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Control, Attitudes *de se* and Immunity to Error Through Misidentification

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Ricevuto il 16 agosto 2013, accettato il 31 gennaio 2014

Abstract In his work on attitudes *de se*, James Higginbotham has observed that the silent subject of the infinitival complements of verbs such as *remember* and *imagine* is (i) unambiguously *de se* and (ii) immune to error through misidentification relatively to the subject of the matrix clause. In this article, we review and criticize Higginbotham's *reflexive* analysis of these infinitival complements. We also show that the type of criticism we raise against Higginbotham's account applies likewise to analyses based on the use of acquaintance relations and centered possible worlds. Finally, following recent ideas in cognitive science, we propose an amendment to Higginbotham's account based on the idea that the thematic-role "Experienter" corresponds to a function mapping events into "minimal selves", in the sense of Shaun Gallagher. **PAROLE CHIAVE:** Attitudes *de se*; Immunity to Error Through Misidentification; Control; Thematic Roles; Minimal Self; Self-reference

Riassunto *Controllo, Attitudini de se e immunità da errore per misidentificazione* – Nel suo lavoro sugli atteggiamenti proposizionali *de se*, James Higginbotham ha osservato che il soggetto nullo dei complementi infinitivi di verbi come *ricordare* e *immaginare* è (i) necessariamente *de se* e (ii) immune da errore per misidentificazione da parte del soggetto della frase principale. In questo articolo, presentiamo un sommario critico dell'analisi *riflessiva* che Higginbotham propone per questa classe di complementi infinitivi. Dimostriamo, inoltre, che le critiche sollevate contro l'approccio di Higginbotham si applicano con uguale forza alle analisi basate sull'uso di relazioni di *acquaintance*. Nella parte conclusiva dell'articolo, proponiamo di modificare l'analisi di Higginbotham sulla base di alcune recenti proposte nell'ambito delle neuroscienze. In particolare, proponiamo che il ruolo tematico di Esperiente corrisponda a una funzione da eventi a *minimal selves*, nel senso discusso da Shaun Gallagher. **KEYWORDS:** Attitudini *de se*; Immunità da errore per misidentificazione; Controllo; Ruoli tematici; Sé minimo; Autoriferimento

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■ *De re* and *de se* reports

A *DE RE* REPORT IS a report of an attitude (or speech act) that an agent has (or has made) about a certain *res*, individual or object:

- (1) a. Ralph believes that the man over there is a spy
 b. Janet said that Arthur lives in London
 c. Roberta thinks she looks beautiful

Some *de re* reports can be about the agent of the attitude (or author of the speech) herself. For example, (1c) reports an attitude that Roberta has about herself, at least under the interpretation where *she* refers to Roberta.

Some, but not all, *de re* reports where the *res* is the agent herself are also *de se* reports (the term *de se* was originally introduced by Lewis).¹ A *de se* report is a report of an attitude that an agent has about herself being fully aware that the *res* she is having an attitude about is herself. It is possible to construct scenarios where an agent has an attitude about herself without knowing that the *res* she is having an attitude about is she herself. Various scenarios of this type have been presented in the literature.²

For example, imagine that Roberta sees a woman on the other side of the room and expresses the thought that the woman is beautiful. Imagine also that the woman Roberta is referring to is Roberta herself, reflected in a mirror. An external observer informed of the fact that the woman Roberta is referring to is Roberta herself can report Roberta's thought by uttering (1c).

In this case, (1c) reports a thought that Roberta has about herself in a context in which Roberta is not aware of the identity between herself and the object of her attitude. Notice, in fact, that in this context Roberta would not agree to express her belief by means of a *first-person* statement such as "I look beautiful".

A *de se* report is a report of an attitude that an agent has about herself being fully aware of the identity between herself and the object of her attitude. If Roberta has a *de se*

belief that she looks beautiful, she would agree to express her belief with a first-person statement such as "I look beautiful". Natural languages display several means for unambiguously reporting a *de se* attitude or speech. Contrast (1c) with (2).

- (2) Roberta thinks she herself looks beautiful

(1c) is compatible both with a scenario where Roberta is not aware of the identity between herself and the object of her thought and with a scenario in which she is aware of such identity. In other words, (1c) only contributes information about a property that Roberta assigns to a certain *res* which turns out to be herself, leaving unspecified the way in which Roberta identifies that *res*.

On the other hand, (2) is only compatible with a scenario in which Roberta is aware of the identity between the *res* and herself. That is, (2) is judged as false in the scenario where she thinks that the woman at the other end of the room is beautiful without realizing that the woman is Roberta herself.³

■ Control

In this article we discuss another case of a grammatical structure that is unambiguously *de se*: control complements. Chierchia⁴ observed that control complements are always interpreted *de se*:

- (3) a. Roberta pensa di essere bella
 Roberta thinks to be beautiful
 b. Gianni ha detto di essere intelligente
 Gianni has said to be intelligent
 c. John expect to win the race

The Italian sentences (3a) and (3b) unambiguously report a first-personal thought or speech of the type "I am beautiful" or "I am intelligent". Similarly, (3c) unambiguously expresses John's expectation that he himself will win the race.

By looking at the interpretive properties of the gerundive complement of the verbs *remember* and *imagine* (and, although in less detail, of *want*), Higginbotham⁵ argues for the stronger claim that the subject of (certain) control structures is not only necessarily *de se*, but also *immune to error through misidentification*, in the sense of Shoemaker⁶ and Pryor,⁷ which we will discuss below. For the time being, we notice, following Higginbotham, some interpretive properties of the gerundive complements of the verb *remember*.

Both (4a) and (4b) are unambiguously *de se* in that they report a memory that Ralph has about himself, in full awareness of the identity between himself and the object of his memory (for convenience sake, but not necessarily as a matter of theoretical choice, we follow Higginbotham in representing control structures as having an unpronounced subject PRO, as proposed by Chomsky).⁸

- (4) a. Ralph remembers PRO going to the movies
b. Ralph remembers himself going to the movies

There is, nevertheless, a sense in which (4a) is more “first-personal” than (4b). As discussed by Fodor,⁹ (5c) follows naturally from (5a-b), whereas (5d) does not. The facts that only Churchill gave the speech and that he remembers doing so, do not support the conclusion that only Churchill remembers himself giving the speech. It could in fact be the case that someone else remembers Churchill giving the speech. However, the same premises support the conclusion (5c).

- (5) a. Only Churchill gave the speech
b. Churchill remembers PRO giving the speech
c. Only Churchill remembers PRO giving the speech
d. Only Churchill remembers himself giving the speech

Higginbotham further notices that the gerundive complement of *remember* contrasts with its finite complement in that it has an

event-like interpretation, rather than a proposition-like interpretation. Suppose that my grandfather died before I was born. In this scenario, I can remember that my grandfather was called “Rufus” but I cannot remember my grandfather being called “Rufus”. That is, (6b) may be true in the given scenario, but (6a) is inevitably false.

- (6) a. I remember my grandfather being called “Rufus”
b. I remember that my grandfather was called “Rufus”

Accordingly, whereas (7a) is perfectly acceptable, (7b) is contradictory in a way that is reminiscent of the “Moore Paradox”.

- (7) a. I used to remember PRO walking to school in the 5th grade, but I no longer remember it.
b. I used to remember that I walked to school in the 5th grade, but I no longer remember it.

Intuitively, the crucial property of the control complement of *remember* seems to be that it reports the remembered event as “experienced” by the subject or, as suggested by Pryor,¹⁰ “from the inside”, that is, from the introspective, first-personal point of view of the bearer of the memory. When I remember going to the movies or walking to school, I remember the experiences of going to the movies or walking to school.¹¹ This intuition extends to the control complement of *imagine*.

- (8) a. I imagined PRO flying through space
b. I imagined myself flying through space

Both sentences are *de se*, in that the subject must be aware that the object of his imagination is he himself. However, (8b) does not specify whether I am imagining an object, which I identify with myself, flying through space or whether I am imagining the subjective experience of flying. The complement of (8a), on the other hand, unambiguously refers to the subjective experience of flying through space.

Higginbotham reports a similar com-

ment, attributed to Michael Martin, about the control complement of *want*:

There is [...] a difference in the intentions I may have when I intend to stop smoking (i.e., PRO to stop smoking), and when I intend merely that I should stop smoking. The latter intention might be fulfilled, say, by paying someone forcibly to remove cigarettes from my person whenever I am caught with them; but that is not fulfillment of an intention to stop smoking, which can only be done through willful refusal to put a cigarette to my lips and light up.¹²

We believe that something on the same lines can be said also for the control complement of Italian *pensare* (En. “Think”). Suppose I have to recognize people in pictures that are shown to me. If I recognize the man in the picture as myself, I could utter (9a), but not (9b). The intuitive reason is, again, that (9b) unambiguously expresses an introspective perspective according to which the object of the thinking is the “from the inside” experience of flying.

- (9) a. In questa foto, penso che sto volando
 In this picture, think-1p that am-1p flying
 b. In questa foto, penso PRO di volare
 In this picture, think-1p PRO to fly

As anticipated, Higginbotham argues that the central feature of control complements of *remember* and *imagine* is that they are immune to error through misidentification. In the next section, we introduce briefly the concept of immunity to error through misidentification.

