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Pritty Patel-Grosz
Patrick Georg Grosz
Sarah Zobel *Editors*

Pronouns in Embedded Contexts at the Syntax-Semantics Interface

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Introduction

This edited volume brings together a selection of papers in connection with the workshop "Pronouns in Embedded Contexts at the Syntax-Semantics Interface," held at the University of Tübingen on 7–9 November 2014.

Traditionally, pronouns (e.g., third person singular pronouns *he/she/it*) are taken to be natural language expressions that denote individual variables, which receive their values either from context or via binding. For instance, in (1a), *he* can be taken to refer to the previously introduced individual *John*, as indicated by the paraphrase in (1b).

(1) a. **John** thinks that **he** is blond.
    b. *Paraphrase:* **John** thinks that **John** is blond.

Pronouns, their syntactic and semantic behavior, and the question of how to capture them formally have always received a lot of attention in the literature (see Büring 2011 for an overview). Much recent literature, though, has focused specifically on the properties of pronouns in embedded contexts (e.g., Percus and Sauerland 2003a, b; Schlenker 2003; Patel-Grosz 2012, 2014; Pearson 2012; Sundaresan 2012; Podobryaev 2014, among others), including prominently the so-called *de se/de re* ambiguity, (anti-)logophoricity, and indexical shift – all of which occur in attitude reports which also form the central contexts of interest in this volume.

To give an example for the kind of questions that arise for pronouns in attitude contexts from the point of view of syntax and semantics, we outline the *de se/de re* ambiguity (see Lewis 1979; Perry 1979; Chierchia 1989). Consider the contexts in (2) and (3), which are both compatible with the statement in (1a) – each relative to a different reading. The *de se* reading of an attitude report expresses a conscious self-directed attitude by the attitude holder about himself.

(2) *De se context for (1a)*
    John is thinking about the hair color of every male person in his circle of friends. While most of John's friends are dark-haired, John thinks about himself: "I am blond."

If John's belief in (2) is reported with (1a), the pronoun *he* corresponds to the first person pronoun *I* in a direct "speech" report of John's actual thoughts. This correspondence is often seen as a central characteristic of *de se* readings: did or would the attitude holder use *I* when stating his belief?

De se readings contrast with so-called *de re* readings which express an attitude about a specific individual. This also includes attitudes of an attitude holder about himself; the crucial difference to the *de se* readings is that the *de re* readings do not convey that the attitude is consciously self-directed. Hence, with predicates such as *think*, *believe*, and *claim*, contexts that aim to bring out the *de re* reading while blocking the *de se* reading (to our knowledge) always involve mistaken identity – see (3).

(3) *De re context for (1a)*
John is dark-haired, and he is well aware of the fact that he is dark-haired. He is currently looking through photographs of a recent costume party, where he was wearing a blond wig. When he sees a photo of himself from behind that had been taken by a friend, he does not realize that he is looking at himself. While looking at the photograph, John thinks: "That guy is blond."

If John's thought in (3) is reported with (1a), *he* does not correspond to a first person pronoun *I* in the given direct speech report of John's thoughts but to the definite description *that guy*. In fact, John is not aware that his thoughts involve himself; he happens to have an accidental belief about himself. Therefore, (1a) can only be understood in its *de re* reading.

From the point of view of the syntax-semantics interface, analyses of the *de se/de re* ambiguity need to address, for instance, the following questions: Is there a structural difference between the *de se* and the *de re* reading? Do the *de se* and the *de re* readings draw on the same interpretational mechanisms, and if so, does the pronoun contribute the same content in both cases?

The core idea that is pursued in this volume is that investigating the syntactic and semantic behavior of pronouns in embedded contexts like attitude reports can shed new light on the very nature of pronominal elements. In this spirit, the proposed volume brings together a range of different contributions on the topic of pronouns in embedded contexts from researchers working in syntax and semantics and thus serves as a means of gaining a multifaceted picture of the current developments in this area of research and the questions that still remain to be answered.

The volume encompasses research on (i) the semantics of attitude reports and pronominal elements contained therein, including the semantics of pronominal features and their connection to indexicality; (ii) the connection between pronominal typology (e.g., personal vs. demonstrative pronouns) and logophoricity/anti-logophoricity; and (iii) the localization of pronouns in embedded contexts within a bigger picture that involves the nature of perspective and the analysis of quasi-pronominal phenomena such as sequence of tense. These are three of the core areas in current syntactic and semantic research on pronouns in embedded contexts.

The two papers by **Landau** and **Tiskin** advocate novel theoretical approaches to well-known phenomena in the linguistic (and philosophical) literature which still present new puzzles for ongoing research.

Landau ("Direct Variable Binding and Agreement in Obligatory Control") focuses on constructions that involve obligatory control (e.g., *Only Richard hated* [*PRO to play hip hop*]) and lays out a system for modeling the relationship between the anaphoric element *PRO* and its antecedent DP at the syntax-semantics interface. Landau focuses on the correlation between φ-agreement (between *PRO* and its antecedent, e.g., in grammatical gender) and obligatory *de se* interpretations, which poses a problem for standard approaches to obligatory control. Developing an approach in which *de se* attitudes are analyzed as a particular type of *de re* attitudes, Landau's solution argues that the control infinitive contains a left-peripheral variable that is syntactically bound by the controlling antecedent, an idea that originated in the 1970s, reformulated in a contemporary context.

Tiskin ("Intentional Identity as a Transparency Phenomenon") concentrates on the analysis of English personal pronouns (*she/he*) in attitude contexts in connection with the problem of *intentional identity*. His point of departure is the classical *Hob-Nob sentences* of Geach (1967) (e.g., *Hob wants to buy an apartment, and Nob wants it to be near the city center* where the question arises of how the pronoun *it* gets its reference if *an apartment* is read *de dicto* and thus non-referentially). Tiskin argues in favor of an analysis in a dynamic framework, adopting a definite description account of third person pronouns. His solution for the problem of intentional identity takes the pronoun in the second attitude report to pick up a counterpart of the discourse referent introduced by the indefinite description in the first attitude report.

Subsequent to Landau and Tiskin's papers, which focus on English-language data, the four papers by **Kaiser**, **Hinterwimmer** and **Bosch**, **Shushurin**, and **Herbeck** each provide a case study of cross-linguistic variation from a theoretic perspective.

Kaiser ("Pronoun Use in Finnish Reported Speech and Free Indirect Discourse: Effects of Logophoricity") focuses on the contrast between the third person pronouns *hän* ("he/she") and *se* ("it") in Finnish, which can both pick up a human antecedent in a suitable context. In this paper, Kaiser demonstrates that these two pronouns pattern differently with respect to (anti-)logophoricity in (Colloquial Finnish) reported speech *vs.* (Standard Finnish) free indirect discourse (FID). In reported speech, *se* seems to be the default, with *hän* being a logophoric element, whereas in free indirect discourse, *hän* is the default, with *se* patterning as an anti-logophoric element. Kaiser argues that the Finnish patterns support theories of reference resolution that draw both on logophoricity and salience.

Parallel considerations apply to the distinction between personal pronouns and demonstrative pronouns in German, for which **Hinterwimmer** and **Bosch** ("Demonstrative Pronouns and Propositional Attitudes") posit that demonstrative pronouns (i.e., *der/die/das*) are anti-logophoric, whereas personal pronouns (i.e., *er/sie/es*) have an unmarked distribution. The contexts in which they investigate the

behavior of these two classes of pronouns are complement clauses that are selected by attitude predicates such as *glauben* "believe." While demonstrative pronouns in such complement clauses can generally not refer to the matrix subject, this constraint is suspended in certain contexts. The pattern is attributed to the idea that demonstrative pronouns cannot be resolved to the most prominent perspective holder, which, by default, is the matrix subject of an attitude predicate – a default that can be overridden.

Moving on from distinctions between classes of overt pronouns to the topic of null pronouns, **Shushurin** ("Null Pronouns in Russian Embedded Clauses") addresses the limited distribution of partial *pro*-drop in Russian embedded clauses (such as the Russian translation of "Vadim said that (he) would come in the evening") and how partial *pro*-drop ties in with the phenomenon of so-called finite control. While this type of *pro*-drop has been previously discussed for complements of attitude verbs, Shushurin focuses on partial *pro*-drop in sentential adjuncts and embedded *wh*-questions, arguing that, in contrast to complement clauses, these involve a minimally specified silent pronoun. Such a deficient *pro* must cliticize to an overt complementizer, thus deriving its distributional restrictions to clauses with complementizers. Hence, while partial *pro*-drop in complement clauses is due to an agree relation, its occurrence in sentential adjuncts and embedded *wh*-questions is licensed by a topic chain.

In a related investigation, **Herbeck** ("Deriving Null, Strong, and Emphatic Pronouns in Romance *Pro*-Drop Languages") surveys the distribution of *null* vs. *overt* pronouns in Spanish and Catalan. He argues for a proposal at the syntax-semantics interface, which aims at formally capturing the range of different types of overt/null pronouns in Romance and at establishing a better understanding on how syntax and pragmatics interact. Herbeck zooms in on the connections between the *null* vs. *overt* distinction, on the one hand, and information structure, on the other hand. He treats subject pronouns as the post-syntactic spell-out of information-structural ("topic/focus") morphemes. This discourse-related account of pronominal form is connected to a view in which embedded subject pronouns are syntactically "built" in the C-domain of the clause that contains them.

In the last contribution to this volume, **Sharvit** ("Sequence of Tense: Syntax, Semantics, Pragmatics") addresses the broader empirical domain within which pronouns in embedded contexts can be situated. She does so by focusing on *sequence-of-tense* (*SOT*) phenomena (e.g., the embedded past tense in *John said that Mary was self-employed* when reporting John's present-tense statement "Mary is self-employed"). Tense is often viewed as pronominal in nature, and sequence-of-tense effects have been argued to also exhibit distinctions along the lines of the *de se/de re* ambiguity outlined above. Sharvit questions whether sequence-of-tense effects are due to an *SOT rule* in connection with a *de re* interpretation of the

temporal pronoun or whether they could be captured by an account that appeals to pragmatic strengthening. She argues that the combination of an SOT rule and a *de re* construal are indeed necessary.

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Direct Variable Binding and Agreement in Obligatory Control

Idan Landau

Abstract Standard semantic theories of Obligatory Control (OC) capture the obligatory *de se* reading of PRO but fail to explain why it agrees with the controller. Standard syntactic theories of OC explain the agreement but not the obligatory *de se* reading. A new synthesis is developed to solve this fundamental problem, in which the controller directly binds a variable in the edge of the complement. The associated semantics utilizes the idea that *de se* attitudes can be modelled as a special case of *de re* attitudes. The specific interaction of feature transmission and phase-based locality derives a striking universal asymmetry: Inflection on the embedded verb blocks OC in attitude complements but not in nonattitude complements. A semantic benefit is a straightforward account for "unexpected" binding between PRO and *de re* reflexives/pronouns.

1 Introduction

Imagine that Kelly is planning a birthday party. She is not sure how much alcohol she wants in the party because she is worried that some of the guests might get drunk and become rude and unpleasant. Kelly's friend, Sue, calms her down. She tells Kelly not to worry: "Nobody will get that drunk, and anyway, I know all the people you invited. They will behave themselves at the party, I promise". Sue does not, in fact, plan to attend the party, as she has travel plans for the day before. But Kelly was not aware of these plans, so she did, in fact, send Sue an email invitation to the party (which Sue has not opened yet).

In this scenario, Sue made a promise about a group of people, which, unbeknowst to her, includes herself. Consider the following reports of this situation.

(1) a. Sue_i promised [that she_i would behave herself at the party].
b. Sue_i promised [PRO_i to behave herself at the party].

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(1a) has a true reading under this scenario, although admittedly it is not salient. This is known as the *de re* construal of the pronoun *she*. (1b), on the other hand, is clearly false in the given scenario. Sue made no first person commitment in promising what she did to Kelly, since she was not aware of the fact that she is one of the invitees. This is described as an obligatory *de se* construal of the silent PRO subject of the infinitival complement. That PRO in Obligatory Control (OC) displays this unambiguous reading (as opposed to the lexical pronoun in (1), which is ambiguous) has been known since Morgan (1970), and taken to be the fundamental explanandum of formal semantic treatments of OC (see Chierchia 1990; Percus and Sauerland 2003a; Schlenker 2003; von Stechow 2003; Anand 2006; Stephenson 2010; Pearson 2013, 2016). Call this *Fact 1*.

Another observation, much more elementary, is that PRO in OC agrees with the controller in all ϕ-features. This can be seen indirectly in the shape of agreeing reflexives, like *herself* in (1b). Importantly, the agreement cannot be reduced to semantic coherence (i.e., matching the natural gender of coreferential expressions). This is because *behave oneself* is only formally reflexive, not notionally so; its object is not referential, hence not subject to any constraints on denotation. Nor can its shape be blamed on default morphology, which is masculine in English, not feminine. It seems that the nonreferential *herself* in (1b) must formally agree with its binder PRO, which must formally agree with its matrix controller. Furthermore, the agreement *overrides* semantic considerations, as Schlenker (2011) pointed out.

(2) John, a transsexual, hopes [PRO to become a woman
and PRO to buy himself/*herself a car].

Although John is a woman in each of the contexts compatible with his hopes, and so is the buyer (= the second PRO), the masculine gender feature must be inherited from the matrix controller. This seems to be a result of a semantically opaque rule of morphological agreement. Call this *Fact 2*.[1]

Put together, these two facts set up what I call the "problem of form and meaning in OC", which is stated in (3c).

(3) *The problem of form and meaning in OC*
   a. Fact 1: In attitude contexts, PRO must be construed *de se*.
   b. Fact 2: In all OC contexts, PRO agrees with the controller.
   c. The standard semantic explanation for (a) and the standard syntactic explanation for (b) are *incompatible*.

The first part of this paper (Sects. 2 and 3) lays out this problem in detail. Briefly, we will see that the prevailing semantic analysis of OC is based on the

[1]There is a narrowly circumscribed class of exceptions to Fact 2: Inflected infinitives that display partial control in Brazilian Portuguese may (and sometimes must) carry plural agreement although the controller is singular (Modesto 2010, 2013). This is due to the intervention of additional syntactic material in the complement (see discussion in Landau 2016). I do not discuss partial control in this paper.

property/centered-worlds theory, which involves a syntactic configuration that is incapable of mediating agreement, for principled reasons. Conversely, the prevailing syntactic analysis of OC is based on direct variable binding between the controller DP and PRO, and this syntax is incapable of ensuring the *de se* construal. This dilemma is fundamental, although seldom acknowledged. Resolving it is the main goal of this paper.

My proposal, in essence, will be to enrich the variable binding analysis with grammatical machinery that has been fruitfully employed elsewhere, in such a way that both Fact 1 and Fact 2 will follow from a single, coherent model. This is really a revival of an old idea. For a short while in the 1970s, after the demise of the Equi-NP Deletion theory and before the rise of the property theory of OC in Montague Grammar, it was thought that OC PRO is a variable directly bound by the controller (Morgan 1970; Fodor 1975; Partee 1975). The evidence seemed straightforward. First, PRO can be bound by quantified expressions (4a); second, it gives rise to a sloppy reading, and excludes a strict reading, in the scope of *only* (4b) and in VP-ellipsis contexts (4c).

(4) a. [Every contestant]$_i$ expected [PRO$_i$ to win].
(≠ *every contestant expected every contestant to win*)
b. [Only Richard]$_i$ hated [PRO$_i$ to play hip-hop].
(≠ *Richard is the only one who hated Richard's playing hip-hop*)
c. Mary$_i$ hoped [PRO$_i$ to get a new car] and Claire did too.
(≠ *Claire hoped for Mary to get a new car*)

Compelling as it initially seemed, the direct variable binding approach was soon abandoned due to its failure to capture the "holy grail" of OC, Fact 1. This had the unfortunate consequence of losing Fact 2, which is no less fundamental. The bound variable interpretation of PRO was then handled very differently; not in the syntax, but in the semantics of the attitude verb, which associates the referent of the controller with its doxastic counterparts in each of the alternative worlds/contexts that the verb quantifies over.

The basic question, then, is this: Is the bound variable interpretation of PRO *syntactically* represented or not? By giving a positive answer to this question, my proposal is aligned with the earlier generative approaches to OC as well as with the more recent syntactic treatments. However, it simultaneously takes full account of the need to accommodate Fact 1 within any solution. The second part of this paper (Sects. 5, 6, and 7) provides novel arguments for this approach, over and above the resolution of the dilemma in (3).

The structure of the paper is as follows. Section 2 presents the mainstream generative view on the syntax of OC. This view readily explains Fact 2 but fails to explain Fact 1 (worse, it predicts systematic *de re* construal in OC). Section 3 presents the mirror-image problem with the formal semantic view of OC: it explains Fact 1 but not Fact 2. Four different implementations of this view are considered, two of which recognize the agreement problem and attempt to address it. I argue that the solutions offered are far from satisfactory. Section 4 lays out the

present proposal, the Two-Tiered Theory of Control (TTC). This theory integrates the results of several strands of research: The treatment of *de se* as a special kind of *de re*, the formalism of concept generators (Percus and Sauerland 2003a), the syntactic encoding of discourse information in the clausal left periphery, the notion of minimal pronouns, feature transmission and feature deletion. Two types of control are distinguished, in attitude and nonattitude contexts (*logophoric* and *predicative* control, respectively). I argue that logophoric control is constructed as a second tier above predicative control, hosting a variable that is directly bound by the controller DP.

Section 5 presents a novel argument in favor of the TTC from a crosslinguistic pattern: Embedded inflection disrupts logophoric but not predicative control. This effect is shown to be rooted in the syntax of Feature Transmission and provides a novel argument in favor of this device over other devices that were proposed to handle the cancellation of the presuppositional import of ϕ-features on bound pronouns. Section 6 considers a beneficial outcome of the analysis – a straightforward account for "unexpected BT effects", where PRO binds a *de re* reflexive/pronoun. Section 7 concludes the paper by comparing the overall explanatory advantage of the TTC over the standard semantic accounts of OC.

2 The Syntactic Analysis: Getting Agreement but Not *de se*

Although there has been much dispute over the syntax of OC constructions, some basic assumptions are shared across most of the popular approaches. In particular, those approaches that take OC complements to be clausal assume that PRO is an anaphor-like element, bound by the controller.[2] The S-structure in (5a) is mapped to the LF in (5b), which is associated with the semantic representation in (5c).

(5) The standard syntactic analysis of OC

a. John_i expected [PRO_i to be elected]

b. [$_{TP}$ John [$_{T'}$ λx [t_x expected [PRO_x to be elected]]]]

c. (λx.x expected x to be elected)(j)

Agreement between PRO and the controller follows from this analysis straightforwardly, given a couple of standard assumptions. First, predication is a vehicle of agreement. Since the T' node in (5b) is predicated of the subject controller *John*, the features of the subject are copied onto this predicate. These features are then shared on the λ-abstractor at the edge of the predicate, similarly to the agreement effect between a relative head and the relative pronoun. Next, the λ-abstractor transmits these features to any variable it binds, assuming some version of the Feature Transmission mechanism of Heim 2008 and Kratzer 2009. Since PRO

[2]See Chomsky 1980, 1981, Manzini 1983, Bouchard 1984, Koster 1984, Borer 1989, Sag and Pollard 1991, Wyngaerd 1994, Landau 2000.

is bound by the λ-abstractor, it comes to agree with the controller DP with which the λ-abstractor agrees.

This account of agreement in OC is principled insofar as it relies on agreement mechanisms independently operative in the grammar. The problem arises, however, on the semantic side. Put succinctly, the bound variable corresponding to PRO (i.e., the second bound *x* in (5c)) is construed *de re* and not *de se*.

To see this, consider "The drunken politicians" scenario from Percus and Sauerland 2003a, (6a). The analysis in (5) assigns the LF (6c) to the sentence (6b) in this context.

(6) a. "A group of drunken election candidates watching campaign speeches on television do not recognize themselves in the broadcast. John, the only confident one, thinks "I'll win", but does not recognize himself in the broadcast. Bill and Sam, both depressive, think "I'll lose", but are impressed by the speeches that happen to be their own and are sure "*that* candidate" will win. Peter, also depressive, happens to be impressed not by his own speech but by John's".

b. Only John expects to be elected.

c. only(j)(λx.x expected x to be elected)

As Percus & Sauerland (P&S) point out, this LF necessarily generates falsity in the given scenario. Not only John, but also Bill and Sam satisfy the property *[λx.x expected x to be elected]*. But (6b) does have a true reading here; it is simply not captured by (6c).

The problem is that the specific acquaintance relation holding between the attitude holder (AH) and himself is left unspecified here. Thus, the second occurrence of the bound variable *x* need not satisfy the *de se* relation that is characteristic of OC. Any kind of *de re* relation – including misidentification of the 'self' – would be sufficient to render (6c) true. In the semantic literature this result is taken to imply that the syntax of OC must be more complex than direct variable binding. Although I will argue below that the conclusion is too strong, it should be clear that the standard syntactic analysis falls short of explaining the obligatory *de se* reading in OC. In the analysis to be developed below, the syntactic account is explicitly augmented to capture this fundamental semantic fact.

3 The Semantic Analysis: Getting *de se* but Not Agreement

As noted in the introduction, the most popular view of OC constructions in the formal semantic literature involves quantification over intensional properties or, equivalently, over centered worlds. This view correctly captures the obligatory *de se* reading but leaves the agreement between the controller and PRO unexplained. In a nutshell, the problem arises because PRO is not bound by the controller on this view; rather it is bound by an operator introduced by the attitude verb, which bears no syntactic relation to the controller.

To illustrate this problem, I will sketch two representative exemplars of this view, Chierchia 1990 and Stephenson 2010 (Sect. 3.1). Then I will turn to two attempts at dealing with the agreement challenge, von Stechow 2003 and Pearson 2013, and show why they are unsatisfactory (Sect. 3.2). Finally, I will indicate why I think the agreement problem poses such a fundamental challenge to the semantic analyses, which is not likely to be solved without a substantial revision of basic assumptions (Sect. 3.3).

3.1 OC Complements as Properties or Sets of Centered-Worlds

The property theory of OC is most commonly associated with Chierchia's work (1984, 1990). The theory can be summarized as follows. A sentence like (7a) is mapped to the S-structure (7b); a null operator, attached at the left edge of the complement, binds the subject variable (=PRO) and turns the propositional denotation of the complement into a property. This property serves as the first argument of the control (attitude) verb, while the controller DP serves as the second one, as in the logical structure (7c). Meaning postulates, inherent in the verb's lexical entry, generate a meaning along the lines of (7d).

