO and *Oedipus* are covalued for Tiresias (something she does not know).

Reason #2: it could be because these sentences entail that according to Antigone, PRO and *Oedipus* are covalued for her (something she does not believe).

Only the first reason is right:

Antigone must believe that PRO and its controller have the same semantic value for Tiresias. Indeed, if we assume that Antigone knows that Tiresias believes that the killer is Oedipus, but she doesn’t, the sentences in (11b) become true. And this is predicted: if the control

<sup>9</sup> Thinking of PRO as bound by its antecedent, the *de dicto omnibus* requirement does not follow from the binding relation itself. Indeed, modifying the scenario so that Laius has in fact several sons, who all participated in killing Laius. In such a scenario, changing *the son of Laius* to *every son of Laius* in (9a) or (9b) with the pronoun or PRO bound would not change their truth values.

<sup>10</sup> This means in particular that control, the antecedent/PRO relation, is different from the antecedent/reflexive relation as illustrated in in (2a): the *de dicto omnibus* requirement does not apply to the relation between anaphors such as reflexives and their antecedents. This is discussed in Sportiche (2019) which:

1. illustrates how reflexives and bound pronouns differ from PRO in only requiring covaluation for some relevant thinker, and what it means for the Binding theory.
2. discusses how this construal of the Binding Theory leads to a different way of addressing Heim’s 1994 puzzling reflexive pronouns in *de se* reports, in the context of which I will discuss some cases found in Sharvit (2011) or Pearson (2016).

The main conclusion of this article is precisely that reflexives and bound pronouns must be covalued with its (their) antecedent(s) for some particular thinker only (but crucially not in a way that satisfies the *de dicto omnibus* requirement), while pronouns cannot be covalued with local potential antecedents for some particular thinker as well.

relation must be read *de dicto* relative to Tiresias, it means that covaluation of PRO and its controller are reported to hold in Tiresias's thoughts (in his doxastic alternatives). If Antigone is aware of the content of Tiresias's thoughts, she must believe that covaluation of PRO and its controller holds for him (this follows from standard meaning composition). That reason #2 is incorrect can also be shown by using an example similar to example (3). Assume Tiresias unlike Antigone, believes in the existence of centaurs and furthermore believes that they eat after waking up. If Antigone believes this about Tiresias, I could truthfully report:

- (12) Antigone believes that [<sub>P</sub> Tiresias thinks that after PRO<sub>k</sub> waking up, a centaur<sub>k</sub> eats].

This is true even though *a centaur* and PRO do not have the same semantic value for Antigone: they have no semantic value for her.

### 2.3.2 Summary

The general conclusion is the following (limiting ourselves to exhaustive control<sup>11</sup>):

- (13) a. There is a unique syntactically smallest (for inclusion) attitude report A that includes the control relation. PRO and its controller must have the same semantic value for the (unique) attitude holder  $\alpha$  of this attitude. For  $\alpha$ , PRO and its controller must be covalued.  
 b. Consequently, PRO and its controller is reported to have the same semantic value for  $\alpha$  by any attitude holder  $\pi$  whose attitude report includes A.

(13a) is the *de dicto omnibus* requirement, the requirement that PRO and its controller must be read *de dicto* for all attitude holders whose attitude report includes the control relation in the sense above.<sup>12</sup> For ease of reference, I will call the thinker  $\alpha$  in (13a) the **control attributing** thinker or attitude holder (or CA thinker, or CAT for short).

We will show next that this requirement holds of all control relations.

## 2.4 How general is the *de dicto omnibus* requirement?

When does this *de dicto* requirement hold?

- Nothing in what was said relies on anything other than someone having thoughts about identity of semantic value. It does not matter that PRO is animate (inanimates can't be read *de se*), or that PRO is in an OC context, whether under an attitude or not.

<sup>11</sup> This should be modified when non exhaustive (partial/split) control is involved. In split or partial control, there can't be simple identity. Intuitively, we can think of PRO as an implicit sum or conjunction or group, where each member of this set is exhaustively controlled and thus subject to the *de dicto omnibus* in relation to its antecedent. In part because of this, the *de dicto omnibus* requirement is similar to but weaker than Anand's 2006 *Referential Equivalence*, or Gluckman's 2018 *Intensional Chain Uniformity* if antecedent(s)/PRO relations form a chain in the requisite sense. I assume that *Intensional Chain Uniformity* does not hold of such control relations. Indeed, the existence of referential overlap in antecedent(s)/PRO relations (partial control, split control), or with pronominal binding, that are not available for some of the core constructions Gluckman (2018) analyzes (e.g. *tough-movement*) suggests that such relations should not fall under *Intensional Chain Uniformity*.

<sup>12</sup> Literally read, *de dicto omnibus* is stronger than the text states: it would require reason #2 to hold. The text interpretation is the minimal way in which *de dicto* for all is satisfied.

- And indeed, the *de dicto omnibus* requirement can be shown to hold of OC and NOC PROs regardless of whether they are inanimate PROs (so non *de se*) or OC under non attitude predicates (so non *de se* either). This is what this section shows.
- This means that when it comes to this interpretive property, there is no (obvious) OC/NOC, attitude, non attitude etc.. dividing line. But, assuming that we have a reliable way of identifying a silent DP as a PRO, that is as having the same internal make up as as what we did take to be PRO here, does this requirement hold of any pair antecedent/PRO? It looks likely for OC cases, and it may be for all NOC cases but work on each individual case type is needed to decide.

#### 2.4.1 *de dicto omnibus* with inanimate PROs in NOC

Consider the following scenario:

(14) Damaged House Scenario:

A (unique) house, the house on the hill, was damaged and it was subsequently repainted, as I am aware. Lydia sees date-stamped pictures of this house from different angles and thinks there are two houses, a green house, which she does not know is in fact the house on the hill, and another one.

She thinks that:

- The green house was repainted (True) after another house was damaged (False: in fact after the same house, the house on the hill, was).
- Another house was damaged (False: it is the house on the hill that was).

As seen earlier, the crucial case is when we use a description read *de re*. Suppose:

(15) Lydia says/thinks: The green house was repainted after another house was damaged.  
I report

- Après PRO<sub>k</sub> avoir été endommagée, la maison sur la colline a été repeinte  
After PRO<sub>k</sub> getting damaged, [the house on the hill]<sub>k</sub> was repainted  
Quant à [la maison sur la colline]<sub>k</sub> / As for [the house on the hill]<sub>k</sub>,...
- ...Lydia pense qu' après qu' elle<sub>k</sub> ait été endommagée, elle<sub>k</sub> a été repeinte  
...Lydia thinks that after it<sub>k</sub> got damaged, it<sub>k</sub> was repainted
- ...Lydia pense qu' après PRO<sub>k</sub> avoir été endommagée, elle<sub>k</sub> a été repeinte  
...Lydia thinks that after PRO<sub>k</sub> getting damaged, it<sub>k</sub> was repainted

In both (15b) and (15c), we overtly scope the description *the house on the hill* out (by using a hanging topic structure so that it cannot totally reconstruct) so that it must be read *de re*. The contrast between them remains: the pronoun case is a true report of Lydia's thinking, while the PRO case is not. In the latter, Lydia would have to believe that the damaged house is the house on the hill.<sup>13</sup>

This follows from the *de dicto omnibus* requirement: Animacy plays no role.

<sup>13</sup> Note that these are NOC configurations despite the fact that control is obligatory here - PRO<sub>arb</sub> being necessarily animate. This is shown by the possibility of: *Le tableau<sub>k</sub> a été vendu bien qu' après PRO<sub>k</sub> avoir été endommagé, aucune restauration n' a eu lieu* / *The painting was sold even though, after being damaged, no restoration took place*

### 2.4.2 *de dicto omnibus* with attitudinal PRO in OC

First let us illustrate that the *de dicto omnibus* requirement holds for OC attitudinal cases. Consider first:

- (16) a. (i) John<sub>k</sub> hopes that he<sub>k</sub> will win  
           (ii) John<sub>k</sub> hopes PRO<sub>k</sub> to win  
       b. (i) Bill thinks that John<sub>k</sub> hopes that he<sub>k</sub> will win  
           (ii) Bill thinks that John<sub>k</sub> hopes PRO<sub>k</sub> to win

(16a-i) can be true with coreference *de re* only, for example if John hopes: "this guy will win", where this guy is him without him realizing it. Clearly this is not possible in (16a-ii): since PRO must be read *de se*, (16a-i) is equivalent to the speaker reporting that John hopes: 'I will win'. Since 'I' picks out John, there must be coreference for the speaker, and this what the control relation codes.

This is duplicated in the next two cases.

In (16b-i), he<sub>k</sub> can be John *de re* only, so not *de dicto*. But not in (16b-ii). Here again, Bill's thought must be of John hoping : 'I will win', so PRO and John must be coreferential for Bill.

### 2.4.3 *de dicto omnibus* with OC PRO in non attitudinal complements - Subject Control

Let us return to the Oedipus scenario (5) and modify it as follows:

- (17) Oedipus is a good, deserving king of Thebes whose reward would be for Thebes's plague to disappear or equivalently, given the gods's demand, that Laius's killer be punished.

Suppose Oedipus claims:

- (18) The reward I deserve is that the killer of Laius be punished.

Now consider the following reports in French in (19) with their nearest translations in English:

- (19) a. [Le roi de Thèbes]<sub>k</sub> mérite qu' on le<sub>k</sub> punisse  
           [The king of Thebes]<sub>k</sub> is so deserving that we him<sub>k</sub> should punish  
       b. [Le roi de Thèbes]<sub>k</sub> mérite d' PRO<sub>k</sub> être puni  
           [The king of Thebes]<sub>k</sub> deserves PRO<sub>k</sub> to be punished

In this scenario, both sentences in (19) are true: The king of Thebes deserves a reward namely that he *qua killer of Laius* be punished.

Consider next:

- (20) a. [Le roi de Thèbes]<sub>k</sub> prétend PRO<sub>k</sub><sup>1</sup> mériter qu'  
           [The king of Thebes]<sub>k</sub> claims PRO<sub>k</sub><sup>1</sup> to be so deserving that  
           on le<sub>k</sub> punisse  
           he<sub>k</sub> should be punished  
       b. [Le roi de Thèbes]<sub>k</sub> prétend PRO<sub>k</sub><sup>1</sup> mériter d' PRO<sub>k</sub><sup>2</sup> être puni  
           [The king of Thebes]<sub>k</sub> claims PRO<sub>k</sub><sup>1</sup> to deserve PRO<sub>k</sub><sup>2</sup> to be punished

Sentence (20a) is true. Oedipus says he deserves as reward that the killer be punished, where I, who knows that he is killer, replaces this description by a pronoun picking him out as referent. But sentence (20b) it is false. In it, PRO<sup>2</sup> is (OC-)controlled by PRO<sup>1</sup>; PRO<sup>1</sup> must be understood *de se*. This means that Oedipus thinks of its reference as being him. In other words, we can paraphrase ‘Le roi de Thèbes]<sub>k</sub> prétend PRO<sub>k</sub><sup>1</sup> mériter ...’ as *the king of Thebes claims: ‘I deserve ...’*. Because PRO<sup>2</sup> is controlled by PRO<sup>1</sup>, it must be understood as meaning ‘I’ too (hence *de se*). Sentence (20b) can be paraphrased as: *the king of Thebes says: my reward is that I should be punished*, which is false. In other words, in this subject OC PRO case under a non attitude verb (*mériter/ deserve*), the *de dicto omnibus* requirement must be met mandating semantic identity for the king of Thebes Oedipus.

#### 2.4.4 *de dicto omnibus* with OC PRO in non attitudinal complements - Object Control

The same pattern is found in object control cases under non attitudinal cases:

(21) Wrong ball scenario:

There is a white ball, which Gottfried sees as gray, on a rail forming a down and up curve. The ball must be forced down to move along the rail. What really happened: Gottfried forced the white ball downward making it go down and up again.

Gottfried can’t see the lowest portion of the rail which is hidden by a screen. A blue light was turned on right when the ball was behind the screen making the ball moving up look blue. My view is unimpeded by the screen: I know there is no blue ball, it is the same white ball lit blue.

What Gottfried thinks happened: ‘I forced the gray ball downward so that it hit and thus forced another ball, a blue ball, to move upward.’

- (22) a. Quant à [la boule blanche]<sub>k</sub>, Gottfried l’<sub>k</sub> a forcée à PRO<sub>k</sub> monter  
 As for the white ball, Gottfried it<sub>k</sub> forced PRO<sub>k</sub> to move up  
 ‘As for the white ball, Gottfried forced it to move up’
- b. Quant à [la boule blanche]<sub>k</sub>, Gottfried prétend lui<sub>k</sub> avoir appliqué une  
 As for the white ball, Gottfried claims to-it<sub>k</sub> to have applied a  
 telle force qu’ elle<sub>k</sub> est montée  
 such force that it<sub>k</sub> moved up  
 ‘As for the white ball, Gottfried claims to have applied such a force to it that it moved up’
- c. Quant à [la boule blanche]<sub>k</sub>, Gottfried prétend l’<sub>k</sub> avoir forcée à PRO<sub>k</sub>  
 As for the white ball, Gottfried claims it<sub>k</sub> to have forced PRO<sub>k</sub>  
 monter  
 to move up  
 ‘As for the white ball, Gottfried claims to have forced it to move up’

The facts are similar. The first two sentences are true in this scenario. But the third one is false. PRO must be understood as referring to the white ball for Gottfried, but Gottfried does not think that the white ball moved up. This means that this object OC PRO under a non attitude verb (*forcer/ to force*) must meet the *de dicto* requirement, mandating semantic identity for Gottfried.



### 3 Why must PRO be read *de se*

#### 3.1 Introduction

Chierchia (1990) expanding on observations made in Morgan (1970) connected conceptual discussions in the philosophy of language (Castañeda, 1967, Perry, 1977, Lewis, 1979) with grammatical phenomena by analyzing PRO in (23a) as mandatorily read *de se*:

- (23) a. Oedipus expects PRO to be identified  
 b. Oedipus<sub>m</sub> expects he<sub>m</sub> will be identified

In the Oedipus, scenario, in (23a), unlike what happens in (23b), Oedipus must be thinking "I will be identified" for this sentence to be a true report of his expectations and is thus false: Oedipus has expectations about himself *de re* but not *de se*. This is a robust observation (although not all agree, see Cappelen and Dever, 2013) holding crosslinguistically in comparable structures.<sup>14</sup>

An explanatory analysis of this observation should derive why independently motivated lexical properties of the elements in the syntactic environment, and the properties of PRO, after all as an ordinary DP showing ordinary morphosyntactic Case and featural properties (cf. Landau, 2013), wherever it occurs syntactically, compositionally combine to yield this mandatory reading. In Chierchia's 1990 analysis and all subsequent ones, as far as I know, that this reading must arise is simply posited directly or indirectly instead of being derived (see section 3.4.2).