Immunity to error through misidentification

Wittgenstein¹³ distinguishes two uses of the first-person pronoun: a use as *subject*, exemplified in (10a), and a use as *object*, exemplified in (10b).

- (10)a. I am in pain
 b. I have a bump on my forehead

The use of *I* as subject is immune to error through misidentification. Consider the statement *Janet is in pain*. There are several grounds on which this statement can be challenged. Among other things, someone may erroneously make the statement *Janet is in pain* because she has mistakenly identified Janet as the person that is in pain when, in reality, it is someone else who is in pain. Consider now (10a). The author of the statement may be wrong in that it is not pain what she is feeling. However, she cannot be wrong that it is she herself who is in pain. As Wittgenstein puts it, «there is no question of recognizing a person when I say I have toothache. To ask “are you sure it is you who has pain?” would be nonsensical».¹⁴

The use of *I* as object is not immune to error through misidentification. In the case of (10b), for example, one could conceive of situations in which he knew that someone had a bump in his head, and legitimately wonders whether the one having a bump in his head was he himself.

Shoemaker¹⁵ suggests that the uses of the first-person pronoun as subject are immune to error through misidentification because in those cases the access to the self is immediate and non-observational, in the sense that it does not involve a perceptual or reflective act of consciousness. We will elaborate on this point later in the article. Notice, for the time being, that Shoemaker’s observation captures the intuitive link between being the immediate, introspective experiencer of an event and the impossibility of failing to identify oneself as such.

Finally, notice that immunity to error through misidentification does not mean infallibility. When you make a claim that *a* is *F* and your claim is immune to error through misidentification,

it is not possible for you to be right in thinking that something is *F*, but to have

made a mistake in figuring out which this it is that is *F*.¹⁶

However, you may still be mistaken in thinking that something is *F*.

Immunity to error through misidentification and control

Higginbotham¹⁷ argues that the subject of control complements (call it *PRO*) is immune to error through misidentification (at least with certain predicates, such as *remember*, *imagine*, and *want*) relatively to the subject of the main clause, in the same way the first person pronoun is, when used as subject, relatively to the speaker.

Consider the following inference:

- (11)a. I remember someone saying that John should finish his thesis by July
 b. As I am now assured, it was I who said it
 c. I remember *PRO* saying John should finish his thesis by July

The inference is not sound: (11c) does not follow from (11a-b). My having acquired knowledge that it was me who said John should finish his thesis by July does not warrant the conclusion that I remember saying so. On the other hand, notice that (11a-b) support the conclusion in (11d).

- (11)d. I remember myself/my saying John should finish his thesis by July

The facts in (11) show that (11c) is incompatible with a scenario where the bearer of the memory is in doubt about the identity of the person who he remembers said John should finish his thesis by July. In fact, (12a) seems contradictory, whereas (12b) does not.

- (12)a. Jim remembers saying that John should finish his thesis by July,
 although, now that he thinks about it, he is not sure it was he who he remembers saying it.

- b. Jim remembers himself saying that John should finish his thesis by July,
 although, now that he thinks about it, he is not sure it was he who he remembers saying it.

It seems therefore that, in (11a), Jim expresses that fact that he has a memory such that he cannot be wrong in identifying the subject of his memory as himself. The intuitive reason for the contrast in (12) is that, when Jim remembers *PRO* saying something to John he does not remember the proposition that he did so; rather, he remembers the subjective experience of saying something to John. It is in this sense that the control complement of *remember* is immune to error through misidentification relatively to the subject of *remember*.¹⁸

The same conclusion holds for *imagine*. (13a) sounds contradictory, whereas (13b) does not. Again, the intuition behind this judgment is that (13a) reports Mary's subjective experience of flying through space, which, as such, is immune to the possibility of misidentifying its experiencer, whereas (13b) is also compatible with Mary's imagining an individual, whom she identifies with herself, flying through space.

- (13)a. Mary imagined flying through space,
 although she is not sure it was she who she imagined flying
 b. Mary imagined herself flying through space,
 although she is not sure it was she who she imagined flying

It is important to observe that *PRO* contrasts with the first person pronoun in that it is *always* immune to error through misidentification. Remember that *I* is immune to error only when used as subject, but not when used as object. *PRO*, on the other hand, is always immune to error through misidentification, independently of the nature of the predicate of which it is an argument. For example, *PRO* is immune to error both in (14a), where it is the subject of the predicate *being in love*, and (14b), where it is the subject of the passive

predicate *being kissed by Mary*. Moreover, both sentences are naturally interpreted as reports of John's subjective memory or imagination of the experiences of being in love with Mary or being kissed by Mary.

- (14)a. John remembers/imagined PRO being in love with Mary
 b. John remembers/imagined PRO being kissed by Mary

There are, in fact, two properties of the control complements under discussion that we want to make explicit: (i) PRO is always interpreted as the object of an *implicit de se* thought, in the sense of Recanati,¹⁹ to be defined below; (ii) the immunity to error through misidentification of PRO is not *basis-relative*, in the sense of Morgan,²⁰ which we will explain below.

Recanati distinguishes two types of *de se* belief: explicit *de se*, a type of belief about oneself that is not immune to error through misidentification, and implicit *de se*, a type of belief about oneself that is necessarily immune to error through misidentification. If we adopt the distinction proposed by Recanati, we can describe the control complements under discussion as unambiguous cases of implicit *de se*.

Morgan individuates *basis-relativity* as a fundamental property of immunity to error through misidentification *relative to the first-person*. Whether a first-person sentence, thought, judgment, or belief is immune to error through misidentification, depends on the basis on which it is made:

There are different *bases* on which I might judge "I hear trumpets". For example, I might base that judgment on an auditory perception I am having. If I do, the judgment seems to be fp-immune [i.e. immune to error through misidentification *relative to the first person*; D&F]. But what if I had made the same judgment on the basis of an inference from the following judgments: "The person in the

third row hears trumpets" and "I am the person in the third row" (we can imagine that I have come to know both of these premises through testimony)? At least when made on this kind of inferential basis my judgment "I hear trumpets" does not seem fp-immune. If the first premise of the inference had been true, but the second premise had been false, the error I made would have been an error through misidentification.²¹

Morgan's observation does not apply to the control cases under discussion. These complements are, in fact, *necessarily immune to error through misidentification*. In an intuitive sense, on which we will elaborate later, these complements provide information *about the basis itself*, by expressing the introspective, subjective nature of the reported experience. If John remembers *PRO hearing trumpets*, he must remember the experience of directly perceiving trumpets, an experience which is necessarily immune to error through misidentification.

Higginbotham's account of control

Higginbotham²² proposes that *PRO* stands in an anaphoric dependency with the subject of the matrix predicate to the effect that *PRO* is interpreted as the *experiencer* in the event designated by the matrix predicate. To see this, consider the example in (15a). The truth-conditions proposed by Higginbotham are as in (15b).

- (15)a. John imagined PRO flying through space
 b. $\exists e(\text{Imagine}(e, \text{John}, \lambda e'(\text{Flying-throughspace}(e', \text{Exp}(e))))))$

The complement of *imagined*, as analyzed in (15b), is an intensional property of events of flying through space such that the subject of the flying is the experiencer in the event of imagining. According to Higginbotham's analysis «the peculiar semantic contribution of *PRO* [is] that it presents the subject as *the*

subject (or experiencer) of the event or state *e* as given in the higher clause». ²³ That is, according to (15b), John is imagining that *the experiencer of the imagining itself* is flying through space.

Higginbotham's analysis maintains that a *de se* belief is a special case of reflexive belief, where the subject of belief itself is a constituent of the thought believed. ²⁴ A reflexive thought so conceived is immune to error through misidentification: John cannot imagine that the experiencer of the imagining is flying through space while failing to identify the experiencer of the imagining with himself. In fact, according to Higginbotham, it is implausible that a person *x* could be in a state *e* of imagining being *F* without recognizing that *x* is the experiencer of *e*, that is, the subject of the property of events being imagined. If that were the case, we would have to conclude that *x* has thoughts of which *x* does not seem to himself to be the author. ²⁵

Before evaluating Higginbotham's proposal in more detail, there is one aspect of (15b) that needs clarification. Higginbotham follows Davidson ²⁶ in constructing events as individual objects. Events may have participants and these participants are essential to the event in which they participate. Here, we interpret Higginbotham's notion of thematic-roles in the sense of Parsons, ²⁷ that is, as functions mapping events onto individuals. Accordingly we take the term *Exp(e)* to denote the individual who is the experiencer in the event *e*. Given Higginbotham's assumption that participants are essential to the event in which they participate, *Exp(e)* must denote the same individual in every possible world in which it denotes something. It follows from (15b) that the identity *Exp(e) = John* is a metaphysical necessity. For the same reason, (15b) is necessarily equivalent to (15c):

(15)c. $\exists e(\text{Imagine}(e, \text{John}, \wedge \lambda e'(\text{Flying-through space}(e', \text{John}))))$

(15c), however, is at best a representation

of a *de re* imagining that John entertains about himself. As such, (15c) does not represent a thought that is immune to error through misidentification. How, then, is the difference between (15b) and (15c) to be characterized? Higginbotham ²⁸ devises two potential solutions to this problem. The first is to depart from the individuation of propositions as sets of possible worlds. Under this view, the properties $\wedge \lambda e'(\text{Flying-through space}(e', \text{John}))$ and $\wedge \lambda e'(\text{Flying-through space}(e', \text{Exp}(e)))$ have equivalent intensions but do not necessarily represent the same thought. This is because *John* and *Exp(e)* are two different *concepts* of the same individual. The second solution maintains a modal individuation of propositions but admits possible worlds that are not metaphysically possible. In those possible worlds *John* and *Exp(e)* may not be identical. In this way, the identity between (15b) and (15c) is a metaphysical necessity but not a necessity relatively to other modal bases. ²⁹ In the remainder of this article, we will mainly adopt the second solution when discussing and criticizing Higginbotham's proposal. The reason is that Higginbotham does not offer a sufficiently explicit account of what he has in mind when distinguishing between an individual and a concept in a non-modal framework. Therefore, we are not able to offer a sufficiently explicit criticism of Higginbotham's proposal when considering this version of his hypothesis.