(7) Chierchia's (1990) *analysis of OC*
   a. Pavarotti promised to restrain himself.
   b. S-Structure: Pavarotti$_i$ promised [Op$_i$ [PRO$_i$ to restrain himself]].
   c. Logical structure: **promise** (P, [λx.x restrain x])
   d. Paraphrase: Pavarotti promised that the actual world will be located in a spatiotemporal region where he has the property self-restraint.

Note that the self-ascriptive meaning in (7d) guarantees the *de se* relation: The property of self-restraint is ascribed to that individual which Pavarotti takes himself to be in his 'promise'-worlds, namely, his doxastic counterpart.

Consider now how agreement works. Chierchia suggests that the null operator in (7b) must be coindexed with an antecedent in order to be identified, and agreement ensues from coindexing. But this coindexing does not express any semantic relation. The property *[λx.x restrain x]* is not predicated of *Pavarotti*, but rather of *Pavarotti's* doxastic counterpart. If *Op* just needs to be syntactically bound, *any* matrix argument may fit the bill. Separating the agreement requirement from the semantics thus incorrectly predicts nonexistent mismatches.

(8) *Pavarotti promised Olga$_i$ [Op$_i$ [PRO$_i$ to restrain herself]].

In (8), the semantic composition would proceed as in (7), associating PRO with Pavarotti's doxastic counterpart. Crucially, this interpretation is not represented via syntactic coindexing, being obtained in the semantics only. Syntactically, however, *Op* needs identification, and so searches for a c-commanding antecedent. The matrix object is perfectly suitable – in fact, favored over the subject for locality reasons.

Coindexing with the object provides *Op*, and consequently PRO, with the necessary ϕ-features. The fact that they do not match the features of the semantic controller is not registered anywhere along the way, since, as noted, the *Op* is "uninformed" as to the identity of that controller. The semantic and the syntactic computations do not contact in any way that can block this undesired result.[3]

The semantic type of properties, in intensional semantics, is <s,<e,t>>. It is easy to see that the semantic type <<s,e>,t> is isomorphic to it. But <<s,e>,t> is just the semantic type of sets of centered worlds. Thus, the property theory of OC can be recast as a centered world theory of OC. This is the essence of Stephenson's (2010) proposal, to which I now turn.

Stephenson defines, for every centered world <w,j>, the individual J, the "center" of the world, such that w is experienced from J's point of view. Furthermore, PRO denotes just that center, (9a). Doxastic (or in this case, bouletic) alternatives are defined as in (9c); note that the center of each such alternative world is just the doxastic counterpart of the AH. The meaning of (9d) is represented in (9e).

(9) a. $\text{PRO} =_{\text{def}} \text{J}$

b. $[\![\textit{want}]\!] = \lambda p_{<s,et>}.\lambda z.\forall <w',y> \in \text{WANT}_{w,z} : p(w')(y) = 1$

c. $\text{WANT}_{x,w} = \{<w',y>$: it is compatible with what x wants in w for x to be y in w'$\}$

d. $[\![\text{Sue wants [PRO}_J \text{ to go on the roller coaster}]]\!]^{w,j} =$

e. $[\![\textit{wants}]\!]\ (\lambda w'.\lambda j'.[\![\text{PRO}_J \text{ to go on the roller coaster}]\!]^{w',j'})(\textbf{Sue}) =$ 1 iff $\forall <w',y> \in \text{WANT}_{w,\text{Sue}}$: y goes on the roller coaster in w'.

Once again, the *de se* relation is guaranteed by the way centered worlds are defined and linked to the actual world; the embedded property is predicated of the doxastic counterpart, as desired.[4]

How is agreement established between the controller and PRO on this proposal? Stephenson remains silent on this point, and indeed, it is hard to imagine a plausible answer. PRO and *Sue* in (9e) bear no syntactic relation to each other. PRO is bound by *λj'*, which is associated with *Sue* via the semantics of *want*; the choice of the doxastic alternative and its center is made on the basis of who the AH (Sue) is in the real world. But this is not a syntactic relation that can mediate agreement.

As in Chierchia's property theory, we are left with two options: Either agreement is allowed to "interpret" semantic representations and recognize "AH" and "world center" as possible relata; or agreement is confined to the syntax, as in the standard view, but then the controller and PRO remain unrelated, and agreement unexplained.

[3]The problem is not due to a semantic clash between the gender features of the (doxastic counterpart of) Pavarotti and the reflexive *herself*. First, ϕ-features on bound reflexives are uninterpreted (Heim 2008, Kratzer 2009). Second, the problem remains even when the reflexive is nonargumental (hence, its ϕ-features are necessarily inert): **Pavarotti promised Olga to behave/perjure herself*.

[4]An anonymous reviewer also raises the question whether the world-center in OC should be unified with the experiencer of taste predicates, given examples like *Mary wants to be dead*, where *want* quantifies over <w,j> pairs in which j is not capable of experiencing w at all.

3.2 Two Attempts to Capture Agreement

Although the formal semantic literature is generally brief or even silent on the problem of agreement in OC, two proposals explicitly attempt to solve it. I discuss and evaluate them in this section.

The first proposal is by von Stechow (2003). In this analysis, attitude verbs are treated as quantifiers over <individual,world,time> triplets, and introduce λ-binders that bind embedded variables (of types e, w and t, respectively). To guarantee the binding of PRO, it is endowed with the features [log] and [loc]; jointly they ensure that PRO is bound by the closest attitude verb. von Stechow also assumes that ϕ-features on bound pronouns are unintepreted. Rather than transmitting them at PF (as in Heim's and Kratzer's proposals), they are removed at LF by *Feature Deletion*. Variable binding, then, is contingent on ϕ-matching, followed by deletion of the variable's ϕ-features.[5] An OC construction like (10a) receives the LF in (10b) (world and time variables in the complement are suppressed). Doxastic alternatives are defined as in (10c), and the semantics of the attitude verb involves the standard universal quantification over these alternatives. The *de se* reading is obtained by taking the doxastic counterpart, *x'*, to be the mental target of the attitude.

(10) a. John wants to win the lottery.

b. $\text{John}_{[3rd]}\ \lambda_i\ \text{want}_{[3rd]}\ \lambda_{[log]}<x_{[3rd]\text{-}j},w_k,t_n>\ [\text{PRO}_{[loc,log,\sout{3rd}]\text{-}j}$ win the lottery].

c. $\text{WANT}_{x,w,t} = \{<x',w',t'>|$ x' has in w' at t' every property x hopes for himself in w at t$\}$

Agreement between PRO and *John* is obtained as follows: (i) The attitude verb *want* agrees with its subject, *John*; (ii) The ϕ-features on *want* are inherited by the individual λ-binder it introduces; (iii) PRO must be bound by this binder in virtue of its [log/loc] features; (iv) binding requires ϕ-matching.

This analysis raises a number of problems, not only for agreement. First, the locality of binding in OC is encoded (by [loc]) and not explained. Second, it is implied that PRO is inherently specified as a logophoric pronoun, whereas in fact it is found in a variety of non-attitude contexts (e.g., *The paintings managed [PRO to make the place a little brighter], This tool is [PRO to be used with caution]*). The fact that PRO in attitude complements is a locally bound variable should emerge from properties of the construction itself and not be written into its lexical entry.

Third, the inheritance of ϕ-features from the attitude verb to the individual λ-binder is not syntactically grounded. The λ-binder is located at the edge of the complement, presumably in [Spec,CP] or a related position. But there is no automatic feature sharing mechanism between V and [Spec,CP] of its complement, although von Stechow's analysis seems to rely on some such mechanism.

Fourth, and most relevant to our present concerns, the postulated agreement between the attitude verb and the AH is also not syntactically grounded. It cannot

[5]The ϕ-matching condition is lifted in languages with indexical shift, allowing 1st person embedded pronouns to be semantically bound by 3rd person matrix DPs.

be made parasitic on subject-verb agreement because the congruence between "subject" and "AH" is accidental. Object control verbs like *persuade* introduce attitudes that are keyed to the matrix *object*'s doxastic alternatives. Worse, the controller does not even have to be the AH, e.g. with communication verbs (*tell, recommend*, *urge*, etc.). Even if these verbs quantify over doubly-centered worlds, what is to tell the grammar which of the two λ-binders should match the ϕ-features of PRO? PRO simply "searches" for a local verbal binder and has no stake in which of the λ-binders introduced by the verb ends up binding it. At any rate, the purported "middleman" in the agreement chain – the attitude verb – never manifests the ϕ-features of the AH or the controller *as such* (although it may or may not manifest subject agreement, an independent relation).

Finally, controllers may be oblique arguments, which never trigger verbal agreement elsewhere (e.g., *John pleaded* ***with Mary*** *to forgive him*, dative experiencer controllers, etc.). Why would they trigger (invisible) agreement only on control verbs?

A second, more recent attempt to integrate agreement into a formal semantic analysis of OC is presented in Pearson 2013:147. Following Chierchia 1990, an individual abstractor is generated at the edge of the attitude complement, (11b). Doxastic alternatives are defined as in (11c). The semantics of an attitude verb like *intend*, with an irrealis complement, involves quantification over <individual,world,time> triplets as well as a temporal shift to the future, (11d). The *de se* reading is achieved in the by-now familiar way.

(11) a. John intends to win the lottery.
b. [λx [PRO_x to win the lottery]]
c. $INTEND_{x,w,t}$ = { <y,w',t'> | it is compatible with what x intends in w at t for x to be y in w' and for t to be t'}
d. $[\![intend]\!]^{g,c}$ = λP.λx.λt.λw.∀<w',t',y> ∈ $INTEND_{x,t,w}$, ∃t'': t'<$_{precedes}$ t'' & P(y)(t'')(w')

As for agreement, Pearson recognizes the unfortunate reliance of von Stechow's analysis on subject-verb agreement. To overcome it, she defines the *designated argument* of an attitude verb: It is the individual whose doxastic counterpart is identified with the individual coordinate of the world-time-individual triplet quantified over by the predicate (e.g., subject of *promise*, object of *persuade*). A special feature, dubbed [att], serves to establish agreement between the verb and this argument; ϕ-agreement piggybacks this relation. As in von Stechow's analysis, the individual λ-binder picks these ϕ-features. PRO must be bound by the individual abstractor, and binding requires ϕ-matching (followed by Feature Deletion).[6] Thus, PRO comes to agree with the designated argument, which is the controller.

[6]Adapting a proposal by Percus and Sauerland (2003b), Pearson (2013: 536) speculates that the abstractor is just PRO itself, having moved from the subject position. This simplifies the process in that ϕ-matching between PRO and its binder reduces to copy identity under movement. The problems listed below, however, remain unchanged.

In this analysis, agreement with PRO is correctly dissociated from subjecthood of the controller. However, it is still tied to the *de se* center (the designated argument). This leaves out control by the addressee under communication verbs.

Second, the feature [att], which solves the subject-orientation problem, introduces a new problem. It looks like a tailor-cut feature for the problem at hand, not otherwise attested. In fact, [att] re-encodes a purely semantic relation in the morphology, bypassing syntax.

Finally, three problems inherent in von Stechow's analysis carry over to Pearson's: The alleged agreement relation between the attitude verb and the designated argument is never manifested as such; the required agreement between the attitude verb and the complement [Spec,CP] is not syntactically motivated; and controllers are often oblique arguments, which never trigger verbal agreement elsewhere.

In sum, while most of the formal semantic accounts of OC disregard the problem of agreement, the few that do address it fail to provide a satisfactory account. The failure, I believe, is not incidental, but rather reflects a fundamental shortcoming that cannot be overcome without a radical reorientation of the entire approach.[7]

3.3 Why Is the Agreement Problem So Fundamental?

Why do the standard semantic accounts of OC, framed within the property theory or the centered-world theory, fail to capture the agreement between PRO and the controller? The reason is simple and principled: The syntactic configurations required by these theories are patently unsuitable to mediate agreement. More concretely, the two semantic relata – the controller and PRO – are *not* syntactic relata; either they are completely unrelated in the syntax, or they are indirectly related by a series of arbitrary links that cannot be justified on syntactic grounds.[8]

[7]The four semantic proposals discussed here invoke either Feature Transmission or Feature Deletion to explain the absence of the standard presuppsoitional import of ϕ-features on bound pronouns. It is well-known that other accounts exist that rely on assigning bound pronouns nonstandard denotations (Sudo 2014). The agreement problem, however, is deeper than the distinctions among these camps, which all rely on the premise that agreement requires coindexing. But on the standard semantic analysis of OC, PRO is not essentially coindexed with the controller DP; rather, it is coindexed with a local operator. Hence, *all* these approaches to ϕ-features on bound pronouns fail to extend to OC. Nevertheless, a crucial crosslinguistic generalization about the distribution of OC complements will turn out to favor the Feature Transmission approach; see Sect. 5.4.

[8]The semantic literature, by and large, does not acknowledge the problem of agreement in OC. A notable exception is Schlenker (2003, 2011): "In a nutshell, the difficulty is that even though PRO is bound by an operator in the embedded clause, it still inherits its morphological features from an argument of the matrix clause. The details are somewhat stipulative on every account" (Schlenker 2011: 1575).

This state of affairs can lead to one of two conclusions. One option is to make substantial changes in the theory of agreement. Most importantly, agreement would have to be able to operate postsyntactically, and even post-LF, at the semantic component. In particular, Agree (x,y) would have to be defined over pairs <x,y> such that "y binds the individual variable that is the doxastic counterpart of x". Although possible in principle, such a move seems very undesirable. Even ignoring the characterization of the dependency itself, the very idea that agreement applies to semantic representations goes against the grain of much work in generative grammar. In fact, current work suggests, quite plausibly, that agreement is a PF process, since its input is affected by morphological operations (Bobaljik 2008; Sigurðsson 2006, 2009; Chung 2014) and its output fails to affect semantic interpretation (Heim 2008). In particular, an argument of the latter type was made that agreement in OC must be a PF phenomenon (Landau 2016).

A second option is to make substantial changes in the formal semantic analysis of OC; specifically, develop an analysis that invokes an "agreement-friendly" syntax. This syntax must *simultaneously* support (i) agreement between the controller and PRO, using straightforward and independently justified agreement mechanisms, and (ii) an account of the obligatory *de se* reading in OC that is also streamlined with some general approach to the semantics of attitudes. The analysis below was developed with these two goals in mind.

4 The Two-Tiered Theory of Control (*de se* as a Special *de re*)

The conclusion of the last section adumbrates the outlines of the theory I propose.

The syntax of OC constructions will employ direct variable binding between the controller DP and PRO, or more precisely, between the controller DP and a variable that co-varies with PRO. This will allow straightforward ϕ-agreement by Feature Transmission (much in the spirit of Schlenker 2003 and Maier 2011). The question posed in Sect. 1 will receive a positive answer: The bound variable interpretation of OC PRO *is* syntactically represented.

The semantics of OC constructions will employ an analysis of *de se* attitudes as a special case of *de re* attitudes. That is, a presupposition associated with the head of the complement will guarantee that the *de re* variable is acquainted to the AH via the 'self' relation. This will rule out the unwanted *de re* readings that standard syntactic accounts of OC invariably let in (as noted in Sect. 2).

In Sect. 4.1, I present the general syntax-semantics format for *de re* attitudes, based on Percus and Sauerland 2003a. In Sect. 4.2, I derive the *de se*-version of that analysis and integrate it with the syntax of OC constructions. In Sect. 4.3, I turn briefly to OC under nonattitude verbs, suggesting that it is mediated by simple predication.

4.1 *De re Attitudes: A General Syntax-Semantics Format*

As a starting point, I assume that information about the speech/thought context of the matrix clause is represented syntactically in the C-system of the attitude complement, a conclusion emerging from a long research tradition.[9] For simplicity, all the matrix coordinates will be compressed as a tuple on C, although more articulated projections are consistent with everything that follows.

The complementizer of an attitude complement introduces a *context tuple*, or, adapting Bianchi's (2003) term, a *logophoric center*, consisting of the author of the speech/mental event, an optional addressee, the belief time and the belief world. This context is represented as a variable, *i*, whose coordinates are extracted by designated functions.

(12) *Attitude complementizers*

a. Version I: $C(omp)_i$: <AUTHOR(i),ADDRESSEE(i),TIME(i), WORLD(i)>

b. Version II: $C(omp)_i$: <pro_x,pro_y,TIME(i),WORLD(i)>
Presuppositions: pro_x = AUTHOR(i), pro_y = ADDRESSEE(i)

The two versions are semantically equivalent but differ syntactically. In version I, the individual coordinates contain the (syntactically present) functions AUTHOR and ADDRESSEE. In version II, the indexical content is supplied by presuppositions on C and the individual coordinates are pure variables, represented as null, unvalued pronouns. For reasons to become clear soon, we adopt the latter.

The null coordinate pronouns are minimal in the sense of Kratzer 2009. For concreteness, assume the following lexical entry ([$u\phi$] stands for unvalued ϕ-features).

(13) *A minimal pronoun*
X is a minimal pronoun if and only if X=[D,$u\phi$].

Within different derivations, X can become a reflexive, a bound lexical pronoun, a resumptive pronoun, a *pro* element identified by local agreement, a relative pronoun, or indeed, as we will see below, a controlled PRO. The choice among these options is determined by a combination of the syntactic context and the lexical inventory of the language. Very often, minimal pronouns are bound and consequently ϕ-valued by Feature Transmission from their binder. I return to this point in Sect. 5.2, where I discuss the interaction of OC and agreement.

With this syntactic machinery in place, we can turn to the semantic analysis of *de re* attitudes.[10] The core intuition, inherited from the philosophical literature,

[9] See Koopman and Sportiche 1989, Bianchi 2003, Sigurðsson 2004, 2011, Speas 2004, Adesola 2005, Baker 2008, Giorgi 2010, Sundaresan 2012.

[10] For extensive discussion, see Percus and Sauerland 2003a, Schlenker 2003, Anand 2006, Maier 2011 and Charlow and Sharvit 2014.

is that *de re* attitudes imply an acquaintance relation between the AH and some *res* (the individual who the belief is about); this relation is sometimes called "the description of the *res* for the AH". In Percus and Sauerland's (2003a) insightful implementation, the acquaintance relation is introduced via a concept generator, and attitude complements are analyzed as functions from concept generators to propositions. The following characterization is adapted from their work.

(14) *Concept generators*

$G_{<e,<\kappa,e>>}$ is a concept generator iff:

a. $[\![G]\!]^{g,c} = \lambda res.\lambda i'.\iota(r_e)$: r is picked by description G of the *res* for the AH (=the AH"s concept of the *res*) in context i' (r is the "counterpart" of the *res*).

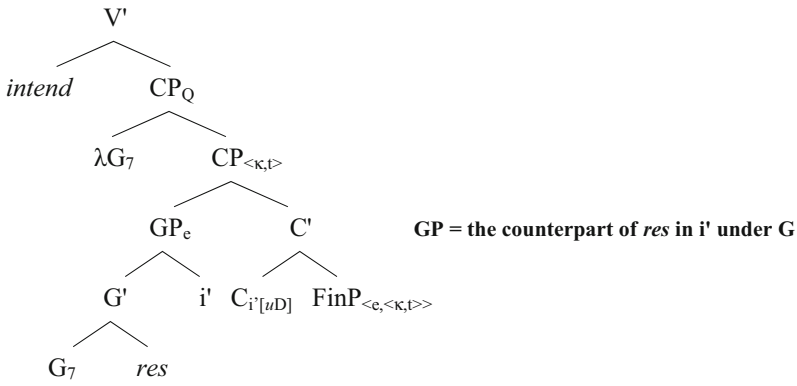
G must be suitable, where a concept generator is *suitable* for x, an AH, in context c, iff:

b. Acquaintance: $\forall z \in Dom(G)$, there is some acquaintance relation R, such that:
   i. R(x,z) in WORLD(c), and
   ii. $\forall i' \in DOX_{x,w}$, R(AUTHOR(i'),G(z)(i')) in WORLD(i').

c. Uniqueness: $\forall y,z \in Dom(G)$, $y \neq z \rightarrow G(y) \neq G(z)$.

As noted, the attitude complement, on this analysis, is a function from concept generators to sets of contexts (=propositions), type <<e,<κ,e>>,<κ,t>> (where κ is the type of contexts and contexts are coordinate tuples). Applied to a given *res*, the concept generator returns the counterpart of the *res* in the AH's doxastic alternatives; the embedded property is then predicated of this individual counterpart. Syntactically, I assume that the property-denoting constituent is a FinP (we will shortly see how this denotation is derived) and the individual counterpart is hosted in [Spec,CP]. This gives us the following general structure.

(15) *de re*: a general format



The selectional [*u*D] feature on C requires a nominal specifier (we may call this kind of complementizer a *transitive* C). This is where the *res* is projected and

mapped by G to the counterpart individual, in the attitude context i'. C predicates its complement FinP on its specifier GP, producing a proposition.[11] The following is a partial semantic composition.

(16) a. $[\![\text{CP}]\!]^{g,c} = \lambda i''.[\![\text{FinP}]\!]^{g,c}(g(7)(\text{res})(i'))(i')$
b. $[\![\text{CP}_Q]\!]^{g,c} = \lambda G_7.\lambda i'.[\![\text{FinP}]\!]^{g,c}(G_7(\text{res})(i'))(i')$
c. $[\![\textit{intend}]\!]^{g,c} = \lambda Q.\lambda x.\lambda w.\exists G$ for x in w $\wedge$ G is suitable $\wedge\ \forall i' \in \text{INTEND}_{x,w}$, $Q(G)(i') = 1$
d. $[\![\ [\textit{intend}\ \text{CP}_Q]\ ]\!]^{g,c} = \lambda x.\lambda w.\ \exists G$ for x in w $\wedge$ G is suitable $\wedge\ \forall i' \in \text{INTEND}_{x,w}$, $[\![\text{FinP}]\!]^{g,c}(G(\text{res})(i'))(i') = 1$

To illustrate, given the sentence *Ralph intended for Betty to join the club*, this treatment yields the following paraphrase: There is a concept generator for Ralph in the actual world, that establishes a suitable acquaintance relation between Ralph and Betty under some description, and in all of the contexts that conform to Ralph's intentions, the person picked by that description joins the club.

The next step is to construct a representation of this form for *de se* attitudes.

