Deriving de re blocking effects

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This paper presents and attempts to account for novel empirical data from English in which the de re blocking effect–that an obligatorily de se anaphor cannot be c-commanded by its de re counterpart–is attested. I argue that at least some instances of the de re blocking effect cannot be accounted for via syntactic accounts, contra Percus and Sauerland (2003b) and Anand (2006). Via experimental evidence, it is shown that the de re blocking effect takes place with passives and across clause boundaries with certain predicates but not with others, and in a completely local configuration with PRO. Given the difference between blocking with PRO and the other kinds, I argue that there are at least two different kinds of de re blocking effects. I propose that some instances of blocking may involve lexical restrictions on thematic relations between de se and de re counterparts.

Keywords: de re, de se, de re blocking effect, dream, PRO, control, theta-roles

1 Introduction

I will begin with a reminder of what it means for an attitude to be de se: a notion that has been discussed in detail in works such as Lewis (1979), Chierchia (1990), Anand (2006) and Pearson (2018), among many others. Take a context in which Caitlin looks into a mirror to dress up for an event and she thinks to herself "wow, I look beautiful." Paired with such a context, it is felicitous to use (1) below; after all, this is the usual way in which a sentence like (1) would be read. As such, the pronoun *she* in (1) is a pronoun read de se; such pronouns are interpreted from the first-personal perspective of the attitude holder, which is *Caitlin* in (1). In other words, *Caitlin* self-attributes the property of being beautiful to herself.

(1)   Caitlin believes that she looks beautiful.

A sentence like (1) seems prima facie to be acceptable, however, even if Caitlin is not self-attributing the property of being beautiful to herself. Take a context in which a photo of Caitlin had been taken before the date; decades have passed since the photo was taken, and Caitlin has gone senile. She sees the photo of herself and thinks "wow, the girl in that photo is beautiful!" rather than "I look beautiful." These two beliefs are different, even though the two pronouns end up referring to the same person. Under such a context, *she* in (1) would be read de re. In contrast to one read de se, it is not interpreted from the first-personal perspective of *Caitlin*.

With the de se vs. de re distinction in mind, we now have the theoretical tools needed to help understand the intricacies that arise with the predicate *dream*. This predicate is interesting as it shows that we can take the first-personal perspective of someone else; in other words, we can

experience the world in someone else's shoes. Imagine that you have a dream in which you are Biden during the 2020 election, and Biden beats Trump in the dream. Under such a context, it is felicitous to use (2), even though you, the reader, are most likely not Biden in the real world.

(2)   I dreamed that I was Biden and I defeated Trump.

This shows that it is possible for you to have the perspective of Biden in dream-worlds. Biden, then, is your *dream-self*, a notion we will be coming back to throughout this paper. But as Lakoff (1972) has pointed out, even if your dream-self is Biden, it is possible for your bodily counterpart to appear in the dream, but in the third-person. Let us call this your *real-self*. Imagine that your real-self is running for President, and Biden, your dream-self, is running for Vice President; your real-self beats Trump in the dream. (2) can be felicitously paired with such a context.

The dream- and real-selves can therefore be different, leading to interesting semantic consequences. A dream-self need only be a mental counterpart to you, while your real-self need only be a bodily counterpart. Of course, in most dreams, mental and bodily counterparts overlap. But we have seen that the first-person pronoun can refer to either the mental or the bodily counterpart. Furthermore, given that in the dream, the mental counterpart is just the one which you have the first-personal perspective of, this is also your de se counterpart. The bodily counterpart is your de re counterpart. In other words, the first-person pronoun which refers to the dream-self is pronoun read de se, while one which refers to the real-self is read de re.

Percus and Sauerland (2003b) points out an asymmetry that arises when we have two pronouns, one referring to the dream-self and the other to the real-self, in the same sentence, like in (3) in which one pronoun c-commands the other. They note that there are three possible readings while one is dispreferred. We will be focusing on the readings in bold, 2 and 4, in this paper:[1]

(3)   **Possessor blocking:** I dreamed that I was Trump and I kissed my daughter.
        Possible reading 1: In the dream, Trump kissed Ivanka. (de se kissed de se's d)
        Possible reading 2: In the dream, Trump kissed my daughter. (**de se kissed de re's d**)
        Possible reading 3: In the dream, I kissed my daughter. (de re kissed de re's d)
        Less plausible reading 4: In the dream, I kissed Ivanka. (**de re kissed de se's d**)

Let us call this instance "possessor blocking." Such contrasts have been verified experimentally by Pearson and Dery (2013) via picture choice tasks, though I use context-sentence pairs instead in this paper. Anand (2006) expands this to configurations like *I kissed me*, which are unacceptable unless in *dream*-contexts, as Arregui (2007) points out. Principle B does not apply here. With *I kissed me*, we obtain the same contrast as in (3) above: we again find that (4) is best paired with a context in which the dream-self (de se) is the one kissing the real-self (de re).

(4)   **Generic blocking:** I dreamed that I was Biden and I kissed me.
        Possible reading: In the dream, Biden kissed me. (de se kissed de re)
        Less plausible reading: In the dream, I kissed Biden. (de re kissed de se)

Let us call such instances "generic blocking." We will get further into the details of each account in the next section, but the generalization, following Anand (2006), seems to be more general than just *dream*, as such contrasts arise in other languages as well, with constructions that have

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[1]Gennaro Chierchia (p.c.) points out that reading 33, involving two real-selves, seems to be unacceptable as well. The judgments are indeed difficult; I share this judgment as well. This is worth investigating, but I must leave it open to future research; I am narrowing my focus to configurations 2 and 4.

other obligatorily de se anaphors. So Anand defines the *de re blocking effect* as follows: an obligatorily de se anaphor cannot be c-commanded by its de re counterpart.

Works such as Percus and Sauerland (2003b) and Anand (2006) have attempted to come up with accounts for this–ranging from movement and agreement to an independently defined binding constraint–but I will argue that neither can account for the novel pieces of data presented in this paper. My goal in this paper is simple: I will show that *there are at least some instances of the de re blocking effect which cannot be accounted for via syntactic accounts that appeal to c-command or locality*. I will propose that at least some instances of the de re blocking effect arise due to lexical restrictions that predicates have on de se and de re counterparts.

For example, let us take (4) and invert the position of the pronouns–by passivizing the embedded clause. Experimental evidence indicates that we have the same blocking configuration as in (4); the existing accounts which rely on syntactic constraints would predict the opposite pattern:

(5)   **Passive blocking:** I dreamed that I was Biden and I was kissed by me.
Possible reading: In the dream, Biden kissed me. (de se kissed de re)
Less plausible reading: In the dream, I kissed Biden. (de re kissed de se)

Another example involves a configuration where blocking seems to arise even if the two pronouns are not in the same clause, as long as they are semantically connected.[2] Empirical evidence indicates that blocking does not arise in configurations like *I said that I ate a Big Mac*; I propose this is because *fire* is a performative utterance:

(6)   **Blocking across clauses:** I dreamed that I was Biden and I said that I was fired.
Possible reading: In the dream, Biden fired me. (de se vs. de re)
Less plausible reading: In the dream, I fired Biden. (de re vs. de se)

We will refer to such instances as "blocking across clauses." Anand's definition of the de re blocking effect predicts such asymmetries might arise outside of the same clause, but Percus and Sauerland (2003b), for example, cannot straightforwardly derive blocking outside clause boundaries. Furthermore, the fact that this blocking is lexical cannot be derived by either account.

Interestingly, Anand's definition of the de re blocking effect predicts another novel observation made in this paper, that has nothing to do with *dream*: a pronoun read de re cannot c-command PRO. As Chierchia (1990) points out, PRO cannot be read de re and must be read de se. What makes this sentence interesting is that, although PRO is interpreted de se in this sentence, it is from the first-personal perspective of a de re referent of a pronoun–which from now I refer to as a *de re counterpart*. Nothing should go wrong. Yet (7) is judged as unacceptable in English:

(7)   **PRO blocking:** Caitlin is a genius at playing soccer, but she has lost her memories due to hitting her head. She sees a video of a girl, also named Caitlin, playing soccer beautifully on Youtube, and in a post-game interview, the girl says that she wants to win a medal in a tournament next year. The video was taken just a few days before she lost her memories. Caitlin does not recognize the girl as herself, but is very impressed with her, and believes that the girl in the video will win a medal next year.

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[2]One might object to the asymmetry in (48), and claim that it arises because of the verb *fire*: as we associate Biden with a position of power and the ability to fire people. I will discuss this point further in section 3, but experimental data indicates that this same asymmetry arises even with predicates like *kiss*, where it is equally natural to think of Biden kissing the real-life self. The verb *fire* was used due to its unique lexical semantics, as will be discussed in section 4.2.

Caitlin thinks that she wants to win a medal.

Let us refer to such instances as "PRO blocking," which seems to arise when there are two attitude verbs present: the matrix predicate, and the control predicate in the embedded clause. This is similar to the asymmetry in (48), but with one crucial difference: in (48) the pronoun read de se is de se with respect to the matrix subject, and the pronoun read de re is de re with respect to the matrix subject. But in (7), although the de re pronoun is again de re with respect to the matrix subject, PRO is de se with respect to the pronoun read de re, and *not* the matrix subject. As such, locality is not a problem. Given this difference, it seems difficult to derive the de re blocking effect in each case via the same theoretical constraints.

After providing the empirical foundation for the instances of blocking above, I explore an alternative, lexical approach to de re blocking, in which I propose that blocking may also arise due to thematic restrictions that predicates place on their arguments. I suggest that for conceptual reasons, it is more plausible for de se counterparts to be Agents, and de re counterparts to be Themes. I also discuss whether PRO blocking may be unified with my lexical approach.

The paper is structured as follows. In Section 2, I introduce the reader to the concepts needed to fully understand the paper. Section 3 provides experimental evidence that the de re blocking effect actually does take place in the instances of blocking seen above, based on two experiments. I also introduce a novel instance of blocking not discussed above, involving possessors. Section 4 proposes an analysis of the blocking effects discovered in section 3. I discuss further consequences of this data: for example, the de re blocking effect with PRO is novel evidence for the existence of PRO, and Chierchia (1990)'s semantics for control and de se. Section 5 concludes.

2 Background

The goal for this section is to give the necessary background to understand the data and analysis in sections 3 and 4 respectively. I first introduce the reader to the primary semantics for pronouns read de se that will be used in this paper in 2.1, and discuss an alternate approach. I provide a brief introduction to de re semantics in terms of concept generators in 2.2. I then go into detail on two of the papers mentioned in the introduction prior: Percus and Sauerland (2003b) in 2.3, and Anand (2006) in 2.4.

2.1 The semantics of de se

It is clear that (1) has different truth-conditions depending on whether the pronoun is read de se or de re. Therefore, (1) has a different semantics based on which kind of pronoun is present: but how exactly does it differ? I must first provide the background on some necessary notions.