The *de dicto omnibus* requirement does not entail that PRO must be read *de se* (or *de te*) in the relevant classical contexts. The reason is simple: in, say, (23a), Oedipus is not a relevant attitude holder because Oedipus's attitude report does not include the control relation since the controller *Oedipus* is outside of the scope of the attitude verb *expect*. As a result, PRO and its controller *Oedipus* need not be coreferential for Oedipus, hence need not be read *de se*. But the similarity between the *de se* requirement found in such cases and the *de dicto omnibus* requirement seems too strong to be accidental. The *de se* requirement would follow if the control relation had to be one of semantic identity for Oedipus.

In this section, I will make a proposal to reduce mandatory *de se*-ness to *de dicto omnibus* requirement. Before doing so however, let me illustrate that mandatory *de se*-ness is required in other syntactic contexts than OC under attitudes.

#### 3.2 NOC *de se* subcases of *de dicto omnibus*

One such context is found, as discussed above, in obligatory control cases as in example (20b), where *de se*-ness arises indirectly with a PRO subject of a clause complement of the non attitude verb (*mériter/deserve*): this PRO must be identical to its controller, another PRO, itself mandatorily read *de se*. Interestingly, in such a case, that PRO<sup>2</sup> must be read *de se* does follow from the *de dicto omnibus* requirement given that PRO<sup>1</sup> must be read *de se*. This reinforces the suspicion that all cases of *de se* PRO should fall under this requirement.

We can also document the existence of mandatory *de se* readings of PRO in NOC contexts. Still in the simple Oedipus scenario, consider the following:

<sup>14</sup> I will however limit my discussion here to French and English only.

- (24) a. Oedipus thinks or says: ‘after the killer is punished, the plague will disappear’  
I report  
b. Oedipe<sub>k</sub> pense qu’ [après il<sub>k</sub> aura été puni, la peste disparaîtra ]  
Oedipus<sub>k</sub> thinks that [after he<sub>k</sub> has been punished, the plague will disappear ]  
c. Oedipe<sub>k</sub> pense qu’ [après PRO<sub>k</sub> avoir été puni, la peste  
Oedipus<sub>k</sub> thinks that [after PRO<sub>k</sub> having been punished, the plague  
disparaîtra ]  
will disappear ]

In the current scenario, sentence (24b) is true, with the pronoun read as *de re* pronoun. But sentence (24c) is false. Truth would require Oedipus’s thoughts to be: ‘after I am punished, the plague will disappear’ which of course is not the case. This is a straight *de se* requirement but in the context of Non Obligatory Control.<sup>15</sup> This behavior is found in even more complex cases. Speakers like me accept long distance control in the following cases (reported fine by many: Lebeaux, 1984, Chierchia and Jacobson, 1986, Landau, 2013, ch.7, i.a.):

- (25) Oedipe<sub>k</sub> pense qu’ il est important que /Oedipus<sub>k</sub> thinks that it is important that...  
a. [après que le tueur<sub>k</sub> aura été puni, la peste disparaisse]  
[after the killer<sub>k</sub> has been punished, the plague disappear]  
b. [après qu’ il<sub>k</sub> aura été puni, la peste disparaisse]  
[after he<sub>k</sub> has been punished, the plague disappear]  
c. [après PRO<sub>k</sub> avoir été puni, la peste disparaisse]  
[after PRO<sub>k</sub> having been punished, the plague disappear]

Sentences (25a) and (25b) are true. Sentence (25c) is well formed but false in this scenario once again because PRO must be read *de se*.

For (25c), given our characterization of the control attributing attitude holder, the CA thinker is the speaker, the only thinker whose attitude report include the control relation. The *de dicto omnibus* requirement requires that there be coreference between PRO and Oedipus for the speaker which is true: that PRO need to be read *de se*, that is that PRO mean Oedipus for Oedipus is not predicted.<sup>16</sup>

Consider now the more complex case:

- (26) Oedipe<sub>k</sub> pense qu’Antigone croit que ... / Oedipus<sub>k</sub> thinks that Antigone believes that...  
a. [après que le tueur<sub>k</sub> aura été puni, la peste disparaîtra]  
[after the killer<sub>k</sub> has been punished, the plague will disappear]  
b. [après qu’ il<sub>k</sub> aura été puni, la peste disparaîtra]  
[after he<sub>k</sub> has been punished, the plague will disappear]

<sup>15</sup> In a sense, this is not unexpected if, as Landau (2013) suggests following others, some NOC PRO must be [+human] and logophoric. Indeed, logophors typically require to be read *de se* in the appropriate environments. This again suggests that something more general is going on, possibly encompassing all cases of PRO. Note also that there are grounds to conclude non controlled PRO is always logophoric, once we properly understand what logophoricity entails, see Charnavel (2019a). However, (Landau, 2013, p. 32 and 234) disagrees, see the discussion in section 8.

<sup>16</sup> Example (24c) or (25c) show that an assumption made in Pearson 2015b, p. 110ff - namely that PRO can only be read *de se* relative to a local controller - is not tenable : the mandatory *de se*-ness of PRO is unrelated to PRO being bound locally. See section 3.3.

- c. [après PRO<sub>k</sub> avoir été puni, la peste disparaîtra]  
 [after PRO<sub>k</sub> having been punished, the plague will disappear]

Sentences (26a) and (26b) are true. Sentence (26c) is well formed but false in this scenario yet again because PRO must be read *de se*.

For (26c), given our characterization of the control attributing attitude holder, the CA thinker is again the speaker, the only thinker whose attitude report include the control relation. The *de dicto omnibus* requirement requires that there be coreference between PRO and Oedipus for the speaker which is true. But that PRO need to be read *de se*, that is that PRO mean Oedipus for Oedipus is not predicted.

So an account is needed for both (25c) and (26c).

Note further that what Antigone thinks of the denotation of PRO is not relevant. To check this prediction, assume that Oedipus has discovered that he is the killer but has kept this from Antigone. Now there is coreference between PRO and *Oedipus* for Oedipus but not for Antigone. Sentence (26c) now becomes true in this scenario. It does not matter that she thinks the killer is not Oedipus. Judgments are difficult. To make them easier perhaps, imagine that Antigone thinks that after the killer behaves himself for a while, the gods will be satisfied and the plague will disappear. Could Oedipus (knowing that he is the killer) truthfully utter:

- (27) a. Antigone croit qu' après que je me sois bien comporté pendant un certain temps, la peste disparaîtra.  
 Antigone believes that once I have behaved myself for a while, the plague will disappear.  
 b. Antigone croit qu' après PRO m'être bien comporté pendant un certain temps, la peste disparaîtra.  
 Antigone believes that after PRO having behaved myself for a while, the plague will disappear.

These sentences seem true. In it, we force control of PRO by the speaker with the first person idiomatic reflexive. This sentence does not attribute to Antigone the knowledge that the speaker, Oedipus, is the killer.

If the treatment of all mandatory *de se* readings of PRO is to be unified, such cases show that this treatment should not rely on a lexical property of attitude predicate (as there is not lexical connection between the adjunct clause and the attitude verb in all these NOC cases). In addition, the standard treatments of the mandatory character of the *de se* readings in OC cases as in (23a) do not say anything about the required identity between PRO and its controller in non attitudinal OC cases embedded under attitudes such as (20) and (22). In section 3.3 below, we turn to the question of why the belief that there is covaluation between PRO and its controller must be ascribed to the controller itself in all these cases.

### 3.3 Back to the simple case: *de se* and Descriptions

The *de dicto omnibus* requirement mandates that PRO and its controller be covalued for the control attributing attitude holder. I now would like to ask: how does covaluation come about? I will limit the discussion to coreference here without loss of generality, I think. This question subdivides in two:

1. What is it about the thoughts of an attitude holder that triggers coreference for her?
2. How is the coreference requirement technically encoded?

The second question is a question about (presumably compositional) mechanisms. I will discuss it later in section 5. I will concentrate here on the first question.

Assume, perhaps controversially, that talking about some person  $\pi$  reporting intended or presupposed coreference between  $\alpha$  and  $\beta$  is equivalent to talking about implicit or explicit descriptions that  $\pi$  entertains of them: coreference of  $\alpha$  and  $\beta$  for  $\pi$  is equivalent to saying that  $\pi$  holds true a single description uniquely identifying both the referent of  $\alpha$  and the referent of  $\beta$ .<sup>17</sup> Considering again example (10b) repeated below:

- (28) Quant au fils de Laios<sub>k</sub>, Antigone pense qu' après PRO<sub>k</sub> avoir été puni, il<sub>k</sub> aura satisfait les dieux  
 As for the son of Laius<sub>k</sub>, Antigone thinks that after PRO<sub>k</sub> having been punished, he<sub>k</sub> will have satisfied the gods

I, the speaker, hold an identifying description of the son of Laius, namely *the son of Laius*, which is true of the referent of both PRO and *he*. Antigone holds an identifying description of the referent of *he*, namely *my father* or *the king of Thebes*, which must also hold of PRO. Where do these descriptions come from? Either they are explicitly stated, e.g. *the son of Laius*, or they are supplied as background to the scenario, e.g. *the solver of the Sphinx's riddle*, *the father of Antigone*, or for proper names some indexical description, e.g. *the person talked about in this book reputed to have solved the Sphinx's riddle*, that is *that person* (cf. Kripke, 1972, Kripke, 2013).

But consider one case of mandatory *de se* reading such as (23a) repeated below.

- (29) Oedipus expects PRO to be identified

Coreference of *Oedipus* and PRO must hold for Oedipus. Clearly, this is not due to some contextual information. Regardless of context, we judge that such coreference must hold for Oedipus. The only property supplied in the present case is grammatical: PRO is controlled by *Oedipus*. But there must be a description shared by PRO and its controller yielding coreference for Oedipus. What description must be true so that coreference holds for Oedipus? This is what I turn to in the next section.

### 3.4 How the *de se* reading arises

Given that PRO must have the same semantic value as its controller for Oedipus, I will hypothesize that PRO necessarily shares a description with its controller that requires it to be read *de se*.

Here is in a nutshell a first implementation of the idea of where this description comes from:<sup>18</sup>

Attitudes predicates quantify over centered worlds. The standard treatments take it that attitude verbs have a lexical property according to which the center of any such centered world is the *de se* coordinate of the attitude holder in that world. I will argue that such a **lexical** treatment is implausible and that instead, centered worlds are so centered because of a central cognitive property: any attitude holder must have a description of himself

<sup>17</sup> I thus assume that names or pronouns must be anchored to the world via implicit or explicit descriptions, crucially allowing descriptions containing indexical elements.

<sup>18</sup> I will discuss a modification of this idea in section 6.1.

according to which the center of any centered world over which any of his attitudes can quantify is him *de se*. I hold such a description of myself. But by a standard theory of mind assumption, I assume other thinkers hold such a description of themselves too. So I hold such a description of Oedipus. Therefore (since by *de dicto omnibus*, *PRO* and *Oedipus* are coreferent), I hold such a description of *PRO*. Applied to *PRO*, this description will make it the center of any centered world *PRO*'s controller's attitudes quantify over, which means that it has to be read *de se*.

The next two sections summarize some standard ideas about how to treat clauses embedded under attitude predicates and how control works in such cases.

### 3.4.1 Centered worlds: the intuition<sup>19</sup>

For readers unfamiliar with these ideas, I begin by summarizing some standard ideas about attitude predicates quantifying over sets of centered worlds.

A centered world is a pair (individual, world) providing a context of evaluation, a context within which a proposition is situated to be evaluated. A world is a fully specified state of affairs down to the number of atomic particles in the universe. Fundamentally, we are uncertain as to which world we live in but we believe that there are certain worlds in which we do not live, worlds inconsistent with our beliefs, e.g. a universe in which there is only one particle. My holding a belief about the world means excluding some conceivable worlds, leaving other possibilities as candidates for the world I believe I live in. We may also be uncertain as to who we are: I could be confused or amnesiac. What I believe about myself would for example exclude my believing that I am Andromache of Troy, but not excluding that I am my brother. Holding a belief about myself means excluding some candidates for myself, leaving other possibilities open. Attitude predicates are assumed to quantify over sets of pairs (center, world)= centered worlds where the world is a world the attitude holder believes she could be in and the center is who she takes herself to be in that world.

To illustrate, suppose I want to decide whether I could truthfully report what I believe by saying:

(30) 'I was in Bear Canyon on 12/08/2018'

I am not sure whether this is true because my memory is hazy. So I ask you to prove to me that I was. I will be convinced by you showing me incontrovertible pictures of Flora and Leila in Bear Canyon on that date if:

(31) I take the actual world to be one in which:

- a. I am either Flora or Leila &
- b. Both Flora and Leila were in Bear Canyon on that date (as shown in the pictures)

So for me to evaluate the truth of this statement, what's relevant are the pairs (Flora,  $w_{Flora}$ ) (Leila,  $w_{Leila}$ ), where  $w_{Flora}$  is a world in which I take myself (*de se*) to be Flora,  $w_{Leila}$  is a world in which I take myself (*de se*) to be Leila. Each of these pairs is a centered world, a world in which there is a distinguished individual, its center, who is who I take myself to be in this world, my *de se* coordinates in this world. Now suppose that I am shown pictures of Flora and Leila in Bear Canyon on that date which convinces me

<sup>19</sup> See e.g. [Pearson \(2015a\)](#) and the references therein for more in this topic.

that they were there then. Is (30) then true? intuitively, it should be. And it will be since, given that I take myself to be Flora in  $(\text{Flora}, w_{\text{Flora}})$ , ‘I’ uttered by me in  $(\text{Flora}, w_{\text{Flora}})$  will refer to Flora, and ‘I’ uttered by me in  $(\text{Leila}, w_{\text{Leila}})$  will refer to Leila. In other words, the center of a world in such cases is both the person who I take myself to be in it, or the person I think is picked out by the singular first person pronoun uttered by me in this world. The latter notion is usually called the author of the context of evaluation within which the truth of a sentence such as (30) is evaluated. So we can indifferently talk about world centers, or authors of evaluation contexts. Of course, what is needed is much more general (as I could be so much in doubt as to who I am that I have infinitely many candidates for who I take myself to be). So what is relevant is a set of pairs of a world and its center  $(a, w)$  where given what I believe,  $w$  is a world I could be in and  $a$  is who I take myself to be in  $w$ .