4.2 De se as a Special Case: Logophoric OC

As several authors observed, the cognitive relation between the AH and the *res* establishes an egocentric perspective that can serve as the basis of *de se* attitudes (Lewis 1979; Reinhart 1990; Percus and Sauerland 2003a; Schlenker 2003; Anand 2006; Maier 2011). *De se* would be that special case of *de re* where *res*=AH and the reflexive acquaintance relation is self-identification ("This is me!" / "This person is the author of my thoughts!"). Notice that this possibility comes for free and is in fact inevitable, given the general characterization in (14). The fact that it provides an elegant solution to the syntactic problem of agreement in OC was never taken as an argument in its favor, simply because from the semantic point of view, this possibility needs no special advocacy. Furthermore, the obligatory nature of the *de se* reading was often taken as evidence against a *de re* syntax for OC. The inference, however, is not compelling, as there are other ways – lexical rather than syntactic – to guarantee a *de se* reading within the general *de re* structure. Given these considerations, the convergence between the syntactic and the semantic arguments for a *de re* treatment of *de se* is all the more compelling.

Let us state this option more formally. We define two concept generators, G_{SELF} and G_{THOU}, that yield a self-identification relation (*de se*) and an addressee-identification relation (*de te*), respectively.

[11] It is, in fact, not required that the *res*-containing expression, GP, occupy a clause-peripheral position. The particular format in (15) is already geared towards the OC structure in (18) below, where GP is necessarily generated in [Spec,CP].

(17) *De se/te* as a special kind of *de re*

a. $G_{SELF} =_{def} G: \forall y \in Dom(G), G(y) =$ AUTHOR.
For any individual z: $[\![G_{SELF}]\!]^{g,c}(z) = \lambda c'.\text{AUTHOR}(c')$

b. $G_{THOU} =_{def} G: \forall y \in Dom(G), G(y) =$ ADDRESSEE
For any individual z: $[\![G_{THOU}]\!]^{g,c}(z) = \lambda c'.\text{ADDRESSEE}(c')$

G_{SELF} and G_{THOU} are constant functions. Because of the uniqueness condition (14c) on suitable Gs, their domains are singletons. Thus, every individual is paired with a unique G_{SELF} and a unique G_{THOU}, which map it to the AUTHOR and ADDRESSEE functions, respectively.

What is special about OC (attitude) contexts, then, is that the acquaintance relation between AH and himself is fixed by G_{SELF}, and not by any other conceivable G.[12] This bit of semantic information cannot be part of the meaning of the attitude verb itself, which, of course, accommodates all kinds of *de re* ascriptions. The natural locus for this information is rather the OC complementizer, C^{OC}; it is only in combination with this complementizer that attitude verbs generate obligatory *de se* readings. This intuition is rendered below as a presupposition triggered by C^{OC}. I will call this type of control *logophoric*.

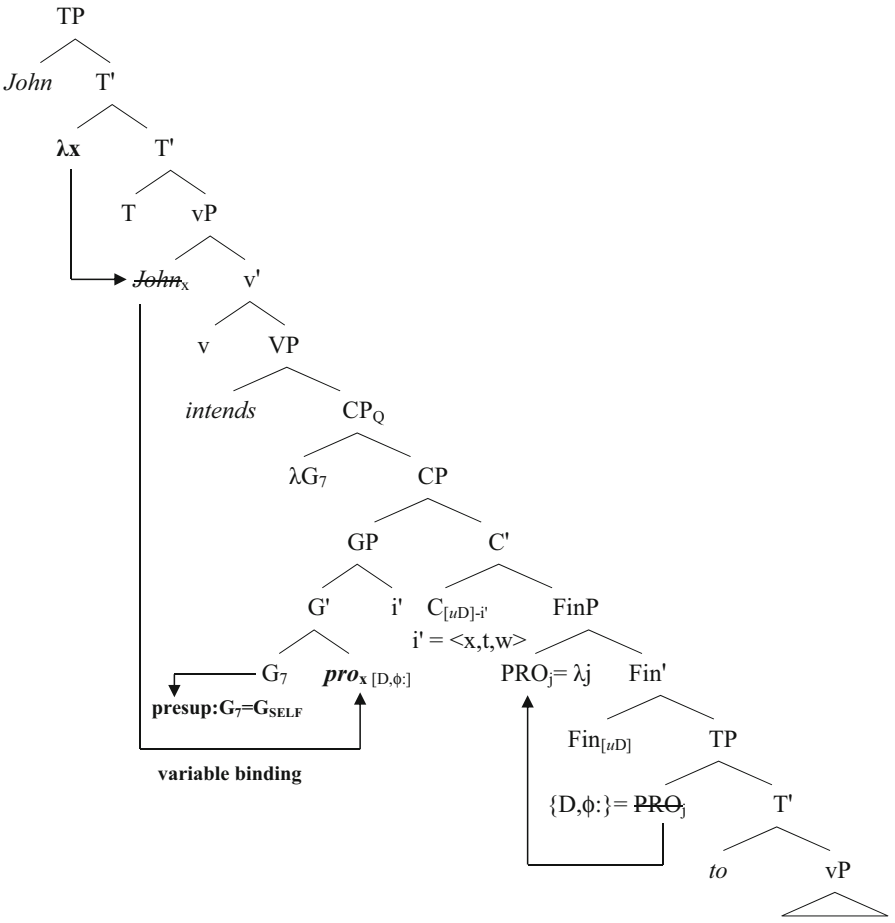
Consider now how logophoric OC complements are constructed syntactically. Following the general format of *de re* complements (15), a predicative FinP is embedded under a logophoric C, C^{OC}, which projects the AH's doxastic counterpart. At this point we should address the question of how a clausal projection, FinP, comes to denote a property. A standard way of achieving this result is by operator movement to the edge of the projection (e.g., *tough*-constructions, relative clauses etc.). In the case at hand, the operator is no other than PRO. By moving from [Spec,TP] to [Spec,FinP], PRO creates an operator-variable configuration that is interpreted as property (for earlier incarnations of this idea, see Chomsky 1980, Hendrick 1988 and Clark 1990). In order to force this movement, we assume that the Fin head in OC complements, just like C^{OC}, is a transitive head, endowed with a selectional feature [*u*D] that attracts PRO to its specifier.

Note that PRO is nondistinct from the coordinate pro_x (the different labels are merely a convenience); both are generated as minimal pronouns. Precisely because it is a contentless element – virtually, a numerical index – PRO does not saturate the λ-predicate formed by its movement. In other words, the radical impoverishment of a minimal pronoun allows it to turn into an operator, once moved. The trace of PRO, equally devoid of content, serves as the variable abstracted over.

The diagram below illustrates the syntactic derivation of a simple attitude subject control sentence; object control receives a parallel treatment, except that C_i, projects pro_y instead of pro_x. pro_y would be associated with G_{SELF} under psychological object control and with G_{THOU} under communicative object control.

[12] From this point on I focus on *de se* and assume that *de te* is amenable to a parallel treatment.

(18) *Derivation of logophoric control*



As we shall see below, this structure supports an explicit semantic composition of the obligatory *de se* reading. It has significant additional benefits as well.

First, the subjecthood of PRO is derived. Because of the Minimal Link Condition, $Fin_{[uD]}$ attracts to its Spec the closest nominal (D-bearing element), namely the subject. Thus, the unsaturated position in the complement must be the subject position. Note also that a lexical DP in this position would render the structure uninterpretable, since FinP would be a saturated proposition which cannot be predicated of the nominal in [Spec,CP] (see the denotation of C^{OC} in (19b)).

Second, obligatory *de se* is dissociated from PRO and pinned to C^{OC}, the head of attitude OC complements. This is just the right result (cf. Maier 2011, where the *de se* presupposition is tagged on PRO). As indicated in the next section, OC PRO fails to display obligatory *de se* in nonattitude contexts (e.g., *John failed to win the prize, We forced John to wake up*), while controlled lexical pronouns, in languages like Korean and Hungarian, show it in attitude contexts (Madigan 2008;

Szabolcsi 2009). The property only arises in attitude OC complements because it is specifically written into the lexical entry of their head, C^{OC}. It arises as a presupposition attached to an argument of the head, just like run-of-the-mill lexical presuppositions do.[13]

Third, controller choice is left open; *some* coordinate must be projected, but neither the matrix V nor C^{OC} dictate which one it is *at the level of LF*. Again, this is just right. Controller choice is sensitive to a variety of pragmatic considerations that are better handled outside core syntax (see Landau 2013:124–148).

Fourth, the locality of binding is derived without stipulative diacritics on PRO. The PRO-predicate applies to a function of pro_x and pro_x is mapped to the AUTHOR of the local (embedded) context because it is an *argument* of that context.[14]

Fifth and most importantly, this structure provides a principled explanation for agreement in OC, which was the fundamental hurdle for the standard semantic accounts. The variable binding dependency between the controller and pro_x and the predicative relation between pro_x and the PRO-derived predicate, jointly mediate Feature Transmission between the controller and PRO. No special assumptions or ad-hoc mechanisms are invoked; PRO agrees with the controller for the same reason that bound pronouns agree with their binders and relative pronouns agree with relative heads. Crucially, the syntax just sees a simple variable, pro_x, and a simply operator, PRO, both of which need ϕ-valuation. The semantics, however, sees $G_{SELF}(g(x))(i')=AUTHOR(i')$, which delivers the *de se* reading. Our initial challenge is met: The syntax of OC simultaneously supports the right semantics and the right morphology.[15]

At this stage we can verify that the structure in (18), combined with the general *de re* semantics in (15), delivers the desired *de se* interpretation. Note, in particular, the role of the "major player", C^{OC}: it introduces the G_{SELF} presupposition,

[13]One might object that writing *de se* into lexical meanings does not explain it; but this objection, of course, equally holds of the standard accounts. Natural language privileges *de se* attitudes and this design feature must ultimately be reflected in lexical inventories. Still, the clear advantage of the current proposal is that it does not posit systematically ambiguous lexical entries for attitude verbs, one for *de re* and one for *de se*. Rather, there is a single *de re* verbal entry for both readings, and distinctions in possible values for the concept generator are specified on the different complementizers the verb may take (which are anyway distinguished in form).

[14]This result may not be trivial if attitude complements are treated as sets of centered-worlds rather than contexts projected from C. Indeed, as an anonymous reviewer observes, the two implementations are semantically equivalent. However, on the centered-worlds implementation (e.g., Stephenson 2010), the λ-binder of PRO is not projected from C in any syntactic sense. Thus, the choice of the belief-world variable as the world argument inside GP seems arbitrary. In contrast, the choice of i' as the context argument inside GP in (18) can be seen as a syntactic reflex of selection by the i'-bearing head, C.

[15]Sauerland (2013) sketches a solution to the agreement problem of *de se* pronouns that invokes a *de re* component in them. This component, however, unlike pro_x in the present account, does not enter any syntactic relation with the controller; rather, it is locally bound by an operator at the left edge of the complement. Hence, the same difficulties arise as on the other semantic approaches discussed in Sect. 3.

predicates its complement of its specifier, and abstracts over contexts. The G_{SELF} presupposition projects all the way to the matrix clause.

(19) *John intends to visit Athens*

a. $[\![[_{FinP} \text{ PRO to visit Athens}]]\!]^{g,c} = \lambda z.\lambda c'.[\![\text{visit Athens}]\!]^{g,c}(z)(c')$

b. $[\![C_i^{OC}]\!]^{g,c} = G_7{=}G_{SELF}\text{: } \lambda P.\lambda y.\lambda i'.P(y)(i')=1$

c. $[\![C']\!]^{g,c} = [\![C_i^{OC}]\!]^{g,c}([\![FinP]\!]^{g,c}) = \lambda y.\lambda i'.G_7{=}G_{SELF} : [\![\text{visit Athens}]\!]^{g,c}(y)(i')=1$

d. $[\![GP]\!]^{g,c} = g(_7)(g(x))(i')$

e. $[\![CP]\!]^{g,c} = [\![C']\!]^{g,c}([\![GP]\!]^{g,c}) = \lambda i'.G_7{=}G_{SELF} : [\![\text{visit Athens}]\!]^{g,c}(g(7)(g(x))(i'))(i')=1 = \lambda i'.G_7{=}G_{SELF} : [\![\text{visit Athens}]\!]^{g,c}(G_{SELF}(g(x))(i'))(i')=1$

f. $[\![CP_Q]\!]^{g,c} = \lambda G7.[\![CP]\!]^{g,c} = \lambda G_7.\lambda i'.G_7{=}G_{SELF} : [\![\text{visit Athens}]\!]^{g,c}(G_{SELF}(g(x))(i'))(i')=1$

g. $[\![\textit{intend}]\!]^{g,c} = \lambda Q.\lambda x.\lambda w.\exists G \text{ for x in w} \wedge G \text{ is suitable} \wedge \forall i' \in \text{INTEND}_{x,w}, Q(G)(i') = 1$

h. $[\![[\textit{intend } CP_Q]]\!]^{g,c} = \lambda x.\lambda w.G{=}G_{SELF} : \exists G \text{ for x in w} \wedge G \text{ is suitable} \wedge \forall i' \in \text{INTEND}_{x,w}, [\![\text{visit Athens}]\!]^{g,c}(G_{SELF}(g(x))(i'))(i')=1$

The existential quantification over G is superflous, given that its value is fixed as G_{SELF}, yielding (19i). Since there is always a suitable choice of G_{SELF}, this is simplified as (19j); and since G_{SELF} maps its argument to AUTHOR, we obtain (19k).

(19) i. $= \lambda x.\lambda w.G_{SELF} \text{ is suitable} \wedge \forall i' \in \text{INTEND}_{x,w}, [\![\text{visit Athens}]\!]^{g,c}(G_{SELF}(g(x))(i'))(i')=1$

j. $= \lambda x.\lambda w.\forall i' \in \text{INTEND}_{x,w}, [\![\text{visit Athens}]\!]^{g,c}(G_{SELF}(g(x))(i'))(i')=1$

k. $= \lambda x.\lambda w.\forall i' \in \text{INTEND}_{x,w}, [\![\text{visit Athens}]\!]^{g,c}(\text{AUTHOR}(i'))(i') = 1$

(19k) captures the right *de se* semantics, as desired.[16] We now turn to provide a brief account of OC under nonattitude predicates.

4.3 Predicative Control

Although the obligatory *de se* (or *de te*) reading is often taken to be criterial of OC and PRO itself, this cannot be true. OC is attested in a number of nonattitude environments, where the *de re*/*de se* distinction is irrelevant. Predicates that select such complements belong to four classes: modal, aspectual, implicative and

[16]The analysis in (18) is much inspired by Percus and Sauerland (2003a) treatment of *de re* attitudes. It should be noted, though, that P&S propose a different LF for OC complements, involving pronoun-movement, which derives the obligatory *de se* reading as in the property view of Chierchia 1990. The agreement problem, therefore, extends to their analysis as well.

evaluative (see Landau 2013: 33–34). For reasons to become immediately clear, I label this type of OC as *predicative control*.

(20) *Predicative (nonlogophoric) control*

a.	John is able [PRO to swim faster than you run].	*modal*
b.	Mary started [PRO to draw a picture].	*aspectual*
c.	Bill managed [PRO to finish on time].	*implicative*
d.	It was rude of Paul [PRO to make this suggestion].	*evaluative*

Standard tests (e.g., *de dicto* readings of definite descriptions, opacity for existential entailments) indeed confirm that the complements in (20) are not attitude contexts. Control, therefore, cannot be mediated by any of the mechanisms discussed in Sects. 4.1 and 4.2. The formal semantic literature, in fact, shows little interest in how control is achieved in these cases (see Grano 2015 for a notable exception). I discuss them in the present context not because they pose the same kind of agreement puzzle (they do not), but rather because they set certain constraints on the proper analysis of logophoric control.

The most obvious constraint is that PRO should be a truly minimal pronoun, and in particular, should not be tagged with any inherent "logophoric" feature, to guarantee its *de se* interpretation. Any such feature, invoked in logophoric control, must be absent from PRO in predicative control (which lacks the *de se* reading). This would imply an ambiguous entry for PRO, a highly undesirable result, given the plain observation that the distinction is fully recoverable from the grammatical environments in which PRO occurs.

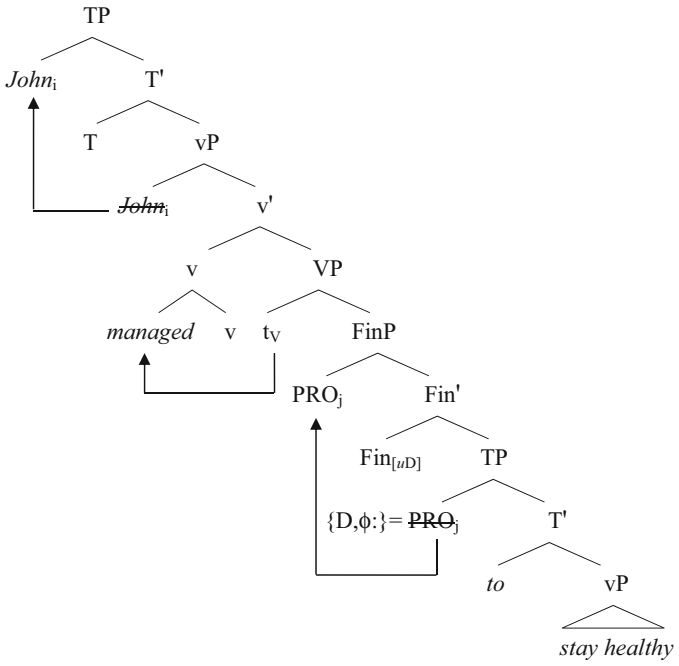
In nonattitude control, the complement's property is directly predicated of the matrix controller. This direct predication relation is represented at LF. Semantically, at least for the nonmodal predicates, it has the consequence that some real-world action took place. For example, (20c,d) entail that Bill finished on time and that Paul made the suggestion, respectively. (20b) entails that Mary engaged in the beginning of the action of drawing the picture.

The predicative analysis of OC has, of course, a long pedigree, starting from Williams 1980. A natural execution of this analysis is the restructuring hypothesis, which takes the complement to be a subclausal, VP projection, denoting an unsaturated property (Wurmbrand 2003). Indeed, modal, aspectual and implicative verbs are the core members of restructuring predicates in Romance and Germanic languages. This syntactic option, however, cannot be the only one, since many languages without any grammatical evidence for restructuring employ predicative control. For these languages, there must be a way of turning the clausal projection of the complement into an unsaturated property.

In the analysis of logophoric control we have already introduced this device – operator movement to [Spec,FinP], realized by PRO. The natural conclusion is that complements of predicative control are bare FinP projections, lacking the CP layer. This makes sense since the C projection, by hypothesis, precisely encodes the information that is not registered in such (nonattitude) complements, about the participants of the speech/thought event.

The diagram below illustrates the general syntactic format of predicative control with an implicative verb. Predicative control is also attested with a few object control verbs (e.g., *force*). For those, we assume that the complement is embedded inside a causative small clause and predicated of the causee.

(21) *Derivation of predicative subject control*



Note that the core properties of interest are derived. The abstracted-over position must be the subject, due to the Minimal Link Condition, as before. No lexical DP is allowed in that position for semantic type reasons (the matrix verb selects an unsaturated property). The locality of control is ensured by the strict locality of predication (e.g., mutual m-command).[17]

Agreement between the controller and PRO boils down to agreement under predication. The unvalued PRO-operator that forms the λ-abstract inherits the ϕ-features of the controller DP by standard Agree. Note that Feature Transmission under variable binding is not involved here. This difference will provide the key to a striking crosslinguistic asymmetry between the distribution of the two types of OC complements, the topic of the next section.

[17]Other important contrasts between logophoric and predicative control also follow, like the tolerance to partial, split or implicit control. I also do not elaborate here on the specific semantics of nonattitude control verbs, although there are obvious differences between the different subclasses in (20). These matters are discussed in Landau 2015.

5 The Selective Effect of Inflection on OC

The treatment of logophoric OC in terms of direct variable binding naturally accounts not only for the agreement between PRO and the controller, but also for the effect of agreement between PRO and the verbal inflection in the complement on the control relation itself. The data and the crosslinguistic generalization that emerges from them are described in Sect. 5.1. Section 5.2 lays out the formal mechanism of feature sharing and characterizes the agreement profile of predication and variable binding. Section 5.3 applies these syntactic devices to the (predicative and logophoric) OC configurations to derive the crosslinguistic generalization from Sect. 5.1. Finally, Sect. 5.4 highlights the theoretical implications of these results to the debate within the semantic literature surrounding the proper treatment of ϕ-features on bound pronouns.

5.1 The OC-NC Generalization

Crosslinguistic studies have revealed many languages in which OC is attested with inflected complements (e.g., subjunctive, inflected infinitive, nominalized complement). In all those cases, however, inflection is possible only in a subset of OC complements. Outside that subset, inflection cancels OC and licenses an embedded referential *pro* subject, that is, no control (NC). While Landau (2004, 2006, 2013) characterizes this subset in terms of the temporal properties of the complement, Landau (2015) argues that the true criterion is whether the complement is an attitude context or not. The interaction of inflectional agreement in the complement ([+Agr]) and its semantics is stated below.

(22) *The OC-NC Generalization*
[+Agr] blocks OC in attitude complements but not in nonattitude complements.

Equivalently, a complement clause whose head is inflected for ϕ-features may either display predicative control or no control at all, but may not display logophoric control. We illustrate the effects of this generalization in the data sample below; for the full picture, the reader is referred to the cited works.[18] In all cases, OC is diagnosed in the relevant sources not just by obligatory coindexing but by additional standard tests (e.g., no strict reading under ellipsis). NC is diagnosed either by free pronominal reference or a lexical DP in the embedded subject position.

(23) **OC in [–Att,-Agr] complements**
Mary_i managed [$\text{PRO}_{i/*j}$/*Bill to finish in time].

[18]The notation [±Att] is merely intended to label the semantic type of the complement and should not be thought of as a grammatical feature.

(24) **OC in [–Att,+Agr] complements**
Greek subjunctives (Varlokosta 1993)
O Yanis tolmise na figi (*o Giorgos).
the John.NOM dared PRT leave.3SG (*the George.NOM)
'John dared (*for George) to leave.'

(25) **OC in [+Att,–Agr] complements**
a. Mary$_i$ planned/hated [PRO$_{i/*j}$/*Bill to lock the door].
b. *Welsh uninflected infinitives* (Tallerman 1998)
Gwnaeth Elen gytuno [i / *iddi ddarllen y llyfr].
did Elen agree to / *to.3FSG read the book
'Elen agreed to read the book.'

(26) **NC in [+Att,+Agr] complements**
a. *Greek subjunctives* (Varlokosta 1993)
O Yanis elpizi na figi (o Giorgos).
the John.NOM hopes PRT leave.3SG (the George.NOM)
'John hopes to leave' / 'John hopes that George would leave.'
b. *European Portuguese inflected infinitives* (Raposo 1987)
Eu penso/afirmo [ter-em os deputados trabalhado pouco].
think /claim.1SG to.have-3PL the deputies worked little
'I think that the deputies have worked a little bit.'
c. *Welsh inflected infinitives* (Tallerman 1998)
Disgwyliodd Aled [iddi hi/*pro* fynd].
expected Aled to.3FSG she/*pro* go
'Aled expected her to go.'