Centered worlds are pairs <w, x> consisting of a possible world w and an entity x present in w. Imagine that we are presenting the matrix subject, say Caitlin, pairs of worlds and entities (in other words, centered worlds) and asking them whether they could be entity x in world w. The centered worlds to which Caitlin would say yes to are called the *doxastic alternatives*, often used in the semantics for a predicate like *believe*:

(8) $\mathbf{Dox}_{x,w} = \{<w', y>:$ it is compatible with what x believes in w for x to be y in w'$\}$

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We will get into the denotation of *believe* in the next subsection. In a semantics for de se attitude reports like Lewis (1979)'s, the de se LF of (1)–*Caitlin believes that she looks beautiful*–is as follows. This LF states that Caitlin consciously self-ascribes the property of looking beautiful:

(9) $\forall <x,w'> \in \mathbf{Dox}_{\text{Caitlin, w}}$: x looks beautiful in w'

This LF will not hold in a de re scenario, because Caitlin does not identify herself in those centered worlds. Now, we can see that *she* can be interpreted either de se or de re. But some anaphoric elements are *obligatorily* read de se. For example, this is the case for PRO, as Chierchia (1990) notes in his account of de se, inspired by Lewis (1979). It cannot be read de re, indicating that PRO is an obligatorily de se anaphor:

(10)   Jack is a high school student who has lost all of his memories. He watches a video of a high school student solving a very difficult math problem in front of all of his classmates, and the teacher congratulates that student. Jack thinks to himself "that student is very clever!" But that student is actually Jack himself, though Jack doesn't know it.

         # Jack claimed to be clever.

To derive the necessity of this reading, Chierchia used a lambda abstractor base-generated into the left-periphery of the embedded clause; PRO itself is a bound variable:

(11)
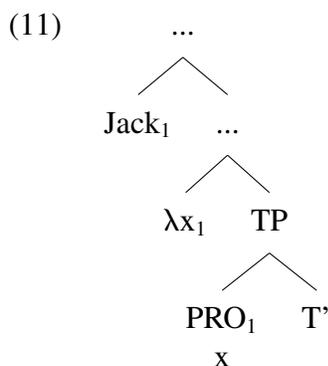
Abstraction operators bind coindexed variables at LF just in case they are of the same type. The matrix subject itself does not bind PRO; PRO is bound by an individual abstractor. The lexical entry for *claim* is given in (12), where (12b) is the embedded clause built-up from the bottom up and (12c) is the matrix clause:

(12)   a. $[\![\text{claim}]\!]^{c,g} = \lambda P_{<e,<st>>}\lambda x_e\lambda w_s.\forall <w',y> \in \mathbf{claim}_{x,w}$: P(y)(w') where $\mathbf{claim}_{x,w} = \{<w',y>$: what x claims in w is true w' and x identifies herself as y in w'$\}$

       b. $[\![\text{CP}_2]\!]^{c,g} = \lambda x.\ \lambda w.\ x$ is clever in w

       c. $[\![\text{CP}_1]\!]^{c,g} = \lambda w.\ \forall <w',y> \in \mathbf{claim}_{\text{Jack,w}}$: y is clever in w'   (Pearson, 2015, p. 82)

This semantics is based on Hintikka (1969)'s semantics for attitude reports where the content of an attitude is not a set of worlds. Chierchia and Pearson's semantics makes it possible for one to bear an attitude de se towards a property just in case that property is self-ascribed. This is because the attitude predicate quantifies over centered worlds rather than worlds. We need not always use doxastic alternatives in the lexical entry for attitude verbs: for example, for *claim*, these are the sets of *claim*-alternatives <w',y> such that it is compatible with the attitude holder saying she is y in w'.

Again, the definition given in (12) entails that the attitude holder would be willing to refer to the person in the *claim*-alternative worlds as herself, and this is not the case in a de re scenario.

Chierchia's account is one of the major LFs given for de se binding in the literature. But another is worth discussing briefly, too. As Lewis (1979), Schlenker (2005) and Anand (2006) among others suggest, de se ascription could just be a kind of de re ascription with a special self-identity acquaintance relation, rendering the approach just seen potentially superfluous:

(13)   Caitlin$_i$ wants of herself$_i$, under self-identity, [$_{CP}$ she$_i$ is beautiful.]

This account differs from the one above in that Chierchia has a dedicated LF for de se binding. In this account, the de se reading is reduced to the same LF as de re, for which we will discuss a treatment of concept generators in the next subsection. Therefore, de se-as-de re readings involve a concept generator as well, so under this account, de se is called a special kind of de re. Furthermore, this indicates that complements of attitude predicates are propositions rather than properties, contra the account just seen, where a property is de se if it is self-ascribed.

Although this seems to reduce de se to de re and may seem like a desirable consequence, several have noted that this approach makes incorrect predictions, and is not enough on its own. This has led some authors, such as Anand (2006), to argue that the property and the concept generator approach to de se LFs are both needed to account for the presence of the de re blocking effect with *dream* but not with other predicates. The presence of blocking with PRO supports Anand's point. Similarly, Pearson (2018) has argued that de se as de re cannot account for counterfactual reports involving counter-identity, and dedicated de se binding is needed for these instances. We now discuss the LFs of de re readings.

2.2   Concept generators for de re LFs

The semantics of de re attitudes has been discussed in great detail in the literature. But for our purposes it suffices to discuss the notion of a *concept generator*, which allows for the DP associated with the res to remain in situ–the res being the individual the de re attitude is about. As Anand (2006) and Charlow and Sharvit (2014) have pointed out, it is problematic to assume that the res moves covertly. I will then assume, following Percus and Sauerland (2003a) that de re attitude ascription involves concept generators, which has been further defended by Anand (2006) and Charlow and Sharvit (2014).

I define concept generators as follows, following Charlow and Sharvit (2014):[3]

(14)   G is an acquaintance-based concept generator for x in w iff:

    a.   G is a function from entities to centered concepts of type <e, <s, <e, e>>>

    b.   For all y, G(y) is an acquaintance-based y-concept for x in w

A concept generator is a function which takes a res as an argument, and outputs a centered concept, which is a function from a centered world to an entity.[4] It is therefore a function of type <e,

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[3]The notion of what it means for a concept generator to be acquaintance-based is not too relevant for us. This notion is based on Lewis (1979); an acquaintance-based relation is one which stands in to one's experience. For example, the individual that "the girl x saw the photo of in w" is the unique one Caitlin has the acquaintance relation "saw the photo of" in w. In the de re context, this individual ends up being Caitlin.

[4]Here I am not following Percus and Sauerland (2003a) in assuming that de re readings are based on concepts of type <s, e>. As such, concept generators are of type <e, <s, e>. I instead follow Charlow and Sharvit (2014), Pearson

<s, <e, e>>>. For example, if (1) is paired with the de re context provided, then *Caitlin* may be associated with the following centered concept:

(15)   [λw. λx. the girl x saw in the photo in w]

In concept generators, the centered concept outputs the res when two things are applied to it: the ordered pair of the actual world, and the attitude holder is applied to it. The res itself is embedded covertly in a resP, which contains a variable over concept generators that is abstracted over:

(16)   Caitlin believes that [λG [[$_{resP}$ G she] is beautiful]].

Note that this is simplified: there are two more variables present in the resP that are abstracted over. Percus and Sauerland (2003a) assume, further, that syntactic structures contain variables over possible worlds and abstractors over these variables. In addition, there is also an individual abstractor, and a covert individual pronoun present in the resP, as well.

   All of this ensures that the constituent resP contributes a certain individual; namely the one which is associated with the concept at each of the centered worlds that are quantified over by the attitude predicate. A more precise LF of (1) is given below:

(17)   λw. Caitlin in w believes [λG. λx. λw'. [$_{resP}$ G she w' x] is beautiful in w']

Believe is analyzed a two-place predicate, which takes a concept generator and the attitude holder (ex. *Caitlin*) as an input, and returns a proposition. It is therefore of type <esee, <e, st>>. *Believe* is then an existential quantifier over concept generators, whose denotation is given:

(18) $[\![believe]\!]^{w, g} = \lambda P_{<esee, est>}.$ λx. λw. ∃G: G is an acquaintance-based concept generator for x in w & ∀<w', y> ∈ **Dox**$_{x,w}$: P(G(x))(y)(w') = 1]

Together with this semantics for *believe*, after the LF given in (17) above is fully computed, we are left with the truth conditions as follows:

(19)   λw. ∃G: G is an acquaintance-based concept generator for Caitlin in w & ∀<w',x> ∈ **Dox**$_{Caitlin, w}$: G(Caitlin)(x)(w') is beautiful in w'

We can now provide a semantics for *dream*, following Anand (2006). With this treatment of concept generators in mind, an attitude predicate like *believe* or *dream* is a function which takes functions from concept generators to properties as inputs:

(20) $[\![dream]\!]^{w, g} = \lambda P_{<esee, est>}.$ λx. λw. ∃G: G is an acquaintance-based *selfless* concept generator for x in w & ∀<w', y> ∈ **dream**$_{x,w}$: P(G(x))(y)(w') = 1

The notion of a *selfless* concept generator will be elaborated upon in section 4.3, but the basic idea in *dream*-complements is that a pronoun read de se cannot be a special case of de re. A predicate like *believe* does not require a *selfless* concept generator. So, what is at play with *dream*?

2.3   The Oneiric Reference Constraint

As mentioned in the introduction, the use of dream reports allows us to shed further light on the de se and de re distinction. This is because a pronoun referring to the dream-self, despite clearly

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(2015) among others with my treatment of concept generators with centered concepts here. Centered concepts are of type <s, <e, e>>.

being a different person from the dreamer, is interpreted de se. This entails that a pronoun referring to the real-self in a dream, if distinct from the dream-self, will be de re. I repeat (4) in (21) below, in which we see that the pronoun denoting the real-self cannot c-command the one for the dream-self in the same clause.

(21)   I dreamed that I was Biden and I kissed me.
         Possible reading: In the dream, Biden kissed me. (de se kissed de re)
         Less plausible reading: In the dream, I kissed Biden. (de re kissed de se)

Percus and Sauerland (2003b) note that a sentence like (21) can in fact express two more possibilities than the ones noted above.[5] We have seen that the dream-self may kiss the real-self. Another alternate reading for (21) is that the dream-self kisses himself, or for the real-self to kiss him or herself. These possibilities for (21) are represented below (the real-self in the first person):

(22)   a.   In my dream, the dream-self kisses me. (de se + de re)
       b.   In my dream, the dream-self kisses himself. (de se + de se)
       c.   In my dream, I kiss myself. (de re + de re)
       d.   # In my dream, I kiss my dream-self. (de re + de se)

The only combination of the de re vs. de se forms that is ruled out is the one in which the de re form c-commands the de se form. Their Oneiric Reference Constraint is defined as follows:

(23)   *Oneiric Reference Constraint* (ORC)   (Percus and Sauerland, 2003b, p. 5)
         A sentence of the form *X dreamed that ... pronoun ...* allows a reading in which the pronoun has the dream-self as its correlate only when the following condition is met: some pronoun whose correlate is the dream-self on the reading in question must not be asymmetrically c-commanded by any pronoun whose correlate is X.

Of course, this alone isn't enough to account for the distribution given in (22); we would prefer to explain why the ORC is present. To do so, they make two crucial assumptions. Following Chierchia (1990), they assume that *dream* has a denotation which selects for properties rather than propositions. Their definition is given below:

(24) $[\![\text{dream}]\!]^g = \lambda P. \lambda x. \lambda w. \forall <y,w'>$ in $\textbf{dream}_{x, w}$, $P(y)(w') = 1$.

They further assume that de se pronouns bear a special diacritic, represented by *. This moves the pronoun to the left-periphery of the embedded clause complement of the attitude verb. A lambda abstractor is that binds the trace is inserted by movement, deriving Chierchia (1990)'s semantics of the de se pronoun. The crucial difference is that under this account, the de se semantics is generated via movement, but base-generated on Chierchia's account.