Against Higginbotham's account of control

We find Higginbotham's proposal intuitive. In particular, we find it intuitive to conceive of *PRO* as the experiencer in the event denoted by the matrix predicate. When, for example, I imagine flying through space, I imagine the experiencer of the imagining flying through space. This analysis seems to account quite naturally for the introspective nature of the reported attitude as well as for the immunity of these structures to errors

due to misidentification.

Our objection to Higginbotham's account of control is that it represents the meaning of control clauses as (intensional) sets of events that are ultimately individuated as satisfying a singular proposition, that is, the attribution of a property to an individual, whereas introspective, first-personal experience cannot be represented as such. It is for this reason, we argue, that Higginbotham's account does not succeed in guaranteeing immunity to error through misidentification.

Consider again (15a) and its truthconditions in (15b). According to (15b), the object of John's imagination is the (intensional) set of events e' such that the individual identified as the experiencer of e , satisfies the property of being flying through space. Such thought is based on the *identification* of an individual and the attribution of a property to it. As such, it is not "identification-free" and, therefore, not immune to error through misidentification.

A fundamental observation, attributed to Shoemaker,³⁰ is that the cases of self-reference that are immune to error through misidentification involve reference "without identification": one can be aware of an object as oneself without identifying it as oneself via properties that one ascribes to the object. As Shoemaker puts it:

My use of the word "I" [in statements such as "I feel pain" or "I see a canary"] is not due to my having identified as myself something of which I know, or believe, or wish to say, that the predicate of my statement applies to it.³¹

And in another place:

In introspective self-knowledge there is no room for an identification of oneself, and no need for information on which to base such an identification [...] There are indeed cases of genuine perceptual knowledge in which awareness of oneself provides identification information, as when

noting the features of the man I see in the mirror or on the television monitor tells me that he is myself. But there is no such role for awareness of oneself as an object to play in explaining my introspective knowledge that I am hungry, angry, or alarmed. This comes out in the fact that there is no possibility here of a misidentification; if I have my usual access to my hunger, there is no room for the thought Someone is hungry all right, but is it me?³²

The type of belief evoked by sentences such as "I feel pain" or "I see a canary" seems to be "identification-free", using a term introduced by Evans. Here, by identification-free belief we mean, following Pryor,³³ a belief which can be justified even though the subject did not base the belief on any identity assumptions: the subject believes of a that it is F even though he went through no process of identifying a as *the thing* he might know or believe be F . Whereas it can be disputed whether all identity-free beliefs are immune to error through misidentification,³⁴ it is clear that all non-identity free beliefs are vulnerable to misidentification:

the identification of a presented object as oneself would have to go together with the possibility of misidentification, and it is precisely the absence of this possibility that characterizes the use of "I" that concerns us [i.e. the uses of I as subject; D&F].³⁵

To strengthen this observation, Castañeda, Shoemaker, and Perry produced convincing arguments that: «no matter how detailed a token-reflexive description is, [...] it cannot possibly entail that I am that person». ³⁶ For example, Perry asks us to consider the case of the amnesiac Rudolf Lingens who is lost in Stanford library:

He reads a number of things in the library, including a biography of himself, and a detailed account of the library in which he

is lost. He believes any Fregean thought you think might help him. He still won't know who he is, and where he is, no matter how much knowledge he piles up.³⁷

The denotation proposed by Higginbotham in (15b) presents a relation between an agent, John, and an (intensional) property of events (which we take to be a function from possible worlds onto sets of events), which is defined as the set of events e' such that the individual x who satisfies the property of being the experiencer of the imagining, also satisfies the property of being flying through space in e' .

Therefore, the object of John's imagination is based on the attribution of a property, flying through space, to an individual, who is identified on the basis of the property of being the experiencer of the imagining. This way of representing John's imagination contrasts sharply with the observations made above as it entails that John is conceiving the person flying as an individual who is identified on the basis of a given property. As stressed by Castañeda, Perry, and Shoemaker, no matter how detailed a description is, it cannot possibly entail that I am the person satisfying it. The property of being the experiencer of a certain event is no exception.

These considerations become crucial when considering a modal framework in which the equivalence between (15b) and (15c) is granted metaphysically but is not a necessity relatively to other modal bases. In fact, if John's *imagination worlds* are allowed to include worlds where $Exp(e)$ and $John$ are not equivalent, there is no reason left to maintain that the reflexive nature of the reported imagination guarantees immunity to error through misidentification. The fact that John has an imagination about the experiencer of the imagining does not guarantee that he is individuating that individual as himself.

We think that the problem with Higginbotham's account stems from treating the term $Exp(e)$ as an individual term, des-

ignating an individual on the basis of the property of being the experiencer of a given event e . As Castañeda, Perry, Shoemaker, and others have taught us, an introspective, first-personal experience that is immune to error through misidentification cannot be represented as the attribution of a property to an individual identified on the basis of some other property. In this contribution, we propose to amend Higginbotham's account by suggesting that the thematic role of experiencer does not map an event onto an individual; rather, it maps an event into a *minimal-self*, in the sense of Gallagher.³⁸ Before putting forward our proposal, we discuss an alternative account of *de se* belief, which is based on the use of centered possible worlds and acquaintance relations.

Centered possible worlds and acquaintance relations

In this section, we discuss an alternative account of *de se* belief, which is based on the use of centered possible worlds and acquaintance relations. Hintikka³⁹ proposes a simple framework for the representation of beliefs based on the notion of *doxastic alternative*. Let a be an intentional agent and w a possible world. Let $Bel(a,w)$ be the set of possible worlds w' such that a , on the basis of the knowledge she has, has no reason to exclude w' as a candidate for being the actual world. Let us call $Bel(a,w)$ the set of *doxastic alternatives* that a has in w . Then, we can say that a believes a proposition p iff a 's doxastic alternatives entail p , that is, iff $Bel(a,w) \subseteq p$. On the basis of these assumptions, a belief report such as (16a) is taken to denote a relation between a subject, Ralph, and a proposition, p , which is satisfied in w iff Ralph's doxastic alternatives in w entail the proposition p :

- (16)a. Jim believes that p
 b. $Bel(j,w) \subseteq p$

As is well known, Hintikka's semantics of belief reports does not offer a satisfactory

account of *de re* and *de se* reports. Here we discuss the problem with *de se* reports. Consider sentence (17a). Hintikka's account assigns to (17a) the truth conditions in (17b), which are verified iff Jim's doxastic alternatives entail the proposition that Jim won the lottery.

- (17)a. Jim believes that he himself won the lottery
 b. $\text{Bel}(j,w) \subseteq \text{Won-the-lottery}(j)$

The truth-conditions in (17b) are not satisfactory because they are verified independently of whether Jim is aware or not aware of the identity between himself and the object of his belief. Lewis⁴⁰ attributes the inadequacy of Hintikka's account to the fact that it treats belief as a relation between a subject and a *proposition*, where propositions do not have sufficient structure to represent the indexical, first-personal nature of some thoughts. Therefore, he proposes to change the object of belief from propositions to properties. Roughly, (17a) is true in Lewis' account iff Jim *ascribes to himself the property of having won the lottery*.

We now offer a formal implementation of Lewis' proposal based on Cresswell and von Stechow.⁴¹ First, within the framework of Lewis' modal realism, no entity can live in more than one possible world. An entity can have *counterparts* in different possible worlds, which are similar but not identical. Within this framework, properties can be regarded as functions from worlds onto entities, or equivalently, as sets of ordered world-individual pairs, $\langle w, a \rangle$. Let us call any pair $\langle w, a \rangle$ a *centered possible world*, adopting the terminology of Quine.⁴²

We can now redefine both the notion of doxastic alternative and the truth conditions of *de se* belief reports on the basis of the notion of centered possible world. Firstly, a centered possible world $\langle w, b \rangle$ is a doxastic alternative for *a* in *w* if *a*'s belief state does not rule out the possibility that *a* is the individual *b* living in world *w*. Let us refer to *a*'s doxastic alternatives in *w* as *Lewis-doxastic*

alternatives, or $\text{Bel}_L(a, w)$. Secondly, *a* believes *de se* that ω , where ω is a set of centered possible worlds, iff *a*'s doxastic alternatives entail ω , that is, iff $\text{Bel}_L(a, w) \subseteq \omega$.