Sometimes the effect of agreement (on logophoric control) can be seen with the same matrix verb, as in the following minimal pair from Turkish (Słodowicz 2007).

(27) a. **OC in Turkish [+Att,–Agr] nominalized complement**
Ahmet$_i$ [PRO$_{i/*j}$ düş-mek]-ten kork-uyor-du.
Ahmet fall.INF-ABL fear-PROG-PST.3SG
'Ahmet was afraid to fall.'
b. **NC in Turkish [+Att,+Agr] nominalized complement**
Ahmet$_i$ [pro$_{?i/j}$ düş-me-sin]-den kork-uyor-du.
Ahmet fall.INF-3SG-ABL fear-PROG-PST.3SG
'Ahmet was afraid that he would fall.'

The OC-NC generalization is a *formal* constraint of the grammar; there does not seem to be any deep semantic reason why agreement on the embedded verb should block control in this selective manner. In order to understand this interaction, we need to have a clear understanding of how agreement operates in the syntactic environments of OC.

5.2 Feature Transmission, Sharing and Deletion

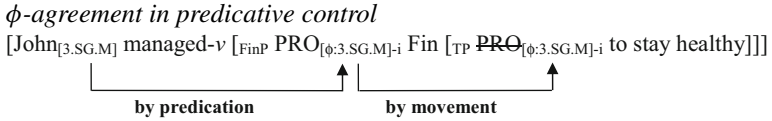
In line with a growing body of research, I assume that agreement processes take place at PF (see Bobaljik 2008; Sigurðsson 2006, 2009; Chung 2014 and Landau 2016). This assumption captures the traditional insight that agreement itself – the insertion of inflectional morphology that registers the interpretable ϕ-features of a nominal elsewhere in the sentence – does not have semantic effects; apparent counterexamples are indeed rare and plausibly involve interpreting "hidden" material rather than the inflectional morphology itself.

Because PF, at least prior to linearization, operates on fully syntactic configurations, agreement may perfectly be subject to structural constraints (c-command, locality etc.). Because PF, however, does not communicate with LF, agreement outcomes may not have semantic consequences. This point is important to bear in mind when we discuss the valuation of PRO below.

Consider first predicative control. It is well known that syntactic predication is a configuration of agreement: If the predicate bears any ϕ-features, they normally match the ϕ-features of the subject. Matching is achieved in one of two ways: (i) feature transmission from subject to predicate, or (ii) feature transmission from predicate to subject. An example of (i) is agreement on adjectival predicates; an example of (ii) is verbal agreement with *pro*, which is likely inserted as a minimal pronoun with unvalued features. Classical GB-style Spec-head agreement is capable of yielding agreement in these two cases. Alternatively, they may be handled by the more current operation Agree, which transmits ϕ-values from valued to unvalued occurrences of features. The choice between these options is not crucial for the present concerns.

Let us see now how this type of agreement is instantiated in predicative control. To recall, a FinP projection is turned into a predicate by the movement of an operator PRO to its specifier, and the predicate applies to the controller DP. Agreement thus piggybacks two syntactic dependencies here: movement and predication.

(28) *ϕ-agreement in predicative control*

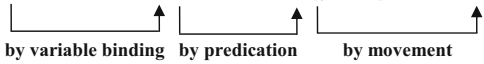


The operator PRO is generated as a minimal pronoun; its [ϕ:] bundle is valued at PF by the saturating DP controller, *John*. This step could be the result of a direct Agree (*John*,PRO) operation, or an indirect result of a prior Agree (*John*,Fin) operation. PRO (or Fin) are accessible from the matrix clause, assuming that FinP is not a phase. Even if it is, the edge position of the raised PRO and Fin guarantees accessibility for agreement (Polinsky 2003; Bobaljik and Wurmbrand 2005). The ϕ-values transmitted to the raised PRO are shared by its lower copy, the variable PRO, by virtue of the movement chain (on feature sharing, see Pesetsky and Torrego 2007).

Consider next agreement in logophoric control. FinP is embedded under a "perspectival" CP that encodes the matrix participants. The head of this CP projects a pronominal variable, which simultaneously saturates the FinP predicate and is bound by the matrix controller. Thus, agreement travels along three syntactic dependencies: variable binding, predication and movement.

(29) *ϕ-agreement in logophoric control*

[John$_{[3,SG,M]}$ λx intends-*v* [$_{CP}$ *pro*$_{x}$ C [$_{FinP}$ PRO$_{[\phi:3.SG.M]\text{-}i}$ Fin [$_{TP}$ ~~PRO~~$_{[\phi:3.SG.M]\text{-}i}$ to visit Athens]]]]



CP is a phase, but once again, *pro*$_{x}$, at its edge, is part of the matrix spellout domain and so is accessible to Feature Transmission from the controller DP.

The added component in (29), compared to (28), is variable binding. That variable binding serves as a vehicle for feature transmission has been forcefully argued by Heim (2008) and Kratzer (2009). I will simply assume the correctness of this view, returning to a (novel) argument in its favor in Sect. 5.4. Feature Transmission can be naturally viewed as a PF response to derivations regulated by the following condition.

(30) *Semantic condition on bound pronouns*
At the semantic interface, bound pronouns must be minimal (i.e., unvalued).

One obvious way of ensuring that bound pronouns are minimal at the semantic interface is to select them as minimal pronouns from the outset. Such null pronouns will then figure throughout the derivation until the LF and PF interfaces. At LF, they are legible by (30). At PF, however, they are *not* legible, assuming that that spellout rules operate with value specifications.[19]

(31) *Output condition on ϕ-features*
At spellout, ϕ-features must be valued.

Feature Transmission, then, is the grammar's way of dealing with unvalued pronouns at PF that *must* be unvalued at LF because they are bound. Is it the only way? Not necessarily. One can imagine that bound pronouns can meet condition (30) via Feature Deletion at LF. Such pronouns would be valued both in syntax and at PF ("losing" their ϕ-specifications only at LF), and hence would trivially meet condition (31) as well. We presently turn to this option. Below I propose that

[19]The existence of "default agreement" does not undermine this condition. On the contrary, default agreement is blocked whenever standard agreement is applicable, precisely because spellout rules favor ϕ-valued inputs.

both operations are available, but independent principles of a very general character guarantee that their respective jurisdictions are disjoint.

Continuing to focus on Feature Transmission (as a special case of agreement), let us state more formally the input and output of these operations. Agreement is a particularly strong form of matching; arguably, the strongest form. I will employ the notion "feature sharing" as developed in HPSG and adapted in Frampton and Gutmann 2006 and Pesetsky and Torrego 2007 to capture this relation. Upon Feature Transmission, the binder and bindee *share* the very same feature occurrences. What agreement between two feature *occurrences* achieves is elimination of one occurrence and "copying" of the other one into two *instances*. If feature occurrences are individuated by indices, the process can be represented as follows.[20]

(32) *Agreement and feature sharing*
$F_{\alpha}[n] \ldots F_{\beta}[\ ] \rightarrow F_{\alpha}[n] \ldots F_{\beta}[n]$

(33) *Feature Transmission*
Given a PF containing $[_{\Sigma} \ldots X_{i\,[\alpha]} \ldots pron_{i\,[\beta]} \ldots]$, where:
a. Σ is the spellout domain of X and *pron*.
b. X binds *pron*.
c. α and β are the ϕ-sets of X and *pron*, respectively.
Then (d) holds:
d. $\forall F_{\alpha}[n], F_{\beta}[m], F \in \alpha \cap \beta$: $m=n$.

In other words, features of the same type that occur both on a pronoun and on its binder must be shared (= have the same indexical address). Sharing is stronger than matching and can only arise from some form of agreement; it follows that the target (or probe) of agreement must be an unvalued item. A pronoun that fails to share its features with some DP cannot be bound by this DP.

Crucially, condition (33a) restricts this outcome to elements occurring in the same spellout domain. Non-local binding is exempt from this condition and is only subject to a weaker, matching requirement, holding at LF.

(34) *Feature Deletion*
Given an LF containing $[\ \ldots X_{i\,[\alpha]} \ldots pron_{i\,[\beta]} \ldots]$, where:
a. X binds *pron*.
b. α and β are the ϕ-sets of X and *pron*, respectively.
Then for $\forall F \in \alpha \cap \beta$, delete F_{β}.

[20]There is an interesting analogy between the sharing/matching distinction on the PF side and the binding/accidental coindexing on the LF side, whose consequences I cannot pursue here.

(34) is notably different from (33) in four respects. First, it applies at LF and not at PF. Second, it is not restricted by locality. Third, it operates on specified pronouns (by deleting their features) and not on minimal ones (by endowing them with features). Fourth, it is conditioned by matching and not by sharing; we return to the significance of this last point shortly.

The differences are all rooted in an architectural difference between the interfaces: While spellout is cyclic, semantic interpretation is not.[21] When the binder and bindee are too far apart to "communicate" at PF, they must resort to LF communication. Since feature sharing requires locality, it is unavailable in this situation, and only feature matching can be imposed.

This distinction between locally bound pronouns, which are targeted by Feature Transmission, and non-locally bound pronouns, which are not, is very much in the spirit of Kratzer 2009. Unlike Kratzer, however, the mechanism we invoke for non-local binding is not context-shifting but rather Feature Deletion (as in von Stechow 2003, Reuland 2010).

In effect, then, both minimal and inherently specified pronouns may end up being bound at LF. Each type meets condition (30) in a different way. A minimal pronoun must be bound within its spellout domain so that Feature Transmission may target it. An inherently specified pronoun must be bound from outside of its spellout domain so that Feature Deletion may target it.

Importantly, the grammar avoides competition between the two mechanisms. The default mechanism for local binding is Feature Transmission. LF may not "sneak in" a Feature Deletion operation unless necessary, which will only arise in a non-local dependency. This derivational logic has parallel consequences elsewhere, as emphasized in Reinhart 2000, 2006 and Reuland 2010, 2011. Broadly speaking, semantic computation (specifically, λ-binding) may not "sneak in" interpretations that are blocked by the syntactic component (specifically, chain formation/Agree). The present account offers a domain-based rationale for this prohibition: Within a spellout domain, PF operations (like Feature Transmission) take priority over LF operations (like Feature Deletion).

With this conception of agreement in place, we can return to our fundamental puzzle: The source of the OC-NC generalization.

5.3 Deriving the OC-NC Generalization

As shown in Sect. 5.1, inflection in the complement has a selective effect on the possibility of control, which is summarized as follows.

[21] It is indeed hard to imagine how long-distance, effectively unbounded dependencies of variable binding can be interpreted in a cyclic fashion. I am also not aware of any syntactic evidence for cyclic effects in this area (unlike, say, visible cyclic effects of Ā-movement; see Boeckx 2007).

(35) *The OC-NC Generalization*
[+Agr] blocks OC in attitude complements but not in nonattitude complements.

Recall also from (28)–(29) that the controller DP and PRO agree via direct predication in nonattitude complements but via variable binding and predication in attitude complements. In fact, variable binding and predication crucially differ in their agreement properties.

(36) *A difference between agreement in predication and variable binding*
a. The formation of a predication relation is *not* contingent on feature matching between the subject and predicate.
b. The formation of a variable binding relation *is* contingent on feature matching between the binder and the pronominal variable.

This difference is quite general and completely independent of the present concerns. Beginning with (36a), notice that predication is closely related with agreement only with verbal and adjectival predicates. PP predicates bear no ϕ-features and nominal predicates need not match their subjects in ϕ-features, particularly when their own features are interpreted. Even adjectival predicates may fail to agree, as in quirky constructions.

(37) a. John is [$_{PP}$ out of his mind].
b. Those women$_{[PL.F]}$ are [$_{DP}$ a committee]$_{[SG.N]}$.
c. Henni er kalt/*köld /*kaldri. (*Icelandic*; Sigurðsson 2008)
she.DAT is cold.NOM.NEUT.SG /*NOM.F.SG /*DAT.F.SG
'She is cold.'

Although not imposed by predication *per se*, agreement on predicates may be required in specific situations. Clearly, when the predicate is not inherently specified for a given ϕ-value, it must undergo valuation, on pains of condition (31). It is also possible for the predicate to bear formal (uninterpretable) ϕ-features that do not originate on its subject, and then undergo *independent matching* with the subject (see Kratzer 2009).

Things are dramatically different with Feature Transmission under variable binding. As Heim (2008) and Kratzer (2009) independently show, variable binding requires ϕ-agreement even in situations where the mismatch in features is semantically warranted.

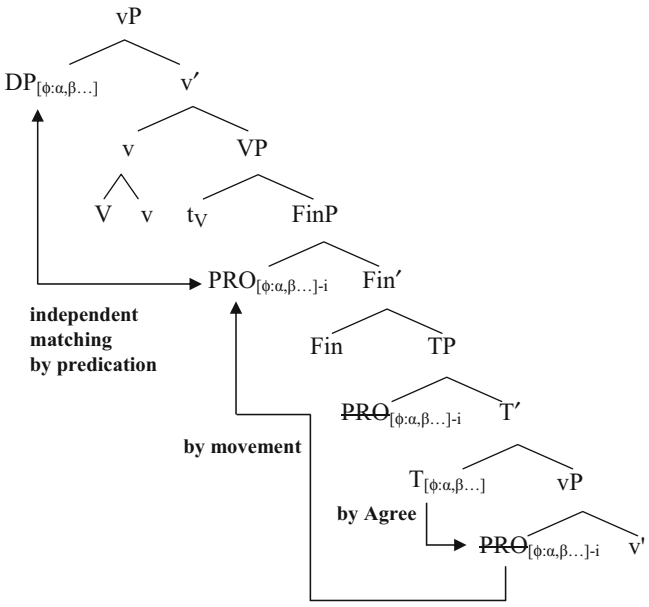
(38) a. * Nina respects myself. (uttered by Nina)
b. * They$_i$ each thought he$_i$ had won.
[cf. They$_i$ each thought they$_i$ had won]

These facts are readily explained on our assumptions. Specifically, condition (33) excludes (38a) and condition (34) excludes (38b). Feature Transmission in the local dependency of (38a) should generate, and Feature Deletion in the

nonlocal dependency of (38b) depends on, matching ϕ-features between the binder and bindee. Without it, these operations fail to apply and condition (30) is violated.

Given the asymmetry in (36), we can provide a principled account of the OC-NC generalization. Consider first the abstract syntactic relations that mediate agreement in predicative control into an *inflected* complement.

(39) *Predicative control into an inflected complement: Grammatical*

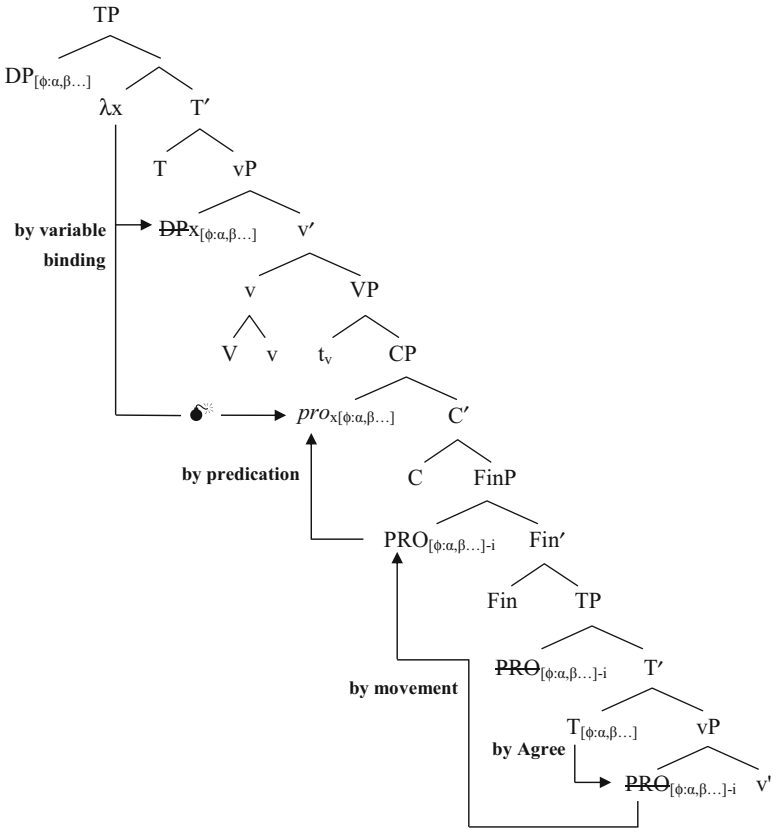


The first, bottom-most relation is established between the ϕ-bearing embedded T and the lower copy of PRO. Given that PRO is a minimal pronoun, hence, unvalued, valuation proceeds from T to PRO; feature sharing is guaranteed both by agreement and movement. At this point PRO can enter independent matching with the controller DP, given that predication is not contingent on Feature Transmission, the conclusion stated above as (36a).

Alternatively, the embedded T is initially unvalued just like PRO is, and both inherit their ϕ-values from the controller, via feature sharing. This would be possible if we assume that FinP is not a spellout domain because it is not a complement of a phasal head (see Chomsky 2008 for the idea that feature valuation occurs only at the phase level). On this alternative, no recourse is made to "independent matching" in predication.

Consider next the abstract syntactic relations that mediate agreement in logophoric control into an *inflected* complement.

(40) *Logophoric control into an inflected complement: Ungrammatical*



The first two steps from the bottom are as in (39): PRO is ϕ-valued by the embedded T. The λ-abstract, FinP, applies to the projected coordinate pro_x in [Spec,CP]. Crucially, the latter is also a minimal pronoun in need of valuation. Merged with a projection that contains a potential goal, it can and must form an Agree relation with the already-valued PRO. Once again, we assume that predication as such does not require Feature Transmission; nonetheless, in this case the process is induced by the presence of an unvalued element, pro_x. Agreement and valuation obey a cyclic logic and cannot be avoided when applicable.

The last step in (40) is variable binding between the λ-operator associated with the controller DP and pro_x. Here pops the problem. Local variable binding *depends* on Feature Transmission (see (36b)). But no ϕ-values can be transmitted to pro_x because it has already been valued in the complement clause. Therefore the binder (= controller) and bindee (= pro_x) fail to share their features, in violation of condition (33d). Importantly, this condition is enforced because pro_x occupies the

topmost specifier of the complement clause, which is part of the matrix spellout domain; this conclusion emerges independently and quite convincingly from studies of long-distance agreement (Polinsky 2003; Bobaljik and Wurmbrand 2005) and is consonant with the Phase Impenetrability Condition of Chomsky 2000.

Can top-down valuation succeed instead? Assume that the embedded T is initially unvalued. Then PRO and pro_x would also be unvalued at the point of variable binding, hence susceptible to Feature Transmission; feature sharing across the chain controller-pro_x-PRO-$T_{embedded}$ would produce an inflected, logophoric OC complement, contrary to fact. There is, however, a principled reason why the embedded T cannot be inserted unvalued: it would be unpronounceable. Recall that all features must be valued at the spellout point (condition (31)). The embedded FinP *is* a spellout domain, being the complement of a phase head, C. The ϕ-features on T must therefore be valued within this domain. Yet PRO is unvalued, and by the time valuation is accomplished – when the controller is merged in the matrix clause – the embedded FinP has already been shipped to spellout. To be licit, the embedded T must "take care of itself" as far as ϕ-values are concerned.

The only remaining option is for pro_x to be a free variable, which yields no control. Note that this result would not be guaranteed on the matching view; on that view, variable binding would not be hindered by the presence of inherent features on the variable as long as they match those of the binder. We thus have an argument for the stronger view that requires feature *sharing* under agreement.

Finally, Feature Deletion at LF, which does apply to bound pronouns in finite complements, is of no help here. Structure (40) is crucially different from (38b) in that the bound pronoun (= the coordinate pro_x) *does* fall within the spellout domain of the binder/controller. Feature Transmission is applicable, hence mandatory, on the economy considerations discussed above. Notice that no look-ahead or even PF-LF contact is assumed here. In fact, strictly speaking, such a PF-failed derivation might still undergo Feature Deletion at LF, with no redeeming effect on grammaticality.

We can summarize the explanation of the OC-NC generalization as follows: Logophoric control is vulnerable to (embedded) agreement and predicative control is not, because logophoric control implicates variable binding whereas predicative control implicates predication, and variable binding is sensitive to agreement in a way that predication is not.

5.4 A Novel Argument for Feature Transmission

The device of Feature Transmission at PF is but one theoretical response to the observation that ϕ-features on bound pronouns do not contribute their standard (presuppositional) meaning. A second response is the device of Feature Deletion at LF (adopted here for non-local binding). Yet other responses involve a radical revision in the denotations assigned to bound pronouns or their evaluation procedure (Sauerland 2013; Sudo 2014). Although this debate is usually informed by semantic considerations, the current discussion offers a fresh perspective on it, from the angle

of agreement. Specifically, the interaction of OC with agreement, and the account provided in the preceding section, favor the Feature Transmission solution over its competitors, at least for local binding dependencies.

Let us examine once again the schematic structures of OC, according to the property/centered-world analysis (41a), on the one hand, and according to the present "special *de re*" variable binding analysis (41b), on the other hand. This time, we explicitly add inflection to the embedded T head.

(41) a. *John* λz [t_z *intended* [λx [PRO_x $T_{[\phi:\alpha,\beta\ldots]}$ [$_{vP}$ . . .]]]]
b. *John* λx [t_x *intended* [pro_x [PRO_i [t_i $T_{[\phi:\alpha,\beta\ldots]}$ [$_{vP}$ . . .]]]]]