    The blocking effect seen in (22d) is analyzed as an instance of Superiority. The lower de se pronoun, c-commanded by the de re pronoun, cannot move, because the de re pronoun is a closer potential Goal for the probe P:

(25)   * I λf dreamed [$_{CP}$ me* λx H I$_f$ kissed t$_x$]

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[5] As noted section 1, this is actually not the kind of configuration that Percus & Sauerland discuss. They instead discuss configurations of the form *I kissed my daughter*, involving a simple possessive structure as the object of the embedded verb. Anand (2006) expands this to constructions like *I kissed me*, which Arregui (2007) are actually acceptable in *dream*-contexts. I will use Anand's configuration more frequently throughout the paper for simplicity.

The movement constraint explicitly refers to morphological features such as first- or third-person features, noting that there are restrictions on what morphological features a pronoun can have. This can be seen in the contrast in (26): the form of the bound pronoun must match up with the argument of *only*.

(26)   Context: I did my homework, but no one else did his homework.

    a.   Only I did my homework.

    b.   * Only I did his (or her) homework.

This is despite the seeming fact that the morphological features of bound pronouns are not interpreted (ex. the person feature of *my*). It seems that bound variable pronouns must share features with the complement of *only*; they extend this reasoning to de se pronouns in *dream*-complements, as well. As such, the ORC is derived by reference to movement and agreement.

2.4   The de re blocking effect

Anand argues that the ORC just presented is not general enough. He notes that the ORC bears a striking resemblance to an interaction between logophoric and non-logophoric pronouns in Yoruba, first pointed out by Adesola (2006). Ordinary pronouns (*o*-forms) cannot c-command the logophoric pronoun *òun* under coreference–logophoric pronouns are usually obligatorily read de se.[6] This is despite the fact that ordinary pronouns and logophoric pronouns may both co-occur in the same logophoric environment (as the subject of an attitudinal embedded clause).

(27)   Olu$_i$ so pé o$_{*i/j}$ ri bàbá òun$_i$.
    Olu say that 3SG see father LOG
    'Olu$_i$ said that he$_{*i/j}$ had seen his$_i$ father.'

As Satik (2019) shows, *òun* in Yoruba, like PRO, is an obligatorily de se anaphor. The sentence below is not possible if Taiwo does not know that he is referring to himself as fat.

(28)   # Taiwo$_i$ ro pè òun$_i$ sanra
    Taiwo thinks COMP YÈ fat
    'Taiwo$_i$ thinks that he$_i$ is fat.' (intended de re reading, but fine if read de se)

As Anand points out, if we trade the logophoric pronoun for the dream-self (de se) and the ordinary pronoun for the real-self (de re), these two puzzles seem to be the same. As such, he defines the *de re blocking effect* below, which is the most crucial notion for this paper:

(29)   *De re blocking effect*
    No obligatorily de se anaphor can be c-commanded by a de re counterpart.

Based on this, one prediction that we would make is that obligatorily de se logophors in other languages would also undergo the de re blocking effect. This prediction is borne out with *ziji* in Chinese and ordinary pronouns:[7]

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[6]There is at least one exception to this generalization. As Pearson (2015) points out, it is at least the case in Yoruba, but the logophoric pronoun in Ewe is not an obligatorily de se. Satik (2019) provides independent evidence from Yoruba showing that the logophoric pronoun cannot be paired with a de re context.

[7]This is not as simple as I have described; Anand (2006) claims that there are two dialects of Mandarin, and only one shows the blocking effect.

(30) Zhangsan$_i$ renwei Lisi$_j$ gei ta$_i$ ziji$_{*i,j}$-de shu.
      Zhangsan think Lisi give 3SG self-POSS book
      'Zhangsan$_i$ thinks that Lisi$_j$ gave him$_i$ his$_{*i,j}$ book.'   Anand (2006)

Pan (1997) and Huang and Liu (2001), among others, points out that *ziji*, like PRO, is an obligatorily de se anaphor. When paired with a de re context, Huang and Liu (2001) reports that the sentence below is unacceptable:

(31) Zhangsan says: "that thief stole my purse!" without knowing that it is his purse.

   a. # Zhangsan$_i$ shuo pashou   tou-le   ziji$_i$-de pibao.
         Zhangsan say   pickpocket steal-PERF REFL-DE purse
         'Zhangsan$_i$ said that the pickpocket stole his$_i$ purse.'   Huang and Liu (2001)

The notion of a "de re counterpart" is supposed to be inclusive enough to include bodily counterparts with *dream* and ordinary pronouns. We will return to this notion in more detail in section 4. Anand offers another method to derive the de re blocking effect, arguing that it is not via Superiority. He first notes that it seems unclear how Percus & Sauerland's derivation of the ORC via movement and agreement could apply to the cases we have just seen in Yoruba and Chinese without major modifications to their syntactic assumptions.[8]

Under Anand's semantics, *dream* selects for a CP headed by the logophoric operator OP$_{LOG}$, an individual abstractor. Anand's basic idea is that there is competition between two potential binders of de se *me*, as shown below:[9]

(32) I dreamed OP$_{LOG}$ λx I λy I fired me$^{log}_x$. (λx binds *me*, non-local)

(33) I dreamed OP$_{LOG}$ λx I λy I fired me$^{log}_x$. (λy binds *me*, local)

The logophoric operator would skip past the subject to bind the object in the non-local configuration, so this is not preferred over the de re embedded subject binding the de se object. To derive this contrast, Anand appeals to a modification of Fox (2000)'s Rule H, so that de se vs. de re interpretations are not included, allowing it to rule out the non-local configuration:

(34) *Rule H (mod de se, simplified)*
      A variable, x, cannot be bound by antecedent, A, in cases where a more local
      antecedent, B, could bind x and yield the same semantic interpretation.

I now present experimental evidence for blocking being present in novel contexts.

3 Data

In this section, I present the two experiments that provide the empirical foundation for this paper. The introduction to this section will go into detail on what the two experiments have in common. In section 3.1, I present Experiment 1, to establish that there is a blocking effect in the case

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[8] Anand (2006) provides further arguments against this account, but it would be outside the scope of our paper to present it here. He also notes that it would be difficult to extend their account to cases in which the blocking effect is obviated by focus sensitive operators. For example, in a sentence like *John dreamt that only he knew that he$_{de\ re}$* had guessed his favorite color, there is no blocking because of the presence of *only*.

[9] In fact, as we will discuss, the existence of the de re blocking effect with PRO indicates that even the local binding configuration here should be unacceptable.

originally reported in the literature, generic blocking, and the two novel cases: blocking across clauses, which involves blocking past clause boundaries, and passive blocking, which involves inverted blocking in passives. I will also test configurations involving simple possessive structures such as *my daughter* to determine whether de re blocking exists; it turns out that there seems to be one more novel and unpredicted instance of blocking. But all instances involve *dream*.

In 3.2 I present Experiment 2, to establish the blocking effect with PRO blocking, in which a de re counterpart self-ascribes a property via PRO, making it different from the other two cases. As such, both experiments were surveys with context-sentence pairs–a context together with a sentence–and participants were asked to judge the naturalness of a sentence paired with its context, on a Likert scale from 1 (very unnatural) to 6 (very natural). To keep the survey as short and as simple as possible, each survey had no more than seven questions visible to the participant. Furthermore, each survey began with two practice examples explaining the notion of naturalness:

(35)   John and Mary are school kids. John complains that Mary kicked him.

   a. Natural: John said that Mary kicked him.

   b. Unnatural: John said that Mary kicked himself.

Both surveys were on Qualtrics and participants were recruited from Prolific; a custom prescreening for native English speakers was applied to ensure that no one else could take the survey.

To ensure that each survey had the highest quality answers possible, some answers were discarded; the criteria for both experiments was the same. The first criteria was, if the participant gave every context-sentence pair the same score, their answer was automatically discarded. The second criteria was based on the participant's judgment of a baseline sentence.

Baseline context-sentence pairs are used to ensure that participants understand the experiment, and filter out the participants who did not understand it. If a participant gave a naturalness judgment of 2 or 1 on a baseline sentence that is clearly acceptable to native speakers, then the entire set of their answers was automatically discarded. Each of the surveys had such questions. For example, experiment 2 had the following question (among a few others), which is clearly acceptable when paired with its context:

(36)   Caitlin is trying to cook. She decides that she wants to make tomato sauce with pasta. She finds a can of tomatoes in the cupboard and tries opening the can, but fails.

          Caitlin tried to open a can.

Finally, p<0.0001 was determined to be significant. P-values were calculated using the Wilcoxon rank sum test, in which two sets of data are paired, because the responses are on a scale and do not follow a normal distribution.

3.1   Experiment 1: De re blocking effect with *dream*

I investigated the distribution of the de re blocking effect with the predicate *dream*: the main goal was to verify that a de re blocking effect was present, both with the original case of generic blocking and possessor blocking, and the aforementioned novel cases blocking across clauses and passive blocking. This experiment consisted of 2 separate surveys with 100 participants each.

3.1.1 Experimental Design

In addition to context-sentence pairs, pictures such as those in Figure 1 following were paired together with all of the contexts apart from two, to make the experiment more understandable for the participant.

(a) De se vs. de re context   (b) De re vs. de se context
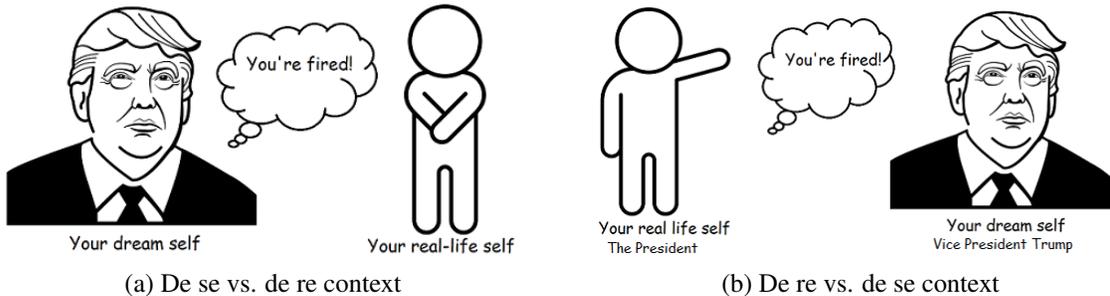
Figure 1: The images used for all of the non-control examples (apart from *kiss*).

The image of Donald Trump was used, and the participant was asked to imagine themselves as Donald Trump in the dream, given that he is a very well-known individual. This experiment had a single control context-sentence pair: "I dreamed I was Donald Trump and I ate a Big Mac." This was also paired with an image. Anyone who gave this pair a 2 or 1 was automatically rejected.

In the first survey, two questions to test generic blocking were asked: "I dreamed that I was Trump and I fired me" was paired with readings in which the dream-self c-commanded the real-self, as seen in (a) of Figure 1, and vice versa, as seen in (b) of Figure 1. Two questions to test blocking across clauses, "I said I was fired" were asked, and paired similarly with Figure 1.

One potential problem with this experiment is using the verb *fire* together with the character of Trump, as Donald Trump is an individual who is associated with firing people. The asymmetry may arise simply because it is difficult for the participant to imagine Trump being fired, rather than doing the firing. To eliminate this possibility, I included 2 questions for a context-sentence pair with the predicate *kiss* rather than *fire*, expecting the results to not differ significantly.

All of the questions of the survey were ordered randomly. Furthermore, not all participants saw every question: there was a 50/50 chance that each participant would see either "I fired me" or "I kissed me." However, all of the participants did see "I said I was fired" and "I was fired by me." This is because, as I will discuss in section 4, the blocking effect in blocking across clauses "I said I was fired" arises due to the unique lexical semantics of *fire*. Furthermore, whether there was a blocking effect in passive blocking "I was fired by me" was also tested; the prediction was that it would still be present, but inverted.