Call the set of all such  $(a, w)$  pairs my *doxastic alternatives* (*doxastic* because these are alternatives consistent with my *beliefs*), and  $a$ , my *de se* coordinates in  $w$ , *the center (or author) of  $w$* .<sup>20</sup>

Assume that sensitivity to my doxastic alternative worlds and their centers is syntactically represented as properties of a complementizer that introduce  $\lambda$  abstracts over these two coordinates  $(a, w)$ , where the pairs range over my doxastic alternatives.

- (32) a. C I was in Bear Canyon on 12/08/2018  
 b.  $\lambda a \lambda w$  I was in Bear Canyon on 12/08/2018 in  $w$   
 This sentence will be true for me if  
 for any  $(a, w)$  in my Doxastic Alternatives,  $a$  is in Bear Canyon on 12/08/2018 is true in  $w$ .

Suppose now someone reports Lydia saying (32a) as:

- (33)  $\text{Lydia}_m$  believes that  $\text{she}_m$  was in Bear Canyon on 12/08/2018

Knowing that Lydia in this instance expressed a *de se* thought, I will take the sentence to be true if it is true that:

- (34) Lydia believes: ‘I was in Bear Canyon on 12/08/2018’

To decide whether this is true, I need to hold certain beliefs about what it means for Lydia to believe this. This means that the content of the embedded clause will have to be evaluated relative to (what I take to be) Lydia’s doxastic alternatives (what she actually believes, she may believe she is Flora or Leila). This means that the syntax of this sentence should be like:<sup>21</sup>

- (35) a.  $\text{Lydia}_m$  believes [  $C_1$   $\text{she}_m$  was in Bear Canyon on 12/08/2018 ]  
 b.  $\text{Lydia}_m$  believes  $\lambda a_1 \lambda w_1$   $\text{she}_m$  was in Bear Canyon on 12/08/2018 in  $w_1$

where  $C_1$  codes the necessity to take Lydia’s doxastic alternatives into account to evaluate

<sup>20</sup> As I may also be in doubt as to who I am talking to, and where and when I am, we would in fact need not pairs but tuples, *contexts*,  $(a, u, t, l, w)$  where in  $w$ ,  $a$  is who I think I am,  $u$  is who I think I am talking to,  $t$  is when I think I am, and  $l$  is where I think I am), etc... I am ignoring this for now but will come back to it.

<sup>21</sup> I would also have to take into account my own doxastic alternatives. Since I am not mentioned in this sentence, who I think I am does not matter, but because the present tense is used in the main clause, when I think I am would). I ignore this here.

truth.

As needed, this representation codes that in any  $w_1$ ,  $a_1$  is Lydia for Lydia, that is who Lydia takes herself to be in  $w_1$ , that is, Lydia's *de se* coordinate in  $w_1$ . For this sentence to be a true report of what Lydia meant, it would be necessary that in any  $w_1$ ,  $she_m = a_1$ , that is that  $she_m$  be the center of the embedded centered world.<sup>22</sup> Why in *any*  $w_1$ ? Why not in some only? Because the verb *believe* is a universal quantifier, it universally quantifies over the attitude holder's doxastic alternatives (cf. Hintikka, 1969).

### 3.4.2 Previous accounts of *de se* PRO in OC

There are different current accounts for the semantic treatment of attitude verbs. I choose one standard one to illustrate the kind of boundary conditions I think they all have to meet. One such account builds on the treatment of attitude verbs as manipulating a centered world parameter. Let us take as example the French verb *croire/believe*. Under such a treatment, the following sentence intended to mean that Oedipus believes the killer to deserve punishment:

- (36) Oedipe croit PRO mériter un châtement  
 Oedipus believes PRO to deserve a punishment  
 'Oedipe believes himself (*de se*) to deserve a punishment'

receives the following treatment:

**Assumption 1:** First, a belief report is true just in case the meaning expressed by the embedded clause returns truth when applied to each of the attitude holder's doxastic alternatives, where these doxastic alternatives are world-individual pairs. The intension of a clause embedded under *croire* is a set of world-individual pairs, a property of type  $\langle s, et \rangle$ , over which *croire* universally quantifies.

- (37) Lexical entry for *believe*.<sup>23</sup>  
 $\llbracket believe \rrbracket^{g,w} = \lambda P \in D_{\langle s, et \rangle}. \lambda x \in D_e. Dox_{x,w} \subseteq P$   
 Where  
 $Dox_{x,w} = \{(a_i, w_i) \mid \text{being } a_i \text{ in } w_i \text{ is consistent with } x\text{'s beliefs in } w\}$

A standard way to code the embedded clause as a property is as follows (where some C-like head introduces the lambda abstracts and a silent locative world pronoun is present in the embedded clause - here as 'in  $w$ ')

- (38)  $[_{CP_0}$  Oedipe  $[VP$  croit  $[_{CP_1}$   $\lambda a \lambda w$   $[$  PRO mériter un châtement in  $w$   $]]]$

**Assumption 2:** In (38), PRO is bound by  $\lambda a$ , so we replace PRO by the  $a$  yielding:

- (39)  $[_{CP_0}$  Oedipe  $[VP$  croit  $[_{CP_1}$   $\lambda a \lambda w$   $[$   $a$  mériter un châtement in  $w$   $]]]$

<sup>22</sup> That is that *she* is read *de se*. Note however that the sentence would be true if Lydia believes of X who unbeknownst to her is her that X was in Bear Canyon, with *she* read *de re* non *de se*.

<sup>23</sup> It is sometimes assumed that alternatives are centered worlds only in case of *de se* ascriptions, so that verbs such as *believe* are ambiguous, either quantifying over worlds, or centered worlds. This is both uneconomical and unnecessary.



The conjunction of these two assumptions codes the fact that PRO must be read *de se* in such structures: the center  $a$  of a doxastic alternative of Oedipus's  $(a, w)$  is Oedipus's *de se* coordinate in  $w$ . Binding PRO by  $\lambda a$  in (39) is coding the fact that PRO is also the center  $a$  of  $w$ , that is Oedipus *de se*.<sup>24</sup>

Consider first Assumption 1.

The attitude verb e.g. *croire/believe* is **lexically** defined so that it quantifies over doxastic alternatives of  $\pi$ 's as defined in (37).<sup>25</sup>

There is both conceptual and empirical evidence that doxastic alternatives must be so characterized. Conceptually, Lewis, 1979 e.g. shows that X holding a belief that P means that X believes: 'I live in a world in which P is true', that is in the present terms, attributing a property to  $a$ , that is to himself *de se*).

Empirically, there are languages (e.g. in Amharic, Uyghur, Turkish, etc...) in which the pronoun 'I' embedded in the complement of an attitude verb can shift: it can refer not or not only to the actual speaker *de se*, but also to the attitude holder *de se* (cf. Schlenker's 2003 work on shifted indexicals). In pseudo English, we can get:

- (40) a. Lydia thinks [ $I_{speaker}$  was in Bear Canyon on 12/08/2018].  
 b. Lydia thinks [ $I_{Lydia}$  was in Bear Canyon on 12/08/2018].  
 c.  $\lambda a_1 \lambda w_1$  Lydia thinks in  $w_1$  [ $\lambda a_2 \lambda w_2$  I was in Bear Canyon on 12/08/2018 in  $w_2$ ].

A unified treatment of the meaning of 'I' can be given by letting it pick out the center of some (or the smallest) context of evaluation containing it where this center is the *de se* coordinate of the attitude holder whose modal alternatives this context encodes: here as being bound either by  $a_1$  (so 'I' means  $I_{speaker}$ , the speaker for the speaker), or by  $a_2$  (so 'I' means  $I_{Lydia}$ , Lydia for Lydia ) in (40c).

So defining doxastic alternatives amounts to a **Self Centering** property, namely the property that attitudes quantify over self centered alternatives. This is achieved by stipulation in the definition of doxastic alternatives.

This stipulation is *somehow* required. Indeed, there is no (possible) attitude verb *schmelieve* where *Lydia schmelieves to be in Bear Canyon* means: Lydia believes X to be in Bear Canyon, where X is the actual Lydia no matter who Lydia thinks she is. This would allow the existence of a language with shifted indexicals where 'I' would shift to the actual Lydia for Lydia. This would mean that she would take it to be true that Lydia is in Bear Canyon, if she schmelieved that  $I_{shifted}$  am in Bear Canyon, even if she believed that Flora (who is who she thinks she is) is not in Bear Canyon.

<sup>24</sup> Simplifying, the truth conditions of (36) are computed as follows:

Given that:  $\llbracket CP_1 \rrbracket^{g,w} = \lambda x.x$  deserves punishment in  $w$   
 $\llbracket VP \rrbracket^{g,w} =$  (by intensional function application with the embedded C introducing abstraction over worlds and centers)  
 $\llbracket croit \rrbracket^{g,w}(\llbracket CP_1 \rrbracket^{g,w'}) =$   
 $\llbracket croit \rrbracket^{g,w}(\lambda w'. \lambda a. a \text{ deserves punishment in } w') =$   
 $\lambda a. Dox_{x,w} \subseteq \{ \langle a, w' \rangle : a \text{ deserves punishment in } w' \}$   
 Hence:  $\llbracket CP_0 \rrbracket^{g,w} = Dox_{Oedipus,w} \subseteq \{ \langle a, w' \rangle : a \text{ deserves punishment in } w' \} =$   
 $\forall \langle a, w' \rangle \in Dox_{Oedipus,w}, a \text{ deserves punishment in } w'$   
 Since Oedipus does not actually think he is the killer, he does not ascribe to all who he thinks he may be the property of deserving punishment: (39) is false.

<sup>25</sup> In Landau's 2015 account, the attitude verb lexically encodes properties of the infinitival complementizer to the same effect.



A fortiori, there is no (possible) attitude verb *schmelieve* where *Lydia schmelieves to be in Bear Canyon* means: Lydia believes X to be in Bear Canyon, where X does not include Lydia.<sup>26</sup> X could be me the speaker, the addressee or the sentence, some discourse prominent referent, etc..<sup>27</sup> If self centering failed, the existence of verbs like *schmelieve* would allow the existence of a language with shifted indexicals where in ‘Lydia schmelieves that I am in Bear Canyon, ‘I’ would shift, but to someone else than either Lydia, or who Lydia think she is.

Such non existing predicates do not seem to be linguistically possible predicates: they should be excluded in principle. But coding the Self Centering property as a **lexical** property of attitude verbs creates an expectation that there could in principle be attitude verbs lacking it. I conclude that the Self Centering property should not be coded lexically but as a property that does not tolerates any exception.

Consider next Assumption 2.

The key property of (39) yielding the *de se* reading is to have PRO bound by the local individual abstractor  $\lambda a$ , but how does this arise from the syntax of (39)?<sup>28</sup> This is simply stipulated in one way or another under all accounts I am aware of (from Chierchia, 1987, Stechow, 2003, Anand, 2006, Schlenker, 2011 to Landau, 2015). The stipulation is direct in most accounts, stipulating strictly local lambda binding of PRO, but indirectly in some as e.g. in Landau, 2015, where the infinitive is turned into a property by stipulating properties that (a) PRO must move to FinP and (b) from the local subject position only, converting the infinitive into a predicate (lambda expression). As far as I can see, this amounts to exactly the same stipulation as that found elsewhere.

The account we (will) provide here eliminates this stipulation, but not all stipulations: it accepts the different, more general *de dicto omnibus* requirement which takes PRO to be coreferential with its controller for the control attributing thinker (and ultimately to control being of anaphoric concepts). But the *de dicto omnibus* requirement is crucially justified independently of *de se* configurations. And indeed, such accounts in terms of local binding of PRO by a  $\lambda$  operator fail to generalize to:

1. The NOC cases requiring *de se* construal under control. Indeed consider cases (24c), (24c), (25c), or (26c) which illustrates the problem clearly and which we repeat below:

- (41) a. Oedipe<sub>k</sub> pense qu’ Antigone croit qu’ [après PRO<sub>k</sub> avoir été puni, la peste disparaîtra]  
 b. Oedipus<sub>k</sub> thinks that Antigone believes that [after PRO<sub>k</sub> having been punished, the plague will disappear]  
 c. Oedipus<sub>k</sub> thinks [  $\lambda a \lambda w$  Antigone believes in  $w$  [  $\lambda a_1 \lambda w_1$  [after PRO<sub>k</sub> having been punished, the plague will disappear in  $w_1$  ] ]

Here we would need to guarantee that PRO is bound by  $\lambda a$ , which would be non local binding.

<sup>26</sup> Because attitude verbs do allow partial control. the meaning : John believes: ‘we were in Bear Canyon’ is allowed (cf. Landau, 2013, Pearson, 2016).

<sup>27</sup> Another example would be the verb *schdream*. With Oedipus’ dreaming that he is Laius, his uttering ‘I’ in his dream would pick out Laius in the dream. If *schdreaming* existed, uttering ‘I’ in his *schdream* would pick out Oedipus.

<sup>28</sup> One option we are not considering is that the embedded infinitive never projects a PRO subject, as this is syntactically implausible. See e.g. Landau, 2013, chapter 3.

2. Says nothing about the cases discussed in section 2.4, that is about the relation between PRO and its antecedent (*de dicto omnibus*) in obligatory control cases under non attitude verbs, as these verbs do not quantify over centered worlds, and thus do not introduce a potential  $\lambda$  binder for PRO.

Finally, note that the first point shows that a unified treatment of *de se* readings via the *de dicto omnibus* requirement must in principle allow unbounded distance between controller and controllee as well as lack of c-command between them (as in NOC). This may cast doubts on taking the control relation to necessarily be a movement relationship, or to be property saturation, cf section 5.3.2.

### 3.4.3 Why does *de se* reduce to *de dicto omnibus*

I am now going to discuss why *de se* reduces to *de dicto omnibus* in the context of an analysis taking attitude verbs to quantify over centered worlds. I will discuss in section 6.1 how to implement this reduction syntactically. Consider again the following sentence, where Lydia believes she is Flora:

- (42) Lydia<sub>m</sub> croit [ C<sub>1</sub> PRO<sub>m</sub> être dans Bear Canyon]  
 Lydia<sub>m</sub> believes [ C<sub>1</sub> PRO<sub>m</sub> to be in Bear Canyon]  
 ‘Lydia believes herself (*de se*) to be in Bear Canyon’

1. In (42), PRO must be understood *de se*
2. Calling *PRO* the linguistic sign and PRO its denotation, the *de dicto omnibus* requirement mandates that in (42), all descriptions that I have of Lydia, the referent of *Lydia*, the antecedent of *PRO*, must be hold of PRO, the referent of *PRO*.
3. Logic of the analysis: I must have a description of Lydia which, when holding of PRO, yields the *de se* reading.
4. What is this description?<sup>29</sup>
  - (a) In the context of centered worlds, this description of PRO should make it the center of Lydia’s doxastic alternatives for Lydia, no matter which one is chosen, hence Lydia *de se*.
  - (b) This description must reference a belief held by Lydia since she must be ascribed the thought that PRO is the center of any of her doxastic alternatives.
  - (c) This description must apply to Lydia since *Lydia* and *PRO* have the same semantic value.
  - (d) So this description should make Lydia the center of Lydia’s doxastic alternatives, no matter which one is chosen.