The fundamental problem with the analysis in (41a), as discussed in Sect. 3, is its failure to provide a reasonable account for the mandatory agreement between the controller (*John*) and PRO. The few attempts to do so seem to invoke an extraordinary type of postsyntactic agreement, defined over semantic relations. At this point we can see that the problem is even greater. The selective effect of inflection on control – the OC-NC generalization – is *not even stateable* in terms of such "semantically oriented" agreement. This is because the crucial factor that blocks OC in attitude complements is the presence of overt agreement between PRO and the embedded T. But this agreement is nonsemantic, possibly even a pure PF process. How can this morphological agreement disrupt the semantic composition? Surely it cannot alter the denotation of the control verb itself. Nor can it turn the complement clause into a proposition, for this would also block OC into inflected *predicative* complements, contrary to fact.[22] Embedded inflectional agreement has no semantic value, yet it obviously destroys what is taken to be a semantic relation. This is a brute fact about control that purely semantic approaches have never been able to come to grips with, for deep, architectural reasons.[23]

Consider now the present analysis, (41b). We can ask: Given this analysis, what approach to ϕ-features on bound pronouns can make sense of the OC-NC generalization? We have already seen that the Feature Transmission approach succeeds in doing just that. On this approach, the embedded inflection values PRO, and consequently pro_x, destroying its "minimal pronoun" status, which is absolutely necessary for variable binding (by the matrix λx) to go through. The

[22]Nonattitude OC verbs select unsaturated properties. The clearest evidence for this is the fact that these verbs universally resist uncontrolled lexical subjects in their complement (Grano 2015), and indeed, it is often impossible to imagine what they could mean with a propositional complement. Yet they often take inflected complements, as in the following Persian example (Darzi 2008).

i.	$Mæn_i$	mi-tun-æm	[(ke) $PRO_{i/*j}$	næ-r-æm	xune].
	I	DUR-be.able-1GS	(that)	not-go.SUBJ-1SG	home
	'I am able not to go home.'				

[23]It should be clear that the selective effect of agreement on control is an inescapable problem for *any* theory of control that is purely semantic (and not just for the property/centered-worlds theory), that is, any theory in which the control dependency is not syntactically represented. For examples of such theories, see Růžička 1999, Jackendoff and Culicover 2003 and Duffley 2014.

point is that nothing similar is available to the alternative approaches. If PRO/pro_x were inherently valued and their features removed by Feature Deletion at LF, one would have to block this operation from applying just in the presence of inflection on T. Similarly, on the semantic approaches that assign nonstandard denotations to bound pronouns, one would have to avoid these denotations just in the presence of inflection on T.

This kind of conditioning, however, is not grammatically plausible. Morphological inflection on T is visible at PF, not at LF, being semantically inert. The grammar cannot condition LF operations, or worse, choice of semantic values, on the basis of morphological information alone. What grammatical logic could block Feature Deletion or a nonstandard denotation on a pronoun (thereby licensing only the referential denotation) *just in case* the pronoun has undergone prior overt agreement with Infl?

The natural locus of interaction for such effects is PF. Indeed, only on the Feature Transmission approach, but on none of its alternatives, variable binding is rigidly associated with a characteristic PF profile (see (33)). Hence, only this approach is capable of accommodating the curious sensitivity of variable binding (in attitude OC) to other PF phenomena, like clausal inflection.

6 The Final Argument: Bound *de re* Reflexives/Pronouns

The argument from agreement and the argument from inflected complements show that the "special *de re*" theory of OC is *syntactically* superior to the standard property/centered-worlds theory. They do not purport to claim a *semantic* advantage. There is one empirical domain, however, that appears to provide a semantic argument in favor of the current proposal. The relevant facts are known in the literature as "bound *de re* reflexives/pronouns" or "unexpected Binding Theory (BT) effects" (Heim 1994; Sauerland 2001; Charlow 2009, 2010; Sharvit 2011). They can be described quite simply.

Suppose Palin reads an article by a politician that tremendously impresses her. The politician lays out a reform plan that she promises to implement, once elected. Palin is taken by this vision and is convinced that the politician should be elected. Palin does not realize, though (maybe due to some temporary memory loss), that she herself wrote that article. In this scenario, Palin says (42a) to herself, which can be reported as (42b) but not as (42c).

(42) a. Palin: "I want to vote for this politician".
b. Palin wants to [PRO_i vote for $herself_i$].
c. * Palin wants [PRO_i to vote for her_i].

Note that Palin holds, simultaneously, a *de se* belief about the voter, PRO, and a *de re* belief about the voted-for, *her(self)*. Nevertheless, BT seems to be indifferent to this distinction, and operates in the usual manner. The reflexive is licensed because it is covalued with a local binder in the utterance world; the pronoun is excluded for the same reason.

The problem is that on this mixed reading, the standard property/centered-worlds theory fails to generate covaluation in the complement. The LFs it assigns are the following.

(43) a. *[$_{TP}$ Palin [λx [$_{vP}$ t_x [wants [$_{CP}$ λw'.λy [$_{TP}$ PRO_y to $vote_{w'}$ for $herself_x$]]]]]]

b. [$_{TP}$ Palin [λx [$_{vP}$ t_x [wants [$_{CP}$ λw'.λy [$_{TP}$ PRO_y to $vote_{w'}$ for her_x]]]]]]

The binder of PRO is a local operator introduced by the attitude verb (see (7b), (9d), (10b), (11b)); this is what guarantees that PRO is associated with the *de se* counterpart of the attitude holder. The binder of the *de re* pronoun/reflexive is the DP corresponding to the attitude holder. Because they are bound by distinct binders, the complement subject and object are not covalued. This falsely predicts ungrammaticality with the reflexive and grammaticality with the pronoun, just the opposite of the pattern attested in (42b–c).[24]

It is important to observe that the "unexpected BT effects" are only unexpected on the assumption that PRO is not a *de re* pronoun. If it is, then just like the embedded object pronoun/reflexive, PRO will be bound by the matrix DP corresponding to the attitude holder. The two *de re* pronouns will differ, of course, in their guises; PRO will be associated with the 'self' acquaintance relation, the object pronoun with a different relation. Still, they would be covalued within a local binding domain (being different guises of the same *res*), as desired. This immediately explains the BT effects, which are now entirely expected. The TTC incorporates a version of this analysis (see also Maier 2011 for an analysis similar in spirit). Although PRO is not directly bound by the matrix controller, it is covalued with a variable that is, namely, the projected argument pro_x.

Consider the details. The TTC assigns the LFs in (44) to (42b–c). We continue to assume the concept-generator analysis of *de re* attitudes. As Percus and Sauerland (2003b) anticipate, complements with distinct *de re* descriptions require a distinct concept generator each; this implies that attitude verbs are type-flexible. Note that the value of G_7, the concept generator that applies to the projected coordinate pro_x, is fixed as G_{SELF} by presupposition (see (18)). Finally, I assume that GP inherits the index of its nominal head by percolation.

(44) a. [Palin [λx [$_{vP}$ t_x [wants [λ_9 λ_7 [$_{CP}$ [$_{GP}$ G_7 pro_x i']$_x$ $C_{i'=<x,t',w'>}$ [$_{FinP}$ PRO_j (=λj) [$_{TP}$ t_j to vote for [G_9 $herself_x$ i']$_x$]]]]]]]
(*Presupposition*: $G_7 = G_{SELF}$)

b. [Palin [λx [$_{vP}$ t_x [wants [λ_9 λ_7 [$_{CP}$ [$_{GP}$ G_7 pro_x i']$_x$ $C_{i'=<x,t',w'>}$ [$_{FinP}$ PRO_j (=λj) [$_{TP}$ t_j to vote for [G_9 her_x i']$_x$]]]]]]]
(*Presupposition*: $G_7 = G_{SELF}$)

[24]Heim's (1994) proposal was to extend the binding domain of the *de re* pronoun/reflexive by deleting PRO and its binder at LF. Charlow and Sharvit independently show that this proposal is untenable.

By λ-conversion we get (45) (the syntactic structure is preserved for perspicuity only).

(45) [Palin [λx [$_{vP}$ t_x [wants [λ_9 λ_7 [$_{CP}$ $C_{i'=<x,t',w'>}$
[$_{TP}$ [$_{GP}$ G_7 *pro*$_x$ i']$_x$ to vote for [G_9 her(self)$_x$ i']$_x$]]]]]]]
(*Presupposition*: $G_7 = G_{SELF}$)

Evidently, the subject and object arguments in the complement are covalued with each other (and with the controller). Since they occur in the same binding domain, the object must surface as a reflexive and not as a pronoun.

We thus see that "unexpected" BT effects in OC complements directly follow from the "special *de re*" analysis, with no further assumptions. BT simply does not care about concept generators and their content; it only operates on syntactically visible indices. On the other hand, in order to account for *de re* binding inside OC (attitude) complements within the standard property/centered-worlds theory, Sharvit (2011) introduces significant changes in BT itself. She formalizes a disjunctive notion of covaluation: one disjunct covers standard covaluation and the other one covers pairs of variables where one member corresponds to the attitude holder and the other member to his/her 'self' (similarly, for *de te* attitudes, covaluation between the attitude holder's addressee and the 'self's addressee' is allowed). Nothing so powerful is needed on the present approach.[25]

Sharvit (2011), in fact, acknowledges the simple alternative entertained here (which she calls "the pure *de re* theory"), but claims that it faces three challenges. Two of these are conceptual and one is empirical. I believe that all three can be adequately answered.

First, Sharvit claims that the pure *de re* theory must "stipulate that when PRO is a *de re* pronoun embedded under an attitude verb, it can only be interpreted relative to the identity function, while other pronouns may be interpreted relative to other descriptions . . . we have to stipulate further that PRO is always syntactically *de re*" (p. 96).

This is not the proper characterization of the facts, however, in light of the discussion in Sect. 4.2. PRO is not inherently *de se* (cf., (20)), and conversely, overt pronouns sometimes are inherently *de se* – when occurring as controlled subjects (Madigan 2008; Szabolcsi 2009). The obligatory *de se* construal is tied to attitude OC verbs as such; in the implementation I proposed, it is a presupposition on the complementizer they select (see (19c)). The "stipulation", therefore, is not about which pronouns may or must be associated with which acquaintance relations, but rather about which complement clauses encode the identity relation (namely, the G_{SELF} concept generator).

[25]For a recent account of the "puzzling" BT effects that simultaneously employs local operator binding (for PRO) and a *de re* concept generator (for the reflexive), see Pearson 2015.

But note that this is not a stipulation at all insofar as it is a necessary ingredient in any adequate theory of OC. OC attitude complements impose *de se*; OC nonattitude verbs do not, and attitude non-OC verbs do not either. This empirical landscape is shared by all approaches. On the property/centered-worlds approach it is represented as an ambiguity in the lexical entry of the attitude verb itself. One variant expresses a *de re* attitude, the other one expresses a *de se* attitude (via local operator binding), and crucially, it is *stipulated* that OC complementation is exclusively associated with the latter. Clearly, this is no less stipulative than the present proposal, and in fact (as we argued), less transparent: The present proposal does not appeal to ambiguity at all. The attitude verb is unambiguously *de re*, and the difference is localized in the C-heads of the different complements it may select, which are clearly distinct ($that_C$ encodes no specific G, C^{OC} encodes G_{SELF}).

Sharvit's second conceptual argument is based on an asymmetry between 1st and 3rd person bound reflexives in Free Indirect Discourse (FID): Only the former give rise to the "unexpected" BT effects (3rd person reflexives must be construed *de se*). This, according to Sharvit, shows that the grammar must be able to generate PRO as a locally bound variable in FID contexts (and let it be covalued with a *de re* 1st person reflexive using the extended notion of covaluation with the 'self'). But if this LF is allowed in FID, there is no reason to block it in standard OC complements.

It is actually not clear to me that the local binding solution is forced by the FID data, but even if it is, I see no compelling reason to assume that it is the solution the grammar employs in OC. There is a nontrivial gap between "can" and "does". For example, English employs both "surface" and "deep" anaphora for VPs, as in *John called Mary and Bill did too*, vs. *John called Mary and Bill did it too*, respectively. There is no conceptual reason why the surface anaphora, available with the gap, should not be available with the pronoun *it* (in fact, it is in Danish, see Hauser et al. 2007). In practice, it is not. Likewise, there is no conceptual reason why verbs should not agree with non-nominative subjects, the way they agree with nominative ones. In practice, they do not. These are all empirical matters. Given that FID is different from standard attitude complements in a number of respects, it should not be surprising to find – if indeed we do – that the syntax of *de se* construal is among those differences.

Sharvit's final argument against the pure *de re* theory is empirical and is based on the "unexpected" Condition B violation in (42c). While the unexpected satisfaction of Condition A in (42b) can be attributed to the availability of the pure *de re* LF (44a), the violation of Condition B in (42c) requires that the grammatical LF (43b) be *un*available in principle. Sharvit reasons that since local operator binding must be an available device of generating *de se* pronouns in the grammar, something else must be invoked to rule out (43b) (namely, her extended notion of covaluation with the 'self').

The argument is valid only if nothing else rules out (43b). In fact, I believe that an independent principle, quite general and demonstrably operative in BT effects, does so. Its first appearance was as "Rule I" in Grodzinsky and Reinhart 1993 and it has since then received various formulations (see Reinhart 2000, 2006; Reuland 2011). This economy principle chooses between different LFs that yield indistinguishable

interpretations. Specifically, it favors A-binding over coreference.[26] Compare the abstract configurations of (43b) and (44b) ([$_{BD}$ ...] indicates the binding domain of the embedded object).

(46) a. Variable binding in (43b)
$\lambda x \ldots x \ldots \lambda y\ [_{BD}\ y \ldots\ OBJ_x]$

b. Variable binding in (44b)
$\lambda x \ldots x \ldots (\lambda z.\ [_{BD}\ z \ldots\ OBJ_x)\ (x)]$

(b) = c. $\lambda x \ldots x \ldots\ [_{BD}\ x \ldots\ OBJ_x]$

On the intended "bound *de re*" reading, the variable *y* in (46a) (corresponding to PRO) and the object variable *x* are covalued in the utterance world (in (42), g(x) = g(y) = Palin). Since this covaluation is *not* achieved by A-binding, it would be blocked by an alternative covaluation that is so achieved. Strictly speaking, (46b) does not appear to be such an alternative, since OBJ_x is A-bound by *z* (= the trace of PRO). However, (46b) readily resolves to (46c) (by λ-conversion), where A-binding does hold in the complement. I would like to suggest that we should interpret Rule I as naturally extending to these cases as well, its ultimate rationale deriving from an output comparison of coreference and binding and not necessarily from how binding is achieved. In fact, this is needed anyway for cases like *John$_i$, it's unclear whether he$_i$ appreciates him$_{*i}$*, where the resumptive pronoun *he* functions as a λ-variable.

The upshot is simple. Since LF (43b) loses *anyway* to LF (44b) (owing to Rule I), we only need to worry about ruling out (44b). This is achieved by the standard Condition B. Hence, "unexpected condition B effects" provide no argument in favor of the standard property/centered-worlds analysis or an unorthodox notion of covaluation.

Before concluding, let me point out that Sharvit's solution to the unexpected BT effects reproduces the agreement problem that preoccupied us in Sect. 3. The standard property/centered-worlds analysis does not provide an adequate account of the agreement between PRO and the controller. The source of the problem, to recall, was the fact that the trace of the controller and PRO are bound by distinct λ-operators. The *same* problem arises between PRO and the reflexive in the LF (43a), which Sharvit adopts for (42b). Since covaluation with the 'self' is only detectable in the semantic component, it cannot possibly feed ϕ-agreement. In fact, formal agreement prevails also in this situation. To observe its effect in isolation, imagine the *de re* scenario presented for (42), with one emphasis: For some reason, Palin comes to believe that the author of the article she has read (who is herself, but she does not know it) is a male. In this context, one still has to use the agreeing *herself* as the bound *de re* reflexive.

(47) Palin wants to [PRO$_i$ vote for herself$_i$/*himself$_i$].

[26] "Rule I: NP A cannot corefer with NP B if replacing A with C, C a variable A-bound by B, yields an indistinguishable interpretation" (Reuland 2011: 57).

In all of Palin's doxastic alternatives, her 'self' is a female and the author of the article (for whom she wants to vote) is a male. This gender mismatch presumably does not block the extended type of covaluation (with the 'self'), but it does raise the thorny issue of agreement: Why must the reflexive, which denotes a male in Palin's doxastic alternatives, manifest feminine gender, in agreement with PRO, given that they do not stand in any syntactic relation to each other?

In sum: The ability of PRO, a *de se* element, to bind *de re* pronouns/reflexives is a strong argument for the "special *de re*" analysis of OC in attitude contexts, because nothing else is expected on this analysis. In fact, *failure* of covaluation between PRO and a bound *de re* element would be unexpected, not its success. By comparison, the standard property/centered-worlds theory can only accommodate these facts by complicating BT conditions (Sharvit 2011) or allowing mixed *de re-de se* LFs (Pearson 2015). Arguments purporting to demonstrate that the grammar must make available a method of generating $\text{PRO}_{de\ se}$ via local operator binding are not compelling. That is not to say that we have proven this method not to be available. Rather, as far as the properties of OC are concerned, I am not aware of any fact – semantic, syntactic or morphological – that *requires* this method. By contrast, the interaction of OC with agreement and inflection does require an analysis of $\text{PRO}_{de\ se}$ as a special kind of a *de re* pronoun. Parsimony, then, recommends discarding the former option.

7 Conclusion

Classical ideas, long abandoned for more sophisticated theories, sometimes return with a vengeance. The idea that OC PRO is a variable bound by the controller, I believe, is such an idea. It was only the second idea that generative grammar developed to account for OC (the first one was the Equi-NP Deletion analysis, soon understood to be defunct). Although it continued to underlie much of the syntactic work in recent decades, it has practically fallen out of grace in the formal semantic literature as early as the mid-1970s (see Thomason 1974). The reasons for this shift were quite compelling, as we have seen, not the least the realization that direct binding of PRO by the controller fails to explain the characteristic *de se* reading of OC constructions.

My starting point in this study was the claim that this conclusion no longer holds. The combination of a rather basic semantic theorem – that attitudes *de se* can always be expressed as a special case of attitudes *de re* – with a particular LF formalism of attitudes *de re* – the concept generator analysis of Percus and Sauerland (2003a) allows for a straightforward revival of the direct binding analysis without sacrificing the *de se* semantics. This analysis rests on modern conceptions of the clausal left periphery, in which context coordinates, as pointers to matrix participants, are syntactically represented.

In the proposed analysis, complement control splits into two types. Nonattitude complements denote a property, which is directly predicated of the controller DP.

The property is formed by λ-abstraction, where PRO itself serves as the abstractor (upon movement). In attitude contexts, the controller DP directly binds a minimal pronoun in the left periphery of the complement, which is associated with the *de se* presupposition via the complementizer. PRO is again a λ-abstractor that covaries with this pronominal coordinate (forming the predicate that applies to the latter).

The main achievement of this theory is a principled explanation of the fact that PRO systematically agrees with the controller DP. This elementary fact poses insurmountable problems for the prevailing semantic approaches that associate PRO with the controller only at some postsyntactic interpretive level. The explanation presently afforded utilizes the mechanism of Feature Transmission at PF, suitably confined to local binding relations (within a spellout domain).

The current theory can claim further advantages over the property/centered-worlds analysis of OC. Significantly, it is capable of explaining a striking asymmetry between attitude and nonattitude OC complements in their vulnerability to inflection (the OC-NC generalization). This selective interaction between agreement and OC points quite conclusively to an ineliminable syntactic substrate over which the control dependency is defined. At the same time, it provides a novel argument in favor of Feature Transmission as the right treatment of ϕ-features on bound pronouns, as opposed to semantic alternatives that cannot possibly accommodate direct information flow between inflectional agreement and semantic operations.

Finally, the "special *de re*" analysis of OC provides a simple account for "unexpected BT effects" between PRO and *de re* reflexives/pronouns, that proved quite recalcitrant for the standard property/centered-worlds analysis. These effects are fully expected, given that PRO is but a *de re* pronoun itself, albeit restricted to the 'self' acquaintance relation.

We have thus come full circle to the classical ideas of generative grammar about control, but this time they seem much more fertile and trustworthy than they did four decades ago.

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Intentional Identity as a Transparency Phenomenon

Daniel Tiskin

Abstract Intentional Identity, introduced by Geach (J Philos 64(20):627–632, 1967), refers to pairs of attitude reports where a pronoun embedded into the second report is anaphoric on a quantifier embedded into the first one. In the Geach sentence (*Hob thinks a witch has blighted Bob's mare, and Nob thinks she killed Cob's sow*) the antecedent carries no commitment to the existence of witches, and moreover the sentence does not require that Nob should know anything about Hob or Hob's mental state. This fact has given rise to the conviction, almost universally shared, that in Intentional Identity reports the anaphoric pronoun cannot be D-type, i.e. that it cannot borrow its reference and descriptive content directly from its antecedent.

We show that the perceived non-committing truth conditions can be derived via a D-type analysis of pronouns, which are taken to be syntactically complex. The crucial ingredient of the proposal is that the predicate within a pronoun in Intentional Identity ascriptions receives a "non-specific transparent" reading (in the sense of Fodor (The linguistic description of opaque contents. PhD dissertion, Massachusetts Institute of Technology, 1970); Schwager (Proc SALT 19:395–412, 2009)), so the second attitude holder (e.g. Nob) is required to know Hob's thoughts no more than Ralph is required to know Ortcutt's name in the famous scenario due to Quine (J Philos 53(5):177–187, 1956).

1 Intentional Identity

Intentional Identity is expressed by *unbound anaphora* where the antecedent and the anaphoric pronoun are both embedded into an attitudinal (or some other modal) clause. The first (modern) author to point such cases out as a problem for semantic

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analysis was Geach (1967),[1] who provided an example of a supposedly true sentence in a scenario where, as (probably) in our own world, no witches exist but "a reporter is describing an outbreak of witch mania":

(1) Hob thinks a witch has blighted Bob's mare, and Nob wonders whether she (the same witch) killed Cob's sow.

The rather uncommon sort of attitude that Nob entertains in (1) is rarely discussed, so we will focus our attention on the more familiar variant as in

(2) Hob thinks a witch has blighted Bob's mare, and Nob thinks she killed Cob's sow.

As there are no real witches, under the classical analysis of quantification *a witch* cannot be construed *de re*,[2] whereas if it were construed *de dicto*, it is at first sight unclear how the pronoun *she* would get its denotation (as it is not bound by *a witch* in the classical sense).

It appears to be a *conditio sine qua non* for the assertability of (2) that the agents whose attitudes are reported share the source of their information about the object of their attitudes (if there *are* at least two agents, of course, cf. the cases of single-agent Intentional Identity in Sect. 1.1). This is known as the *common source condition* (Moltmann 2006, 210–211 and the papers cited),[3] believed by Moltmann to be an obstacle for any purely mechanic D-type approach, i.e. an approach where the pronoun is treated as a shorthand for the description contained in its antecedent. In the setting of (2), this is often enforced by saying that both villagers, Hob and Nob, read a local newspaper, which reports rumours about a witch wreaking havoc in the village.[4]

The aim of the present paper is to argue against one popular view about Intentional Identity, namely that the lack of Nob's knowledge about Hob or Hob's beliefs prohibits the treatment of the pronoun (*she*) as anaphoric on the individual specified by its antecedent (*a witch*) or as borrowing the antecedent's descriptive content. To perform this task, in the remainder of the present section we review

[1] Geach alludes to mediæval scholars, in particular to Buridan; but the latter seems to have only discussed what is now known as *intensional transitive verbs*, as in

(i) I owe you a horse.