A second survey was also conducted, also with 100 separate participants. The participant could see every question, and they were randomly ordered. Instead of having a single survey with double the number of questions, a second separate survey was preferred to keep the survey as short as possible, as Prolific participants are more likely to lose focus or drop out of the survey if it is too long. This survey, for the most part, had questions involving simple possessive structures like *my daughter*, which I dubbed possessor blocking here. This was the original configuration discussed in Percus and Sauerland (2003b) and the strongest evidence in favor of syntactic approaches like theirs. Here were instances of possessor blocking paired with images:

(a) De se vs. de re context   (b) De re vs. de se context
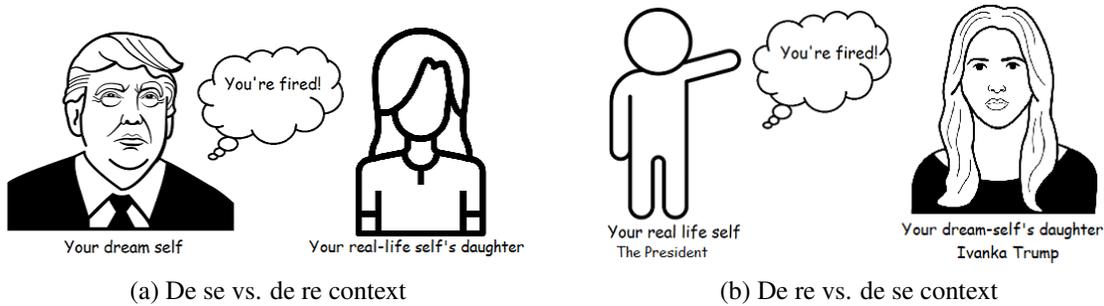
Figure 2: The images paired up with *I dreamed that I was Trump and I fired my daughter*.

Sentences of the form *I dreamed that my daughter fired me*, which I call "inverted possessor blocking" were included as well. Under syntactic approaches to blocking like Percus and Sauerland (2003b) and Anand (2006)'s, the prediction would be that no blocking would occur, and there ought to be no significant difference between these sentences. Indeed, Percus and Sauerland (2003b) discusses such configurations, claiming that both readings below are available:

(a) De se vs. de re context   (b) De re vs. de se context
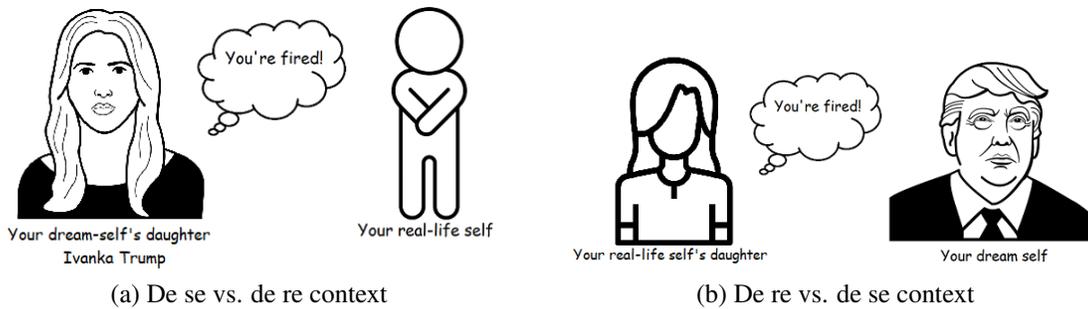
Figure 3: The images paired up with *I dreamed that I was Trump and my daughter fired me*.

Furthermore, given that I am claiming that the de re blocking effect is lexical in *I said that I was fired* and it arises due to the lexical semantics of *fire*, it would be important to test configurations such *I said that I ate a Big Mac*. Syntactic approaches which rely on locality or c-command would predict that blocking would arise regardless of the semantics of the predicate, whereas the lexical approach proposed in this paper–to be detailed further in section 4–would predict blocking would arise regardless. Here is an example of the contexts:

(a) De se vs. de re context   (b) De re vs. de se context
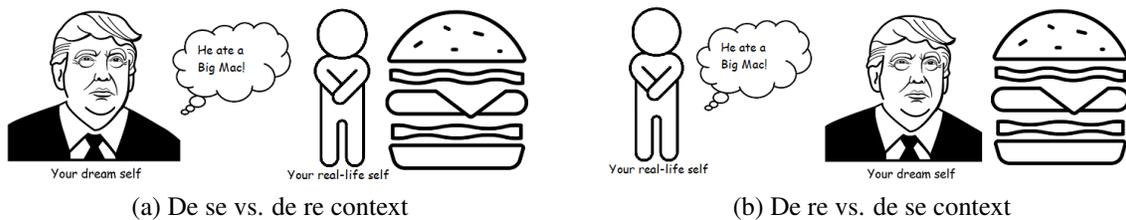
Figure 4: The images paired up with *I dreamed that I was Trump and I said that I ate a Big Mac*.

Based on my thematic approach to blocking, here are my hypotheses:

13

(37)   Total: 9 questions (Survey 1) & 7 questions (Survey 2)
        Each sentence begins with "I dreamed that I was Trump and..."

    a.   Baseline with *dream*: expected to be natural

    b.   "I fired me" (2 questions): the de se vs. de re context-sentence pair is expected to have a higher average than the de re vs. de se context-sentence pair

    c.   "I kissed me" (2 questions): the de se vs. de re context-sentence pair is expected to have a higher average than the de re vs. de se context-sentence pair

    d.   "I was fired by me" (2 questions): the de se vs. de re context-sentence pair is expected to have a higher average than the de re vs. de se context-sentence pair

    e.   "I said that I was fired" (2 questions): the de se vs. de re context-sentence pair is expected to have a higher average than the de re vs. de se context-sentence pair

    f.   "I said that I ate a Big Mac" (2 questions): no meaningful difference expected

    g.   "I fired my daughter" (2 questions): the de se vs. de re context-sentence pair is expected to have a higher average than the de re vs. de se context-sentence pair

    h.   "My daughter fired me" (2 questions): no meaningful difference expected?

I have left a question mark in (37h) above because it has been reported in the literature, such as Percus and Sauerland (2003b), that no blocking is present. But under the thematic approach to de re blocking that I will present in section 4.2, if we extend the account to possessors inside simple possessive structures, we would expect an identical pattern to cases of generic blocking such as "I fired me" above.

3.1.2   Results and Discussion

With the exception of the pattern in *my daughter fired me*, all of these predictions were borne out (the unpredicted result has been put in bold). This experiment was conducted with 100 participants for each of the 2 surveys. In Table 2 below, the column "de se vs. de re average" refers to the sentences that were paired with the image (a) in Figure 1. The "de re vs. de re average" column refers to the sentences that were paired with image (b).

Table 1: A summary of Experiment 2 based on 200 answers. 21 discarded.

Kind of sentence	De se vs. de re average	De re vs. de se average	Significant?
"I fired me"	3.56/6	2.34/6	Yes
"I kissed me"	3.29/6	2.29/6	Yes
"I was fired by me"	3.59/6	2.97/6	Yes
"I said that I was fired"	3.62/6	2.87/6	Yes
"I said that I ate a Big Mac"	3.41/6	3.54/6	No
"I fired my daughter"	4.46/6	3.49/6	Yes
"My daughter fired me"	**3.29/6**	**4.12/6**	**Yes**

My goal is simple. I merely want to show that, when there is a significant difference with the old cases reported in the literature by Percus and Sauerland (2003b), there is also a significant difference with my novel cases. The reader may be confused as to why the difference is so small; normally, in studies that use the Likert scale, we would expect a difference as large as three or

four out of six to represent a meaningful difference. Why should a difference as small as 1/6 or even less in some cases, such as blocking with passives, prove anything? But the judgments here are very difficult. Notice that even with Percus and Sauerland (2003b)'s first reported case of *I fired my daughter* involves a difference of 0.97, which itself is significant (p<0.0001). As such, it is necessary to rely on small differences like this. But what determines whether a difference matters is significance according to the Wilcoxon rank sum test.

For each kind of sentence, the average of the de se vs. de re context and average of the de re vs. de se context were paired and the p-value of the difference was calculated via the Wilcoxon rank sum test. In each instance, the difference between the two scores was significant at p<0.0001, in support of my hypothesis. At the very least, my goal is to show that there is at least a significant subset of English speakers–perhaps the majority–who have blocking effects in these novel cases involving *dream*.

3.2   Experiment 2: De re blocking effect with PRO (PRO blocking)

We now move on to the experiment involving a novel kind of blocking effect. In Experiment 1, we dealt with de se and de re pronouns which were relative to the matrix subject. This time, we are dealing with examples which are completely local: when a de re counterpart self-ascribes a property. I have already given an example of the de re blocking effect with PRO, PRO blocking, in (7), which itself is going to be included in the experiment. Here is another one, in which (38a) is judged as more acceptable than (38b):

(38)   **Case 3:** Jack is a criminal who lost his memories years ago; he once stole a pound of shrimp from a grocery store and was recorded by a surveillance camera while being chased by the police, and in the end he was caught after trying to flee. Years later, he sees a video of himself running from the police on Youtube, not recognizing that it is him in the video. Jack's friend asks him what he is watching, he says that it is a recording of a guy trying to run from the police.

    a.   ? Jack said that he ran from the police.
    b.   # Jack said that he tried to run from the police.

3.2.1   Experimental Design

Sentences like (38a) are what I will call *basic de re* sentences, as they do not have a control predicate or complement. On the other hand, I will continue to refer to sentences like (38b) as PRO blocking, the object of our investigation.

In order to calculate p-values, basic de re examples like (38a) will be paired with PRO blocking sentences like (38b). The answers for the basic de re and PRO blocking will be paired up and its p-value will be calculated with the Wilcoxon test, to determine whether the difference between them is significant at p<0.0001. Why go through this trouble, if native speakers accept basic de re sentences?

I do not believe that the majority of native speakers find basic de re sentences to be fully acceptable–otherwise, our task would be much easier. Although Chierchia (1990), among many other linguists, report basic de re sentences as acceptable, my personal judgment along with the non-linguist speakers that I have consulted is that they are in fact not quite acceptable, but

marginal. PRO blocking itself involves de re pronouns, and this will likely lead to its average score being lower, as well. But this isn't a problem for our investigation of PRO blocking. What matters is this: is PRO blocking significantly worse than basic de re? If so, then this is likely because of a novel instance of local de re blocking. However, there might be a complication.

The comparison between (38a) and (38b) does not involve minimal pairs in terms of syntax: basic de re sentences do not involve the additional syntactic embedding of a nonfinite control complement. As such, one might argue that the difference in acceptability between (38a) and (38b) arises due to the additional syntactic complexity, and *not* due to a blocking effect.

The experiment is designed to help eliminate this possibility. The survey includes three kinds of baseline context-sentence pairs to not only filter out participants which do not understand the survey, but also to determine whether syntactic complexity is actually relevant. Three questions of each of these kinds were in the survey, making a total of 9. Three pairs of the form *Caitlin tried to open a can* paired with a de se context, which I call *de se PRO*, were present in the survey, along with three with a de re context, which I call *de re PRO*. Further, three pairs of what I call *embedded de se PRO* were present. Here is an example:

(39)   Caitlin is trying to make lunch for her sick friend. She tries to open a can of corn and fails, letting her friend know that she tried but couldn't open the can.

Caitlin said that she tried to open a can.

If there is no significant difference in naturalness between simple de se PRO and embedded de se PRO sentences, this would indicate that the addition of additional syntactic complexity (in this case, a finite clause and a phase) does not affect the naturalness judgment of the sentence. In addition to these 9 baseline context-sentence pairs, I also included a total of 3 basic de re pairs and another 3 PRO blocking pairs with non-propositional control complements such as *want*, *try* and *decide*–these are the primary objects of our investigation.