Placing ourselves in the actual world  $w$  (but this will generalize to any world) in which Lydia has thoughts about herself, that is about the actual Lydia (the actual Lydia may think that Lydia in  $(a_i, w_i)$  is someone else than the actual Lydia), assume that the actual Lydia has the following description of **the actual Lydia** (in red to distinguish who is described from who describes):

- (43)  $\forall(a_i, w_i)$  in Lydia’s doxastic alternatives in  $w$ ,  $a_i$  in  $w_i$  is who Lydia in  $w$  thinks in  $w$  **Lydia in  $w$**  is in  $w_i$ .

<sup>29</sup> As any singular proposition true of a particular individual  $\pi$  can be construed as a true property of  $\pi$  ( $P(\pi)$  iff  $\pi \lambda x.P(x)$ ), I may provide the relevant singular propositions instead of writing descriptions in the form of descriptions.

This description simply encodes that Lydia takes herself to be the center of any of her doxastic alternatives. Now this illustrates a property that all thinkers should have, namely:

- (44)  $\forall \pi, \pi$  a thinker in  $w$ , and  $\forall (a_i, w_i)$  in  $\pi$ 's doxastic alternatives in  $w$ ,  $a_i$  in  $w_i$  is who  $\pi$  in  $w$  thinks in  $w$   **$\pi$  in  $w$**  is in  $w_i$ .

But if everyone holds such a belief, by a standard assumption of the theory of mind, everyone should believe that all thinkers hold this belief. In particular, \*I\* believe that Lydia has such a belief:

- (45) I in  $w$  take it that  $\forall (a_i, w_i)$  in Lydia's doxastic alternatives in  $w$ ,  $a_i$  in  $w_i$  is who Lydia in  $w$  thinks in  $w$  **Lydia in  $w$**  is in  $w_i$ .

But I am the control attributing thinker. This means that any description of **Lydia in  $w$**  that I hold, I must, because of the *de dicto omnibus* requirement, have the same of PRO since *PRO* is controlled by *Lydia*. In particular:

- (46) I in  $w$  take it that  $\forall (a_i, w_i)$  in Lydia's doxastic alternatives in  $w$ ,  $a_i$  in  $w_i$  is who Lydia in  $w$  thinks in  $w$  **PRO in  $w$**  is in  $w_i$ .

So first, this means that (I take it that) PRO exists in  $w$ , which is of course the case as PRO is Lydia. This also means that for any of Lydia's doxastic alternatives, I ascribe to Lydia the thought that PRO is the center of this alternative, that is, is Lydia's *de se* coordinate in this alternative.

In other words, I ascribe to Lydia the thought that she takes PRO, the referent of *PRO* to be who she thinks she is: this is the *de se* requirement, derived.

5. A bit more precisely:

- (a) The definition of doxastic alternatives stipulates a (*de se*) identity relation between an attitude holder, Lydia, and the center/author  $a_i$  of her doxastic alternatives. Lydia's doxastic alternatives are defined as:

- (47)  $Dox_{Lydia, w} = \{(a_i, w_i) | \text{being } a_i \text{ in } w_i \text{ is consistent with Lydia's beliefs in } w\}$ .<sup>30</sup>

The property in red in this definition lexically encodes that the self centering property. But:

- i. I argued should not be a **lexical** property.
  - ii. This establishes no direct connection between  $a_i$  and PRO **both** being understood mandatorily *de se* for Lydia, a point I will return to in section 6.1.
- (b) Proposal: Remove self centering from the definition of Lydia's doxastic alternatives: define them **without** requiring that she be the center *de se* of her doxastic alternatives. We separate the notion of center of one's modal alternative from the notion of one's own counterpart in this alternative.

- (48) a.  $Dox_{Lydia, w} = \{(a_i, w_i) | w_i \text{ is consistent with Lydia's beliefs in } w\}$   
 b.  $a_i$  is who 'I' uttered in  $w_i$  picks out in  $w_i$

- (c) More generally: make the red part a (**special**) **description** that any attitude holder  $\pi$  must have of herself: when  $\pi$  thinks of any of  $\pi$ 's doxastic alternatives,  $\pi$  takes the

<sup>30</sup> Note that the *de se* ascription is linguistically implicitly coded in such definitions as a case of NOC *de se* PRO:  $PRO_m$  being  $a_i$   $w_i$  is consistent with  $Lydia_m$ 's beliefs in  $w$ .

center of this alternative to be herself *de se*. In other words:

- (49) a.  $\forall \pi \in w, \pi$  a thinker,  $\forall (a_i, w_i) \in \text{Dox}_{\pi, w}$ ,  $\pi$  takes  $a_i$  to be who  $\pi$  in  $w$  takes  $\pi$  in  $w$  to be in  $w_i$   
 b.  $\text{Dox}_{\pi, w} = \{(a_i, w_i) | w_i \text{ is consistent with } \pi\text{'s beliefs in } w\}$   
 c.  $\forall (a_i, w_i) \in \text{Dox}_{\pi, w}$ ,  $a_i$  is who 'I' in  $w_i$  picks out in  $w_i$

(49c) defines the center of a modal alternative for a thinker. I will assume this definition in what follows.

(d) By the theory of mind,

- (50) a.  $\forall \pi \in w, \forall \rho \in w, \pi, \rho$  thinkers,  $\rho$  takes it in  $w$  that  $\forall (a_i, w_i) \in \text{Dox}_{\pi, w}$ ,  $\pi$  takes  $a_i$  to be who  $\pi$  in  $w$  takes  $\pi$  in  $w$  to be in  $w_i$   
 b.  $\text{Dox}_{\pi, w} = \{(a_i, w_i) | w_i \text{ is consistent with } \pi\text{'s beliefs in } w\}$

(e) For sentence (42) above, that is, applied by me ( $\rho = me$ ) to Lydia ( $\pi = \text{Lydia}$ ) and to the denotation of *PRO* controlled by *Lydia*,  $w^*$  the actual world:

- (51) a. I take it that  $\forall (a_i, w_i) \in \text{Dox}_{\text{Lydia}, w^*}$ , Lydia takes  $a_i$  to be who Lydia in  $w^*$  takes **Lydia** in  $w^*$  to be in  $w_i$   
 b. I take it that  $\forall (a_i, w_i) \in \text{Dox}_{\text{Lydia}, w^*}$ , Lydia takes  $a_i$  to be who Lydia in  $w^*$  takes **PRO** in  $w^*$  to be in  $w_i$   
 c.  $\text{Dox}_{\text{Lydia}, w^*} = \{(a_i, w_i) | w_i \text{ is consistent with Lydia's beliefs in } w^*\}$

(51a) makes the center of any of the doxastic alternatives of the attitude holder be her *de se*.

(51b) does the same thing for *PRO*, and is the *de se* ascription we are after.

In (42): Lydia in  $w^*$  must have a thought with the following content: 'the center of any of Lydia's doxastic alternatives is who Lydia in  $w^*$  takes **Lydia** in  $w^*$  to be in this alternative (namely Flora), hence who Lydia in  $w^*$  takes **PRO** in  $w^*$  to be in this alternative, namely Flora.

In other words, Lydia thinks of herself both as Flora and as center of her doxastic alternatives; she therefore also thinks of the reference of *PRO* as this center hence as Flora: the part in blue amounts to Lydia's thinking of *PRO* as herself *de se*. This conclusion holds as long as this special description holds true.

6. But is this special description in (49a) necessarily true?

As should be clear, this special description is nothing else than a way to code the Self Centering property. Recall that this property lexically limits the doxastic alternatives that a verb like *believe* quantifies over and thus ends up attributing to the attitude holder the property that her beliefs are about so restricted doxastic alternatives. We eliminated the Self Centering Property from the definition of doxastic alternatives and replaced it by the special description, which I call the **Self Centering Description**. It attributes the Self Centering property directly to the attitude holder, and thus must be assumed to be true (since verbs like *schmelieve* do not exist), but now as a **cognitive property** of attitude holders, not as a property of linguistic signs. This is not a linguistic property, this is a property of human thinking in general, a third factor property in Chomsky (2005)'s terms.

(52) **Self Centering Description**

For any attitude holder  $\pi$  in some world  $w$ ,  $\pi$  has the description  $\Delta_w(\pi, \pi)$  of  $\pi$  in  $w$ :  $\Delta_w(\pi, \pi)$ : For any of  $\pi$ 's (doxastic) alternatives  $(a_i, w_i)$  in  $w$ ,  $a_i$  in  $w_i$  is who  $\pi$  in  $w$

takes  $\pi$  in  $w$  to be in  $w_i$ .

As a necessary property of what it means for a thinker to be a thinker, this description cannot fail to hold. This description  $\Delta_w(\pi, \pi)$  provides a function  $SC_{w,\pi}$  mapping any  $w_i$  compatible with  $\pi$ 's beliefs in  $w$  into its center  $a_i$ :

$SC_{w,\pi}: w_i \rightarrow a_i$ , where  $a_i$  is who  $\pi$  takes  $\pi$  in  $w$  to be in  $w_i$ .

Here is the effect that my believing that this Self Centering description holds for anyone will have: it will identify the center  $a_i$  of any centered world  $w_i$  over which a controller's attitude quantify with this controller's *de se* coordinates in  $w_i$  regardless of the syntax of the construction. As  $a_i = SC_{w,\pi}$ , there is no need to lambda abstract over it.

(53) Oedipus<sub>m</sub> expects [ $\lambda w_i$  PRO<sub>m</sub> to be punished in  $(a_i, w_i)$ ]

- (54) a. Oedipus<sub>m</sub> thinks [ $\lambda w_i$  that after PRO<sub>m</sub> turning himself<sub>m</sub> in, the plague will disappear in  $(a_i, w_i)$ ]  
 b. Oedipus<sub>m</sub> thinks [ $\lambda w_i$  Antigone believes in  $(a_i, w_i)$  [ $\lambda \omega_k$  that [after PRO<sub>m</sub> turning himself<sub>m</sub> in, the plague will disappear in  $(\alpha_i, \omega_i)$ ]]]

In all such cases, the center  $a_i$  of  $w_i$  will be identified to the *de se* coordinate of the controller of PRO in each  $w_i$  because of the Self Centering description Oedipus holds of himself in  $w^*$  the actual world (namely  $\Delta_{w^*}(Oedipus, Oedipus)$ ). And the referent of PRO in  $w^*$  will be identified to that center in  $w_i$  because  $\Delta_{w^*}(Oedipus, PRO)$  holds, hence, by transitivity to the *de se* coordinate of its controller.

This extends straightforwardly to embedded cases, that is, cases in which I am not the control attributing thinker. For example in:

(55) Tiresias thinks that Oedipus<sub>m</sub> expects [PRO<sub>m</sub> to be punished]

The control attributing thinker is Tiresias. Whoever he takes Oedipus to be, he takes him to hold true the self centering description of himself. This will derive Tiresias ascribing a *de se* thought to who Tiresias take Oedipus to be.

### 3.4.4 Summary

The **de dicto omnibus** requirement is a property of PRO requiring that PRO be coreferential (or covalued) with its controller for a particular, control attributing thinker. Standard analyses take, as a matter of lexical property, attitude verbs to quantify over worlds centered around the *de se* coordinate of the attitude holder in these worlds. Instead, I took attitude verbs to quantify over centered worlds where the lexical entry of such verbs contains no stipulation concerning the identity of the center of such worlds. This yields for e.g. *believe*:

- (56) a. Lexical entry for *believe*:  

$$\llbracket believe \rrbracket^{g,w} = \lambda P \in D_{<s,et>}. \lambda x \in D_e. Dox_{x,w} \subseteq P$$
 Where  $Dox_{x,w} = \{(a_i, w_i) | a_i \text{ is the center of } w_i, \text{ and } w_i \text{ is compatible with what } x \text{ believes in } w\}$   
 b. By definition, the center  $a_i$  of  $w_i$  is who 'I' uttered in  $w_i$  picks out in  $w_i$ .

I attributed the fact that the center of such worlds is *de se* coordinate of the attitude holder to the existence of a special description - the Self Centering description that people

have of themselves - that restricts in principle what attitude verbs end up quantifying over. This description ultimately yield *de se* readings of PRO via the *de dicto omnibus* requirement, because it entails that PRO is also interpreted as being this center. Nothing in what was discussed is specific to the verb *believe* and can thus be generalized to all attitudes. Given some simple transitive attitude verb *tau* noted  $\tau$ , its lexical entry will look like:

- (57)  $[[\tau]]^{g,w} = \lambda P \in D_{\langle s,et \rangle} . \lambda x \in D_e . ACC_{x,w}^\tau \subseteq P$   
 Where the accessible modal alternatives  $ACC_{x,w}^\tau$  for  $\tau$  are defined as:  
 $ACC_{x,w}^\tau = \{(a_i, w_i) | a_i \text{ is the center of } w_i \text{ and } w_i \text{ is } \tau\text{-compatible}\}$ ,  $\tau$ -compatibility defining accessible worlds for  $x$ .

The Self Centering description generalizes as:

- (58) The **Self Centering** description  $\Omega$   
 For any attitude  $\tau$  and the accessible worlds it quantifies over in  $w$  for  $\pi$   $ACC_{\pi,w}^\tau$   
 The description  $\Omega_w^\tau(\pi, \pi)$  that any  $\pi$  has of  $\pi$  in  $w$  holds true in  $w$ :  
 $\Omega_w^\tau(\pi, \pi) = \forall (a_i, w_i) \in ACC_{\pi,w}^\tau$ , the center  $a_i$  of  $w_i$  is [who  $\pi$  believes in  $w$  that  $\pi$  in  $w$  is in  $w_i$ ].