For a modern overview of the literature on intensional transitives, see Schwarz (2015).

[2] Even splitting the scope of the quantifier proper and the restrictor in the style of Szabó (2010) does not help, as there is plainly no object s.t. Hob's and Nob's beliefs are about it, be it a witch or not.

[3] See also similar thoughts in van Rooij and Zimmermann (1996), whence its title "An Externalist Account of Intentional Identity," and in Rooy (2000).

[4] "It seems that in all... cases [of Intentional Identity], either Nob heard about the witch from Hob, or Hob from Nob, or both heard about the witch from some third party" (Edelberg 1992, 572). As will be seen in Sect. 2, the first two cases out of the three listed are far less problematic than the last one.

the variety of subtypes of Intentional Identity proposed in the literature, and briefly present some of the existing analytic strategies. Those include: (a) the shift from individuals to concepts as entities the antecedent quantifies over; (b) possibilist quantification; (c) substitutional quantification; and (d) analyses based on independence-friendly logic. Section 2 states and criticises what we take to be the widespread prejudice about Intentional Identity, viz. the claim that the relation of the anaphoric pronoun to its antecedent should be indirect in case Nob is unaware of Hob. As the pronoun in (2) is not statically bound, we need a dynamic framework, which is borrowed from Nouwen (forthcoming) and presented in Sect. 3. Section 4 outlines our view on the syntax and semantics of third-person pronouns. In Sect. 5 we present the last ingredient of our analysis, namely the module responsible for non-specific transparency—a manifestation of the larger phenomenon often referred to as *de re*, and apply it to our main example in (2). Finally, Sect. 6 discusses possible modifications of the analysis and directions for further study.

1.1 Classification of Intentional Identity

This subsection summarises the parameters of variation for Intentional Identity ascriptions. The list is not exhaustive; e.g. King (1993) points out the existence of Intentional Identity reports with antecedents other than existential DPs and with multiple anaphoric links. Ogata (2007, 109) provides a case where Intentional Identity is assertible despite there being a mismatch in the specificity of Hob's and Nob's suspects. We limit ourselves to those differences which relate directly to our main concern, namely the commonplace unanalysability assumption to be dealt with in Sect. 2.

Single- vs. Cross-Agent Cases

In principle, Intentional Identity is not confined to sentences reporting attitudes of different agents, such as Hob and Nob in (2). For instance, Rooij (2006, 128) provides

(3) Carl wants to catch a fish today, and he wants to eat it afterwards.

Here *he* corefers with *Carl*, so a story has to be told how coreference is possible without binding; but this issue is well-known and can be handled by virtually any semantics. The case of *it* is trickier, as the choice of the fish may depend on the particular bouletic alternative of Carl's, and the antecedent-anaphor link is established even though both are in embedded contexts. However, this is not characteristic of Intentional Identity: the same configuration of quantifiers and variables is observed e.g. in some cases of purely extensional cross-sentential

anaphora, such as "tele-scoping" (4),[5] as well as in the non-extensional cases known as Modal Subordination (Roberts 1989), shown in (5).

(4) Each degree candidate walked to the stage. He took his diploma from the dean and returned to his seat.

(5) A wolf might come in. He would eat you first.

What makes (3) different from (2) is the fact that both main clauses report attitudes of the same person. Therefore, the common source condition is trivially fulfilled, and it cannot be that the holder of the second attitude is unaware of the holder of the first one. Thus of genuine interest for us are only multi-agent cases, such as (2); we will commit ourselves to such cases in what follows.

Second Holder's Awareness

Unlike the previous dichotomy, the present one is a classification of *scenarios* in which Intentional Identity ascriptions are evaluated. In some cases, the holder of the second reported attitude (H2) is aware of the first attitude and its holder (H1). The awareness-positive Scenario 1 is to be compared with the no-awareness Scenario 2.

Scenario 1 *This morning Hob said to his friend, Nob, "A witch blighted Bob's mare." Nob believes what Hob has told him. He thinks for a moment, and says, "Cob's sow died early this morning. I'll bet the same witch killed the sow, too."* (Edelberg 1986, 1–2)

Scenario 2 *The news reporters simply assumed that a witch was responsible for all the mishaps, and dubbed her "Samantha." Hob and Nob both read the Gotham Star and, like most folks, they believe the stories about the witch. Hob thinks Samantha must have blighted Bob's mare, which took ill yesterday. Nob thinks Samantha killed his friend Cob's sow. (For purposes of later discussion, we assume Nob has no beliefs at all about Hob or about Bob's mare; he is unaware of the existence of either.)* (Edelberg 1986, 2)

In Scenario 1-like cases, one could argue that *she* in (2) stands for some description recoverable from the syntax or semantics of its antecedent, e.g. 'the witch who blighted Bob's mare' or 'the witch who Hob thinks has blighted Bob's mare.' There appears to be a consensus, however, as regards Scenario 2-like cases, that in such cases no analysis of that sort can succeed. We will consider this point in detail in Sect. 2.

[5] In our interpretation of what is going on in (4), we follow Nouwen (forthcoming). See also the treatment of (21) in Sect. 3.

Presence of Branching Individuals

In the classical case of (2), Hob and Nob each assume the presence of no more than one witch. Edelberg (1986, 13) was arguably the first to point out that this is not necessarily the case for Intentional Identity ascriptions. Consider his Scenario 3.

Scenario 3 *Smith and Jones died, and the two detectives, working together on these cases, suspect murder in both cases. Detective B thinks there was a single murderer who killed both, but Detective A thinks the crimes are unrelated. In fact both died of natural causes.*

Here (6a) is intuitively true but (6b) false:

(6) a. Detective A believes someone murdered Smith, and Detective B believes he murdered Jones.

b. Detective B believes someone murdered Jones, and Detective A believes he murdered Smith.

In some sense, to the individual who murdered both Jones and Smith in B's belief worlds there correspond two individuals in A's worlds, each responsible for one murder. Viewed as a transition from B's worlds to A's worlds, this looks like the "branching"[6] of a single individual (or a single *world line*, which is the line of what counts as the same individual across worlds) into two parts. Scenario 3 is of that sort.[7]

The asymmetry in (6) suggests that the correct analysis of Intentional Identity should make use of objects different from plain individuals, perhaps of concepts or counterpart relations; the reason is that individuals as such do not normally branch in the literal sense, whereas two concepts may or may not coincide in one individual satisfying them both, and one individual may have more than one counterpart at some world. In fact our proposal, to be spelled out in Sect. 4, rests on the availability of counterpart relations.

1.2 Approaches to Intentional Identity

A variety of approaches have been suggested to deal with Intentional Identity. Those belonging to the first three groups below try to eliminate the ontological commitment traditionally associated with existential quantification (which leads to the speaker, not just Hob and/or Nob, being committed to the existence of witches as

[6]The metaphor of branching originated in the tradition started by Jaakko Hintikka, see e.g. Hintikka and Sandu (1995); the term *world line* was, to the best of our knowledge, introduced in Kraut (1983).

[7]Cf. also the Birmingham example from Pagin (2014, 102 ff.), which shares its branching character with its non-Geachian predecessor in Kripke (1979).

she utters (2)), so that *a witch* could be construed *de re* after all. Others (Pietarinen 2001, as well as dynamic accounts) provide for some means to create an anaphoric link despite the indefinite antecedent being interpreted *de dicto*.

Quantifying Over Concepts

As Aloni (2001, 135–136) indicates, it is possible to analyse Intentional Identity with the help of quantification over intensions, or rather a special sort thereof, grouped into sets called *conceptual covers*. Informally, a cover contains concepts s.t. for each individual a and each world w there is exactly one concept in the cover uniquely satisfied by a at w. Adopting Aloni's suggestion, (2) can be translated as shown in

(7) $\exists c_{\langle s,e\rangle}\big(\mathbf{thinks}(\text{Hob}, \mathbf{witch}(c) \wedge \mathbf{bBm}(c)) \wedge \mathbf{thinks}(\text{Nob}, \mathbf{kCs}(c))\big)$

Quantifying over concepts instead of individuals allows one to retain widest scope for *a witch*, which solves the binding problem for *she*. The quantification over c is thus non-committal, since it is not individuals but concepts that are quantified over.[8] However, a possible objection to any such theory, found in Pagin (2014, 110), reads: "The problem is that sameness of intension does not seem to be necessary"; that is, nothing speaks for Hob and Nob having the same individuating description for the witch in question. This problem can probably be overcome if concepts are replaced with entities not associated with any descriptive content, such as "world lines" of Kraut (1983).

Quantifying Over Possibilia

Under Salmon's (2002) approach, one has to say that there is a *mythical* witch[9] s.t. Hob and Nob have relevant *de re* beliefs about her. Then one can simply assume widest scope for *a witch* in (2). The ontological assumptions made here are of course not unobjectionable. Besides that, the particular proposal of Salmon's has been put under criticism in Friedell (2013): Salmon's original truth conditions do not entail that Hob takes the object in question to be a witch, which is, however, intuitively required for the truth of (2) in case no real witch exists (and where, therefore, the plain *de re* construal for *a witch* is unavailable).

Similarly, Castañeda (1972) proposes to quantify over all possibilia instead of restricting quantification to a given world. Thus (2) can be given a straightforward *de re* analysis, as the existential commitment to a possible thing is no more than the

[8] Pendlebury (1982, 348) interprets Castañeda (1972) as containing a proposal in a similar vein.

[9] Or alternatively, a real *or* mythical witch, as in Salmon's subsequent work—a change made to account for cases where there is no mythical witch but rather a real individual whom Hob and Nob believe to be a witch.

commitment to its possible, not actual, existence. With a semantics for *de re*, e.g. along the lines of Kaplan (1968), one could account for the apparent (not necessarily real!) contradictions such as

(8) Hob thinks that a witch has blighted Bob's mare, and Nob is certain that she did not blight Bob's mare. (McKinsey 1986)

A proposal along similar lines is found in Glick (2012), where a possible witch has *counterparts* in Hob's belief worlds and in Nob's belief worlds, that is, Glick's way of accounting for *de re* is via counterpart relations. Counterpart theory was first proposed by Lewis (1968). According to it, no individual exists in more than one world, and the properties an object y might have counterfactually are instantiated not by y itself in different worlds but rather by y's counterparts in those worlds. As will be seen in Sect. 4, our analysis, also spelled out in terms of counterparts, comes rather close to Glick's.

Quantifying Substitutionally

Pendlebury (1982) goes for an analysis in terms of substitutional quantification, i.e. quantification over expressions of the language, not elements of the domain of individuals (or concepts). This move cancels the existential commitment of the quantifier. The price to be paid for ontological neutrality is sometimes considered too high: the potential filler for the position quantified over—say, *the tallest witch*—may pick up different individuals in different attitude holders' worlds so that no common focus obtains, i.e. it is not guaranteed that H1's and H2's attitudes are directed towards the same object (Edelberg 1992, 587, fn. 24; Pagin 2014, 102, fn. 11).

I deem this objection inconclusive. The reason is that, according to an influential view (Percus 2000; Schwarz 2012; see also Fintel and Heim 2011, 102 ff.), a quantifier like *the tallest witch* contains at least one silent world pronoun, which specifies which of the extensions of *tallest witch* across worlds is to be considered, i.e. whether the actual extension of the extensions in Hob's and Nob's doxastic alternatives should be taken into account. It is reasonable to suppose that for both occurrences of *the tallest witch* to be substitutionally quantified over by the same quantifier, a match is required in those world pronouns; thus *the tallest witch* must pick out the same individual (or the same "world line") in Hob's worlds and in Nob's worlds. In other words, the following configuration does not entail (2), even on the substitutional construal of quantification:

(9) Hob thinks λw[the$_w$ tallest witch has blighted Bob's mare], and Nob thinks λv[the$_v$ tallest witch killed Cob's sow],

whereas the following one (given a dynamic binding mechanism) does:

(9′) Hob thinks λw[the$_w$ tallest witch has blighted Bob's mare], and Nob thinks λv[the$_w$ tallest witch killed Cob's sow].

Of course, in the case of (9′) a further question arises, namely how to avoid the commitment to Nob's knowledge about Hob's attitude; this is the question we investigate in the next section.

Using Quantifier Independence

In Pietarinen (2001) one finds a construal of Geach's sentence that makes use of *quantifier independence*,[10] a notion familiar from Hintikka and Sandu (1989) and much subsequent work (see Mann et al. 2011). In short, the idea is that quantifiers (and correspondingly attitude verbs) introduce choices on the domains they quantify over: for example, an existential quantifier ranges over (a subset of) the domain of individuals, and a belief operator over (a subset of) the universe of possible worlds. A choice C is said to be *dependent* on some previous choices $C_1, \ldots, C_n$ iff there is a function which can predict what will be chosen at C on the basis of what has been chosen at $C_1, \ldots, C_n$. In game-theoretical semantics, successive quantifiers are by default conceived of as indications of successive choices, with the following choices dependent on the preceding ones. To override the default, the lack of dependence is symbolised as "\".[11] Given this, Pietarinen's translation for (2) is as in (10) (Pietarinen 2001, 168).

(10) $\mathbf{thinks}_{\mathrm{Hob}}\big(\exists x(\mathbf{witch}(x) \wedge \mathbf{bBm}(x) \wedge [\mathbf{thinks}_{\mathrm{Nob}} \backslash \mathbf{thinks}_{\mathrm{Hob}}]\mathbf{kCs}(x))\big)$

The use of $\mathbf{thinks}_{\mathrm{Nob}} \backslash \mathbf{thinks}_{\mathrm{Hob}}$ is intended to mean, in particular, that the choice of the possible world associated with $\mathbf{thinks}_{\mathrm{Nob}}$ proceeds as if the choice associated with $\mathbf{thinks}_{\mathrm{Hob}}$ had never taken place; this ensures that $\mathbf{thinks}_{\mathrm{Nob}}$ will choose a doxastic alternative Nob entertains at the world of evaluation, not in some doxastic alternative of Hob's. At the same time, the existential quantifier over witches is *de dicto*, thus avoiding the ontological commitment to witches (or even objects that are believed to be witches). It is unclear, however, whether the asymmetry Pietarinen allows between the two main clauses in (2) is plausible from the viewpoint of compositionality and what the underlying syntactic structure arguably looks like.

[10] Cf. also Saarinen's (1979) approach in terms of game-theoretical semantics using *backward-looking operators* that set the point of evaluation back to its previous value.

[11] The backslash notation may be thought of as the in-line notation for *partially ordered* (branching) quantifiers (Henkin 1961); introducing this symbol increases the expressive power of the language.

2 The Common Objection to Descriptive Analyses

2.1 The Received Wisdom

An idea that has occurred to many theorists is that Intentional Identity might be analysed in terms of *descriptive* (D-type) pronouns, or *pronouns of laziness*.[12] This would mean that *she* in (2) just stands for a description recoverable from the previous discourse (although not necessarily directly from its antecedent: the relevant description might be, for instance, *the witch Hob thinks has blighted Bob's mare*, not just *the witch*). Already Geach (1967, 630) took notice of this route, and he was also the first to argue against this view, building upon the following consideration:

> our reporter might be justified in asserting [(2)] if he had heard Hob say 'The witch has blighted Bob's mare' and heard Nob say 'Maybe the witch killed Cob's sow,' even if Hob had not thought or said anything about Cob's sow nor Nob about Bob's mare.

To this it might be added that Nob need not know anything about Hob or Hob's beliefs in order for (2) to have a true reading. Versions of this argument, often with reference to Geach, are ubiquitous.[13] Edelberg (1986, 4) and Pietarinen (2001, 149–150, 157) make similarly sceptical remarks; Edelberg (p. 16) provides what he calls an "anti-laziness" example, viz. his mayor/commissioner scenario.

Scenario 4 *Everything is like in Scenario 3, except that Smith was the mayor and Jones was the commissioner. Detective B does not know that Smith was the mayor, and Detective A does not know that Jones was the commissioner.*

Judging from Scenario 3 alone, one could suspect that the source of the asymmetry in (6) is the fact that *he* stands for a recoverable description: since *Detective B believes* ***the one who murdered Smith*** *murdered Jones* is true and *Detective A*

[12]The terminology may be confusing here. Geach (1967) uses the term *pronoun of laziness*, but he does not view *she* in (2) as a full syntactic and semantic duplicate of its antecedent, in contrast to cases like (ii)–(iii).

(ii) This year the president is a Democrat. Next year, he will be a Republican. (Nouwen forthcoming, a.o.)

(iii) The man who gave his paycheck to his wife is wiser than the man who gave it to his mistress. (Karttunen 1969)

cf. also the discussion about the terms *E-type* (due to Evans 1977) and *D-type* in Neale (1990, 184 ff.), where the term *D-type* is reserved for descriptive cases like (ii)–(iii) and the term *E-type* for unbound individual variable-like cases.

[13]On the other hand, Pendlebury (1982, 349) rather surprisingly insists that (1) commits one (except for selected philosophers) to the truth of

(iv) Nob thinks that a witch has blighted Bob's mare and wonders whether she (the same witch) killed Cob's sow.

believes ***the one who murdered Jones*** *murdered Smith* is false, so are (6a) and (6b), respectively. However, the same strategy apparently fails for Scenario 4: (11a) is still true, but *Detective B believes that* ***the one who murdered the mayor*** *murdered the commissioner* is false.

(11) a. Detective A believes someone murdered the mayor, and Detective B believes he murdered the commissioner. (true)

b. Detective B believes someone murdered the commissioner, and Detective A believes he murdered the mayor. (false)

In his later work, Edelberg (1992, 574) considers another scenario where, as he claims, a descriptive analysis is inapplicable.

Scenario 5 *Someone has carefully arranged the scene so that an external observer (e.g. Tanya or Hank) would come to believe that a car accident occurred: bits and pieces of a car are dropped all over, and some amount of ketchup is spilled around to imitate blood.*

Hank is not too much into car engineering, so he thinks "the glass plate connecting the hood and roof of an automobile is not a windshield, but a rainshield."

In this case, Edelberg argues, whatever Tanya thinks, the intuitively true sentence (12) is predicted to be false by a D-type analysis.

(12) Tanya thinks someone went through the windshield of that car, and Hank thinks he hit the pavement right here.

The reason is as before: trying to reconstruct the descriptive material associated with the pronoun *he*, we have to mention the *windshield*; but this term cannot—according to Edelberg—occur in the report of Hank's attitude insofar as Henk's attitude involves *rainshield* rather than *windshield*.

Note that in the argument so formulated, no distinction is drawn between truth *de dicto* and *de re*. As we hope to be able to show in the present section, such a distinction may suggest a way out of the impossibility thesis for D-type approaches.

2.2 Intentional Identity as a Sort of de re

So much for the received wisdom. We will show presently (or perhaps remind the reader) that the lexical material inside an attitude clause is in many cases interpreted in such a way that it does not ascribe the corresponding mental content to the holder of the attitude. The upshot will be that, regardless of whether D-type analyses are tenable, they cannot fail for the reason outlined above.

Note first of all that there are well-established cases in the semantic literature where a part of an attitudinal clause does not (directly) correspond to any mental content of the attitude holder. Putting descriptions aside for the moment, recall Quine's (1956) "double vision" scenario where Ralph has seen the same man, Ortcutt, twice without knowing it was Ortcutt on either occasion. Upon the first

encounter, Ralph suspects that the man whom he has seen is a spy; upon the second, he does not. If the only way to interpret *Ortcutt* were to ascribe Ralph some mental content corresponding directly to the name *Ortcutt*, then the following sentences would point out a contradiction in Ralph's beliefs.

(13) a. Ralph believes that Ortcutt is a spy.
b. Ralph believes that Ortcutt is not a spy.

However, intuitively there is a reading of (13a)–(13b) which entails no contradiction. This intuition has been the driving power behind various proposals (Kaplan 1968; Aloni 2001; Percus and Sauerland 2003; Yanovich 2014; Yalcin 2015, a.o.) as regards the semantics of attitude reports *de re*. The general idea is, roughly, that, although Ralph bears a cognitive relation to (is *acquainted* with) the individual Ortcutt, it is not Ortcutt himself but some other entity related to him that occupies his place in Ralph's thoughts. In fact, in Quine's example there are two such entities, each corresponding to one of Ralph's two encounters with Ortcutt. This entity may be a name, as assumed by Kaplan, or a concept, as Aloni puts it, or a mode of presentation, as in Yalcin's view, etc.

Now, *de re* ascription is not limited to singular terms. In particular, there is abundant evidence that predicates allow for *transparent* readings, i.e. for readings where a given predicate is evaluated not w.r.t. the possible world introduced by the closest modal operator but w.r.t. some other possible world index, perhaps the world of utterance/evaluation.

(14) Sue believes that **bastard** Kresge should be fired. (Potts 2007)
[Sue may have whatever feelings towards Kresge, but the expressive[14] in bold reports the speaker's attitude.]

(15) a. Charley wants to buy a coat like Bill's. (Fodor 1970)
b. A POSSIBLE READING: Charley wants to buy some coat or other provided that it is of a particular kind, and the speaker knows Bill has a coat of that kind.

(16) a. Mary thinks Sue is Catholic. (Sudo 2014)
b. A POSSIBLE READING: Mary only believes Sue is of the same religion as John, whom the speaker, but not necessarily Mary, knows to be Catholic.

In the case of (14)–(16), the predicate (*bastard*, *coat like Bill's*, *Catholic*) is contributed by the speaker and no commitment to the attitude holder's entertaining

[14]In what follows, we shall put expressives aside, but some authors note that they can get an "opaque" reading as well, thereby displaying the transparent/opaque ambiguity characteristic of ordinary predicates in attitude contexts:

(v) My father screamed that he would never allow me to marry that **bastard** Webster. But I love him so much that I don't care about my father's opinion. (Kratzer 1999; Potts 2007)

of an attitude towards that predicate is made. Such readings are also sometimes called *de re*, but it is worth noting that, unlike (13), they do not rely on the reference to an existent object.[15] Since Fodor (1970),[16] readings such as (15b) have been known as *non-specific transparent*, or narrow-Q[uantifier], R[estrictor]-*de-re* (Fintel and Heim 2011), as long as (15b) does not require that there be a *specific* coat Charley wants to buy (and thus resembles the usual *de dicto* reading of (15a)), but at the same time it does not ascribe Charley the mental content 'coat like Bill's' (and thus resembles normal *de re*).[17]

As regards Intentional Identity, the role of the speaker in the ascription of identity has been acknowledged by Rooij (2006, 143):

> ...if Arsky [= Detective A] and Barsky [= Detective B] are engaged in a conversation, it is Arsky and Barsky themselves who are responsible for their use of pronouns and presupposition triggers; but... when a speaker attributes beliefs to Arsky and Barsky or to Hob and Nob, it is the speaker who is responsible for the anaphoric and presuppositional links, and not the agents that the belief attribution is about.