There were two more kinds of context-sentence pairs present in the survey. As Wurmbrand and Lohninger (2019) among others note, some control predicates are propositional while others are not. It would be interesting to see whether the de re blocking effect not only arises with propositional control complements, like in (40a), but also with (40b):[10]

(40)   Boris used to be a famous politician, but he has since become senile. While he was in power, he confessed to having an affair with his mistress on live TV. Boris, years later, sees this same confession on a TV program dedicated to discussing politicians in the past, but does not recognize the politician in the recording as himself.

a. ?? Boris thinks that he admitted to having an affair.
b. ?? Boris thinks that he admitted he had an affair.

The judgments between these two are very difficult to make for native speakers of English. As we will discuss in section 4.4, Anand (2006)'s account, which proposes that there are two paths to de se, would predict that (40b) would be preferable over (40a), given that *she* in a finite embedded clause is not obligatorily read de se.

Here is the layout of the experiment with my predictions. The questions were ordered randomly, and each participant received one of the questions of each of the seven kinds randomly:

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[10]The question marks are meant to represent that the judgments for these sentences are unknown, rather than making a conclusion on their acceptability.

(41) Total: 21 questions, each participant saw 1 of each, total of 7

    a. De se PRO (3 questions): expected to be natural

    b. Embedded de se PRO (3 questions): expected to be natural

    c. De re PRO (3 questions): expected to be unnatural

    d. Basic de re (3 questions): expected to be marginal

    e. De re blocking effect PRO with non-propositional complements (PRO blocking): expected to be unnatural

    f. Complex de re (3 questions): expected to be marginal (?)

    g. De re blocking effect PRO with propositional complements (PRO blocking): expected to be unnatural (?)

3.2.2 Results and Discussion

This experiment was conducted with 140 participants, with the following results:

Table 2: A summary of Experiment 2 based on 126 answers. 14 discarded.

Kind of sentence	Average
De se PRO	5.44/6
Embedded de se PRO	5.25/6
De re PRO	2.32/6
Basic de re	2.80/6
PRO blocking with non-propositional complements	2.04/6
Complex de re	2.44/6
PRO blocking with propositional complements	2.28/6

Most of these predictions were borne out: there was no significant difference between the naturalness judgments for de se PRO and embedded de se PRO (p=0.1878), indicating that the additional syntactic complexity does not significantly influence the naturalness judgments. Furthermore, the difference between basic de re and PRO blocking with non-propositional complements was strongly significant (p<0.00001, when the significance level used in this study is p<0.0001).

Now, it might be claimed that the significant difference between basic de re and PRO blocking with non-propositional complements is not meaningful. The reason is because, in the case of basic de re, this involves a single finite clause. In the case of PRO blocking, this involves a finite clause which has an embedded infinitive as an argument. It might be alleged that the additional syntactic complexity is what leads to the significant difference in judgment, rather than blocking.

To counter this, it is worthwhile to point out that exactly a fourth of the participants (n=35) rated the naturalness of the basic de re pair they were given a 4 or above–the average naturalness score for basic de re pairs was 4.86. On average, these participants rated the PRO blocking pairs with non-propositional complements a 2.86; once again, the difference between these two scores was strongly significant (p<0.00001). In addition, this group did not differ in the significance of their judgments for de se PRO vs. embedded de se PRO (5.51 vs. 5.23, p=0.19), which *does* have the additional syntactic complexity. I believe that complexity is not significant here.

The one exception is that the difference between complex de re and PRO blocking with propositional complements was not significant (p=0.238). But this is not problematic for the existence

17

of the de re blocking effect with PRO. On the contrary, it is likely that the relative unacceptability of the complex de re pairs arose due to semantic complexity. If there truly are two paths to de se, then it might be too difficult for the participant to tease these apart in their judgment of the naturalness of these pairs. Or if there is just one path to de se–Chierchia's path–then the unnaturalness of this pair would be expected. It is likely that the experimental method used in this paper is not strong enough to help the participant tease these two options apart; I leave this open for future research.

4 Analysis

The goal of this section is to present an account of the data discussed in section 3 and discuss the predictions and consequences of the analysis. I argue that neither Percus and Sauerland (2003b) nor Anand (2006) are able to account for any of the novel cases of blocking presented in the section prior in 4.1. To account for these novel cases, I present a thematic account of de re blocking in 4.2: my intention is for my thematic account to exist alongside the approaches proposed by Percus and Sauerland (2003b) nor Anand (2006)–given that they have strong evidence in favor of their existence, such as the existence of possessor blocking. But I propose that it is possible for my thematic account to replace syntactic accounts entirely.

I discuss PRO blocking in 4.3, and discuss its further predictions, and whether it might also involve thematic restrictions. I discuss whether Anand (2006) is correct in assuming there are two paths to de se in 4.4, leaving it open to future research. In 4.5, I argue that this has consequences on existing theories on control, because the de re blocking effect with PRO implies that PRO exists, and it also implies that de se binding of PRO involves an individual abstractor, as Chierchia (1990) has claimed.

4.1 The de re blocking effect is not purely syntactic

My goal in this subsection is to argue that existing theories of de re blocking effects cannot account for the four novel configurations I have identified in this paper. We have seen experimental evidence of the de re blocking effect arising in the cases of passive blocking, blocking across clauses, PRO blocking and inverted possessor blocking. I will now provide LFs of the former three of these cases:[11]

(42)   # **Generic blocking (GB)**
         Miranda$_i$ dreamed that [she$_i$ fired her$_i$].
         LF: Miranda λf dreamed OP$_{log}$ λx [she$_f$ fired her$^{log}_x$].
         In Miranda's dream worlds, her real-self fires her dream-self.
         A de re pronoun c-commands a de se pronoun, both of which are relative to Miranda.
         $[\![$**GB**$]\!]^{w, g}$**:** λw. $\exists$G: G is a *selfless* concept generator for Miranda in w & $\forall$<w',y> $\in$ **dream**$_{Miranda, w}$: G(Miranda)(y)(w') fired y in w'

(43)   # **Blocking across clauses (BC)**
         Miranda$_i$ dreamed that [she$_i$ said that [she$_i$ was fired.]]
         LF: Miranda λf dreamed OP$_{log}$ λx [she$_f$ said that [she$^{log}_x$ was fired]].

---

[11]The passive has an identical LF to the generic form, so I will use the generic here.

In Miranda's dream-worlds, her real-self says that her dream-self is fired.
A de re pronoun c-commands a de se pronoun, both of which are relative to Miranda.
$\llbracket \textbf{BC} \rrbracket^{\textbf{w, g}}$**:** $\lambda w.\ \exists G$: G is a *selfless* concept generator for Miranda in w & $\forall <w', y> \in$
$\textbf{dream}_{\text{Miranda, w}}$: $\forall <w'', z> \in \textbf{say}_{G(\text{Miranda})(w')(y),\ w'}$: y was fired in w"

(44)   **# PRO blocking (PB)**
Miranda$_i$ believes that [she$_i$ decided [PRO$_i$ to prove Goldbach's conjecture]].
LF: Miranda λf believes that [she$_f$ decided OP λx [PRO$_x$ to prove GC.]].
In Miranda's belief-worlds, the individual who she does not realize is
herself self-attributes the property of proving Goldbach's conjecture.
The de re counterpart (relative to Miranda) self-ascribes a property to herself.
$\llbracket \textbf{PB} \rrbracket^{\textbf{w, g}}$**:** $\lambda w.\ \exists G$: G is a concept generator for Miranda in w & $\forall <w', y> \in$
$\textbf{Dox}_{\text{Miranda, w}}$: $\forall <w'', z> \in \textbf{decide}_{G(\text{Miranda})(w')(y),\ w'}$: z proves GC in w"

Existing accounts such as Percus and Sauerland (2003b) or Anand (2006) are not able to account for the presence of blocking in any of these configurations, given that they are fundamentally different from prior instances of de re blocking. To see why, let us begin with passive blocking, which I repeat below in (45), and has been justified with experimental data. The passive blocking configuration has an identical LF to the one of generic blocking in (42) above.

(45)   **Passive blocking:** I dreamed that I was Biden and I was kissed by me.
Possible reading: In the dream, Biden kissed me. (de se kissed de re)
Less plausible reading: In the dream, I kissed Biden. (de re kissed de se)

It is easy to see why the passive blocking facts are problematic for both existing theories. The de re blocking effect is identical to that of generic blocking, yet the pronouns have changed place. Hence, it looks like de re blocking actually arises from thematic restrictions–or perhaps from base-generated positions. Now, it may prima facie seem possible for Percus and Sauerland (2003b) or Anand (2006) to rely on base-generated positions for blocking to occur.

   If a defender of these theories assumes a form of UTAH like Baker (1988)–in which all Agents and Themes are base-generated in the exact same position, so Agents will always c-command Themes–this would allow them to get the right facts. However, recall that under Chomsky (1995)'s Minimalist Program, trees are built bottom up and all syntactic operations like passive formation have already taken place before being transferred to LF. In other words, the syntax of the passive that is sent to LF for semantic interpretation–in which the Theme c-commands the Agent–is what is semantically interpreted, and looks like this, simplified greatly:

(46)   I dreamed that I$_i$ was t$_k$ kissed t$_i$ by me$_k$.

Given that the syntactic relations that the pronouns have to each other have already been inverted when they are shipped to LF, both Percus and Sauerland (2003b) and Anand (2006) would have to stipulate that the copies of the pronouns post-movement are simply ignored. And it is not clear to me whether such a stipulation would be justified.

   The most significant problem, though, may arise from blocking across clauses. Recall from the experiment that I verified that a blocking effect existed across clauses with the predicate *fire*:

(47)   **Blocking across clauses:** I dreamed that I was Biden and I said that I was fired.
Possible reading: In the dream, Biden fired me. (de se vs. de re)
Less plausible reading: In the dream, I fired Biden. (de re vs. de se)

But not so with *I ate a Big Mac*. The fact that blocking can arise due to the lexical semantics of the predicate embedded into the complement clause of *say* seems difficult to derive with both Percus and Sauerland (2003b) and Anand (2006)'s approaches:

(48) I dreamed that I was Biden and I said that I ate a Big Mac.
      Possible reading: In the dream, Biden said that I ate a Big Mac. (de se vs. de re)
      Also possible reading: In the dream, I said that Biden ate a Big Mac. (de re vs. de se)

Let us now move onto PRO blocking. Recall that the blocking effect arises due to Superiority, according to Percus and Sauerland. The de se pronoun cannot move because of the presence of a more local de re pronoun:

(49) a. * I λf dreamed [$_{CP}$ me* λx H I$_f$ kissed t$_x$]

This account derives blocking when the matrix subject binds both pronouns in the embedded clause; not when the more local de re pronoun binds a de se one. As we have seen, the latter is the case with PRO blocking. Recall that in (7), blocking arises when a de re counterpart self-ascribes a property; in other words, a de re pronoun controls PRO. A simple LF is given in (50):

(50) # Miranda λf believes that [she$_f$ decided OP λx [PRO$_x$ to prove GC.]].

Blocking here is therefore underivable via Superiority, given that locality is not a problem. Anand (2006) attempts to derive blocking via reference to locality, as well. His Rule H is repeated below, which derives blocking by ruling out the possibility of a base-generated logophoric operator trying to bind a de se pronoun past a more local de re pronoun.

(51) *Rule H (mod de se, simplified)*
      A variable, x, cannot be bound by antecedent, A, in cases where a more local antecedent, B, could bind x and yield the same semantic interpretation.