## 4 Deriving "de te" as a special case of *de dicto omnibus*

Mandatory *de se* readings have so-called *de te* 'counterparts' as can be illustrated with object control communication verbs such as *tell*, *ask*, *urge*, *recommend*, *order*, etc... in which their infinitive complement clause contains a PRO controlled by the object, but expresses an attitude of the subject.<sup>31</sup>

Thus consider the following branching scenario (from [Schlenker, 1999](#) and [Anand, 2006](#)):

- (59) Bad waiter scenario:  
 Mary is hosting a party. She hears that a certain waiter named John is being a nuisance.  
 S1: Mary tells the nearest waiter, "John has to go." Unbeknownst to her, she's talking to John.  
 S2: Mary tells John, "You have to go."

We get the following judgments:

- (60) a. Mary told John<sub>k</sub> that he<sub>k</sub> had to leave. S1: TRUE, S2: TRUE  
 b. Mary told John<sub>k</sub> to PRO<sub>k</sub> to leave. S1: FALSE, S2: TRUE

The fact that the second sentence is false in the scenario S1 illustrates why *de te* attitudes are taken to crucially involve the essential indexical *you* in the attitude.<sup>32</sup>

<sup>31</sup> Object control verbs such as *persuade* in *The oracle persuaded Oedipus<sub>m</sub> PRO<sub>m</sub> to leave Corinth* can take infinitives expressing an attitude of the object with PRO controlled by this very object. And they behave as expected: PRO must be read *de se* for the referent of the object.

<sup>32</sup> The pair in (60) is not a minimal finite/infinitive pair, first because PRO must be read *de te* while there is no such requirement in the finite case. But also because the finite case is ambiguous in a way that the infinitive case is not. In (60a), Mary may simply be relaying some information to John or issuing a demand or an order. In (60b), she cannot just be relaying some information: she is issuing a command. This is disambiguated in French: the verb *dire à/ say to* plus infinitive means order/demand and is an object control verb and the infinitive is introduced by the particle *de*. Otherwise, the infinitive is bare,

What is interesting and different about this case as compared to the classic *de se* case is that Mary is the attitude holder and there is an interpretive requirement on *PRO*, but *PRO* is controlled by *John*. The required *de te* reading here is that *PRO* must be coreferential with its controller *John* for Mary. Given the previous discussion of the *de se* cases, coreference must arise because there is some description that Mary must hold of both the referent of *John* and *PRO*. This description does not come from the context: where does it come from?

If I, the speaker reports something that happened as Mary telling John something, I must minimally have as implicit description for John something of the form ‘the person I take to be who Mary is talking to’, otherwise this is not a ‘telling’, a ‘saying to’. But this is not all. Regardless of what I believe, if Mary is simply talking out loud without any intention of directing her words to John, and John happens to hear her words, this is not a telling, even though the speaker may believe that it is. Mary must intentionally direct her words to John, that is, Mary must think of John as who the utterance is directed to, her goal: she must think of John as ‘my addressee’. This is the source of the requisite description, rooted in lexical properties of verbs of communication (and verbs taking goal arguments in double object construction, such as *give*, *promise*).

To evaluate the truth of sentences such as those in (60), we must take into account what Mary said, who she thinks she might be, and who she thinks she might be talking to given who she might be. This means that we need to take into account relevant alternatives. These would, in this case, be candidate worlds compatible with what Mary said, with candidates for herself and for her addressees in them compatible with what she believes, that is, these alternatives should be triplets (at least)  $\langle a, u, w \rangle$  such that, for all she believes she could be *a* in *w* talking to *u*, where *w* is a world compatible with what she said.

The standard way to code this would be to take the verb *tell* to quantify over such alternatives and take sentence in (60b) for example to be true just in case in any such world, Mary tells John: ‘you have to go’. This means that in any such *w*, her candidate for herself *a* in *w* said to *u*, who Mary takes John to be in *w*, that *u* should leave.

However, we moved away from such an account in the case of world centers in part to account for the non existence of in principle imaginable attitude verbs. The same considerations apply to the present cases. Indeed, assuming the standard accounts which lexically code the nature of the alternatives the attitude verbs quantify over, it should be possible to have communication verbs such *schtell* where *Mary schtold John to leave* could mean that Mary said to John that someone else than who she thinks John is or could be should leave.

Such verbs do not and cannot exist and should thus be excluded in principle.

To exclude them and reduce the *de te* requirement to the *de dicto omnibus* requirement, the reasoning is parallel to what was done in the world center/*de se* case. We define the

---

it is a subject control verb and it means report information.

- i.
  - a. Marie<sub>m</sub> a dit PRO<sub>m</sub> être prête à Pierre  
    Mary said PRO to be ready to Pierre  
    ‘Mary said to Peter that she was ready’
  - b. Marie a dit d’ PRO être prête à Pierre  
    Mary said PRO to be ready to Pierre  
    ‘Mary told Peter to be ready’

verb *say* as quantifying over triplets (at least)  $\langle a, u, w \rangle$  but simplify the definition of lexically specified accessible alternatives, call them **Pematic**<sup>33</sup> alternatives **Phe**, concerning the nature of the center/author or addressee:

(61) Pematic Alternatives for Mary in  $w$  are defined as:

$Phe_{Mary}^w = \{(a_i, u_i, w_i) | a_i \text{ is the center of } w_i, u_i \text{ is } a_i\text{'s addressee in } w_i, \text{ and } w_i \text{ compatible with what Mary says in } w\}$

Intuitively, Mary must think of John as her addressee. I must have a description of John as who Mary takes to be her addressee, whoever she thinks she is and whoever she thinks John is. That description will hold of PRO since *PRO* controlled by *John*: I take PRO to be who Mary takes her addressee to be, whoever she thinks she is and whoever she thinks John is. This is the *de te* requirement.

Step by step:

1. We want to guarantee that in any  $w_i \in Phe_{Mary}^w$ , there are two individuals  $a_i$  and  $u_i$  such that Mary thinks she is  $a_i$  in  $w_i$  and Mary thinks that  $u_i$  is who she takes John to be in  $w_i$ . In particular, we want to disallow in principle  $u_i$  being anyone who Mary excludes from being John in  $w$ .
2. Assuming this enforced, the *de te* reading would follow if  $PRO = u_i$  in  $w_i$  for any  $w_i$ .
3. I am the control attributing thinker. So the referent of PRO must satisfy all of the descriptions I attribute to its controller that *John* does. So it must satisfy a description that guarantees that  $PRO = u_i$ . This description must be one that says that John is Mary's addressee for Mary whoever Mary thinks that she is or that John is. So it must reference a cognitive property of Mary's, a description that Mary has of John.
4. First the (generalized) Self centering description (58) will hold true:  
 $\forall(a_i, u_i, w_i) \in Phe_{Mary}^w$ , the center  $a_i$  of  $w_i$  is [who Mary believes in  $w$  that Mary in  $w$  is in  $w_i$ ].
5. Next we postulate a candidate description for addressees:  
 $\forall(a_i, u_i, w_i) \in Phe_{Mary}^w$ ,  $u_i$  in  $w_i$  is [who Mary believes in  $w$  that John in  $w$  is in  $w_i$ ]. This is a description that Mary must have of John. Or it could be modified to be a description I have of my own addressee. In addition, to use the verb *tell*, I must believe that John is Mary's addressee, hence that Mary holds true the addressee description of her own addressee.
6. Since I am the control attributing thinker, by the *de dicto* omnibus requirement, the description I have of John, namely as meeting Mary's addressee description, must be true of PRO (since *PRO* is controlled by *John*). In other words, the following is true:  
 $\forall(a_i, u_i, w_i) \in Phe_{Mary}^w$ ,  $u_i$  is who Mary believes in  $w$  PRO in  $w$  is in  $w_i$ .
7. This guarantees *de te* reading.

The *de te* reading is derived if this description of John by Mary is true. And it is. The truth of this description is what prevents the existence of verbs like *schtell*.

Generalizing, the Addressee description we postulate - as counterpart of the Self Centering description for addressee - is the following:

(62) **The Addressee description**  $\Upsilon$ : The description  $\Upsilon_w(\pi, \rho)$  that  $\pi$  has of  $\rho$  in  $w$  holds true of any addressee  $\rho$  of an attitude holder  $\pi$  in  $w$ :

<sup>33</sup> Thanks to David Goldstein for suggesting this term from the Greek word  $\phi\eta\mu\alpha$  meaning 'what is said'.



$\Upsilon_w(\pi, \rho) = \forall (a_i, u_i, w_i) \in Phe_\pi^w$ , the addressee  $u_i$  of  $a_i$  in  $w_i$  is who  $\pi$  thinks in  $w$  that  $\rho$  in  $w$  is in  $w_i$ .

## 5 Mechanism for Control

### 5.1 What is needed

The previous discussion concludes that some unique mechanism should underlie control of OC PROs and NOC PROs (at least the cases of NOC we have explicitly discussed) to yield the *de dicto omnibus* requirement. As mentioned earlier, given the lack of distance restrictions between a controller and an NOC PRO, a mechanism by which PRO is locally lambda abstracted over (as it must) is insufficiently general.

The only independently available mechanism that allows this kind of non local dependencies is covaluation via coreference or binding.

In order to enforce the *de dicto omnibus* requirement, we want PRO to be covalued with its controller for the control attributing thinker  $\pi$ . One option would be to assume that PRO must be the trace of its controller, as proposed in [Hornstein \(1999\)](#). Let first assume that control is never movement. We will discuss Control as Movement in section 5.3.2. For now, let's formulate this requirement as a binding requirement:

(63) Binding of PRO

PRO must be covalued with its controller, that is coreferential with, or bound by, its controller.

Before detailing how this is implemented, I address the following point.

### 5.2 Neither OC nor NOC PRO need be bound

It might appear that this requirement is too weak for OC, which, unlike NOC, generally requires sloppy identity under ellipsis, if this property is assumed to require PRO to be a variable bound by its controller, cf. [Landau \(2013\)](#). The required sloppiness however follows from the independently required obligatoriness of control in OC (driven by a lexical property of the control verb). Thus, *Jean veut PRO partir et Mary aussi/ John wants PRO to leave and Mary does too* ~~*want PRO to leave*~~ must be read as sloppy because PRO in the second conjunct must be OC-ed by Mary, not because PRO is a bound variable.<sup>34</sup> This can be seen in the following type of examples:

- (64) de PRO<sup>1</sup> dormir 8 heures par nuit est bon pour la santé.  
to PRO<sup>1</sup> sleep 8 hours every night is good for health.  
C'est pourquoi Jean essaye de PRO<sup>2</sup> dormir 8 heures par nuit  
That's why Jean tries (to) PRO<sup>2</sup> sleep 8 hours every night

PRO<sup>1</sup> is not a bound variable (it is an arbitrary PRO or is controlled by the implicit possessor of *health*), PRO<sup>2</sup> cannot be a bound variable either: there is no lambda in the

<sup>34</sup> The same remark applies to example (78) of ([Landau, 2013](#), p. 30): in *Only Peter claimed PRO to be the winner*, the focal alternatives are of the form *x claimed PRO to be the winner* where x obligatorily controls PRO: consequently only a sloppy reading is available.

antecedent clause to copy in the elision site.  $PRO^2$  is interpreted as coreferential with *Jean* because of the OC requirement.

Or, after Landau 2013, p. 233 example (454a) repeated here as (65):

- (65) John<sub>k</sub> thinks that [PRO<sub>k</sub><sup>1</sup> behaving himself] will please his mother, and she<sub>m</sub> does too ~~think that [PRO<sub>k</sub><sup>2</sup> behaving himself] will please her.~~  
So to please his mother, his brother Mike<sub>p</sub> tries to ~~PRO<sub>p</sub><sup>3</sup> behave himself.~~

PRO<sub>k</sub><sup>2</sup> is read strictly as Landau 2013, p. 233, reports. So neither it, nor PRO<sub>k</sub><sup>1</sup> is a variable bound by *John*. Yet PRO<sub>p</sub><sup>3</sup> must be read as coreferential with *Mike*. This can't be because it is a bound variable given that the antecedent of the elided constituent contains no such variable.

A similar point can be made on the basis of:

- (66) John wants to PRO<sup>1</sup> sleep in every morning. Mary thinks that not to PRO<sup>2</sup> ~~sleep every morning~~ would improve his health.

Were PRO<sup>1</sup> a variable bound by *John*, it is unclear how PRO<sup>2</sup> could be read strictly (i.e. interpreted as referring to *his*).

I conclude that OC PRO must be coreferential with its controller and may but need not be treated as a variable bound by its controller.

Note also that, contrary to what Landau 2013, p. 233 example (255), reports (citing Chierchia and Jacobson, 1986), pronominal anaphora does not generally require sloppiness. Thus, *Jean veut PRO partir et Mary le veut aussi/ John wants PRO to leave and Mary wants it too* is meaningwise fairly tolerant: it can mean that Mary wants John to want to leave, or that Mary wants to leave or, crucially, that Mary wants John to leave, a strict reading.

## 5.3 Control is of concepts

### 5.3.1 Anaphoric concepts

Take the following sentences in the usual scenario.

- (67) a. Oedipus<sub>k</sub> expects PRO<sub>k</sub> to punish the killer.  
b. Antigone thinks that Oedipus<sub>k</sub> expects PRO<sub>k</sub> to punish the killer.

In the first, the speaker (me) is the control attributing thinker T. In the second, Antigone is. What we want to achieve is that Oedipus and PRO be coreferential (or more generally covalued) for T. I will now informally describe how to reach this result.

Assume that the theory of controller choice, whatever it is, requires that controller DP<sub>1</sub> and controllee DP<sub>2</sub> be coindexed as shown above. (In NOC, controller choice is contextually determined, with some constraints). We would have to interpret this coindexation as one holding for T.

If PRO and its controller are coreferential for T, this means that whichever way T thinks about Oedipus, T will think about the denotation of PRO this way too. This will include contingent properties T attributes them as well as non context dependent descriptions (such as the self centering description discussed earlier, or the error free descriptions

discussed in section 6) which hold necessarily, not contingently, hence derive *de se*-ness.

For T these entities are instances of the same concept.<sup>35</sup>

To get this result, I propose the following:<sup>36</sup>

Assume that Control uses a special kind of world dependent variable which is anaphoric, let us notate one such index  $\iota_{@w}$ : the world variable it contains being anaphoric must be bound in the smallest domain in which it can. Example (67b) would receive the following representation, where we also encode the fact that the verb *think* quantifies over worlds (and assignment functions):

(68) Antigone thinks  $\lambda w$  Oedipus $\iota_{@w}$  expects  $PRO\iota_{@w}$  to punish the killer

Because of control,  $\iota_{@w}$  on *Oedipus* and on *PRO* must have the same value, namely must map onto the same individual at the world  $w$ . Furthermore, the smallest domain within which the world variable inside  $\iota_{@w}$  can be bound is the clause embedded under *think*: in other words, *PRO* and its controller must map onto the same individual for Antigone, as desired. In effect  $\iota_{@w}$  is a function from worlds to individuals, hence a concept.<sup>37</sup>

That (67a) or (67b) involves OC is only relevant in the choice of controlling concept. In NOC, the controller is given in other ways but the derivation will otherwise proceed in the

<sup>35</sup> So, if DP<sub>1</sub> controls DP<sub>2</sub>, one description (whether implicit as with e.g. proper names, or explicit if the DP is a definite description) must uniquely identify the denotation of DP<sub>1</sub> in the right way or else it is not clear who the sentence would be talking about.