Should there be a way to construe *she* in (2) along the lines of (15) and (16), we would be on the safe side: on the one hand, Nob is not ascribed any Hob-related mental content; on the other hand, the existence of a witch or anything that might be a witch is not stipulated (as it would be if *she* were treated like *Ortcutt* in (13)). Traditional analyses of pronouns left no room for a predicate in the syntax or semantics of a pronoun; however, more recent proposals acknowledge the syntactic and semantic complexity of pronouns. Section 4 presents our view on pronominal structure, which will finally allow us to come up with a construal for (2) (Sect. 5) that treats it on a par with (15)–(16).

This strategy will automatically solve the problem of apparent contradictions such as (8), even under a D-type approach to pronouns. Indeed, if *she* gets a *de re* reading, then it does not matter if its descriptive content (e.g. 'the witch who Hob thinks has blighted Bob's mare') matches what Nob ascribes to his suspect (e.g. 'did not blight Bob's mare'), for the descriptive content is not ascribed to Nob anyway. As a result, (8) is no more contradictory than

(17) Lois Lane does not know that Superman is Superman. (Båve 2008)[18]

[15] Schwager (2009) goes to considerable lengths showing that the property in question, such as *coat like Bill's*, need not even be instantiated at the actual world for the transparent reading of (15) to be true. We find her arguments convincing.

[16] Similar observations have been independently made by Bäuerle (1983).

[17] Given this, the scope-based account of the *de dicto* / *de re* ambiguity (Russell 1905) and the account stipulating two different readings for each attitude verb (Quine 1956) undergenerate as they are unable to derive the non-specific transparent reading.

[18] I use this example of Båve's without endorsing the ideas he illustrates using it.

3 The Dynamic System

As already mentioned, the unbound status of *she* in (2) makes the use of a dynamic semantics natural (although see Onea (2013) for a static semantics capable of treating such cases). The dynamic interpretation system presented here is basically that of Nouwen (forthcoming). This system is able to account for donkey anaphora, which is essentially the expressive power needed for Intentional Identity. The two pieces that have to be added are as follows. First, the dynamic effect of an attitude verb has to be spelled out (this part is absent from Nouwen's semantics), as the structural position of the universal quantifier c-commanding the indefinite in the donkey sentence (18) is occupied in (2) by an attitude verb.

(18) Every farmer who owns a donkey beats it.

We treat attitude verbs as universal quantifiers over possible worlds, so that they have all the properties universal quantifiers over individuals have except that attitude verbs quantify over the domain of worlds. Second, something has to be said about the objection presented in Sect. 2.1 above. We will address the objection in Sect. 5. The purpose of the present section is to introduce the basics of the system.

We assume that possible worlds are treated technically the same way individuals are, i.e., they are directly quantified over; if an individual does not happen to exist in a given world, then the individual and the world cannot satisfy any predicate together. This allows us to treat modality (including attitudes) completely on a par with individual-level quantification.[19]

In Nouwen's system, pronouns/variables and proper names are indexed. Given an assignment g, a proper name denotes the value g assigns to its index iff the value is the bearer of the name, and denotes nothing otherwise:

$$[\![\text{John}_i]\!]^g = \begin{cases} g(i) \text{ iff } g(i) = \text{John} \\ — \quad \text{otherwise} \end{cases} \tag{1}$$

A variable x_i denotes the value g assigns to its index: $[\![x_i]\!]^g = g(i)$.

The dynamics of discourse is modelled via the modification of an *assignment state* $G \subseteq \{g \mid g : \mathbb{N} \mapsto D_e\}$, i.e. a set of assignments. A predication *tests* if every assignment in the assignment state satisfies the predicate:

$$G[P(x_i, \ldots, x_j)] = \begin{cases} G \text{ iff } \forall g \in G : [\![P]\!](g(i), \ldots, g(j)) \equiv \mathbf{1} \\ — \text{ otherwise} \end{cases} \tag{2}$$

Therefore, an assignment state G survives an update iff all assignments within G satisfy the constraint imposed by the predicate; otherwise G is ruled out. As long some Gs are ruled out this way, the informativeness of the set of remaining Gs increases: this is how information growth is modelled in Nouwen's system.

[19] For some phenomena outside the scope of the present paper, this might be not enough; see e.g. Stone and Hardt (1999) for the discussion of accessibility in the context of Modal Subordination.

Conjunction in Nouwen's system is rendered as consecutive application:

$$G[\phi;\psi] = G[\phi][\psi] \tag{3}$$

To deal with quantification (which also covers attitude verbs, in our case), Nouwen introduces a sum operator Σ_i, whose subscript indicates to which variable in its argument formula the operator pertains. The operator forms the union of all assignments obtained from the input state by (a) letting the pertinent variable x vary its denotation freely, and then (b) leaving out those of the obtained singleton states that do not satisfy the predicate:

$$G[\Sigma_i\phi(x_i)] = \bigcup \left\{ \{g^{[i\mapsto d]}\}[\phi(x_i)] \mid d \in D_e, g \in G \right\} \tag{4}$$

Given this, a quantifier checks whether the assignment state that results from an update with the Σ'ed restrictor stands in the relation (specified by the lexical semantics of the quantifier) to the assignment state resulting from an update with the Σ'ed conjunction of the restrictor and the nuclear scope. Here the notation $G[\phi](x_i)$ stands for the application of the assignment state G filtered by ϕ to a variable; the outcome is to be conceived of as the set of values the members of $G[\phi]$ assign to the index i.[20]

$$G[\text{Some}_i(P(x_i))(Q(x_i))] =$$

$$\begin{cases} G[\Sigma_i(P(x_i);Q(x_i))] \\ \qquad \text{iff } [\![\text{Some}]\!]\big(G[\Sigma_i P(x_i)](x_i)\big)\big(G[\Sigma_i(P(x_i);Q(x_i))](x_i)\big) \\ \varnothing \qquad \text{otherwise} \end{cases} \tag{5}$$

Formula (6) gives the semantics for *Hob thinks that* ϕ, which in our setting is a universal quantifier over worlds restricted by the corresponding doxastic accessibility property DOX_H ("H" for Hob).

$$G[\text{Hob thinks that } \phi] = G[\text{Every}_j(\text{DOX}_\text{H}(w_j))(\phi(w_j))] =$$

$$\begin{cases} G[\Sigma_j(\text{DOX}_\text{H}(w_j);\phi(w_j))] \\ \qquad \text{iff } [\![\text{Every}]\!]\big(G[\Sigma_j\text{DOX}_\text{H}(w_j)](w_j)\big)\big(G[\Sigma_j(\text{DOX}_\text{H}(w_j);\phi(w_j))](w_j)\big) \\ \varnothing \qquad \text{otherwise} \end{cases} \tag{6}$$

Even though we have introduced an attitude operator, no change has to be made as regards the domain of individuals, D_e: we assume that it contains all possibilia; however, an individual a cannot satisfy any property $\lambda x(P(x,w))$ if a does not exist

[20]The construction $\Sigma_i(P(x_i);Q(x_i))$ is a combination of a conjunction and the sum operator, so its dynamic contribution is as in

$$G[\Sigma_i(P(x_i);Q(x_i))] = \bigcup\{G'[P(x_i)][Q(x_i)] \mid G' = \{g^{[i\mapsto d]} \mid d \in D_e, g \in G\}\}.$$

at the world w. Given this, the semantics for (19) should be as in (20), modulo the definedness conditions for the quantifiers (here omitted for readability).[21]

(19) Hob thinks that a witch has blighted Bob's mare.
$\text{Every}_w\big(\text{DOX}_\text{H}(w)\big)\big(\text{Some}_x\big(\mathit{Witch}(x,w)\big)\big(\mathit{bBm}(x,w)\big)\big)$

(20) $G\big[\text{Every}_w\big(\text{DOX}_\text{H}(w)\big)\big(\text{Some}_x\big(\mathit{Witch}(x,w)\big)\big(\mathit{bBm}(x,w)\big)\big)\big] =$
$G\big[\Sigma_w\big(\text{DOX}_\text{H}(w);\text{Some}_x\big(\mathit{Witch}(x,w)\big)\big(\mathit{bBm}(x,w)\big)\big)\big] =$
$G\big[\Sigma_w\big(\text{DOX}_\text{H}(w);\Sigma_x\big(\mathit{Witch}(x,w);\mathit{bBm}(x,w)\big)\big)\big]$

This allows as output states the states where w is mapped to a world doxastically accessible for Hob and x to a witch s.t. she has blighted Bob's mare at w (which means, moreover, that she exists at w).

Finally, let us see how Nouwen deals with inter-sentential unbound anaphora. His idea is to assume that the variable is implicitly universally quantified in the sentence where it *prima facie* occurs freely—although that variable should bear the same index as its antecedent in the previous sentence; the restrictor of this new quantifier is trivial (i.e., the trivial dynamic transition $\top$, which returns exactly the state it takes as input[22]). Thus, the representation for (21) should be as in (22), and the semantics as in (23), again modulo the restrictions.

(21) ...Nob thinks she killed Cob's sow.

(22) $\text{Every}_x(\top)(\text{Every}_v(\text{DOX}_\text{N}(v))(\mathit{kCs}(x,v)))$

(23) $G\big[\text{Every}_x(\top)(\text{Every}_v(\text{DOX}_\text{N}(v))(\mathit{kCs}(x,v)))\big] =$
$G\big[\Sigma_x\big(\text{Every}_v\big(\text{DOX}_\text{N}(v)\big)(\mathit{kCs}(x,v))\big)\big] =$
$G\big[\Sigma_x\big(\Sigma_v\big(\text{DOX}_\text{N}(v);\mathit{kCs}(x,v)\big)\big)\big]$

Thus, in addition to what is required by (19), the whole of (2) (which is the sequence (;) of (19) and (21)) requires that the witch assigned to x by a given g be s.t. in a certain doxastic alternative v of Nob's, that witch kills Cob's sow. This will be subject to further refinement in Sects. 4 and 5, of course, since in its current form the meaning of (2) does not avoid the objection against D-type analyses.

4 The Analysis of Pronouns

4.1 The State of the Art

For the sake of the present paper, we will concentrate on third-person pronouns in English, exemplified by *she*, as required for (2), mainly disregarding other pronouns and languages. (See Elbourne (2008) for a more balanced overview.)

[21] In order to avoid subscripts on variables, we will henceforth allow for shorthand expressions such as $\Sigma_x\phi(x)$, $\text{Every}_w\phi(w)$ etc. instead of $\Sigma_i\phi(x_i)$, $\text{Every}_j\phi(w_j)$ etc.

[22] This is why no information about x is lost when the input state is updated with $\text{Every}_x(\top)(\phi(x))$; if x is mapped to a witch in G, so it will be in $G[\text{Every}_x(\top)(\phi(x))]$.

As regards the semantic contribution of pronouns, at least two types of approaches can be distinguished, viz. individual variable and descriptive (including the combined description-plus-individual) approaches. The individual variable approach was characteristic of early studies in formal semantics, but it is also represented by one of the seminal studies in the field of syntactic complexity of pronouns, Déchaine and Wiltschko (2002). Déchaine and Wiltschko classified *she* as a pro-ϕP; this means that *she* is not a full DP in that it lacks the D head; but it is not a bare NP either as it has a functional head ϕ, which bears morphological features: $[_{\phi P}\ \phi\ [_{NP}\ \emptyset\ ]]$. Semantically, however, *she* is just a variable, albeit with a restricted range (as it is restricted to female atomic individuals).

Further studies have put the particular hierarchy of levels proposed in Déchaine and Wiltschko's paper under discussion. Some of them, such as Cowper and Hall (2009), essentially agreed with the semantic part of the original proposal (that pronouns are individuals variables), whereas others, e.g. Patel-Grosz and Grosz (2017), converged to a large extent with a tradition that had originated within semantics quite independently. That older tradition has viewed pronouns as descriptively loaded. For instance, Cooper (1979) proposed a description-based semantics for *some* uses of pronouns, viz. the so-called E-type/D-type[23] pronouns found in donkey sentences and the like. As a matter of fact, however, Cooper's proposal (see its implementation in Heim and Kratzer 1998, 290–293) is in a sense a combination of the individual variable and descriptive analyses: the structure assigned to an E-type/D-type pronoun is

$$[_{DP}\ \text{the}\ [_{NP}\ R_{i,\langle e,et\rangle}\ pro_{j,e}\ ]], \tag{7}$$

where R_i is a variable over relations (hence the type $\langle e, et\rangle$) with the index i; R_i is assigned its value (the particular relation the referent of pro_j bears to the referent of the pronoun's antecedent) by the context. The null element pro_j is not anaphoric to the antecedent of the whole pronominal DP, but to the DP on which the choice of the pronominal DP's value depends. For example, in the donkey sentence

(24) If a farmer owns a donkey, he beats it.

the relation R within the denotation of *it* would be 'be the donkey owned by' and the value of *pro* would be the farmer selected by *he*. Elbourne (2008, 422) makes a similar suggestion for clear-cut cases of D-type pronouns, as in

(25) He [pointing at the current Pope] is usually an Italian.

A group of alternative approaches build on the assumption that the nominal part of a pronoun's structure is an *ellipsis site*. This line of research is traceable back to Parsons (1978); among the modern analyses, it is exemplified by Elbourne (2001), who emphasises (p. 243, fn. 3) its difference from the Cooper tradition. The difference lies in the fact that the NP in question is assumed to be a duplicate of the antecedent NP, which licenses its ellipsis. Thus e.g. in the donkey sentence (24) the pronoun *it* is assumed to have the structure $[_{DP}$ the $[_{NP}$ ~~donkey~~$]]$.

[23] See fn. 12 on the use of terms *E-type* and *D-type*.

4.2 The Pronoun in Intentional Identity: The Proposal

Individual-Level vs. Property-Level Variables

Is non-arbitrary choice between the competing proposals (individual variable vs. D-type vs. ellipsis-based), at least for the particular task of analyzing Intentional Identity, possible? On the basis of their experimental findings, Grosz et al. (2015) suggest that, in case of donkey sentences (Intentional Identity was not tested), "a potential approach in terms of dynamic semantics [is to be favoured] over a competing e-type approach." The problem with E-type approaches is that almost all of them postulate a definite determiner in the pronominal structure, which triggers a uniqueness presupposition. This is undesirable for donkey sentences, as nothing prevents the farmer in (24) from having (and therefore beating) more than one donkey. However, in a subsequent theoretical contribution Patel-Grosz and Grosz (2017) use a *weak* definite determiner, so that no such presupposition arises. Moreover, at least at some instances of Intentional Identity, the uniqueness presupposition seems to be a welcome prediction. This is arguably the case with (6): as long as A has two suspects, in A's belief worlds, two individuals correspond to the murderer of Jones in B's belief worlds (who happens to be also the murderer of Smith in those worlds). Assuming that *he* denotes the *unique* counterpart of its antecedent's denotation, the infelicity of (6b) can be accounted for.

This argument is not particularly decisive because it rests on an additional assumption, namely that the pronoun is not a full-fledged description but rather a means to refer to a counterpart. Moreover, Edelberg-style[24] scenarios give some plausibility to the D-type theory. Consider a version of Scenario 3 where there *was* a single murderer of both Smith and Jones and, in addition, Detective A believes Smith's murderer is still in Chicago while Jones' murderer is not. Then (26a) is judged true and (26b) false—even though it was the same person who murdered Smith and Jones.

(26) a. Someone murdered Smith, and Detective A thinks he's still in Chicago.
b. Someone murdered Jones, and Detective A thinks he's still in Chicago.

[24]For Edelberg himself, as we remember, the E-type/D-type theory is a non-starter. This is because he implicitly excludes the possibility of a transparent construal of the anaphoric pronoun. His reluctance to admit transparency can be seen from how he treats a simpler example where the existence of a single murderer, incidentally also the world's shortest man, is assumed:

(vi) The shortest man in the world murdered Smith, and Detective X thinks he is still in Chicago. (cf. (Edelberg 1992, 587, fn. 24))

Here, Edelberg argues, *he* cannot be an E-type/D-type pronoun, for its replacement with *the shortest man in the world* would result in a falsity unless X knows about his height. But it simply would not once we assume that *he* (or *the shortest man in the world*, if substituted) gets a *de re* reading.

If *he* has the descriptive content of its antecedent, the contrast can be explained by pointing out that A does believe *de dicto* that Smith's murderer, whoever (s)he is, is still in Chicago, but does not believe *de dicto* that Jones' murderer still is.

There is an important issue here that we do not hope to settle in the present paper. The question is whether the two attitude holders should agree on the properties they ascribe to the common focus of their attitudes. McKinsey (1986, 162) seems to hold that (8) is contradictory.

(8) Hob thinks that a witch has blighted Bob's mare, and Nob is certain that she did not blight Bob's mare.

That is, for Intentional Identity to be ascribed, the two attitude holders have to agree at least on the properties they predicate of the common focus. Our intuition is, however, that such a conclusion is too quick so that, given sufficient grounds to think that the common source condition is fulfilled, (8) can be asserted.[25]

In any case, there remains a related but different issue, namely whether the attitude holders should agree on the properties denoted by the *restrictor* of the antecedent, such as *witch* in (2) or (8). If disagreement on that matter precludes the ascription of Intentional Identity, then there are good reasons to prefer the D-type analysis of pronouns. This issue is postponed until Sect. 6, but at this point we have to make a simplifying assumption and say that such disagreement is possible. In other words, we are not ruling out

(27) Hob thinks that a witch has blighted Bob's mare, and Nob thinks she is not a witch.

The assumption is made because of the inevitable complexity of any dynamic system which is able to handle property-level discourse referents, but see Hardt (1999) and Charlow (2012) for such proposals.

[25] An anonymous reviewer has called our attention to the relevant passages in Kamp et al. (2011, 382 ff., esp. pp. 383–384). The discussion there is centred around the example (vii), considered in a scenario where noone has in fact broken into Phoebe's garden.

(vii) Phoebe believes that a man broke into her garden and that he stole her prize zucchini. Ella thinks he didn't take anything.

The question is how much of the descriptive content characterising the alleged burglar has to be accommodated to the matrix DRS (discourse representation structure) in order for the pronoun in the second sentence to get its reference. As long as there is disagreement between Phoebe and Ella as to whether the man took anything, the part *he stole her prize zucchini* cannot be accommodated, because otherwise Ella's belief would come out self-contradictory.

Such an approach, where the amount of material to be accommodated is determined "on the spot," reminds of the brief remarks towards the end of van Rooij and Zimmermann's (1996) paper concerning the non-literal status of Intentional Identity w.r.t. the usual *de re* reading of the first holder's attitude report. Only in case the usual *de re* cannot be made sense of (as e.g. in the canonical scenario for (2)) is the sentence reinterpreted as an Intentional Identity ascription.

Although we do believe that this train of thought conveys an important intuition, the present paper attempts to give a more uniform approach, where the semantics of an anaphoric pronoun is the same in all cases.

Reference to Counterparts

Our proposed analysis is a relatively minor departure from the individual variable view. We assume, together with the descriptive theorists mentioned above, the presence of a definite determiner as the head of the pronominal constituent; as for the phonologically null NP occupying the position of the determiner's complement in the syntax, we treat it as expressing the presence of a counterpart relation between the individual corresponding to the index of the pronoun and some other individual; to the latter individual there corresponds a free variable—in this respect our view borrows from the Cooper tradition.[26]

$$[_{\text{DP}}\ \text{the}_w\ [_{\text{NP}}\ pro_j \leftarrowtail\ ]] \tag{8}$$

The semantics of the NP, symbolised as $\leftarrowtail$, is as in

$$\begin{aligned}[\![[_{\text{NP}}\ pro_j \leftarrowtail\ ]]\!]^g = [\![\leftarrowtail]\!]([\![pro_j]\!]^g) = \\ [\lambda x.\lambda y.\text{COUNT}(y,x)](g(j)) = \lambda y.\text{COUNT}(y, g(j))\end{aligned} \tag{9}$$

The predicate $\lambda x.\lambda y.\text{COUNT}(y,x)$ expresses the presence of a *counterpart relation* between x and y (i.e. that x is y's counterpart).

Why do we complicate our semantics by using counterparthood instead of identity? The reason is that we would like our analysis to extend to cases such as the puzzle of two detectives in Edelberg (1986). Indeed, for the simpler case in (2) we could assume that the non-actual individual(s) whom Hob suspects of having blighted Bob's mare is/are just the same individual(s) Nob suspects of killing Cob's sow. However, in Edelberg's puzzle one individual in B's belief worlds is represented to an equal degree by two individuals in A's belief worlds. The latter two individuals are not identical, which suggests that the relation between B's suspect and any of A's suspects is not identity (otherwise A's suspects would also be identical, by transitivity of identity). If not identity, this relation is arguably counterparthood, which is generally neither transitive nor symmetric.

As long as each individual is world-bound, the following are equivalent: to say that x exists at the world w and x is P and to say that x is P at w. Therefore, although we do not consider counterparthood dependent on the world of evaluation, we will henceforth assume that $\leftarrowtail$ takes a world argument as well as two individual arguments. The world argument, as usual (Schwarz 2012), may be supplied by the determiner. Thus the overall semantics for a pronoun such as *she* in (2) is

[26]Let us explain the intuition behind the arrow notation. The counterpart relation is generally not symmetric, so just to write something like "*Count*(a, b)" would not be explicit enough as to which of a and b is whose counterpart. Therefore, we have chosen to point to the "original" with an arrow ($\leftarrowtail$), whose flat end is intended to touch the counterpart. E.g. $a \leftarrowtail b$ should mean that b is a's counterpart.

$$[\![[_{\text{DP}}\ \text{the}_w\ [_{\text{NP}}\ pro_j \leftarrow\!\!\!| \ ]]]\!]^g = \lambda P.\text{The}_x(\text{IN}(x, g(w)); \text{COUNT}(x, g(j)); P(x)), \quad (10)$$

where $\text{IN}(x, w)$ means that x exists at w.

Note that we are not forced to say that a pronoun makes reference to a counterpart relation *only* if it is in an opaque context. Counterparthood boils down to identity whenever the pronoun and its antecedent denote individuals which exist in different worlds: according to Lewis, within a given world everything is its own counterpart, so x and $\iota y.x \leftarrow\!\!\!| \ y$ make reference to the same individual if evaluated at the world where x exists. Therefore, the semantics for pronouns given in (10) is equally suitable for extensional as well as intensional contexts.