In fact, under Anand's configuration, a de re pronoun binding the de se one is the local, and possible one. Yet, the evidence with PRO indicates that this is not possible. PRO is bound by the more local de re pronoun, and not by the matrix subject, so PRO blocking remains underivable for this approach as well. Rule H just does not apply. Both approaches are missing something more fundamental here: namely that a de re counterpart cannot self-ascribe a property.

    The final and most troubling configuration, for all theories and mine, which I will present shortly, is that of inverted blocking with possessors. Recall that syntactic approaches like Percus & Sauerland's and Anand's predict there to be no blocking whatsoever, because such configurations ought to obviate the de re blocking effect, while I predict the opposite blocking pattern, in the configuration below:

(52) **Inverted blocking with possessors**
      I dreamed I was Trump and my daughter fired me.
      Possible reading: In the dream, my daughter fired Trump. (de re's d fires de se)
      Less plausible reading: In the dream, Ivanka fired me. (de se's d fires de re)

These four configurations together make very strong arguments, in my view, that a novel understanding of de re blocking is needed.

    To get these facts (with the potential exception of inverted blocking with possessors), I will propose a thematic approach to blocking in the next subsection. But let us sharpen our notions

of de re blocking as much as possible, so that we will not rule out acceptable structures. I want to point out that de re blocking effects always arise only with three nominals that are coindexed, rather than two. Trivially, the matrix subject pronoun in (53) is de re, and it can be the controller:

(53)   He$_i$ tried PRO$_i$ to run.

It is also clear that the de re blocking effect arises only when all three nominals are coindexed. We do not want to rule out clearly acceptable structures like in (54), in which Caitlin may not be aware that the person trying to catch some fish is a fisherman, so *a fisherman* would be de re:

(54)   Caitlin$_i$ believes that [a fisherman]$_j$ tried PRO$_j$ to catch some fish.

(55) is a general summary of the problem we are dealing with, including all the good and the bad forms. The ellipsis "..." is meant to represent a c-command relation in the tree structure, without regard to clause boundaries. In the sentences below, the second nominal is de se or de re with respect to the first attitudinal verb, and the third is de se or de re with respect to the second.

(55)   a.   Good: de re$_i$ ... de se$_i$
       b.   Good: de re$_i$ ... de se$_i$ ... de se$_i$
       c.   Good: de re$_i$ ... de se$_i$ ... de re$_i$
       d.   Good: de re$_i$ ... de re$_i$ ... de re$_i$
       e.   Bad: de re$_i$ ... de re$_i$ ... de se$_i$

Let us summarize the pattern that we have just found above; namely, that the de re blocking effect involves a *triangle* of coindexed nominals. Let us call this the *minimal anaphoric triangle* and define it as follows:

(56)   *Minimal Anaphoric Triangle*
         A chain of the form <A$_i$, B$_i$, C$_i$> where B and C are anaphoric elements.

Finally, I want to sharpen our notion of a *counterpart*.[12] The rule of thumb is that two arguments, x and y, are counterparts if they are coindexed. Recall that the de re blocking effect is defined by Anand as follows: *an obligatorily de se anaphor cannot be c-commanded by a de re counterpart*. In the cases of generic blocking and blocking across clauses, because the mental and bodily counterparts are coindexed, I assume that this entails that these counterparts are also counterparts of each other.

   PRO blocking is slightly more tricky, but take a control sentence like *Caitlin tried to open a can*, in which Caitlin identifies an individual as herself in her *try*-worlds. This individual is the de se counterpart of Caitlin. Therefore, PRO blocking is ruled out because a de re counterpart cannot itself c-command an (obligatorily) de se counterpart. With our current notion of a counterpart, Anand's original definition of the blocking effect is able to get the generalization from generic blocking-PRO blocking with the added notion of a Minimal Anaphoric Triangle, but I will argue in the coming subsections that this cannot account for the full range of facts.

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[12]This is not to be confused with philosophical issues of personal identity. This is a purely syntactic notion: coindexation. Furthermore, this is not to be confused with Lewis (1986)'s counterpart theory across possible worlds. Under this, individuals exist in only one world, unlike the Kripkean approach. For example, under a Kripkean approach, when I say "I might have been a phonologist" I say that there is another possible world in which I am a phonologist, but under Lewis's I say that there is a counterpart to me–but is crucially not me–who is a phonologist.

4.2 Thematic de re blocking effects

I believe that it is possible to redefine the de re blocking effect in terms of thematic restrictions on predicates rather than via c-command. Notice that in the original case, blocking was obtained when the de re argument was an Agent while the de se argument was a Theme. This still remains the case; what this indicates is that the surface syntactic structure of this sentence may not be relevant for the purposes of blocking.

I propose to redefine one instance of blocking as follows in (57):

(57) *The first de re blocking effect*
In a minimal anaphoric triangle $\langle A_i, B_i, C_i \rangle$ with an (obligatorily) de se and a de re counterpart which have a thematic relation to the same event, the de re counterpart must be a Theme.

Let me state this rule in more basic terms before justifying it in further detail. Take a sentence with a minimal anaphoric triangle in which one of the anaphoric elements, say B, is the de se counterpart, and C is the de re counterpart. Whether it is B or C that is the de re or de se counterpart does not matter for our purposes. Suppose that B and C are assigned θ-roles by the same event. Then the de re counterpart can only be a Theme. Before seeing how this derives most of the configurations seen in the subsection prior, I must get into the notion of a thematic relation.

As Parsons (1990) points out, it seems impossible to have a semantics for θ-roles without adding in events. In order to elucidate this, I must get into a brief and very simple introduction of Parsons's θ-semantics. For example, take a sentence such as *Mary fired John*. This might be given an LF as follows, where there is an event e such that it is an event of firing, and Mary is the Agent of the event while John is the Theme of the event:

(58) $\exists e.$ [fire(e) & Agent(e, Mary) & Theme(e, John)]

As such, *John* and *Mary* are linked to each other, because they have a thematic relation with the same event, e. The semantics given in (58) for *Mary fired John* has an identical LF to the passive form of the sentence *John was fired by Mary*, so the links between *John* and *Mary* are the same.

We can now start to consider how blocking would apply with the definition given in (57), at least for generic blocking, instead of using c-command or locality as in previous accounts. In generic blocking, the de se and de re counterparts are linked because they have each a thematic relation concerning the same event, which is an event of firing, or whatever predicate the reader chooses to substitute in. Furthermore, the de se counterpart is a Theme, while the de re counterpart is an Agent. This is ruled out by (57): the good cases, such as when the de se counterpart is an Agent and the de re counterpart is a Theme, are not ruled out, however.

Let us move onto blocking across clauses, repeated as follows.

(59) # I dreamed that I$_{\text{de re}}$ said that I$_{\text{de se}}$ was fired.

It is not obvious how the two pronouns in this case are linked, as they are not in the same clause. However, notice that, if in a context you meet your employee to fire them, this entails that you said that your employee was fired. To say "you're fired" is a *performative* utterance which changes the social reality that the speaker is describing, by firing the listener. When the firing-person says that the fired-person is fired, it is the same event as the firing of the fired-person.

In other words, in a sentence like "My boss said that I was fired," the boss is the Agent of the event of the firing, and the listener is the Theme of this event. When the boss says that his employee is fired, this is exactly the same event as the firing itself. This means that there is a link between the individual that was responsible for the firing, and the individual that was fired. Therefore, such a sentence has an LF just like (58), at least for the purposes of θ-relations.

This is how the de re blocking effect is derived in blocking across clauses: with no regard to clause boundaries, blocking takes place because the de re and de se pronouns are linked due to the lexical semantics of *fire*. This makes a prediction that can be strong evidence for my account: the de re blocking effect shouldn't arise past clause boundaries between anaphoric elements which are not linked. And this prediction has been confirmed in Experiment 1.

As Belletti and Rizzi (1988) among many others have pointed out, the thematic relations are inverted not just with passives, but also with psych-verbs such as *I frighten him*, where the subject is the Theme but the object is the Experiencer. Although this was not experimentally verified, according the 10 native speakers of English I consulted who had a blocking effect with predicates like *fire* and *kiss* had an inverted blocking effect with *worry*, as shown below.

(60)   I dreamed that I was Trump and I frightened me.
         Possible reading: In the dream, Trump was a source of fear for me.
         Worse reading: In the dream, I was a source of fear for Trump.

This is the account: there are now two obvious questions left to discuss. One is how to derive this definition: why should this exist at all? It is impossible to give a fully developed answer to this question, but I would like to propose an answer below. The other question is how to account for possessor blocking (ex. *I dreamed that I fired my daughter*), the strongest piece of evidence for syntactic accounts. I will provide an answer at the end of this discussion.

All of the cases we have seen, at least in this subsection, in which the de re blocking effect does not arise involves a configuration in which the de se counterpart is either an Agent or an Experiencer, and the de re counterpart is a Theme. The blocking effect arises when the opposite is the case: when the de re counterpart is either an Agent or an Experiencer, and the de se counterpart is a Theme. One solution is to assume that de re and de se counterparts interact with a thematic hierarchy come with predicates–and perhaps this hierarchy arises from conceptual factors.

Since Fillmore (1968), thematic hierarchies have been used to overcome certain limitations involving traditional semantic roles like Agent, Instrument and Theme, which alone are not able to explain why Themes can sometimes be subjects but must be objects in the presence of an Agent or an Instrument. Here are illustrative examples from Fillmore (1968) (p. 33), along with the generalization that we obtain in (61):

(61)   If there is an Agent, it becomes the subject, otherwise if there is an Instrument it becomes the subject, otherwise the subject is the Theme or Patient.

   a.   The door opened. (Theme/Patient subject)

   b.   Dana opened the door. (Agent subject, Theme/Patient object)

   c.   The chisel opened the door. (Instrument subject, Theme/Patient object)

   d.   Dana opened the door with a chisel. (Agent subject, Theme/Patient object, instrument in PP)

   e.   * The door opened by Dana. (Theme/Patient subject, Agent is not subject)

f.   * The chisel opened the door by Dana. (Instrument subject, Agent is not subject)

In (61), we see that the Theme can be the subject as long as there is no Agent or Instrument; the Instrument can be the subject as long as there is no Agent, and the Agent must be the subject, if present. This is why the final two examples in (61) are ungrammatical. As such, the following thematic hierarchy (Agent > Instrument > Patient/Theme) is able to straightforwardly account for the pattern seen in (61), together with the assumption that the argument of the verb bearing the highest-ranked semantic role must be the subject.

   Although each of the hierarchies in (62) below agree with Fillmore's general hierarchy of Agent > Instrument > Patient/Theme, there is unfortunately a great deal of disagreement as to what the correct thematic hierarchy is, as Hovav and Levin (2007) notes. Here are some examples provided by Hovav and Levin (2007), which I have simplified:

(62)   a.   Fillmore (1968): Ag > Inst > Pat/Th
             (No Exp, Goal, Loc)
       b.   Belletti and Rizzi (1988): Ag > Exp > Th
             (No Goal, Loc, Inst)
       c.   Grimshaw (1990): Ag > Exp > Goal/Source/Loc > Th
             (Goal above Pat/Th)
       d.   Jackendoff (1972): Ag, Exp > Loc, Source, Goal > Th
             (Loc and Goal above Pat/Th)
       e.   Jackendoff (1990): Ag > Pat/Ben > Th > Goal/Source/Loc
             (Goal and Loc below Th, Pat above Goal, Loc, Th)
       f.   Baker (1997): Ag > Pat/Th > Goal/Source/Loc
             (Goal and Loc below Pat/Th)
       g.   Bresnan and Kanerva (1989): Ag > Ben > Exp > Inst > Pat/Th > Loc
             (Loc below Pat/Th)

This lack of agreement leads Newmeyer (2002) to reject that thematic hierarchies exist at all given the lack of agreement in their formulations after three decades, in spite of the ubiquity of thematic hierarchies. However, as Hovav and Levin (2007) points out, different hierarchies may be at play for different phenomena and no single hierarchy may be enough. This does not mean that we ought to get rid of the notion of thematic hierarchies entirely.