<sup>36</sup> The first use of concepts in treatments of control is found in Hornstein and Pietroski (2010) to encode the mandatory *de se* requirement. Their approach is conceptually close to the present proposal and we discuss it below. Note also that Landau (2015) uses the notion of concept (via a concept generator) in his treatment of OC control under attitudes, ultimately to *lexically* encode the mandatory *de se* requirement observed in such cases, so differently from the usage we make of this notion. However, there are some similarities: He takes PRO in OC under attitude predicates to be bound by the author coordinate of the context over which this predicate quantifies, as we do, but how we reach this result is different. As noted earlier, he takes PRO to be lambda abstracted over, the lambda expression being saturated by (a syntactic projection of) this author coordinate. This cannot handle *de dicto omnibus* cases which are not *de se*, or NOC cases, *de se* or not. We need not project any context coordinate syntactically, and we in fact argue in section 6 that such projecting overgenerates possible interpretations.

<sup>37</sup> A detour through Hungarian also shows the relevant properties of the control relation are independent of whether the controllee is silent or not. Szabolcsi (2009) shows that in Hungarian, obligatory control allows the controllee to be overt. Szabolcsi (2009) remarks that an overt pronoun in such OC constructions is possible only if this pronoun is modified (e.g. by *only* or *too*). In effect these OC cases with *only* exemplify cases of Partial Control and provide a way to check whether partial control is only available with attitudinal OC verbs as claimed in e.g. Pearson 2016.

i. Context: A group of friends boards a crowded bus that has only one vacant seat.

Senki nem akart csak ő leül-ni  
Nobody not wanted-3SG only he/she sit-INF  
Nobody wanted it to be the case that only he/she takes a seat

In such a case this controlled pronoun must, as Marta Abrusán notes, be read *de se* as well :

ii. A(z amnéziás) hős nem akart csak ő kap-ni érdemrend-et  
the amnesiac hero not wanted-3SG only he get-INF medal-ACC  
The (amnesiac) hero did not want: ‘only I get a medal’ only *de se*

This leads to Abrusán’s *Observation about de se Pronouns*: The overt pronoun in the subject position of infinitival control complements is interpreted exclusively *de se*. So mandatory *de se*-ness can’t be a property just of controlled silent elements like PRO: it is also a property of obligatorily controlled overt pronouns (in appropriate contexts). In other words, the properties of controlled elements seems not to be an intrinsic property of these elements, rather it seems to be a property induced by the **control relation** itself.

same way.

- (69) a. Oedipus $\iota_{@w}$  thinks [that [after PRO $\iota_{@w}$  having been punished ] the plague will disappear ]  
 b.  $\lambda w$  (Oedipus $\iota_{@w}$  thinks in  $w$  [ [after PRO $e\iota_{@w}$  having been punished ] the plague will disappear ]

Finally, it is worth noting that the gist of the discussion of reflexives in Sportiche (2019) is that Binding of reflexives uses a similar kind of index  $\iota_{@w}$ , with the difference that the world variable in it is pronominal rather than anaphoric, and therefore may, but need not be most locally bound.

### 5.3.2 Control and Movement

The proposal we end up with is conceptually closest to that found in Hornstein and Pietroski (2010) with which I will do a brief comparison.<sup>38</sup> Hornstein and Pietroski 2010's proposal:

1. treats PRO as a trace/copy of its controller in OC, and assumes therefore that they must instantiate the same individual concept (the value of a concept generator at the same individual) and thus map to the same individual.
2. posits that this individual concept is a first personal one for the controller hence for PRO, thus deriving the mandatory character of *de se* reading in simple cases.

This treatment agrees with the present proposal in some ways but not others.

First, as a technical matter, we agree that control is of concept but not that PRO itself is a concept. Rather we take PRO to be the argument of a concept because there are cases in which this argument is not a PRO but a realized pronoun (as in Hungarian, cf. footnote 37).

Second, the postulated concept cannot generally be a first personal one for three reasons.

1. The first reason is the existence of *de te* cases which shows that being first personal is insufficient: sometimes, a second personal concept is needed. Other similar cases (e.g. *de nunc*) require further concepts.
2. The second reason is the existence of the non attitudinal or inanimate cases where no first personal concept is involved: what matters is that the control attributing thinker has the same conception of both controller and controllee.
3. The third reason is related to the first two and it holds if we are right that the *de se* or *lit de te...* requirements are sub cases of the *de dicto omnibus* requirement. Under this view, the former does not arise because PRO is a first personal concept or the second because PRO is a second personal concept. It arises because the control attributing thinker has the same conception of both the controller and the controllee: in some cases, this conception relates to the fact that all individuals have a particular first personal concept of themselves (self-centering), but in other cases, there is no such concept (e.g. with inanimates or non attitude OC cases).

Third, and relatedly, their postulated concept is not specified as to who holds it while we take it to be held by the control attributing thinker. This is a crucial difference. This is

<sup>38</sup> Thanks for Paul Pietroski for directing me to this work

not needed under [Hornstein and Pietroski's 2010](#) proposal because it takes PRO and its antecedent to be in a movement relation: concept identity follows. As movement is (Re)Merge, a trace and its antecedent are one and the same syntactic object thus must denote the same element for all because it is exactly as if there was a single DP: there is only one common denotation possible for the pair.

This points to a way in which a movement theory of control would be compatible with what was discussed here:

Whenever a structural configuration allows control to be movement and control is movement, the *dicto omnibus* requirement will fall out of the antecedent and PRO being two occurrences of the very same syntactic object, hence be the same concept of the same object. In case the antecedent is an attitude holder and controls a PRO, mandatory *de se*-ness of PRO will arise due to self centering.

Some factors have been argued to preclude control as movement: first, the existence of split or partial control in OC.<sup>39</sup> Or the fact that the controller/PRO distance in NOC cases is not subject to movement constraints.

Whenever a structural configuration does not allow control to be movement - this would generally be the case for NOC, for OC cases without c-command of the controllee by the controller, OC control into tensed clauses, possibly when control is partial or split, etc.. - PRO will have to be treated as an anaphoric concept as we have suggested. This would mean that there are two independent ways to *de dicto omnibus*, not a theoretically parsimonious option but one not excluded. In other words, there well may be compelling reasons never to take control to be movement, or always to take OC control to be movement but they would have to be based on other considerations.

## 6 Going further?

Just like all previous treatments in terms of centered worlds, ours postulates two distinct *de se* ascriptions in controlled PRO configurations:

The first, Ascription<sub>1</sub>, is that in any of some attitude holder  $\pi$ 's modal alternatives (doxastic, bouletic, phematic, etc...), which is a centered world  $\langle a, w \rangle$  meeting some accessibility conditions,  $a$  is  $\pi$ 's *de se* counterpart in this world. The second, Ascription<sub>2</sub>, is that PRO controlled by (the expression returning)  $\pi$  refers to  $\pi$ 's *de se* counterpart in this world. In effect, we derive Ascription<sub>2</sub> from Ascription<sub>1</sub>, by having PRO pick out the world's center. This property attribution is *de se* because the self-centering description stipulates it. Can Ascription<sub>1</sub> be derived too?

We now explore whether we can do away with this stipulation. One idea is that the world center pronoun is actually a PRO, another is that it is a trace.

### 6.1 One more step: Centering as control?

The first idea is that world centers are PROs in syntactic representations.

To account for the distribution of first and second person reflexives in English, [Ross \(1970\)](#) proposed that every declarative clause is embedded under an abstract performative verb

<sup>39</sup> Note that Split Control cannot be a species of hidden exhaustive control. Thus, in the sentence uttered by Juliet: *Romeo m' a proposé de nous suicider* / *Romeo proposed to me to commit suicide*, the presence of the 1st person plural intrinsic reflexive clitic *nous* requires the subject to be a plural meaning *Romeo and me*.

like ‘I declare to you that...’. But there is no a priori reason why the form of such an analysis could not be generalized to some embedded clauses.

Let’s generalize a version of Ross’s hypothesis to **all** embedded structures under attitudes, say CPs (although gerunds are probably categorially different).

1. Begin with a case of a simple transitive attitude like *croire/believe*. Such an embedded clause CP will now be introduced by a (small) clause like structure (which introduces a center/author, and also a place, a time, and possibly an addressee) for example:

$$(70) \quad \pi \text{ believes (in } w^*) [ \lambda w \text{ a } \mathbf{X} \text{ in } w \text{ s.t. } [\textcolor{blue}{PRO} \text{ to be in Bear Canyon (in } w) ] ]$$

where  $a$  is the center of the world, and the embedding predicate (in a literal implementation of Lewis, 1979)  $X$  is meant to convey something like ‘be in a world such that’.<sup>40</sup>

2. Define the accessible modal alternatives relative to an attitude  $\tau$  for attitude holder  $\pi$  in  $w^*$ :

$$(71) \quad \text{For } \tau \text{ some attitude, } \pi \text{ the attitude holder, addressee present or not depending on } \tau:$$

$$ACC_{\pi, w^*}^\tau = \{ (a, u, w) \mid a \text{ is the center of } w, u \text{ is } a\text{'s addressee in } w, \text{ and } w \text{ is } \tau\text{-compatible for } \pi \text{ in } w^* \}$$

3. Modify the self centering description (as shown by the part in red) to yield the **Error Free Self** description as follows:

$$(72) \quad \text{The Error Free Self description } \mathcal{E}_{w^*}(\pi, \pi):$$

$$\mathcal{E}_{w^*}^\tau(\pi, \pi) = \forall (a, w) \in ACC_{\pi, w^*}^\tau, [ \pi \text{ in } w ] \text{ is [who } \pi \text{ thinks in } w^* \text{ that } \pi \text{ in } w^* \text{ is in } w]$$

Instead of stating that **the center** of an accessible alternative of  $\pi$ ’s is who  $\pi$  thinks  $\pi$  is in this alternative, we state  $\pi$ ’s cognitive property as meaning that  $\pi$  is not mistaken about who he is in an hypothetical situation; he indeed is who he thinks he is.<sup>41</sup>

4. Assume now that in (70),  $a$  is syntactically a *PRO*, notated  $\textcolor{red}{PRO}_a$ , obligatorily controlled by the attitude holder.

$$(73) \quad \pi \text{ believes (in } w^*) [ \lambda w [ \textcolor{red}{PRO}_a \text{ be in } w \text{ s.t. } [\textcolor{blue}{PRO} \text{ to be in Bear Canyon (in } w) ] ] ]^{42}$$

5. My being the control attributing thinker leads me to

<sup>40</sup> Languages using verbal elements as complementizers, e.g. *say*, should be informative in this respect, see Major (2019).

<sup>41</sup> This is related to discussions in the philosophical literature about transworld identity, rigid designation and in relation to direct reference (see e.g. LaPorte (2018)) and recalls the discussions of the property of “immunity to error through misidentification” that (roughly) “internal” access to oneself displays, see for example Prosser and Récanati (2012) for recent discussion. My identifying myself *de se* in a situation imagined by me - the Self Centering description - is “internal” access, it does not transit through perception - and thus can’t fail.

<sup>42</sup> When *believe* takes a finite clause complement as below in (ia), the corresponding structure is as in (ib):

- i.
  - a.  $\pi$  believes that Mary left
  - b.  $\pi$  believes (in  $w^*$ )  $[ \lambda w [ \textcolor{red}{PRO}_a \text{ be in } w \text{ s.t. } [\text{Mary left (in } w) ] ] ]$

- (i) take the error free description of  $\pi$  by  $\pi$  to be true and consequently
  - (ii) conclude that the error free description of  $\text{PRO}_a$  by  $\pi$  to be true as well.
- $a = \text{PRO}_a$  will now mandatorily inherit the description  $\mathcal{E}_{w*}(\pi, \pi)$  yielding:  $\mathcal{E}_{w*}(\pi, \text{PRO}_a)$ :
- $\mathcal{E}_{w*}(\pi, \text{PRO}_a) = \forall w \in \text{ACC}_{\pi, w*}^\tau, [\text{PRO}_a \text{ in } w] \text{ is } [\text{who } \pi \text{ thinks in } w* \text{ that } \pi \text{ in } w* \text{ is in } w]$
- Where  $\tau$  is *croire/believe* and  $\text{ACC}_{\pi, w*}^\tau$  is  $\text{Dox}_{\pi, w*}^{\text{croire}}$ .
- This says that the center  $a = \text{PRO}_a$  of this alternative must be  $\pi$  for  $\pi$ , that is, must be read *de se*.
6. Note Self centering still holds but is derived now. It is derived from the (cognitively) necessary truth of  $\mathcal{E}$  and from a syntactic property: the center of accessible alternatives is a PRO obligatorily controlled by the attitude holder.
  7. But it should be clear now that in (73), what makes  $\text{PRO}_a$  be read *de se* also makes  $\text{PRO}$  be read *de se* just because it is obligatorily controlled by  $\pi$ . There is no need for any direct relation between the two PROs. They are interpreted as they are because of the control relation holding between each of them and the controller.

If this is on the right track, two further questions arise for which I have no answer (but see section 6.5)

- (i) why must the syntactic positions of  $\text{PRO}_a$  and  $\text{PRO}$  be limited to hosting PROs? The case of  $\text{PRO}$  is a standard question about PRO's distribution, with unclear answers. The case of  $\text{PRO}_a$  could be assimilated to that of  $\text{PRO}$  if the syntax of complementation can be assimilated to an (ungoverned) infinitive or small clause structure.
  - (ii) why must these PROs be obligatorily controlled by **this** controller? This could plausibly falls under theories of obligatorily control such as Farkas (1988) which tries to relate the choice of controller to who is responsible for the state of affairs described by the controlled clause. Since what is being talked about is the content of someone's thoughts, it seems reasonable to take that the thinker is the proximate responsible party.
- Turn now to verbs of communication such as *tell, say to, ....*

1. With verbs of communication, the simplest would be for there to be an OC controlled PRO that stands for the addressee  $u$  and is controlled by the main clause addressee. At the same time, as the embedded clause expresses an attitude of the (reported) speaker, there has to be a second PRO centering the Phematic alternatives on who that speaker thinks he is.
2. We would therefore need for the embedding verb to select a different complement structure:

$$(74) \quad \pi \text{ told } \rho \text{ (in } w*) \text{ } [\lambda w \text{ } [\text{PRO}_u \text{ is the goal of } \text{PRO}_a \text{ saying in } w \text{ s.t. } [\text{PRO} \text{ to leave (in } w)]]]]$$

Where  $\text{PRO}_a$  is controlled by  $\pi$  and is thus interpreted as the center of the Phematic alternatives.  $\text{PRO}_u$  (and  $\text{PRO}$ ) should be controlled by  $\rho$  and be interpreted as the addressee of  $\text{PRO}_a$  in  $w$ .