Higginbotham objects to Lewis's proposal by pointing out that centered possible worlds are insufficient to distinguish between beliefs *de se* and beliefs *dere*. We review Higginbotham's argument by considering the following scenario:

Suppose I [J. Higginbotham] believe (in world @, say) that somebody has won the lottery, but I don't believe it is me (myself). The result has been announced by ticket number, and I therefore believe that the person with ticket 47 has won the lottery, but I don't have an opinion as to whether I myself am the person with ticket 47. Then (as is said in these scenarios) you, commenting on me, can defend the statement that H has an opinion as to who has won the lottery, because H knows that the person with ticket 47 has won, and you know that he is that person.⁴³

Consider a model $\langle D, W \rangle$ where *D*, the domain of quantification, includes two individuals, *H* and *B*, and *W* includes the four possible worlds, @, *w*, *w'*, and *w''* described in (18).

- (18)a. @ \rightarrow H wins, H holds ticket 47, B holds ticket 45
 b. *w* \rightarrow B wins, H holds ticket 45, B holds ticket 47
 c. *w'* \rightarrow H wins, H holds ticket 45, B holds ticket 47
 d. *w''* \rightarrow B wins, H holds ticket 47, B holds ticket 45

Accordingly, the domain of centered possible worlds corresponds to the product $D \times W$:

- (19)a. $\langle H, @ \rangle$
 b. $\langle H, w \rangle$
 c. $\langle H, w' \rangle$
 d. $\langle H, w'' \rangle$
 e. $\langle B, @ \rangle$
 f. $\langle B, w \rangle$

g. $\langle B, w' \rangle$

h. $\langle B, w'' \rangle$

In the scenario described by Higginbotham, H 's doxastic alternatives are the possible worlds (19a) and (19b). (19c-d) and (19g-h) are excluded from H 's alternatives, because in those worlds the holder of ticket 45 wins. (19e-f) must also be excluded because H knows that $H \neq B$. When H realizes that he himself is the owner of ticket 47 he further excludes (19b) from his doxastic alternatives, because in w it is B who owns ticket 47. In short

the proposal is that by taking the product $D \times W$ of agents and worlds we can specify the first-personal nature of some of our beliefs, whilst allowing that we may have beliefs about ourselves that are not firstpersonal.⁴⁴

Higginbotham's objection to this picture is that it does not capture the nature of the *de re* report *H believes that he has won the lottery*. Notice that in (19b) H does not win the lottery. Therefore, the centered worlds (19a) and (19b) are bound to be the objects of a belief about the description *the owner of ticket 47*. That is, they represent, at best, the object of a *de dicto* belief that H has about the description *the owner of ticket 47*, and cannot be the object of a belief about a specific *res*.

Notice that, in Higginbotham's scenario, this conclusion is actually sound. In effect, at the stage in which H has been informed that the winner is the holder of ticket 47 but is still not aware that he himself holds that ticket, H seems to be entertaining a *de dicto* belief that *the owner of ticket 47*, whoever that is, has won the lottery. At that stage, H does not seem to have a particular *res* in mind which is the object of his belief. Therefore, it seems also correct to assume that (19a) and (19b) offer a satisfactory representation of H 's belief in the present scenario.

Notice, furthermore, that the scenario considered by Higginbotham is actually in-

compatible with the statement *H believes that he has won the lottery*, whereas it is compatible with the statement *H believes that the holder of ticket 47 won the lottery*, where the pronoun is replaced with a definite description.

It is still possible, however, to construct a scenario in which H has a *de re* belief about himself without being aware that the object of his belief is he himself. Suppose that H is waiting to find out who won the lottery and, as above, does not know the number of his own ticket. Suppose furthermore that, for some reason, H has formed the belief that the man sitting at the opposite end of the room is the winner, unaware of the fact that that man is H himself reflected in a mirror. At this stage, H 's belief is represented by (19a) and (19c), that is, by those possible worlds that are centered on H where H wins.

Suppose now that, once the winner has been announced, H believes that the winner is the owner of ticket 47. This belief excludes (19c) from the centered possible worlds accessible to H , because in (19c) the winner is the owner of ticket 45. In conclusion, the only centered possible world accessible to H is (19a) even though, at this stage, H is not aware that the *res* he believes to be the owner of ticket 47 and the winner of the lottery are both himself. We believe this example offers better support to Higginbotham's conclusion that the use of centered possible worlds does not capture the *de re* nature of *de se* reports.⁴⁵

Higginbotham discusses the possibility of using acquaintance relations to "rebuild" *de re* beliefs within the framework of centered possible worlds but eventually dismisses it:

in *Postscript A* to [*Attitudes De Dicto and De Se*] Lewis endeavors to build the perceptual *de re* back into the picture, via acquaintance relations. However, even apart from the question what such relations are (they involve ascribing properties to one's own perceptual system, of thinking of oneself as looking or staring at, for example, and in this sense they are

conceptually sophisticated; they are also necessarily self-conscious, inasmuch as they involve the self-ascription of perceptual properties), talk of *de re* belief remains on Lewis's extended view a manner of speaking, since it is not a (purely or narrowly) psychological state in his sense.⁴⁶

Nevertheless, we wish to stress that, if we leave aside the type of objection raised by Higginbotham, acquaintance relations do succeed in providing a satisfactory rendering of *de re* belief which distinguishes it from *de se* belief. Furthermore, the use of acquaintance relations solves the so-called double vision puzzles originally pointed out by Quine.⁴⁷ Cresswell and von Stechow⁴⁸ were the first to propose a generalized account of attitudes *de re* and *de se* based on the use of both Lewis' centered possible worlds and Kaplan's⁴⁹ notion of acquaintance relations.

More recently, Maier⁵⁰ has advocated an explanation of *de re* and *de se* belief based on the use of acquaintance relations within the framework of *Discourse Representation Theory*. In what follows, we present the main features of the *truth-conditions* assigned to *de re* and *de se* beliefs by a framework based on acquaintance relations: an agent *a* believes *de re* of *b* that *P* iff the following three conditions are met:

- (20) a. R is a contextually relevant acquaintance relation;
 b. R relates the agent of the belief *a* with the *res* *b*;
 c. $Bel_i(a, w) \subseteq \{\langle w, x \rangle : y \text{ is the object } x \text{ is related to by } R \text{ and } P(y) \text{ is true in } w\}$.⁵¹

As anticipated, an advantage of this analysis is that it accounts for the so-called double vision puzzles, such as Quine's famous Orcutt's example.⁵² In short, the analysis allows that a subject has contradictory beliefs about a certain *res* as long as those beliefs are entertained under different acquaintance relations toward the *res*. Ralph may think that Orcutt is a spy under the acquaintance relation "seen (by Ralph) in a brown hat in

occasion 1" and at the same time think that Orcutt is not a spy under the acquaintance relation "seen (by Ralph) in a green hat in occasion 2".

In this framework a *de se* belief is a special kind of *de re* belief where the acquaintance relation is one of self-identification. When *H* has a *de re* belief about the winner of the lottery, he believes that the individual he is acquainted with as "man sitting at the other hand of the room" is the winner. When *H* has a *de se* belief, he believes that the man he is acquainted with as the subject that is identical to himself is the winner. Therefore, centered possible worlds *can* successfully account for both *de re* and *de se* belief reports when combined with the use of acquaintance relations.

A more cogent objection to this type of analysis (which Maier is well-aware of)⁵³ is that it cannot account for those reports that are unambiguously *de se*. The choice of what is the relevant acquaintance relation to be used when interpreting a *de re* report is determined by the context of utterance and not by grammatical features of the report. How is it then possible that natural languages display a range of *grammatical* means to unambiguously report a *de se* belief?

This, we submit, is a cogent empirical problem that undermines the use of acquaintance relations to represent *de re* and *de se* belief and might ultimately support Higginbotham's account, which seems better suited for the cases of *grammatical* encoding of *de se*.

On top of these objections, we would like to stress here that a framework based on acquaintance relations *cannot* explain the semantic properties of the control complements we are considering in this article. The reasons supporting these conclusions are the same as those we presented against Higginbotham's proposal:⁵⁴ ultimately, the object of a belief is necessarily represented as the attribution of a property to an individual that is identified on the basis of a certain property, in this case an acquaintance relation.

This is clear in (20c): the object of x 's belief is the individual y such that x is related to y by means of the acquaintance relation R . For the same reason that there is no property whatsoever that entails that I am the individual bearing that property, so there is no acquaintance relation that necessarily entails that I am the individual I am acquainted with, therefore deriving immunity to error through misidentification.⁵⁵

■ Experiencers as bridges to “minimal-self”

Acquaintance relations (in the sense discussed above) lend themselves to an important extension. Consider the following reflexive sentences in English and Dutch, respectively:

- (21)a. Bill admired himself
b. Bill bewonderde zichzelf

Clearly, the same kind of ambiguity can be detected as in the cases of *de re* / *de se* ambiguity detected in the complements of verbs of propositional attitudes.⁵⁶ To briefly illustrate this, consider the scenario in which Bill is watching a man on TV who is bravely rescuing a boy whose life is endangered. Bill admires the man, without realizing that what he is presently seeing are the recorded images of something he did years before. As for the cases of *de re* reviewed above, an external observer is allowed to describe this situation, in English, by making use of (21a).

The reason for this is arguably the following: though the rescuing person is certainly Bill (coreference is induced by the use of the reflexive pronoun, under standard assumptions), nothing prevents Bill from accessing the *res* he is admiring in terms of an acquaintance relation (say, “the man who is bravely rescuing the boy”), in terms that are pretty much compatible with Bill’s unawareness that the *res* is Bill himself. The same holds for the standard reading assigned to (21a), which we may identify with a *de se* reading: Bill admires himself, in the full

awareness that the person whom he admires is he himself.