   The hierarchy given in (63) below which I use for the first de re blocking effect, is identical to Belletti and Rizzi (1988)'s as seen in (62). It does not contradict any of the other hierarchies seen in (62). I propose that the reason why the de re blocking effect is due to the existence of the hierarchy in (63):

(63)   *Thematic Hierarchy for De Re and De Se Counterparts* (THC)
       A de re counterpart cannot precede a de se counterpart on the following hierarchy:
       Agent, Experiencer > Theme

Although we are getting closer to answering this problem, it is still unclear as to *why* this hierarchy exists. Why should it exist at all? It may exist simply due to conceptual factors: Tanenhaus et al. (1989) among others, suggests that verb-based thematic roles "help guide parsing decisions and mediate between discourse information, general knowledge and parsing" (p. 212)–thematic

roles are simply aspects of conceptual information.[13] Seen in this way, it may simply be difficult to conceive of, or process, a de se counterpart–the bearer of one's first-personal perspective–having a thematic role lower on the hierarchy than the thematic role of the bodily (de re) counterpart. That is why the de re blocking effect exists.

At this point, an immediate prediction is that hierarchies might also be at play with other linguistic phenomena involving other kinds of nominals, not just de se and de re counterparts–for example with reflexives and their binders. Indeed, this descriptive generalization bears a striking resemblance to another one made by Jackendoff (1972) concerning reflexives, given in (64):

(64)   *Thematic Hierarchy Condition* (THC)
         A reflexive cannot precede its antecedent on the following hierarchy:
         Agent, Experiencer > Location, Source, Goal > Theme

There are many pieces of evidence that this generalization covers. But here is one that bears resemblance to the blocking that we have just seen, in which the reflexive must be a Theme:

(65)   a.   The artist painted herself in a realistic style. (Theme reflexive)
        b.   * The artist was painted by herself in a realistic style. (Agent reflexive)

Once again, similarly to what I proposed above for the first de re blocking effect, it may arise due to conceptual factors. According to Ray Jackendoff (p.c.), the reason why such a hierarchy might exist is because reflexives are stereotypically are acted upon, rather than vice versa. In other words, it is difficult for one to conceive of a reflexive being an actor rather than acted upon.[14]

But given that the THC has been around for decades, it has been discussed and challenged in great detail in the literature: for example, by Safir (2004), Büring (2005) and Varaschin (2020) among others, and few today would take it as a theoretical primitive–though discussing the objections would go beyond the scope of this paper. However, Jackendoff's observations still need to be accounted for: Varaschin (2020) attempts to reduce Jackendoff's THC, while accounting for its counterexamples, in terms of a more detailed interpretive factor involving logophoricity.[15]

I leave it open whether the de re blocking effect might be accounted for in a similar manner. The obvious challenge with such an attempt is that even determining that de re blocking exists with the very simple cases discussed in this paper is a complex endeavor–unlike the much more intuitive examples involving reflexives that originally motivated Jackendoff's THC.

The most problematic piece of evidence for my account is the fact that possessor blocking exists, which is plainly not accounted for under a thematic conception of de re blocking effects:

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[13]For further evidence for this claim, the reader is referred to the review of several studies in Tanenhaus et al. (1989).

[14]One encouraging similarity that I will note before concluding this subsection is that, although (65b) above was judged to be unacceptable, it is in fact more unnatural rather than purely ungrammatical. I take this to be another piece of evidence for a thematic account of de re blocking: the experimental evidence also indicates that the judgments were similarly sensitive. Under syntactic accounts of de re blocking, it is not clear why the judgments would be so sensitive–one might expect a greater contrast.

[15]To be more specific, Varaschin notes that contexts which originally motivated the THC have a semantic property, namely that they involve proxy functions applied to a semantic argument. His "Logophoric Strategy" is defined as follows: *When a reflexive marker cannot be the argument of a syntactic predicate which is semantically reflexive, the variable to which it corresponds must refer to an entity that bears a logophoric discourse role – i.e. to some kind of perspective bearer.*

(66)   **Possessor blocking:** I dreamed that I was Trump and I kissed my daughter.
Possible reading 1: In the dream, Trump kissed Ivanka. (de se kissed de se's d)
Possible reading 2: In the dream, Trump kissed my daughter. (**de se kissed de re's d**)
Possible reading 3: In the dream, I kissed my daughter. (de re kissed de re's d)
Less plausible reading 4: In the dream, I kissed Ivanka. (**de re kissed de se's d**)

Indeed, although it appears that I have shown that not all de re blocking effects can be accounted for via c-command or locality, possessor blocking seems difficult under a thematic conception of de re blocking without further stipulations. There are two possibilities at this stage. I would either have to incorporate some syntactic de re blocking mechanisms into my account, along with thematic blocking. Alternatively, I would have to extend the definition of my thematic de re blocking effect so that it can look into possessors–more specifically, elements inside more complex NPs which bear a Possessor θ-role. This would get us the right result in (66) above given that Possessors are ranked under Agents in thematic hierarchies, as in Polinsky and Kozinsky (1992).

But inverted blocking with possessors remains a problem for all theories, including mine:

(67)   **Inverted blocking with possessors**
I dreamed I was Trump and my daughter fired me.
Possible reading: In the dream, my daughter fired Trump. (de re's d fires de se)
Less plausible reading: In the dream, Ivanka fired me. (de se's d fires de re)

In this configuration, the preferred reading is the one in which the de re counterpart is the Possessor and the de se counterpart is the Theme, and the dispreferred one involves a de se counterpart which is a Possessor and the de re counterpart is a Theme. This is fully unpredicted under my approach; I am not aware of any hierarchies which rank Possessor below Theme.

To get the right result here, I would have to assume, in line with Hovav and Levin (2007), that different phenomena have different hierarchies at play: for de se and de re counterparts, as follows: Agent > Theme > Possessor. Once again, this may arise due to conceptual factors: the reason is because simple possessive structures like *my daughter* do not refer to the real-self or the dream-self, but rather something the real-self or dream-self is the Possessor of. However, this is mostly a stipulation, and this is a line of inquiry I must leave open to future research.

4.3   PRO blocking

I now present an analysis of the second half of de re blocking effects. It may not be possible to extend the thematic analysis in the subsection prior to what we have seen with PRO blocking. For the time being, I would like to opt for a simpler analysis of the de re blocking effect with PRO instead, defined below:

(68)   *The second de re blocking effect*
In a minimal anaphoric triangle, de re counterparts cannot self-ascribe a property.

This might be a theoretical primitive; it would be optimal to derive it from other, more primitive constraints, but I am not able to offer such an analysis at this time. Instead, I would like to offer three pieces of evidence that this generalization in (68) is true, independent of PRO blocking (the blocking effect with PRO).

In section 2.4, independent evidence for Anand's de re blocking effect was provided by Adesola (2006). Ordinary pronouns cannot c-command logophoric pronouns, which are obligatorily de se anaphors. (27) is repeated in (69) below:

(69)   Olu$_i$ so pé o$_{*i/j}$ ri bàbá òun$_i$.
       Olu say that 3SG see father LOG
       'Olu$_i$ said that he$_{*i/j}$ had seen his$_i$ father.'

Based on the generalization in (68), we would expect cases similar to PRO blocking to be ruled out in Yoruba as like *òun*, a logophoric pronoun, PRO is also an obligatorily de se anaphor. This prediction seems to be borne out based on the intuitions of the single speaker I have consulted: it is impossible for the pronoun to c-command *òun* if they corefer, but possible if they do not:

(70)   Olu$_i$ so fun Taiwo$_j$ pé o$_{*i,m}$ so pé Bóla$_k$ féron òun$_i$.
       Olu said to Taiwo that 3SG said that Bola like LOG
       'Olu$_i$ told Taiwo$_j$ that he$_{*i,m}$ said that Bola$_k$ likes himself$_i$.'

Similar to what we see in Yoruba, recall in section 2.5 that Anand (2006) makes the correct prediction, given in (30), repeated in (71) below, that *ziji*, an obligatorily de se anaphor, cannot be c-commanded by its de re counterpart–or by an ordinary pronoun.

(71)   Zhangsan$_i$ renwei Lisi$_j$ gei ta$_i$ ziji$_{*i,j}$-de shu.
       Zhangsan think Lisi give 3SG self-POSS book
       'Zhangsan$_i$ thinks that Lisi$_j$ gave him$_i$ his$_{*i,j}$ book.'   Anand (2006)

Based on (68), we would also expect de re *ta* to be unable to c-command its obligatorily de se counterpart *ziji* past a clause boundary. As such, the empirical prediction now is that (72a) should be preferable over (72b). In other words, we first need to check the acceptability of the ordinary pronoun when paired with a de re context, as in (72a).[16]

We need to compare this to a structure which has a similar shape to PRO blocking that is judged as infelicitous–when the de re counterpart has a de se belief. If the speakers think that (72b) is less felicitous than (72a), then this indicates the presence of a de re blocking effect. Based on the three native Mandarin speakers that I have consulted, this prediction seems to be borne out.

(72)   Zhangsan has amnesia. Zhangsan and Lisi are watching a video of a man winning a swimming competition a few years ago. After the man wins the competition, he starts yelling that he won to everyone in the audience. Zhangsan tells Lisi that the guy in the video said that he won. Zhangsan doesn't realize that the man in the video is himself.

    a.   ? Zhangsan$_i$ shuo ta$_i$ ying-le.
        Zhangsan said 3SG win-PERF
        'Zhangsan$_i$ said that he$_i$ won.'

    b.   # Zhangsan$_i$ gaosu Lisi$_k$ ta$_i$ shuo ziji$_i$ ying-le.
        Zhangsan tell Lisi 3SG say REFL win-PERF
        'Zhangsan told Lisi that he said that he won.'

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[16]The judgments for (72a) are rather controversial among the native speakers I have consulted. Like what we have seen in English, the de re form of the ordinary pronoun seems to be marginal. Some speakers seem to accept (72a) fully, while others do not accept it at all, and others believe that it is marginal. But the point is whether the native Mandarin speakers I consulted preferred (72a) over (72b), which they did.

The third prediction that we might make based on (68) is that the de re blocking effect would not take place with PRO if the matrix subject had a de se attitude towards someone who was not himself, but with other predicates, not just *dream*. If the matrix subject is very senile or mentally ill, it is possible for the matrix subject to incorrectly attribute de se belief to someone who is not himself. This prediction seems to be borne out, as (73) seems to be a significant improvement over the usual PRO blocking examples among the native speakers of English that I consulted, though this was not experimentally verified:

(73)   John is very senile. He sees a video of Trump after he loses the election, running away to Russia to avoid being prosecuted. John identifies the person in the video as himself.

          ? John believes that he is Trump and that he tried to run away from the police.

To recap, there seems to be multiple pieces of evidence for (68): de re counterparts cannot self-ascribe a property.