3. We take  $\pi$ 's phematic alternatives in  $w*$  to meet the template in (71) and we modify the addressee description as we did the self-centering description to:

$$(75) \quad \text{The Error Free Addressee description } \Upsilon: \text{ The description } \Upsilon_{w*}(\pi, \rho) \text{ that } \pi \text{ has of } \rho \text{ in } w* \text{ holds true of any addressee } \rho \text{ of a potential attitude holder } \pi \text{ in context } w*:$$



$\Upsilon_{w*}(\pi, \rho) = \forall(a, u, w) \in Phe_{\pi}^{w*}, [\rho \text{ in } w]$  is [who  $\pi$  thinks in  $w*$  that  $\rho$  in  $w*$  is in  $w$ ].

If  $\rho$  is the addressee of  $\pi$  in  $w*$ , and  $\rho$  controls  $PRO_u$ , then  $\Upsilon_{w*}(\pi, PRO_u)$  will hold, making it the addressee of the embedded context.

One difficulty here is syntactic as we postulate two distinct PROs (within the same minimal clause), each obligatorily controlled: this is not a configuration that is independently attested, in particular OC of  $PRO_a$  above. Either this means that this syntacticization is not warranted, or that OC PRO can have a wider distribution that usually assumed, or that the syntax is not as we have sketched it.

A speculative way to overcome this syntactic problem could take the following form: inspired by a construction extensively discussed in [Gluckman \(2018\)](#) illustrated below:

(76) [This book]<sub>m</sub> took John<sub>k</sub> three hours [ e<sub>m</sub> [ PRO<sub>k</sub> to read t<sub>m</sub>]]

As [Gluckman \(2018\)](#) shows, the infinitive involves wh-movement (as in *tough*-construction cases) to e<sub>m</sub>, which must take *this book* as antecedent, while PRO must be controlled by *John*. If we assume that e<sub>m</sub> is a PRO, this ends up being a double OC situation. We could thus modify the syntax of (74) as follows, with movement of PRO<sub>u</sub>:

(77)  $\pi$  told  $\rho$  (in  $w*$ ) [  $\lambda w$  [PRO<sub>a</sub> [**PRO<sub>u</sub> is the goal of t<sub>a</sub> saying in  $w$  [PRO to leave (in  $w$ )]]]]]**

Needless to say, much would remain to be clarified, e.g. why the A-bar movement of PRO<sub>a</sub> must be strictly local (the author of this context can't come from an embedded clause), although such a restriction is not specific to this case (as it applies for example in tough movement in French, e.g.).

## 6.2 *de nunc* as a species of *de te*

We have restricted our attention to the center of accessible modal alternatives, or addressee when there is one. But as should be clear, a contextual parameter of evaluation ranging over such alternatives should include (at least) a time coordinate and a location coordinate encoding for a given alternative, the time or location at which the attitude holder places herself in this alternative. Just like with centers, there are cases of *de nunc*, that is temporal *de se* attitudes. Consider the following case from [Anand, 2006](#), p.16-17 (attributed to K. von Fintel) to test for obligatory *de se*. Just like an attitude holder can have an attitude about someone who is actually him without knowing that it is about him (thus a non-*de se* thought), an attitude holder can have an attitude about the actual time of the attitude without knowledge that it's about the time of the attitude (thus, a non-*de se* thought).

(78) John wakes up at 4 a.m., hears a dripping noise, and says to himself "It's raining." He also thinks it's 3 a.m.  
At 4 a.m., John believed it to be raining.

This sentence is true. John's belief held at 4 a.m. for the speaker, but at 3 a.m. for him. He would consider true the statement 'it was raining at 3 a.m.' but possibly false the statement 'it was raining at 4 a.m.'. This means that attitude verbs quantify over times, and that for each of his doxastic alternatives, the value of the time coordinate in this alternative (which is what John thinks the time is in this alternative) must be the time at



which the truth of the attitude is evaluated. To guarantee this under a binding view, we could generalize the standard treatment of centers, addressees etc., that is, assume that the infinitive clause is introduced by a  $\lambda t$  binding the  $t$  variable of the infinitive and have the attitude verb quantify over alternatives with a time coordinate.

Or we could generalize our treatment of *de te*. Without going into details, we could:

1. Postulate that an attitude holder  $\pi$  holds a necessary description of the time at which any if its doxastic alternatives holds: the time at which it holds is the time at which  $\pi$  thinks that it holds.
2. Represent times as DPs, and as a PRO the time at which the infinitive is evaluated.
3. Make the event time of the attitude a controller of the PRO encoding the time at which the infinitive is evaluated.
4. A-bar move from this PRO to make this PRO locally controllable as we did in the *de te* case.

### 6.3 Still one more step: Immunity to Error<sup>43</sup>

We postulated that speakers are not and cannot be mistaken about who they think they are or about the identity of the addressee(s) of who they think they are in their doxastic alternatives. But this immunity to error is completely general: one can be mistaken about the world but one can't be mistaken about the content of one's thoughts, or about what one feels.

If I imagine a situation in which I am somewhere at some time talking to someone, I cannot be mistaken in my thoughts about who, where or when I am in this imagined situation, or who I am talking to. In other words, the Error Free Self or Addressee descriptions need not be postulated: they follow from a more general cognitive property: a thinker is immune to error in relation to the content of his thoughts, and in particular, of his modal alternatives. This immunity to error is thus what ultimately would underlie the *de se*, *de te*, *de nunc* readings.

### 6.4 Properties or Propositions?

As mentioned earlier, there are good grounds for thinking that holding an attitude, say a belief attitude, requires attributing oneself a *de se* property. This underdetermines the semantic type of the complement clause of an attitude verb. Under approaches taking attitude verbs to quantify over centered worlds, the semantic type of this complement is indeed a property of the attitude holder(s) (and of their addressee(s) for communication verbs) as we had assumed prior to section 6.

However, if we pursue the line developed in this section, attitude verbs do not quantify over tuples including authors and addressees (and presumably times, locations etc.), they just quantify over sets of worlds - which happen to be centered (include an addressee, etc...) - the semantic type of this complement is that of a proposition. Still, the attitude holder, e.g., attributes herself a property *de se* because this complement necessarily contains a individual pronoun, the world center, which must refer to the attitude holder, hence attributes it a property.<sup>44</sup>

<sup>43</sup> Thanks to Carolyn Anderson for raising this point.

<sup>44</sup> How the truth conditions of (36) and similar examples are computed would have to be slightly modified from footnote 24. The sentence will end up having the following representation (cf. section 5.3.1 for how this is achieved) where PRO is the same concept for the speaker as that returning Oedipus or the

## 6.5 Difficulties with Centering as Control, or as Raising

Now suppose we reduce the relation between an attitude holder and the center of her modal alternatives to a control relation as shown below in (79b) instead of as in the earlier approach (79c) (where, recall,  $a$  is the value of a function of  $w$  because of self centering):

- (79) a. Erica believes that Matt left  
 b. Erica believes (in  $w^*$ ) [  $\lambda w$  [ **PRO be in  $w$  s.t.** [Matt left in  $w$  ] ]  
 c. Erica believes (in  $w^*$ ) [  $\lambda w$  [ [Matt left in  $(a, w)$  ] ]

In principle, **PRO** must be Erica *de se* because I, as the control attributing thinker, attribute Erica the Error Free Self Description which PRO inherits. But suppose we embed these sentences one step:

- (80) a. Lucy thinks that Erica believes that Matt left  
 b. Lucy thinks that Erica believes (in  $w^*$ ) [  $\lambda w$  [ **PRO be in  $w$  s.t.** [Matt left in  $w$  ] ]  
 c. Lucy thinks that Erica believes (in  $w^*$ ) [  $\lambda w$  [ [Matt left in  $(a, w)$  ] ]

Now Lucy is the control attributing thinker and is committed to having the same conception of Erica and of **PRO**. But not me.

This means that this sentence could be truthful even if I do not believe that the center of Erica's modal alternatives is not her, or is her but not *de se*. This possibility arises because the attribution by me to Erica of the Error Free Self description does not percolate to **PRO**. But such a situation is impossible. The right representation of the sentence should make it so. Note that representations (79c) and (80c) (without PRO) have the right property because the identity of  $a$  in  $w$  derives from the self centering description which every thinker holds true of every other thinker so everyone believes that Erica's modal alternatives are centered on her *de se*.

This may mean that the relation between an attitude holder and the center of her modal alternatives is not a relation of control.

A conceivable alternative is that the control relation is more demanding than we have assumed. Recall that we have taken controlled elements to be anaphoric concepts as below:

- (81) a. Lucy thinks [  $\lambda a \lambda w$  G(Erica <sub>$k$</sub> )<sup>Lucy</sup> believes **PRO <sub>$k$</sub>**  ... Matt left ]  
 b. Lucy thinks [  $\lambda a \lambda w$  G(Erica <sub>$k$</sub> )<sup>Lucy</sup> believes ANA( $e_k$ ) <sup>$\alpha$</sup>  ... Matt left ]  
 c. Lucy thinks [  $\lambda a \lambda w$  G(Erica <sub>$k$</sub> )<sup>Lucy</sup> believes G(Erica <sub>$k$</sub> ) <sup>$\alpha$</sup>  ... Matt left ]  
 d. Lucy thinks [  $\lambda a \lambda w$  G(Erica <sub>$k$</sub> )<sup>Lucy</sup> believes G(Erica <sub>$k$</sub> ) <sup>$a$</sup>  ... Matt left ]

We could derive the desired result by postulating that an anaphoric concept must always

---

center of his doxastic alternatives)

- (i) [  $_{CP_0}$  Oedipe [  $_{VP}$  croit [  $_{CP_1}$   $\lambda w_i$ . SC <sub>$w_i, Oedipus$</sub> ( $w$ ) mériter un châtime<sup>nt</sup> in  $w_i$  ] ] ]  
 where the embedded C introduces abstraction over worlds.

$\llbracket VP \rrbracket^{g,w} =$  (by intensional function application)  
 $\llbracket croit \rrbracket^{g,w}(\lambda w_i. SC_{w_i, Oedipus}(w) \text{ deserves punishment in } w_i) =$   
 $\lambda x. Dox_{x,w} \subseteq \{w' : SC_{w_i, Oedipus}(w) \text{ deserves punishment in } w_i\}$   
 Hence:  $\llbracket CP_0 \rrbracket^{g,w} = Dox_{Oedipus,w} \subseteq \{w' : SC_{w_i, Oedipus}(w) \text{ deserves punishment in } w_i\} =$   
 $\forall w' \in Dox_{Oedipus,w}, \text{ the center of } w' \text{ deserves punishment in } w'$   
 The center of  $w'$  is who the first person pronoun picks out in it. Since Oedipus does not actually think he is the killer, he does not ascribe to all who he thinks he may be the property of truthfully saying 'I deserve punishment': (39) is false.

inherit at least all the non contingent descriptions true of the antecedent of its argument. Among these, I have a description of Erica according to which she is Error Free about who she is in her modal alternatives. When inherited by  $PRO_k$ , this would make the sentence untrue if I do not believe she is the center *de se* of her modal alternatives. Another way to proceed is to take the syntactic relation in (79b) or (80b) not to be a relation of control, but to be a movement relation, a raising relation:

- (82) a. Erica believes that Matt left  
 b.  $Erica_k$  believes [ $_{CP}$   $t_k$  C [ $_{TP}$  Matt left ]]  
 c.  $Erica_k$  believes (in  $w*$ ) [  $\lambda w$  [  $t_k$  be in  $w$  s.t. [Matt left in  $w$  ] ]

Under a movement analysis (in exhaustive control cases), PRO and its antecedent are two occurrences of **exactly the same syntactic object**. These two occurrences have to denote the same object not only for the control attributing thinker, but for other thinkers too: the DPs *Erica* and its trace  $t$  have exactly the same internal structure<sup>45</sup> and therefore exactly the same interpretation for all.

Although the exact syntax of this approach are not entirely clear, this assumption perhaps shows better compatibility with standard syntactic hypotheses about the distribution of raising and control constructions. Thus, while the subject of a TP in a CP is the typical host position for PRO (an ungoverned position in GB terms), we expect the subject of a CP complement or the subject of a TP complement of a V as in ECM cases or raising to subject cases (CP deletion or transparency cases) not to be able to host a PRO (as these are positions governed by the higher verb in GB terms).

But a difficulty for a movement approach arises when we consider ways of syntactically introducing dependent clauses of attitudinal predicates other than with (obvious) complementation. Consider for example:

- (83) a. According to John, *griffins roam free in deeper levels of this cave*  
 b. In John's thoughts, *griffins roam free in deeper levels of this cave*

In both cases the italicized clause denote modal alternatives (possibly phematic in the first, doxastic in the second). Minimally, we should treat them as arguments of *according* or of *thoughts* and coarguments of *John* although how exactly to achieve this syntactically is not immediately obvious. The problem is of that *John* does not surface c-command the clausal argument so movement from the periphery of the clause to the overt attitude holder's position looks unavailable. Other options are conceivable but a discussion would have to be too extensive for the present article.

## 7 Conclusion

1. I report an observation about how the relation between a PRO and its controller are interpreted, the *D(e) D(icto) O(mnibus)* requirement. It says: PRO and its antecedent denote the same concept for the Control Attributing thinker - CAT.
2. DDO is an observation I do not derive, although it seems possible to construe controllees in such a way that DDO holds.
3. DDO holds of all control relations (so this is not about centered worlds specifically because of non attitude cases).

<sup>45</sup> I ignore here the possible effects of trace conversion as in Fox (2002) which do not affect the conclusions.