In this case, we can obviously propose that the *res* Bill is admiring is accessed by Bill as “identical to Bill”: in other words, “identity” is the salient acquaintance relation, as in Maier’s terms. At first sight, these considerations seem to lend further support to the pragmatic approach, since the *de re* / *de se* ambiguity seems connected to the intervention of a contextually salient “acquaintance relation” in the pragmatics, independently of the grammatical structure used to encode the relevant proposition. There is also an important empirical advantage, since *de se* / *de re* ambiguities are correctly predicted to arise whenever a conscious subject can be conceived of as accessing a *res* by means of some contextually relevant acquaintance relation. Reflexive structures are thus a nice example of this kind of extension.⁵⁷

However, this picture is not really satisfying, for the same reason envisaged in the discussion above: grammar is capable of getting rid of the ambiguity, contrary to what we should expect if acquaintance relations are the only relevant factor for the ambiguity. In the case of reflexive structures, the problem arises with so-called “lexical” reflexives, exemplified, for English and Dutch, in (22a-b) below, respectively:

- (22)a. Bill washed / shaved
b. Bill waste /schoor zich

For the sentences in (22), it is quite tempting to propose that they can be given only a *de se* reading. *Prima facie*, it sounds contradictory to say “Bill washed without realizing that the person he washed was he himself”. Interestingly, this observation extends to verbs with incorporated reflexives (En. self-admire, It. *autoeleggarsi* “self-elect”). To see this, it suffices to consider that one can apparently say, without being contradictory, things like “Bill admired himself on TV without realizing that the person he was admiring was he himself”, as already em-

phasized above, whereas it clearly sounds contradictory to say things like “Bill engaged in a mental process of self-admiration without realizing that the person he was admiring was he himself”. Why should lexical reflexives be unambiguous? More exactly, why do they necessarily trigger a *de se* interpretation?

Here is a possible line of explanation, based on seminal observations by T. Reinhart and much successive work.⁵⁸ Lexical reflexive structures are structures in which a unique argument has to be assigned more than one theta-role (we disregard here the syntactic reasons why this happens). The two theta-roles that are assigned to the unique argument (for instance, to “Bill” in (22)) are first “bundled” together in the lexicon: roughly we form, starting from the theta-role of agent and the theta-role of patient associated with the verb “wassen” “to wash”, a complex theta-role “Agent ♦ Patient”, and then we assign this complex theta-role to the argument “Bill”.

The interpretive effect of this lexical/syntactic procedure comes quite close to the “reflexive” reading that Higginbotham associates with *de se*, as extensively discussed in the previous sections. Roughly, the washed person, that is, “Bill” in (22b), is also assigned the Agent theta-role (as an effect of bundling), and this is reasonably equivalent to saying that the washed person is necessarily accessed by the conscious subject as the washing person. In other words, the patient is accessed as “identical to the agent”.

Crucially, however, this reflexive interpretation, according to which an object is essentially conceptualized as non-distinct from the subject, is no longer merely the consequence of a particular sort of acquaintance relation (identity) induced in the pragmatics: it is thematic bundling, that is, a lexical process with syntactic implications, that enforces identity as the only possible acquaintance relation.

The final picture would thus be something along the following lines: the cognitive

basis for the *de re* / *de se* ambiguity lies in the possibility of accessing a *res* as non-distinct from the subject accessing it. In some cases, this possibility can be grammatically enforced, with the effect that the ambiguity disappears, in the sense that the relevant grammatical structure can *only* be used with a *de se* reading, and not simply *optionally* used with a *de se* reading depending on the context of utterance, as is the case when acquaintance relations are a function of the pragmatics.

However, some important empirical refinements are in order here. Consider first another class of Dutch lexical reflexives, exemplified in (23):

(23) Jan verbaasde zich
“John got surprised”

There are no scenarios in which (23) could be used with a *de re* interpretation, to express, for instance, the reading according to which Jan surprised himself in seeing his own image reflected in a mirror, and without recognizing the image in the mirror as he himself. The only possible interpretation of (23) is one in which it is used as a report of the fact that Jan got surprised.

What is reported is a past subjective experience of surprise whereby the cause of the surprise cannot be distinguished from the experiencer: the experience is immediately given to a *self* that is not identified by means of explicit acts of reflection or of external perception. If I utter a sentence like “Ik verbaas me” (“I am surprised”), it is thus pointless for you to inquire whether I could be mistaken about the identity of the experiencer of the surprise, as an instance of error through misidentification. It makes no more sense for you to ask me: “Are you really sure that it is you who is surprised?” than it does when you ask: “Are you sure that it’s really you who is seeing a canary?” as a reaction to my assertive use of the sentence “I see a canary”. On these grounds, (23) can be taken to instantiate the subclass of *de se* readings that

we have identified as IEM-readings.

From this perspective, there is a substantial difference between the lexical reflexives exemplified in (23) and those exemplified in (22). As emphasized in the discussion above, there is certainly a strong bias to interpret (22) as a report on an event in which Bill consciously washed/shaved himself, i.e. he washed/shaved while being completely aware that the person washed/shaved was he himself. In spite of this, it is not difficult to figure out situations in which (22) can be read in ways that are incompatible with a strict *de se* reading.⁵⁹

For instance, suppose that Bill is found in the bathroom in a sleep-walking condition while engaging in a series of actions that we would undoubtedly qualify as shaving. In this scenario, we are allowed to report the situation, both in English and Dutch, by using sentences containing a lexical reflexive. We might say, for instance: “I entered the bathroom and I saw Bill shaving”, whereas it is quite likely, in the sleep-walking scenario, that Bill was not acting consciously, i.e. he was probably not aware, among other things, that the person shaved was he himself. What thus do (22) and (23) really have in common?

The correct generalization seems to be that in the structures involving lexical reflexives there are strong reasons (say, on general cognitive grounds) to identify one of the two arguments of the predicate as “referentially non-distinguishable” from the other. In the case of “zich verbazen” in (23), there are no reasons to distinguish between the “experiencer” argument and the “cause” argument, since what we are reporting is an immediately given subjective experience.

In the case of “zich wassen/scharen” in (22), what is described is a state of affairs in which the Agent automatically performs a well-defined series of actions (including internal motor control instructions) automatically affecting some of his body parts (similar considerations hold for “zich ontkleden” (to get undressed), etc.).

In this case, it is thus not required that the

Agent be aware that she is non-distinct from the Patient, it is only required that the agent be involved in an automatically developing course of actions whereby there is no sensible distinction to be made between the Agent and the Patient, in the sense that the individual washed/shaved cannot possibly be different from the individual who performs the given course of actions.

As is well-known from the literature on lexical reflexives, proxy-readings are completely excluded, whereas they are allowed for the variants involving self-reflexives. In a wax-museum scenario, in which John is moving, washing, shaving his wax-counterpart, we cannot report this situation by means of the sentence “John beweegt/wast/scheert zich”, whilst it is perfectly acceptable to describe it by means of the sentence “Jan beweegt/wast/scheert zichzelf”.

Arguably, proxy-readings do not satisfy *the* crucial requirement for theta-bundling, that is, the condition according to which bundling is enforced by UG between two given theta-roles when these two theta-roles cannot be possibly be assigned “distinct” referential indexes. The statue of John goes proxy for John and it is not exactly John. In fact, the sort of movements required from John when he washes his wax-counterpart (including the internal motor control instructions) are quite different from the movements (again, crucially including the internal motor control instructions) that result in “John washing”.

On these grounds, we propose that the data on lexical reflexives argue for the hypothesis according to which theta-bundling is automatically activated, on UG grounds, whenever two theta-roles are “referentially indistinguishable”. This can result in *de se* readings displaying IEM-effects (when an Experiencer role is involved) or in readings where the IEM-effects are separated from *de se* effects, as is the case for “zich bewegen/wassen/scheren”. If I truly utter the sentence “I shaved”, it cannot be the case that I was mistaken in identifying the shavee with

myself.

The reason is that if the shavee is not me but another person, it necessarily follows that I miscategorized the whole shaving event (since, as argued above, the event of “shaving” is distinct from the event of “shaving someone”, including the event of “shaving himself”, that readily allows a proxy-reading).

In all cases, theta-bundling is dictated by metaphysical necessity, i. e. by the impossibility that the theta-roles involved be distinguished referentially. However, *de se* effects manifest themselves only when an Experiencer theta-role is involved, and gives rise to reports on subjective experiences. As a conclusion, a sufficiently fine-grained analysis of lexical reflexives suggests that theta-bundling is strictly connected to “referential indistinguishability”. It may, but need not, give rise to “grammaticalized *de se*”.