Before concluding, I have said at the start of this subsection that it may be possible to reduce this instance of de re blocking to the first; that is, in terms of thematic roles. I will now propose that this may be possible, if we add in an event semantics for control infinitives, which I do so in (74) below. My attempt, however, will be rudimentary, and meant to only be illustrative, in hopes that future research may clarify the exact semantics of this construction.[17] Here is my attempt at doing so, in which I provide an LF with and without events for comparison:

(74)   Mary tried to win.
        a.   **LF without events:** $\forall$<y,w'> $\in$ **try**$_{Mary, w}$: y wins in w'
        b.   **LF:** $\exists$e. [try(e) & Exp(e, Mary) & $\forall$<y,w'> $\in$ **try**$_{Mary, w}$: win(e) & Exp(e, y)]

What this LF says is this: there is an event of trying such that Mary is its experiencer, and in all of Mary's try-worlds, this same event is an event of winning, and Mary's de se counterpart is the experiencer of this winning; Mary herself is not the experiencer of winning. As such, Mary and her de se counterpart share thematic relations to the same event.

With this knowledge at hand, we can attempt to derive PRO blocking thematically. Recall that in PRO blocking, a de re pronoun self-ascribes a property; it controls PRO, and this is ruled as unacceptable. A control predicate never assigns a θ-role such as Theme to its subject; only a role like Agent, Source or Experiencer. My definition of the first de re blocking effect in the section prior makes the correct prediction, given the de re counterpart has a θ-role that is not a Theme.

By no means is this attempt at deriving the second de re blocking effect in terms of the first unproblematic, though: a sentence such as *Mary claimed to win* seems to refer to two distinct events: one is an event of claiming, and the other is an event of winning, unlike the case in (74) prior. But given the current lack of a well-developed event semantics for control infinitives in the literature, I must leave this open to future research.

4.4   Two paths to de se?

Anand (2006) argues that the blocking effect with *dream* is in fact not present with predicates

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[17]For a much more complete attempt at adding an event semantics to control infinitives, the reader is referred to Pearson (2020). Although a discussion of her semantics would go well beyond the scope of the paper, her event semantics of the control infinitive does not contradict the more simple semantics that I have provided here.

such as *believe*, *hope*, *pretend* or *claim*. His example meant to illustrate this is shown:[18]

(75)   John comes late one night, drunk and without his keys. Undeterred, he smashes through a window and goes up to bed. By morning, he has forgotten the incident, and is shocked to see the back window in pieces. Fearing that he is being robbed, he runs upstairs to check his safe.

        a.   John$_i$ hoped that he$_i$ [*qua* robber] hadn't yet found his$_i$ [*qua* mental counterpart] safe.   Anand (2006)

If true, one wonders why is this the case. Why should blocking be present with *dream* on one hand, but not with *hope* on the other? Anand suggests this can be handled if we assume that both LFs for de se binding–the property and the concept generator approach–are attested. Here is how it works. Recall the semantics of *dream*, repeated below:

(76) $[\![dream]\!]^{w, g} = \lambda P_{<esee, est>}. \lambda x. \lambda w. \exists G$: G is an acquaintance-based *selfless* concept generator for x in w & $\forall <w', y> \in \mathbf{dream}_{x,w}$: $P(G(x))(y)(w') = 1]$

This is similar to *believe*, with one difference, not counting the worlds involved in the definition: the concept generator need not be *selfless*. The semantics of *believe* is given below.

(77) $[believe]^{w, g} = \lambda P_{<esee, est>}. \lambda x. \lambda w. \exists G$: G is an acquaintance-based concept generator for x in w & $\forall <w', y> \in \mathbf{Dox}_{x,w}$: $P(G(x))(y)(w') = 1]$

What does it mean for a concept generator to be selfless? It means that de se ascription cannot be a special kind of de re. The de re blocking effect can take place only as a result of Chierchia's dedicated LFs for de se binding, and if *dream* cannot have de se as de re LFs, then de re blocking effects will be obtained. This is not so for all other predicates like *hope*. Two LFs will be possible: one where de se is de re, and one with dedicated de se binding. We have no way of knowing that the latter would be ruled out, since the former seems to be acceptable.

    In Experiment 2, I have argued that there is strong evidence that a kind of de re blocking effect exists with PRO. One of Anand's predictions was also tested. Recall that in a sentence such as *Miranda believes that she claimed to prove Goldbach's conjecture*–the presence of PRO, an obligatorily de se anaphor, seems to cause blocking. I experimentally attempted to verify whether changing the nonfinite clause to finite, as in (78), would lead to a significant improvement to the sentence. There was not a significant difference between the acceptability of (78) and its nonfinite form:

(78)   Miranda was a professor of mathematics who lost all her memories due to hitting her head, and had to start her life anew. She does not remember any of her past research. But she kept her interest in math, and found a paper written by a mathematician named Miranda–who she does not realize is herself. The paper, and therefore the mathematician, both claim to have a proof of a problem known as Goldbach's conjecture. Miranda believes that the proof is successful, and is impressed by this mathematician, not realizing it is herself.

        ?? Miranda believes that she claimed that she proved Goldbach's conjecture.

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[18]Among the native English speakers that I have consulted, many of the ones who had the de re blocking effect with *dream* also had it with the example in (75). I leave this open to future research.

If there are two paths to de se, one of Anand's predictions would be that there could be a significant difference between the acceptability of (78) and its nonfinite form with PRO. PRO requires de se binding by a base-generated individual abstractor, as Chierchia argues. But both forms of de se binding are possible with finite clauses, allowing for this sentence to be acceptable.

It is too premature to come to a conclusion on whether Anand's account is correct or not. It could be that there is actually only one path to de se, and that is binding by an abstractor, and that is why there is not a significant difference between the finite and nonfinite forms. Alternatively, it could be that the judgments are simply too difficult to tease apart with the experimental method provided here. Future research would be useful, especially in determining whether there is blocking with (75). If there is, and *dream* is not special, then this would be strong evidence in favor of there being just one path to de se, and not two.

4.5   Consequences for theories of control

As mentioned prior, although Chierchia's approach to control assumed dedicated de se binding, not all theories of control do so. Landau (2015)'s two-tier theory of control argues that the de se reading of PRO is a special kind of de re: as we have seen, doing so makes certain predictions that can be empirically tested, and this is the goal for this subsection.

Landau builds a theory of control that places equal importance to both syntax and semantics. The approach intends to solve two problems: why PRO must be read de se in attitude contexts and why there is syntactic agreement between PRO and the controller. The "two-tier" theory of control is named as such because control complements, according to Landau, divide into two types: in non-attitudinal contexts OC is a kind of prediction which is made possible via movement of PRO, where PRO abstracts over the complement. The predicative head is designated as *Fin*, and an example derivation is given in (79).

The second tier of control, for attitudinal complements, is established by logophoric anchoring, which builds on the predicative tier. The attitude complement is a function from concept generators to propositions. A de re variable, pro, is embedded inside a concept generator, and the de se reading is obtained via a presupposition. I give a simplified derivation of a sentence with logophoric control in (80); although it is simplified, I have kept the essence of the approach.

(79)   *Predicative control*
       John forced the car$_i$ PRO$_i$ to stop.

       FinP
       PRO$_i$ Fin'
              Fin   TP
              [uD]
                    PRO$_i$ T'
                    [D,Φ]
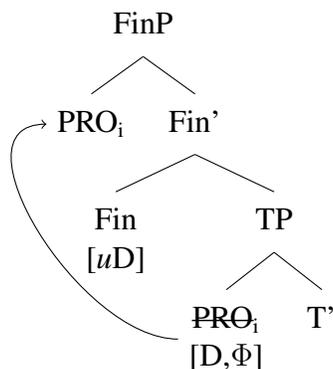
(80)   *Logophoric control*
       John$_i$ tried PRO$_i$ to eat.

       CP
       GP   C'
       G   pro   C   FinP
                     PRO to eat
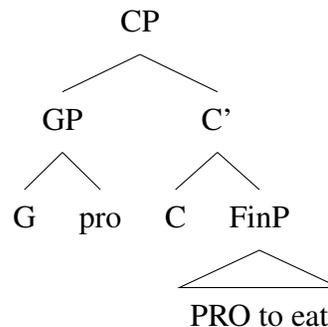
Based on the discussion we just had in 4.3, the astute reader will notice that this account predicts

that no de re blocking effect can be present with PRO. As we have seen, PRO blocking shows that this is false; Chierchia's approach to control makes the correct prediction here.[19]

But perhaps the most interesting consequence of PRO blocking in this paper is that it is in fact novel data for the existence of PRO. After all, the de re blocking effect–that de re counterparts cannot self-ascribe a property–requires that such a de se anaphor is present, which PRO is. It would be mysterious as to how there could be blocking without a de se element.

The original evidence for the existence of PRO was based on Chomsky (1986)'s θ-Criterion. For example, we want to avoid *Mary sent John* meaning the same thing as *Mary sent John to himself*, so (half of) the θ-Criterion is defined as follows: *each argument may bear one and only one θ-role*. This requires the stipulation of PRO, given that *try* in a sentence like *Mary tried to take out the trash* assigns a θ-role to the matrix subject, and we do not want *Mary* to violate the θ-Criterion after movement by receiving a θ-role each from *try* and *take out*.

Hornstein (1999) argues that the advent of Minimalism allows us to eliminate PRO from our grammar. But it is not completely clear to me whether this is an argument against Hornstein (1999)'s account in which control is derived by movement. Hornstein suggests that movement can account for the required de se interpretation of OC PRO because movement leaves behind a variable binder. But Chierchia (1990) points out that variable binding alone does not allow us to distinguish de se interpretations from de re ones. I leave it an open question as to whether the movement theory of control can account for the de re blocking effect with PRO.

5   Conclusion

In this paper, I have presented four novel contexts in which the de re blocking effect seems to arise:

(81)   a.   **Blocking across clauses**: I dreamed that I said I was fired.
             but not: I dreamed that I said I ate a Big Mac.
       b.   **Passive blocking**: I dreamed that I was fired by me.
       c.   **PRO blocking**: Caitlin thinks that she$_{\text{de re}}$ wants PRO$_{\text{de se}}$ to win a medal
       d.   **Inverted possessor blocking**: I dreamed that my daughter fired me.

I have claimed that neither of the existing accounts of blocking presented in Percus and Sauerland (2003b) and Anand (2006) are able to account for these cases. I have argued at least two of these instances–and potentially four–may be accounted for in terms of thematic restrictions that predicates have on de re and de se counterparts. I have also claimed that PRO blocking exists, which in itself may be a different kind of de re blocking effect entirely, given its different configuration. In this instance, blocking arises because a de re counterpart cannot self-ascribe a property to herself, a novel observation.

Open problems remain, but I will discuss one that goes out of the scope of this paper. It concerns why the basic de re reading–ex. *Caitlin believes that she is beautiful* paired with a de re context–is so marginal. It has been reported since at least Chierchia (1990) that such sentences

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[19]Also see Pearson (2018) for a similar argument against the two-tier theory of control. But these arguments need not mean that we should reject the entire two-tier theory of control; see Satik (2019) for an account which is similar to Landau's in spirit, with one of the crucial differences being that control complements are properties.

are acceptable, but many speakers reject it outright, and most find them marginal. Could this be related to θ-roles? This seems unlikely. (82) below, in which the de re pronoun is a Theme rather than an Experiencer (the θ-role that *Caitlin* gets from *beautiful*), seems to be equally marginal:

(82)   Caitlin and John are best friends. John is in love with Caitlin, although he does not want to tell her this. John tells Caitlin that he is trying to kiss the love of his life but unsure how to do it. He asks her for advice. Caitlin doesn't realize that John is going to try to kiss her.

?   Caitlin thinks that John is trying to kiss her.

But at the very least, this paper opens multiple interesting paths open for future research, greatly expanding the empirical terrain on an understudied phenomenon in formal semantics.

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