4. Attitude predicates do not quantify over centered worlds, just worlds. They take propositional complements.
5. PRO is directly anteceded by its antecedent (I argue not necessarily bound, on empirical grounds, but binding is of course possible under the right circumstances). Hence agreement.
6. *de se* in OC and NOC comes from PRO and its antecedent being the same concept for CAT because of the Self Centering description (possibly reduced to immunity to error regarding their own thoughts) that people have of themselves, hence that everyone believes that everyone has of himself (this is not linguistic, just how we think about ourselves and others). The content of this description is that:
  - (a) any individual takes the the center of any of his doxastic alternatives to be him *de se*, and therefore (theory of mind):
  - (b) any thinker (including CAT) takes x to be the center of any of x's doxastic alternative *de se*, hence (because of DDO) if "x" controls PRO:
  - (c) CAT takes PRO (Controlled by "x") to be the center of any of x's doxastic alternative *de se*.
7. If this is right, there are three contributions:
  - (a) a descriptive one: DDO
  - (b) an analytical one: *de se* is not (and cannot be) due to a lexical property. It arises because of a non linguistic cognitive property.
8. What is missing:
  - (a) what determines the controller
  - (b) how to truly derive DDO, which would require deriving why controllees have to be anaphoric concepts, and why these elements distribute as they do.

## 8 Appendix: non *de se* in NOC?

Various authors report that, in properly set up cases, that is within attitude contexts, NOC PRO need not be read *de se*. Does this contradict what was concluded here? I think the answer is negative. I will discuss two cases, one from [Hornstein \(1999\)](#) and one from [Landau \(2013\)](#). ([Hornstein, 1999](#), p.73) reports the following:

- (84) a. The unfortunate expects PRO to get a medal.  
b. Only Churchill remembers PRO giving the blood, toil, tears and sweat speech.

In (84), a *de se* ascription is mandatory. Thus the first one is false if the unfortunate is an amnesiac not realizing ‘I will get a medal’. The second is true as as nobody but Churchill can remember ‘I gave the blood, toil, tears and sweat speech’.

But the next two sentences yield the opposite judgments, true for the first one, false for the second.

- (85) a. The unfortunate believes that PRO getting a medal would be boring.  
b. Only Churchill remembers that PRO giving the blood, toil, tears and sweat speech was momentous.

Indeed, for example, the last sentence “is consistent with the notion that many people other than Churchill recall that the BST speech was momentous”, as Hornstein writes. Hornstein paraphrase is exactly right: the speech was momentous, regardless of who gave it. This reading is available because this is NOC: PRO in (85) need not be controlled by the subject of the main clause, it may be read as ‘arbitrary PRO’ or  $PRO_{arb}$ . Closer paraphrases of the sentences in (85) are:

- (86) a. The unfortunate believes that for anyone to get a medal would be boring.  
b. Only Churchill remembers that anyone giving the blood, toil, tears and sweat speech was momentous.

These entail the following:

- (87) a. The unfortunate<sub>k</sub> believes that for him<sub>k</sub> to get a medal would be boring.  
b. Only Churchill<sub>k</sub> remembers that <sub>k</sub> giving the blood, toil, tears and sweat speech was momentous.

In order to decide whether such examples contradict our finding regarding the *de dicto* requirement on NOC PRO, we need to guarantee that we are dealing with a case of control by the subject of the main clause, the easiest case being a case of exhaustive control of PRO by this subject.

([Landau, 2013](#), p. 32 and 234) reports a very similar case:

- (88) Hacked Computer scenario: John’s computer has been hacked, and some secret files have been copied from it by a business competitor. John’s company holds an urgent meeting to decide on the necessary measures. John has no idea that his own computer was the one that was hacked, but he is determined to punish any careless workers who failed to protect their computers against malicious attacks.

In this scenario, [Landau \(2013\)](#) reports the following judgements: (a) is false but (b) may be true.

- (89) a. John<sub>k</sub> insists on [PRO<sub>k</sub> being punished] only *de se*: False  
 b. John<sub>k</sub> insists that [PRO<sub>k</sub> being punished] will prevent similar hacks *de se*: False;  
*de re* True

We see the same confound: PRO in the second sentence can be understood as PRO<sub>arb</sub>, hence entail that John being punished will prevent similar hacks.

We need to control away from this possibility, e.g. by guaranteeing exhaustive control of PRO by *John*. As sentences with PRO<sub>arb</sub> always have generic flavor (see [Moltmann, 2006](#)), one strategy is to try to make the infinitive receive an episodic interpretation. So suppose we modify the scenario as follows:

- (90) Hacked Computer scenario: John's computer has been hacked, and some secret files have been copied from it by a business competitor. John does not realize that his own computer was hacked. He is determined to punish any careless workers who failed to protect his computer against malicious attacks; he decides to impose a financial penalty on the culprit and instruct accounting to fine him - himself, he does not realize. The next day he holds a meeting at which (where we independently know that the reflexive can be read non *de se*, cf. [Heim, 1994](#)) he insists that the fact that he punished the culprit will act as a deterrent.
- a. John<sub>k</sub> insists that [PRO<sub>k</sub> having punished himself<sub>k</sub> yesterday] will prevent similar hacks False  
 b. John<sub>k</sub> insists that [him<sub>k</sub> having punished himself<sub>k</sub> yesterday] will prevent similar hacks True

Native speakers (I consulted) judge the first sentence as false: PRO must be read *de se*. Crucially, they also report that replacing PRO by a pronoun is true as in is true, as in previous cases of PRO/pronoun alternations.<sup>46</sup>

We can further corroborate these judgments by modifying the scenario as follows.

- (iv) Corrupt chief scenario: Don, the police chief, is lecturing his officers because newspapers have reported that an unnamed officer was involved with shady characters. He insists that the culprit should keep his nose clean from now on to prevent further bad publicity and refers to a similar previous incident in which he insisted on the same strategy and it worked. The unnamed officer was Don himself, although he never realized it, unlike Mel, one of the officers, who did.
- (v) Mel reports:  
 a. (i) Don<sub>k</sub> had insisted on [PRO<sub>k</sub> keeping his<sub>k</sub> nose clean ] only *de se*: False  
 (ii) Don<sub>k</sub> had insisted on [him<sub>k</sub> keeping his<sub>k</sub> nose clean ] *de re non de se* possible: True  
 b. Don<sub>k</sub> (now) insists that  
 (i) [PRO<sub>k</sub> having kept his<sub>k</sub> nose clean] prevented further harm only *de se*: False  
 (ii) [him<sub>k</sub> having kept his<sub>k</sub> nose clean] prevented further harm *de re non de se* possible: True

In (b), the use of the idiom *keep one's nose clean* together with the episodic interpretation of the infinitive forces PRO to refer back to Don only. And the result is an incorrect report of Don's attitude. An overt pronoun being able to be read *de re* only yields true sentences.

<sup>46</sup> Thanks to Idan Landau for pointing this out.

The same is true of French in comparable cases using the idiom *garder ses distances* although the pairs PRO/pronoun are not as minimal as in English:

- (91) French
- a. (i) Don<sub>k</sub> affirme [PRO<sub>k</sub> avoir gardé ses<sub>k</sub> distances] only *de se*: False  
(ii) Don<sub>k</sub> affirme qu' [il<sub>k</sub> a gardé ses<sub>k</sub> distances] *de re non de se* possible: True
- b. Don<sub>k</sub> affirme que  
(i) le fait d' [PRO<sub>k</sub> avoir gardé ses<sub>k</sub> distances] avait limité les ennuis only *de se*: False  
(ii) le fait qu' [il<sub>k</sub> ait gardé ses<sub>k</sub> distances] avait limité les ennuis *de re non de se* possible: True

In conclusion, when the proper control relation is enforced, PRO must be read *de dicto omnibus* or *de se*, depending on the configuration.

Several questions remain. Exhaustive control is not the only option both in OC cases, with embedding attitude verbs, and it is legitimate to ask what happens when control is not exhaustive. I will not discuss this here but the findings reported here remains relative to each control relation: a partial controller of a PRO must be in a *de dicto omnibus* relation with whatever part of PRO it controls.

We may finally now wonder whether, even in the PRO<sub>arb</sub> case, PRO has to be read *de dicto omnibus* in some sense. Moltmann (2006) shows that with arbitrary PRO (as well as generic *one*), an agent ascribes a property to each one in the domain "as if to himself", that is, while projecting himself onto everyone in the domain. For example, a speaker describes a particular experience (or a particular frequency of experiences) which he recognizes as generalizable to others, abstracting from particularities of his own situation. I think that the denotation of PRO must be understood as necessarily including the agent himself *de se* for him although this needs further discussion (cf. Moltmann, 2006).

## References

- Anand, P. (2006). *De de se: MIT dissertation*. Ph. D. thesis, MIT Cambridge, MA.
- Cappelen, H. and J. Dever (2013). *The inessential indexical: On the philosophical insignificance of perspective and the first person*. OUP Oxford.
- Castañeda, H.-N. (1967). Indicators and quasi-indicators. *American philosophical quarterly* 4(2), 85–100.
- Charnavel, I. (2013). Locality and logophoricity: A view from French anaphors. To appear in *Linguistic Inquiry*. Available at <http://ling.auf.net/lingbuzz/002683>.
- Charnavel, I. (2019a). Apparent exemption from condition A: a perspective-based theory. Available at <http://ling.auf.net/lingbuzz/002683>.
- Charnavel, I. (2019b). *Locality and Logophoricity: A Theory of Exempt Anaphora*. Oxford Studies in Comparative Syntax. Oxford University Press.
- Chierchia, G. (1987). Anaphora and attitudes de se. In B. van Bartsch and E. van Boas (Eds.), *Language in Context*. Dordrecht, Netherlands: Foris.
- Chierchia, G. (1990). Anaphora and attitudes de se. In B. van Bartsch J. van Benthem and P. van Emde Boas (Eds.), *Semantics and contextual expression*, pp. 1–32. Dordrecht, Netherlands: Foris.
- Chierchia, G. and P. Jacobson (1986). Local and long distance control. In *Proceedings of the North Eastern Linguistic Society 16*, pp. 57–74. UMASS (ed.): Amherst, MA: GLSA Publications.
- Chomsky, N. (2005). Three factors in language design. *Linguistic Inquiry* 36(1), 1–22.
- Farkas, D. F. (1988). On obligatory control. *Linguistics and Philosophy* 11(1), 27–58.
- Fox, D. (2002). Antecedent-contained deletion and the copy theory of movement. *Linguistic Inquiry* 33(1), 63–96.
- Gluckman, J. (2018). *Perspectives on Syntactic Dependencies*. Ph. D. thesis, UCLA.
- Heim, I. (1994). Puzzling reflexive pronouns in *de se* reports. Unpublished Handout.
- Hintikka, J. (1969). Semantics for propositional attitudes. In J. W. Davis, Hockney, and Wilson (Eds.), *Philosophical Logic*, pp. 21–45. Reidel.
- Hornstein, N. (1999). Movement and control. *Linguistic Inquiry* 30(1), 69–96.
- Hornstein, N. and P. Pietroski (2010). Obligatory control and local reflexives. *Movement theory of control* 154, 67.
- Kripke, S. (1972). Naming and necessity. In D. Davidson and G. H. Harman (Eds.), *Semantics of Natural Language*. Dordrecht: Reidel.
- Kripke, S. (2013). *Reference and Existence: The John Locke Lectures for 1973*, Oxford University. Oxford University Press.



- Landau, I. (2013). *Control in generative grammar: A research companion*. Cambridge University Press.
- Landau, I. (2015). *A two-tiered theory of control*, Volume 71. MIT Press.
- LaPorte, J. (2018). Rigid designators. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Spring 2018 ed.). Metaphysics Research Lab, Stanford University.
- Lebeaux, D. (1984). Anaphoric binding and the definition of pro. In *Proceedings of NELS*, Volume 14, pp. 253–274.
- Lewis, D. (1979). Attitudes de dicto and de se. *The philosophical review* 88(4), 513–543.
- Major, T. (2019). Revisiting the syntax of monsters in Uyghur. ms. UCLA.
- Moltmann, F. (2006). Generic one, arbitrary PRO and the first person. *Natural Language Semantics* 14(3), 257–281.
- Morgan, J. (1970). On the criterion of identity for noun phrase deletion. In *In Papers from the Sixth Regional Meeting of the Chicago Linguistic Society*, pp. 380–9. CLS. Chicago.
- Pearson, H. (2015a). Attitude verbs. In L. Matthewson, C. Meier, H. Rullmann, and T. E. Zimmermann (Eds.), *to appear in Companion to Semantics*. Wiley. Available at the semantics archive.
- Pearson, H. (2015b). The interpretation of the logophoric pronoun in ewe. *Natural Language Semantics* 23(2), 77–118.
- Pearson, H. (2016). The semantics of partial control. *Natural Language & Linguistic Theory* 34(2), 691–738.
- Perry, J. (1977). Frege on demonstratives. *The Philosophical Review* 86(4), 474–497.
- Prosser, S. and F. Récanati (2012). *Immunity to error through misidentification: New essays*. Cambridge University Press.
- Reuland, E. (2018). Governing Binding: How far does syntax reach? Presentation at the Workshop on Anaphoricity and Logophoricity, Harvard University, September 2018.
- Ross, J. R. (1970). On declarative sentences. *Readings in English transformational grammar* 222, 272.
- Safir, K. (2010). PRO and subject of NP and de se. Rutgers University.
- Schlenker, P. (1999). *Propositional Attitudes and Indexicality: A Cross-Categorical Approach*. Ph. D. thesis, MIT.
- Schlenker, P. (2003). A plea for monsters. *Linguistics and philosophy* 26(1), 29–120.
- Schlenker, P. (2011). Indexicality and de se reports. *Semantics: An international handbook of natural language meaning* 2, 1561–1604.
- Sharvit, Y. (2011). Covaluation and unexpected BT effects. *Journal of Semantics* 28(1), 55–106.

- Sportiche, D. (2019). Binding, relativized. ms, UCLA.
- Stechow, A. v. (2003). Feature deletion under semantic binding. In M. Kadowaki and S. Kawahara (Eds.), *Proceedings of the North East Linguistics Society*, Volume 33, Amherst, Massachusetts, pp. 377–403. Graduate Linguistic Student Association: University of Massachusetts at Amherst.
- Sundaresan, S. (2010). A reductionist treatment of control and anaphora. cited in Landau (2013) as to appear in a special issue of Scientific Cyprus Journal on Theoretical and Applied Linguistics, Kleanthes Grohmann (ed.).
- Szabolcsi, A. (2009). Overt nominative subjects in infinitival complements in hungarian. In M. den Dikken and R. M. Vago (Eds.), *Approaches to Hungarian*, Volume 11, pp. 251–276. John Benjamins.