On these grounds, let us go back to control structures. We have seen above that sentences like (4a), repeated here as (24), report the remembered event of going to the movies from the first-personal perspective of the subject, i.e. they report the subject’s experience of going to the movies:

(24) John remembers PRO going to the movies

We have already emphasized that it is this sort of obligatory “implicit *de se*” (Recanati) or, in Shoemaker’s sense, the fact that the access to the self is immediate and non-observational, i.e. independent of any perceptual or reflective act of consciousness, that makes control structures of the type in (24) paradigmatic instances of “immunity to error through misidentification”. It is also well-known that instances of obligatory control (OC) such as (24) are incompatible with a *de re* reading, whereas the structures exemplifying non-obligatory control (NOC) can be interpreted *de re*.⁶⁰ A relevant minimal pair is offered in (25):⁶¹

(25)a. The crow remembered PRO being stupid
(OC; *de se* reading only)

b. The crow said that PRO singing that song was stupid
(NOC; ambiguous between a *de re* and a *de se* reading)

The question obviously arises why OC triggers unambiguous *de se* and immunity to error through misidentification (IEM). The answer that naturally suggests itself is that OC might simply be another case of thematic bundling: the internal theta-role (the one traditionally associated with PRO in the syntactic literature) is “bundled” with the main clause subject theta-role. Compulsory *de se* immediately follows. In (24), for instance, the individual going to the movies (or, more exactly, in the present terms, the individual who experiences going to the movies) is necessarily accessed as the experiencer of the remembering, as a direct consequence of thematic bundling. Identity is thus grammatically enforced as the only legitimate acquaintance relation, and *de se* is the only available interpretive option.⁶²

However, this is only a partial answer to the question we have raised. It is in fact still not entirely clear why thematic bundling should enforce, besides compulsory *de se*, also IEM-effects, as is actually the case with obligatory control structures. In (24) thematic bundling has the effect that the object of John’s remembering is represented as the attribution of a property (i.e. the property of experiencing going to the movies) to an individual who is identified as the experiencer of the remembering. However, as stressed by an influential philosophical tradition to which we adhere (Castañeda, Perry, and Shoemaker), no matter how detailed a description is, it cannot possibly entail that *I* am the person satisfying it.

As already emphasized above, being the experiencer in a certain event should be no exception. Or, in slightly different terms, identifying two individuals who are the experiencers in two different events should not lead to that kind of immediate, non-observational access to the self that is responsible, according to Shoemaker, for the

IEM-effects. What is then the source of IEM for sentences like (24) and (25a)? Clearly, something is still missing.

We believe that the solution to this problem simply consists in considering another problem that has not been made explicit, so far. Namely, we proposed, based on our discussion of lexical reflexives, that thematic bundling typically involves theta-roles sharing the “experience” feature. But why should this be the case? A way of tying up these loose ends consists in exploring the possibility that they are intimately connected. It might be the case that thematic bundling is particularly sensitive to the Experiencer theta-role because the latter is different from the other theta-roles. And it might be the case that this difference is the source of the IEM-effects triggered by thematic bundling. Gallagher explores the idea of a primitive consciousness that is still not shaped by conceptual thought. This notion of “minimal self” is arguably linked to the senses of ownership and agency triggered by motor action and cognition in the models that have been developed for schizophrenia. In Gallagher’s terms, a minimal self is

a consciousness of oneself as an immediate subject of experience, unextended in time. The minimal self almost certainly depends on brain processes and an ecologically embedded body, but one does not have to know or be aware of this to have an experience that still counts as a self-experience.⁶³

The basic insight is that we do not need individual-identification by means of property ascription in order to be able to account for «the sense that I am the one who is causing something to move, or that I am the one who is generating a certain thought in my stream of consciousness» or for

the sense that I am the one who is undergoing an experience. For example, the sense that my body is moving regardless

of whether the movement is voluntary or involuntary.⁶⁴

This notion of “minimal self” has to be carefully kept apart from what Gallagher and other influential neuroscientists identify as the “narrative self”, which is conceived of as an object endowed with a more or less coherent set of properties, corresponding to the stories that we and others entertain about ourselves, based on events in the past and in the future.

Clearly, it is the *first-personal* concept of minimal self, and not the *third-personal* concept of narrative self, that is intuitively linked to Shoemaker’s idea of an access to the self that is independent of any perceptual or reflective act of consciousness (an access that he defines as “immediate” and “non-observational”). It is the minimal self that provides the source for the IEM-effects originally detected by Wittgenstein in sentences such as “I am in pain” or “I am hearing the sound of bells”.

In the present framework, this basic insight may be implemented by proposing that the Experiencer theta-role is not a function from events to canonical individuals, as in the Davidsonian tradition. It follows that *Exp(e)* is not equivalent to an individual term, and that the bundling of two experiencer theta-roles is not equivalent to identifying two individuals in terms of some mechanism of property-ascription to these individuals. This is already a welcome result, if we want to pursue the idea that compulsory *de se* and IEM-effects (as detected in obligatory control structures) cannot be the result of some specific modality of property-ascription to individuals, contrary to the line of analysis advocated by Evans and Higginbotham.

Suppose all of this is essentially correct. What is then an Experiencer? Essentially, we think that “Experiencer” (as a theta-role at the interface between the conceptual system and the linguistic system) is a function that applies to events and delivers “minimal sel-

ves". This is intended to model the insight that there are event participants that are not canonical individuals (that is, objects defined as non-trivial set of properties).

It goes without saying that the strength of the proposal depends on how minimal selves are modeled within the assumed semantic framework: What are the metaphysical/ontological properties of such objects and what type of semantics do they entail for the Experiencer theta-role? Also, how do minimal selves relate to canonical individuals?

Here, we provide a few preliminary answers to these questions, while leaving a more in-depth analysis of these and strictly related issues to a future occasion. The minimal self, as defined by Gallagher, is a mental object, an instance of *res cogitans*, corresponding to the conscious, self-aware subject of experience.⁶⁵

We think that a minimal self, the subject of an experience, is intrinsically related to the event it experiences in that the subject and the experience are both necessary and sufficient conditions of each other's existence. An experience of hearing trumpets, to see an example, does not exist without a subject experiencing the hearing; at the same time, the minimal self corresponding to the subject of the experience of hearing trumpets exists only in as much as the experience itself exists. The bidirectional causal relation between experiencer and experience is paralleled at the epistemic level if we maintain that the subject of the experience and the experience itself are epistemically indistinguishable (a thesis that, according to Brooke, can already be found in Kant).

Suppose for a moment that you are looking at some words typed on a screen:

Kant's claim seems to be that the representation of the words on the screen is all the experience I need to be aware not just of the words and the screen but also of the act of seeing them and of who is seeing them, namely, me.⁶⁶

The metaphysical qualities of the minimal self suggest that the Experiencer theta-role is a directly referential rigid designator with the same semantic properties of other names of mental phenomena. As is well known, Kripke's theory of reference entails that the claim "heat is molecular motion" is a logical necessity. The reason why we have an intuition that the sentence represents an *a posteriori* truth lies in the fact that the description that is used to "fix the reference" of the rigid term "heat" is such that it could fail, in some possible world, to identify the same reference as the term "molecular motion". However, Kripke⁶⁷ also makes a point that the same strategy cannot apply to names of mental phenomena such as "pain" and to corresponding materialistic claims such as "pain is C-fibre stimulation". Whereas, in the case of "heat", we can distinguish the manifest qualities that are used to fix the reference of the term and the reference of the term itself, no such distinction is possible between the qualities that are used to fix the reference of "pain" and pain itself:⁶⁸

To be in the same epistemic situation that would obtain if one had pain *is* to have a pain.⁶⁹

Names of mental phenomena are therefore directly referential and rigid and their reference is not fixed on the basis of a description. The Experiencer theta-role can be conceived of as a function from an event to an immediately given subjective experience, i.e. a minimal self. Reference to the minimal self is also direct and rigid: crucially, it is not fixed by means of a description. Minimal selves, as other mental entities, can be accessed exclusively by introspection.

The peculiar status of first person Experiencer subjects observed by Wittgenstein follows straightforwardly. A truthful claim about an experience can be made only by the individual who has introspective access to the minimal self that is the subject of the experience. Since the access to the minimal self

is limited to the individual that “bears” it, through direct introspection and without the recourse to descriptive content, there cannot be any “error of misidentification”, though there can still be, of course, an error in the “categorization” of the subjective experience itself. Intuitively, the link between minimal selves and their “bearers” is established by means of inferential processes, though we will not discuss this in any detail here.

Let us briefly consider an example. Suppose that someone wakes up after a long period of unconsciousness, unable to remember who she is and also unable to have, in the few seconds following her awakening, any perception of her body apart from an intense sense of nausea. This person might immediately think something of the sort of “I feel nausea”. Clearly, the experiencer in such an event qualifies as an optimal candidate for a “minimal self”, since her “subjective” participation in the event of feeling nausea is not dependent on any process of identifying an individual endowed with some non-trivial set of properties (apart, of course, from the property of feeling nausea). Somewhat more explicitly, a minimal self could be defined as the experiencer in the class of events that are primitively defined as “subjective experiences”.

From this perspective, $Exp(e)$ is not a canonical individual-referring expression. $Exp(e)$ does not refer to an individual a which might or might not be endowed with the property P corresponding to its participation in the relevant “subjective” experience (i.e. to an individual a for which it might be the case $Exp(e) = a$ or it might be the case $Exp(e) \neq a$); rather, $Exp(e)$ refers to something that necessarily satisfies P (in the worlds where P is instantiated) and is uniquely defined as something that satisfies P .

Let us take stock of where we stand. In a nutshell, we have proposed that the mechanism responsible for grammatical enforcement of compulsory *de se* and IEM-effects in control structures is thematic bundling. The reason why thematic bundling yields these

interpretive effects is that bundling unifies two Experiencer theta-roles. Experiencers map events onto “minimal selves”.

This elegantly accounts for the subtle interpretive effects we detected in control structures such as (24): the object of the remembering is not the ascription of a property to an independently established individual, it is rather the subjective feeling of undergoing the perceptual experience described by the infinitival complement. This entails that (24) is to be interpreted as a report on the fact that the minimal self involved in the experience of remembering is identified with the minimal self undergoing the experience of going to the movie.

Intuitively, this process of minimal-self unification gives rise to a more complex minimal self defined by the fact that the subjective experience of going to the movies is also a subjective experience of remembering. Cognitively, this can be seen as a first step towards the construction of a narrative self, that is, an individual to which one could ascribe properties as the result of a conscious act of reflection. However, analyzing the complex cognitive/linguistic interplay between minimal and narrative self largely exceeds the limits of the present contribution, and we leave it to future work.

Here, we are content with having sketched the basic ingredients of an analysis according to which (i) control structures provide a way of encoding compulsory *de se* and immunity to error through misidentification;⁷⁰ and (ii) the latter crucially depends on the absence of any process of individual-identification through property-ascription, in full compliance with some of the insights of an influential philosophical tradition, including Castañeda, Perry and Shoemaker.

The present proposal is based on an original reinterpretation of the Experiencer theta-role, to be developed and refined in future work. Significantly, our proposal offers good prospects for a combination of the results of the research on linguistic encoding of first-

personal thoughts and the by now impressive body of neuropsychological research on the construction of (the different forms of) consciousness.

Notes

¹ See D. LEWIS, *Attitudes De Dicto and De Se*, in: «The Philosophical Review», vol. LXXXVIII, n. 4, 1979, pp. 513-543.

² See a.o. H.-N. CASTAÑEDA, “He”: *A Study in the Logic of Self-consciousness*, in: «Ratio», vol. VII, n. 2, 1966, pp. 130-157; G. CHIERCHIA, *Anaphora and Attitudes De Se*, in: R. BARTSCH, J. VAN BENTHEM, P. VAN EMDE BOAS (eds.), *Semantics and Contextual Expressions*, Foris, Dordrecht 1989, pp. 1-31; J. HIGGINBOTHAM, *On Words and Thoughts About Oneself*, in: F. RECANATI, I. STOJANOVIC, N. VILLANUEVA (eds.), *Contextdependence, Perspective, and Relativity*, Mouton-De Gruyter, Berlin 2010, pp. 209-238; D. KAPLAN, *Demonstratives*, in: J. ALMONG, J. PERRY, H. WETTSTEIN (eds.), *Themes from Kaplan*, Oxford University Press, Oxford 1989, pp. 581-663; T. REINHART, *Self-representation. Lecture Delivered at Princeton Conference on Anaphora*, October 1990.

³ See H.-N. CASTAÑEDA, “He”: *A Study in the Logic of Self-consciousness*, cit.; H.-N. CASTAÑEDA, *On the Logic of Attribution of Self-knowledge to Others*, in: «The Journal of Philosophy», vol. LXV, n. 15, 1968, pp. 439-456; J. HIGGINBOTHAM, *Remembering, Imaging, and the First Person*, in: A. BARBER (ed.), *Epistemology of Language*, Oxford University Press, Oxford 2003, pp. 496-533; J. HIGGINBOTHAM, *On Words and Thoughts About Oneself*, cit.

⁴ See G. CHIERCHIA, *Anaphora and Attitudes de se*, cit.

⁵ See J. HIGGINBOTHAM, *Remembering, Imaging, and the First Person*, cit.

⁶ See S. SHOEMAKER, *Self-Reference and Self-Awareness*, in: «The Journal of Philosophy», vol. LXV, n. 19, 1968, pp. 555-567.

⁷ See J. PRYOR, *Immunity to Error Through Misidentification*, in: «Philosophical Topics», vol. XXVI, n. 1-2, 1999, pp. 271-304.

⁸ See N. CHOMSKY, *Lectures on Government and Binding*, Foris, Dordrecht 1981.

⁹ J.A. FODOR, *The Language of Thought*, Harvard University Press, Harvard 1975, p. 133ff.

¹⁰ See J. PRYOR, *Immunity to Error Through Misidentification*, cit.

¹¹ A further prediction pointed out by an anonymous reviewer, is that sentence (i) should not be contradictory: (i) John remembers that he has been to Stuttgart, but he can't remember having been to Stuttgart. We submit that the prediction is met.

¹² J. HIGGINBOTHAM, *Remembering, Imaging, and the First Person*, cit., p. 503.

¹³ See L. WITTGENSTEIN, *The Blue and Brown Books (1933-1935)*, edited by F. SKINNER, A. AMBROSE, Basil Blackwell, Oxford 1958.

¹⁴ *Ivi*, pp. 66-67.

¹⁵ See S. SHOEMAKER, *Self-Reference and Self-Awareness*, cit.

¹⁶ J. PRYOR, *Immunity to Error Through Misidentification*, cit., p. 283.

¹⁷ See J. HIGGINBOTHAM, *Remembering, Imaging, and the First Person*, cit.

¹⁸ It is important to stress that the immunity to error that we have described is relative to the subject of the main predicate *remember*. That is, the subject cannot be mistaken when identifying the object of her memory as herself. This does not exclude cases in which the memory reported is a false memory. In fact, the claim made in this section is that it follows from (11c) that there is no possibility that I am mistaken in identifying myself as the individual I remember saying that John should finish his thesis by July. It is not claimed that it follows from (11c) that it was me who said John should finish his thesis by July. The last claim goes through if it is assumed that *remember* is a factive predicate and entails, as such, the truth of its complement. However, the discussion of quasi-memories raises some doubts about the validity of this assumption (for an overview see J. PRYOR, *Immunity to Error Through Misidentification*, cit., section V). Notice, at any rate, that the issue of whether *remember* is in effect a factive predicate, does not affect the weaker claim that is supported in this section.

¹⁹ See F. RECANATI, *Perspectival Thought*, Oxford University Press, Oxford 2007.

²⁰ See D. MORGAN, *First-Person Thinking and Immunity to Error Through Misidentification. What Does it Tell us About De Se?*, in: S. PROSSER, F. RECANATI (eds.), *Immunity to Error Through Misidentification: New Essays*, Cambridge University Press, Cambridge (MA) 2012, pp. 104-123.

²¹ *Ivi*, p. 106.

²² See J. HIGGINBOTHAM, *Remembering, Imaging, and the First Person*, cit.

²³ *Ivi*, p. 514.

²⁴ This type of analysis is reminiscent of G. EVANS, *The Varieties of Reference*, Oxford University Press, Oxford 1982: «in a self-conscious thought, the subject must think of an object in a way that permits it to be characterized as the subject of that very thought» (*ivi*, p. 213).

²⁵ See J. CAMPBELL, *Immunity To Error Through Misidentification and the Meaning of a Referring Term*, in: «Philosophical Topics», vol. XXVI, n. 1-2, 1999, pp. 89-104.

²⁶ See D. DAVIDSON, *The Logical Form of Action Sentences*, in: N. RESCHER (ed.), *The Logic of Decision and Action*, Pittsburgh University Press, Pittsburgh 1967, pp. 104-112.

²⁷ See T. PARSONS, *Events in the Semantics of English: A Study in Subatomic Semantics*, MIT Press, Cambridge (MA) 1990.

²⁸ See J. HIGGINBOTHAM, *Remembering, Imaging, and the First-Person*, cit. ; J. HIGGINBOTHAM, *On Words and Thoughts About Oneself*, cit.

²⁹ Delfitto and Fiorin endorse Higginbotham's proposal that in a *de se* belief the object of the belief is identified as the Experiencer *Exp(e)* in the event *e* of believing. However, they reject Higginbotham's assumption that the participants in an event are essential properties of the event and maintain that thematic roles are not rigid designators. This descriptive analysis of thematic roles has intriguing consequences. Nevertheless, the objection we raise against Higginbotham's proposal in the following section applies with equal strength to Delfitto and Fiorin's implementation of Higginbotham's framework (see D. DELFITTO, G. FIORIN, *Person Features and Pronominal Anaphora*, in: «Linguistic Inquiry», XLII, n. 2, 2011, pp. 193-224, footnotes 1 and 13). Another solution to the problem we are discussing may be represented by Recanati's proposal that the concept corresponding to *Exp(e)* is used attributively in the sense of Donnellan (see K.S. DONNELLAN, *Reference and Definite Descriptions*, in: «The Philosophical Review», vol. LXXVII, n. 3, 1966, pp. 281-304). This proposal has also the advantage that it separates the use of the concept *Exp(e)* from the need to identify its referent. This proposal is criticized and dismissed by Morgan (see D. MORGAN, *First-Person Thinking and Immunity to Error Through Misidentification*, cit.).

³⁰ See S. SHOEMAKER, *Self-Reference and Self-Awa-*

reness, cit.

³¹ *Ivi*, p. 558.

³² S. SHOEMAKER, *Self-Knowledge and "Inner Sense"*. *Lecture I: The Object Perception Model*, in: «Philosophy and Phenomenological Research», vol. LIV, n. 2, 1994, pp. 249-269, here pp. 257-258.

³³ See J. PRYOR, *Immunity to Error Through Misidentification*, cit., p. 291.

³⁴ See *ivi*, section V, for a discussion of "quasi-memories".

³⁵ S. SHOEMAKER, *Self-Reference and Self-Awareness*, cit., p. 561.

³⁶ *Ivi*, p. 560.

³⁷ J. PERRY, *Frege on Demonstratives*, in: «The Philosophical Review», vol. LXXXVI, n. 4, 1977, pp. 474-497.

³⁸ See S. GALLAGHER, *Philosophical Conceptions of the Self: Implications for Cognitive Science*, in: «Trends in Cognitive Sciences», vol. IV, n. 1, 2000, pp. 14-21.

³⁹ See J. HINTIKKA, *Knowledge and Belief: An Introduction to the Logic of the Two Notions*, Cornell University Press, Ithaca-New York 1962.

⁴⁰ See D. LEWIS, *Attitudes De Dicto and De Se*, cit.

⁴¹ See M.J. CRESSWELL, A. VON STECHOW, "De Re" *Belief Generalized*, in: «Linguistic and Philosophy», vol. V, n. 4, 1982, pp. 503-535.

⁴² See W.V.O. QUINE, *Propositional Objects* (1965), in: W.V.O. QUINE, *Ontological Relativity and Other Essays*, Columbia University Press, New York 1969, pp. 139-160.

⁴³ J. HIGGINBOTHAM, *On Words and Thoughts About Oneself*, cit, p. 222.

⁴⁴ *Ivi*, p. 223.

⁴⁵ Chierchia, who was the first to adopt Lewis' property based semantics of propositional attitudes, was well aware of the difficulties Lewis' approach faced when accounting for attitudes *de re*. To solve this problem Chierchia adopts a mixed approach whereby the complement of a verb of proposition attitude is ambiguous and can denote either a property, in which case the complement is interpreted *de se*, or a proposition, in which case it is interpreted *de re* (see G. CHERCHIA, *Anaphora and Attitudes De Se*, cit.).

⁴⁶ J. HIGGINBOTHAM, *On Words and Thoughts About Oneself*, cit., p. 235, fn. 8.

⁴⁷ See W.V.O. QUINE, *Quantifiers and Propositional Attitudes*, in: «The Journal of Philosophy», vol. LIII, n. 5, 1956, pp. 177-187.

⁴⁸ See M.J. CRESSWELL, A. VON STECHOW, "De Re"

Belief Generalized, cit.

⁴⁹ See D. KAPLAN, *Quantifying*, in: D. DAVIDSON, *Words and Objections*, Reidel, Dordrecht 1969, pp.

⁵⁰ See E. MAIER, *Presupposing Acquaintance: A Unified Semantics for De Dicto, De Re, and De Se Belief Reports*, in: «Linguistic and Philosophy», vol. XXXII, n. 5, pp. 429-474.

⁵¹ One important difference between Maier's truth-conditions and those proposed by Cresswell and von Stechow is that in Cresswell and von Stechow the acquaintance relation *R* is closed under existential quantification, whereas in Maier it is a free variable that receives a value from the context. Maier shares the idea of context-dependent acquaintance relations with Abush and Aloni (see D. ABUSH, *Sequence of Tense and Temporal De Se*, in: «Linguistic and Philosophy», vol. XX, n. 1, 1997, pp. 1-50; M. ALONI, *Quantification Under Conceptual Covers*, Ph.D. Thesis, University of Amsterdam 2000).

⁵² See W.V.O. QUINE, *Quantifiers and Propositional Attitudes*, cit.

⁵³ See E. MAIER, *Presupposing Acquaintance*, cit.

⁵⁴ See J. HIGGINBOTHAM, *Remembering, Imaging, and the First-Person*, cit.

⁵⁵ Unless, of course, we want to treat introspection itself as a sort of acquaintance relation. This possibility, however, is radically rejected in S. SHOEMAKER, *Self-Knowledge and "Inner Sense"*, cit.

⁵⁶ Notice, in fact, that the ambiguity of (4b) above also resides in the use of a self-anaphor, as shown by the comparison with (4a).

⁵⁷ See D. DELFITTO, G. FIORIN, *Towards an Extension of De Se / De Re Ambiguities: Person Features and Reflexivization*, in: «Lingue e linguaggio», vol. VII, n. 1, 2008, pp. 25-46.

⁵⁸ See M. MARELJ, E.J. REULAND, *Deriving Cross-linguistic Variation: The Case of Reflexives and Other SE Constructions*, in: Proceedings of SLS 6, Provence University Press, 2012.

⁵⁹ We are indebted to Benjamin Bruening and to Hazel Pearson for some enlightening discussions on these and related topics.

⁶⁰ The distinction between obligatory and non-obligatory control predicates, introduced by Williams, is determined by the ability of the complement of the predicate to host a lexical subject (see E. WILLIAMS, *Predication*, in: «Linguistic Inquiry», vol. XI, n. 1, 1980, pp. 203-238): (i) Bill

tried [PRO /*Mary to sing] (OC); (ii) Bill wanted [PRO/Mary to sing] (NOC).

⁶¹ See D. REGGIANI, *A Short Introduction to Control Theory*, in: «Lingue e linguaggio», vol. X, n. 1, 2011 pp. 133-160.

⁶² An anonymous reviewer raises the problem of the legitimacy of an operation of theta-bundling that bundles together two theta-roles belonging to distinct predicates. Is there any independent evidence for this move? And in which sense is theta-bundling then still conceived as a lexical operation? First of all, it should be noted that effects quite close to theta-bundling have been proposed in the so-called movement *a*-theory of control (see a.o. M.R. MANZINI, A. ROUSSOU, *A Minimalist Theory of A-Movement and Control*, in: «Lingua», vol. CX, n. 6, 2000, pp. 409-447; C. BOECKX, N. HORNSTEIN, J. NUNES, *Control as Movement*, Cambridge University Press, Cambridge 2010). Here, there is a unique argument to which two distinct theta-roles are assigned. Still, the objection might be that what we have here is the same result achieved through movement, not through a lexical operation of theta-bundling. What we would like to suggest is that there is in fact an independent argument supporting theta-bundling as an operation applying to a unique complex predicate: in sentences such as (24) something like "complex event formation" is arguably going on, to the effect that a complex predicate is created in the semantics out of the main clause and the embedded clause predicates. In a nutshell, the argument runs as follows: when we utter (24) we do not really want to say that there is a subjective experience of remembering (whose subject is John) whose content is the event consisting in John going to the movies. This is rather the interpretation of the counterpart of (24) in which "remember" takes an infinitival complement (and it is of course the correct reading of "John remembers that he has gone to the movies"). What (24) expresses is the meaning according to which John is – in a sense – the experiencer of an event of going to the movies, while this event is categorized – by John himself as its experiencer – as an event of "remembering". Clearly, this interpretation is based on some process of complex predicate formation in the semantics. Ultimately, there is thus a clear sense according to which theta-bundling, when it applies to control-structures, applies to

two roles belonging to a unique complex predicate.

⁶³ S. GALLAGHER, *Philosophical Conceptions of the Self*, cit., p. 15.

⁶⁴ *Ibidem*.

⁶⁵ See D. CHALMERS, *The Conscious Mind: In Search of a Fundamental Theory*, Oxford University Press, New York 1996.

⁶⁶ A. BROOK, *Kant, Self-Awareness and Self-Reference*, in: A. BROOK, R.C. DE VIDI (eds.), *Self-Reference and Self-Awareness*, John Benjamin, Amsterdam 2001, pp. 9-30, here p.18.

⁶⁷ See S. KRIPKE, *Naming and Necessity*, Harvard University Press, Cambridge (MA) 1980, pp. 151-153.

⁶⁸ See T.S. GENDLER, J. HAWTHORNE, *Introduction: Conceivability and Possibility*, in: T.S. GENDLER, J. HAWTHORNE (eds.), *Conceivability and Possibility*, 2002, pp. 1-70, here p. 39.

⁶⁹ See S. KRIPKE, *Naming and Necessity*, cit, p. 152.

⁷⁰ However, we do not claim that “control” is a unitary phenomenon and that it receives a unitary interpretation (roughly involving a *de se* reading and IEM-effects). This has been already clarified by the distinction between obligatory control and non-obligatory control discussed in the text. And even if we abstract away from NOC, there are cases in which IEM-effects are apparently

not compulsory. Consider (i) in Italian: (i) Gianni pensa di aver spedito, trent’anni prima, il messaggio al Presidente [Gianni thinks to have sent, 30 years before, the message to the President]. The relevant observation is that we may utter (i) to describe a scenario in which Gianni has vague memories about the relevant series of events that took place 30 years before, and although he thinks that the message was sent by him himself, it was in fact one of the officials working with him who sent the message to the President. A different case is provided by cases such as (ii) Maria wants to be slim. The relevant scenario is one on which Maria refuses to help herself to a biscuit and someone utters (ii). In Jaszczolt’s words, «the speaker of (ii) may not even intend to convey Maria’s wish but merely generalize on Maria’s eating habits», to the effect that «cognitive access to oneself and PRO are not inseparably connected» (see K.M. JASZCZOLT, *First-Person Reference in Discourse: Aims and Strategies*, in: «Journal of Pragmatics», vol. XLVIII, n. 1, 2013, pp. 57-70). We do not think that these examples can be taken to show that control can be loosely interpreted as proposed by Jaszczolt. However, we have to leave a detailed discussion of the issues involved to a future occasion.