5 Intentional Identity in Terms of Transparency

5.1 Non-specific Transparency

Recall from Sect. 2 that we are going to derive the truth conditions for Intentional Identity ascriptions by interpreting the pertinent pronoun transparently. As mentioned there, a traditional *de re* construal such as those for (13) does not help here, as it needs actual existence of the *res* for its operation. Alternatively, one could argue that the *res* in the case of (2) is not real but rather belongs to Hob's doxastic alternatives; the difficulty here is that no acquaintance relation between Nob and the individuals in Hob's belief world (as well as with Hob himself) is presupposed in the classical scenario for (2), given here as Scenario 2.

On the other hand, cases like (15)–(16) do not require the actual existence of any dubious individual. This suggests that we should try to adapt the semantics of non-referential *de re*—i.e. of transparent readings of predicates (rather than referring expressions and quantifiers)—to the needs of Intentional Identity.

The last decades witnessed a handful of proposals as to how non-specific transparent readings could be derived. Following Sæbø's (2015) classification (originally concerned with definite descriptions only), we can single out two "main methods" used in derivations. One is to force the evaluation of the target expression w.r.t. the actual world (or, in multiply nested attitude reports, w.r.t. a world index higher in the structure than the closest attitude verb); following Schwager (2009), this may be called *transparent evaluation*. Another method is to substitute some other piece of structure for the target expression; we will call this technique *substitution*.[27]

[27]The machinery of *concept generators* (Percus and Sauerland 2003; Percus 2013; Charlow and Sharvit 2014) should be viewed as a sort of substitutional analysis. Concept generators (CGs) are $\langle e, se\rangle$-type functions that provide, for a given (normally actual) individual x, an acquaintance function (for a given attitude holder) that returns the individual in the holder's attitudinal alternatives w that plays the epistemic role of x at w. So far CGs have been applied to *de re* readings of referential and quantificational expressions, but not to transparent readings of predicates.

Transparent Evaluation

Let us contemplate transparent evaluation first. The non-specific transparent reading of (15a) will be assigned the following LF:

(15a) Charley wants to buy a coat like Bill's.

(28) Charlie wants λw[PRO to_buy$_w$ [a$_@$ coat_like_Bill's]]

Here the index @ means that the restrictor predicate of the indefinite DP, i.e., *coat like Bill's*, is evaluated at the actual world. In the (static) version of transparent evaluation presented in Schwarz (2012), this would be ensured via the following lexical entry for *a*:

(29) $[\![\text{a}]\!] = \lambda w.\lambda P.\lambda Q.\lambda v : \exists x(P(x, w) \wedge Q(x, v))$,

where the first world argument (w) is the world where the restrictor P is evaluated, and the second one (v) serves for the evaluation of the nuclear scope, which is λx[PRO buys x] in the case of (28).

Given what has been said about pronominal structure in Sect. 4.2, there is the slot for a world argument at the determiner:

(30) ... and Nob thinks [$_{\text{DP}}$ the$_w$ λy[$x \leftarrowtail y$]] killed Cob's sow.

If w is mapped to the actual world, then the denotation of the DP will have to be an actual individual; but there is most likely no actual individual that is a counterpart of a witch x. If w is a doxastic alternative of Hob's (dynamically bound by *Hob thinks* in the previous clause), then the denotation of the DP will be an individual in Hob's belief world. Those individuals cannot satisfy properties (such as *killed Cob's sow*) in Nob's belief worlds, as in our counterpart semantics an individual exists only in one world. Therefore, the predication in (30) will be uninterpretable. To make in interpretable, one will have to introduce a concept generator (see fn. 27):

(30′) ... and Nob thinks [CG [$_{\text{DP}}$ the$_w$ λy[$x \leftarrowtail y$]]] killed Cob's sow.

However, the CG (as usually defined) invokes an acquaintance function. As stated above, there are reasons to doubt that Nob may be acquainted with an individual

Note that CGs can *combine* with a DP whose restrictor predicate is evaluated at the actual world:

(viii) Mary thinks that the mayor is a spy.
Mary thinks λCGλw[[CG [the$_@$ mayor]] is_a_spy$_w$]

The reason for this combination to be needed is that [the$_@$ mayor] returns an actual individual, to whom several individuals may correspond in Mary's belief worlds (imagine a double vision scenario for Mary and the mayor along the lines of (13)); the choice of the corresponding individual is made by the CG.

As mentioned at the very beginning of the present section, it is unlikely that there is any acquaintance relation between Hob's imaginary witches and Nob's ones, and certainly, there is no *actual* individual whose counterparts-via-acquaintance are Nob's suspect witches. Therefore, we do not consider the use of CGs an option as regards Intentional Identity.

which exists only in Hob's belief worlds. All in all, we conclude that *w* should be mapped to a doxastic alternative of Nob's, i.e., *w* should be (dynamically) bound by *Nob thinks*, which is *not* an instance of transparent evaluation.

Substitution

Among the variety of substitution-based approaches, we will consider the one proposed by Schwager (2009). This version was specifically designed for the analysis of the transparent readings of predicates, as it grew out of dissatisfaction with the counterintuitive predictions of the transparent evaluation-based analysis.

The unwelcome predictions of transparent evaluation arise whenever the predicate under discussion has an empty extension at the actual world. For instance, take Schwager's example in (31) (see (12) in Schwager (2009)).

(31) Mary wants to buy a building with at least 194 floors.

This sentence has a true reading if Mary, having seen Burj Dubai (which is assumed to have 193 floors and to be the tallest building ever constructed), expresses her wish to buy a building (whichever that may be) yet one floor taller. She has not counted the floors of Burj Dubai, and she couldn't care less about whether taller structures even exist. First, Mary's thoughts do not make any reference to the property *building with at least 194 floors* itself, so (31) is not plain *de dicto*. Second, mapping the world pronoun at *building with at least 194 floors* to the actual world is hopeless: there is no object *a* s.t. *a* satisfies this property at @ or s.t. *a* has a counterpart that does so. For the same reason, one cannot hope to get correct truth conditions by taking (31) as *de re* w.r.t. the set of *actual* 194-floor buildings: this set is empty, so (31) would come out as equivalent with

(32) Mary wants to buy a unicorn,

as the set of actual unicorns is just as empty as the set of actual 194-floor buildings. Therefore, the only familiar option that works for (31) would be to analyse it as *de re* w.r.t. the *intension* of the predicate *building with at least 194 floors*, however this should come about compositionally.

Schwager has devised another example (of which we outline a version) to show that an intensional solution lacks generality, though. Suppose that, by coincidence, all and only professors of physics are council members and Jones, a reporter, wants to get the latest news about a recent breakthrough in physics (and he could not care less about the council). Then, according to Schwager, (33) has a true reading.

(33) The reporter wants to interview a council member.

Taking (33) as *de re* w.r.t. the intension of *council member* would lead us to the conclusion that what matters for Jones is that his interviewee should be a council member, whereas it is just the opposite, and only by sheer coincidence Jones' desire will be satisfied (only) if he meets a council member. Therefore, Schwager claims, the correct analysis should be able to "switch" between the actual world and some

other worlds in its search for substitutes depending on whether the properties are instantiated at @.

In order to implement the latter idea, Schwager introduces a comparative similarity ordering $\leq_w$ on worlds (as suggested in Lewis 1973), so that $v \leq_w u$ means that v is no less similar to w than u is. Given this, it is possible to formulate the truth conditions of a non-specific transparent reading in terms of the truth conditions of the plain *de dicto* reading for a minimally different sentence:

(34) *Schwager's substitution* (Schwager 2009, 409)
An attitude report $\phi(P)$ read transparently w.r.t. its constituent predicate P is true at the world w iff there is another property Q s.t., for all $\leq_w$-minimal worlds v where P is instantiated,

1. $\lambda x.Q(x, v)$ is instantiated;
2. $\lambda x.Q(x, v) \subseteq \lambda x.P(x, v)$; and
3. $\phi(Q/P)$ (the result of the substitution of Q for P), read *de dicto* w.r.t. Q, is true at v.[28]

Obviously, $\forall u : @ \leq_@ u$, that is, the actual world @ is no less similar to itself than any other world is similar to @. Therefore, if P is instantiated at @, the analysis mimics the extensional *de re* analysis w.r.t. P, but if not, then the outcome is more like intensional *de re*.

5.2 An Implementation

The idea behind our dynamic implementation of Schwager's idea is that when a property $P_{\langle e,st\rangle}$ is interpreted *de re*, the assignment state is tested against the set $\textsc{sub}(P)$ of all properties that stand to P in a certain relation; that relation is precisely Schwager's precondition for substitution:

$$\textsc{sub}(P) = \{Q \mid \forall w(((\nexists v <_@ w) \wedge (\lambda x.Q(x, w) \neq \varnothing)) \Rightarrow \lambda x.Q(x, w) \subseteq \lambda x.P(x, w)\} \tag{11}$$

From (11) it can be seen that $\textsc{sub}(P)$ is undefined unless P is able to take a possible world argument, which precludes extended denotations, e.g. for singular terms. If a pronoun were semantically just a variable, as on the traditional analyses, there would be no way to generate a non-specific transparent reading for *she* in (2).[29] Luckily,

[28] See Sudo (2014), where the relation between P and Q is called contextual equivalence.

[29] As we have suggested before (Tiskin 2014), the *in*ability of reflexives to get a *de re* reading on their own relates to the fact that they are semantically not predicates but rather arity-reducers for their verbs (Szabolcsi 1989; Lubowicz 1999; Lechner 2012); here, we believe, lies the source of the patterns for "bound *de re*" readings (Charlow 2010; Sharvit 2011).

according to the analysis given in Sect. 4, a personal pronoun has as a constituent an expression which is semantically a predicate (type $\langle e, st\rangle$); therefore, it can get a non-specific transparent reading.

How is the use of SUB(·) invoked in the syntax? One could choose one of two ways here. One way, which we prefer for the sake of simplicity, is to stipulate that an operator (symbolised ►) is freely available, which can associate freely with any predicate-type expression, even if that expression is part of a lexical item such as e.g. she_i. The semantic contribution of ► is the switch from the ordinary denotation of a predicate to the disjunction of the members of SUB(·):

$$[\![\blacktriangleright\, \alpha_{\langle e,st\rangle}]\!] = \bigvee \text{SUB}([\![\alpha]\!]) \tag{12}$$

Another way is to say that to substitute SUB(P) for P is *always* (or quite generally) a possibility, much in the same way *at three* is usually understood as 'around three' in (35), unless some special circumstances force higher precision.

(35) I'll come back at three.

This phenomenon is known as *pragmatic slack* (Lasersohn 1999; Lauer 2012). Following this train of thought, a special sort of imprecision consists in an expression being interpreted as the disjunction of the predicates entailing it in the sense of (34).

Given our choice in favour of ►, we assume that the syntax of the pronoun *she* in (2) is as in

$$[_{\text{DP}}\ \text{the}_w\ [_{\text{NP}} \blacktriangleright\ [_{\text{NP}}\ pro \leftarrow\ ]]]; \tag{13}$$

the semantics of this compound, for some predicate α, will then be as in[30]

$$\begin{aligned} &G\Big[\ldots [_{\text{DP}}\ \text{the}_w\ [_{\text{NP}} \blacktriangleright\ [_{\text{NP}}\ pro \leftarrow\ ]]]\ \alpha_{\langle e,st\rangle}\Big] = \\ &G\Big[\ldots \text{The}_x\big(\text{IN}(x,w);\ [\![[_{\text{NP}} \blacktriangleright\ [_{\text{NP}}\ pro \leftarrow\ ]]]\!](x)\big)\big([\![\alpha]\!](x,w)\big)\ldots\Big] = \\ &G\Big[\ldots \text{The}_x\big(\text{IN}(x,w);\ \big(\bigvee \text{SUB}([\![[_{\text{NP}}\ pro \leftarrow\ ]]\!])\big)(x)\big)\big([\![\alpha]\!](x,w)\big)\ldots\Big] \end{aligned} \tag{14}$$

In (2), the role of α is played by *killed Cob's sow*, and the whole structure is embedded in a universal quantifier over individuals (see Sect. 3) and a universal quantifier over worlds (cf. the simpler version in (20), where the pronoun denotes just a variable):

[30] Strictly speaking, no free variables are allowed in Nouwen's system, whereas *pro* is free; hence the "…" marks.

$$G\Big[\text{Nob thinks } [_{\text{DP}} \text{ the}_v \ [_{\text{NP}} \blacktriangleright \ [_{\text{NP}} pro \leftarrowtail]]] \text{ killed\_Cob's\_sow}\Big] =$$
$$G\Big[\text{Every}_x\big(\top\big)\big(\text{Every}_v\big(\text{DOX}_{\text{N}}(v)\big)\big(\text{The}_y\big(\text{IN}(y,v);\tag{15}$$
$$\big(\bigvee \text{SUB}(\lambda z.x \leftarrowtail z)\big)(y)\big)\big(kCs(y,v)\big)\big)\big)\Big]$$

Thus, the overall representation for the update with (2) is

$$G\Big[\text{Every}_w\big(\text{DOX}_{\text{H}}(w)\big)\big(\text{Some}_x\big(Witch(x,w)\big)\big(bBm(x,w)\big)\big);$$
$$\text{Every}_x\big(\top\big)\big(\text{Every}_v\big(\text{DOX}_{\text{N}}(v)\big)\big(\text{The}_y\big(\text{IN}(y,v);\tag{16}$$
$$\big(\bigvee \text{SUB}(\lambda z.x \leftarrowtail z)\big)(y)\big)\big(kCs(y,v)\big)\big)\big)\Big]$$

In brief, the only differences from an instance of "telescoping" (cf. Nouwen's (51)–(52)) are that (a) the universal quantifier in each of the two clauses ranges over worlds and not over individuals, and that (b) one of the predicates is embedded into the $\bigvee \text{SUB}(\cdot)$ construction.

6 Discussion and Loose Ends

What we have accomplished so far is a translation of (2) into the language of the dynamic system adopted in Sect. 3. Moreover, we have also provided an explanation for the infelicity of (6b): the cases in (6) differ from (2) in that the *unique* counterpart of B's suspect in A's belief worlds is undefined, but uniqueness is required in (6b) due to the presence of the pronoun *he*.

We have deliberately put aside the examples in (26), which are not instances of Intentional Identity. If those are considered relevant, one may feel the pressure to switch from (any variety of) the individual variable analysis of pronouns to a D-type analysis. The crucial point about transparency aimed against the criticisms in Sect. 2 may be (and should be) retained under the descriptive approach as well as under the variable approach.

The present section discusses some potential changes to the analysis, which do not diminish the plausibility of the crucial point of the foregoing discussion. We do not aim to present complete solutions or technical proposals here, but we do hope to report some intuitions that may stimulate future research.

6.1 Qualitative Disagreement

The example (27) in Sect. 4.2 points to an issue not yet completely resolved (although see McKinsey 1986), namely the amount of disagreement between the

two attitude holders that does not yet preclude the ascription of Intentional Identity. Whereas checking the speakers' intuitions about (27) as well as McKinsey's (8) is of some value by itself, an experimental design with greater resolving power may be proposed. The idea behind it is to find out whether there is a hard-to-detect ambiguity to Intentional Identity ascriptions. Percus and Sauerland's (2003) *only*-test has been designed specifically for ambiguity detection. Although originally the test served to tease apart *de se* and *de re* readings, it can be adapted to the needs of our study. Here is how it goes.

Scenario 6 *Hob, Nob, and Rob all read the same newspaper; one day the paper tells about some evil person who has been wreaking havoc around (without further specifications). Hob, just like some other unnamed villagers, thinks that whoever that was is a witch and blighted Bob's mare; Nob believes whoever that was is a witch and killed Cob's sow; Rob also believes whoever that was killed Cob's sow, but thinks instead she was an evil scientist.*

Now, one has to evaluate (36) against Scenario 6.

(36) Hob and others think a witch blighted Bob's mare, but **only** Nob thinks she killed Cob's sow.

Does it have a true reading? If it does, then Intentional Identity ascriptions have a reading where the descriptive content of the antecedent DP is retained in the pronoun. If, in addition, it has another reading which is false, then we have an ambiguity between a descriptive reading of the pronoun and its individual variable reading.

6.2 Domain Mismatch

Some additional light can be shed upon the semantics of the pronoun in question if a method is found to tell whether a successful ascription of Intentional Identity requires that the antecedent DP and the pronoun agree completely in the domains they range over. Here is a scenario where this requirement is violated.

Scenario 7 *Hob lives alone in his house in Gotham village; Nob shares a house with his sister. When the witch mania breaks out, Hob suspects every female villager, as well as some specific or hypothetical non-villagers, of witchhood; Nob does just the same except that he never casts any suspicion on his sister.*

The test sentence here could be just Geach's (2): is it as easily assertible here as in Geach's classical setting? What happens if there are more mismatches than just one individual, or if Hob also has a sister he does not suspect but Nob does; and finally, if only Hob has such a sister but Nob does not? (The latter situation is one where the domain of *she* expands as compared to the domain of *a witch*; if it is only Nob who has an innocent sister, the domain contracts rather than expands.)

6.3 Transparency and Negation

Compared to Schwager's analysis of non-specific transparency, our proposal in Sect. 5.2 is a simplification. The way we collected all the properties $Q \in \textsc{sub}(P)$ in order to create the denotation of $[\blacktriangleright\ P]$ was essentially by (infinite) disjunction $\bigvee$. As long as the $\blacktriangleright$ operator may occur within the scope of a negation (e.g. as in *Hob does not believe that a witch...*), our (11) predicts rather strong truth conditions for such cases. Just as in

(37) Hob does not run or sleep.

the perceived meaning is that Hob neither runs nor sleeps, the predicted meaning of

(38) Hob does not think that Brigitta is a [▶ witch].[31]

will be that for no $P \in \textsc{sub}(\llbracket\text{witch}\rrbracket)$, Hob thinks that Brigitta is a P, which may be too strong. This problem has a remedy: instead of making a disjunction over $\textsc{sub}(P)$, $[\blacktriangleright\ P]$ may be taken to return the set $\textsc{sub}(P)$ itself, which is then handled by semantics as if it were a set of *alternatives* (Kratzer and Shimoyama 2002; Charlow 2015). The set of alternatives can participate in Functional Application (which proceeds "pointwise," i.e., every member of the set is applied to its argument so that the result of the application is also a set). After the higher negation, as in (38), is merged, the set of alternatives may be quantified over by a special closure operator, whereby the quantifier over alternatives outscopes the negation, resulting in the scope ordering "$\blacktriangleright\ > \neg$."

6.4 Context Dependence

The final remark is related to the nature of the mechanism that generates the transparent reading. More precisely, there are indications that Schwager's analysis fails to capture a surprising property of non-specific transparent readings, or perhaps of a certain subclass thereof. For instance, Cable (2011) claims that

(39) Mary thinks we are tap-dancing just now.

has a true reading if Mary has no idea what we are doing but realises we are doing what we usually do on such occasions, which is in fact tap-dancing; however, this reading disappears if Mary has a *wrong* opinion on the matter, e.g. that we are dancing rock'n'roll. This sort of sensitivity of non-specific transparent readings to certain plainly *de dicto* attitudes is not predicted by Schwager; nor is it predicted by any other analysis we are acquainted with. Even though we have something to suggest here (see Tiskin 2016), reasons of space preclude any further discussion at

[31] For another case where the main predicate of the subordinate clause gets a non-specific transparent reading, consider (16).

this point. It should be borne in mind, however, that if Intentional Identity does not prove to follow the same sensitivity pattern on closer scrutiny, it may be concluded that the sort of transparency it displays differs from the one found in (16) or (39), contrary to the assumption made in the present paper.

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Pronoun Use in Finnish Reported Speech and Free Indirect Discourse: Effects of Logophoricity

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Abstract Many languages have logophoric pronouns which refer to the person whose speech, thoughts or feelings are being reported, and some languages also have antilogophoric pronouns. This paper investigates (anti)logophoricity in the pronominal system of Finnish, in particular in reported speech and free indirect discourse (FID). I first show that the referential patterns exhibited of two types of third person pronouns in Finnish – the human third-person pronoun *hän* (he/she) and the non-human third person pronoun *se* (it), which can also be used for human antecedents in certain contexts – seem to be very different in reported speech vs. FID contexts. However, I argue that the *hän/se* variation can be derived from a basic generalization – namely that *hän* refers to SELF (see also Laitinen L, From logophoric pronoun to discourse particle. A case study of Finnish and Saami. In: I Wischer & G Diewald (ed) New reflections on grammaticalization. John Benjamins, Amsterdam/Philadelphia, pp 327–344, 2002) – as long as we take into account (i) the size of the logophoric domain and (ii) the different defaults of standard Finnish and colloquial Finnish. Furthermore, I suggest that we do not need to posit an additional association between *se* and NON-SELF, because the referential behavior of *se* can be derived from the size of the logophoric domain and the register defaults. In addition, once we look at how these two pronominal forms interact with the demonstrative pronoun *tämä* (this) in Finnish, it becomes clear that theories of reference resolution need to consider both logophoricity and salience.

1 Introduction

Some languages have a distinct class of logophoric pronouns that are used to refer to the 'subject of consciousness', i.e. the person whose speech, thoughts or feelings are being reported (e.g. Clements 1975; Hagège 1974; Sells 1987; Culy 1994). It has also been suggested that some languages have antilogophoric pronouns which

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cannot refer to the subject of consciousness (e.g. Culy 1997). This paper explores the role of logophoricity and antilogophoricity in the pronominal system of Finnish, in particular in contexts involving reported speech and free indirect discourse.

In Finnish, there is more than one pronominal option for referring to human third person antecedents. As illustrated in the examples below from a novel by Anni Polva, both the pronoun *se* 'it' and the gender-neutral personal pronoun *hän* 's/he' can be used. In (1a), *hän* is used to refer to the main character, Tiina, and in (1b), *se* is used to refer to the same character. In this example, and elsewhere in the paper, I translate *se* as 'it' in English, in order to distinguish it from *hän*.

(1a) **Tiina** juoksi kotiin niin nopeasti kuin jaloillaan pääsi. **Hän**$_{\text{TIINA}}$ hengitti puuskuttaen . . . (Polva 2011: 7)
'**Tiina** ran home as fast as her legs would carry her. **She**$_{\text{TIINA}}$ was out of breath . . . '

(1b) Sekasotkua **se**$_{\textbf{TIINA}}$ joka tapauksessa oli saanut aikaan, kuten tavallisesti. (Polva 2011: 29)
'In any case, **it**$_{\textbf{TIINA}}$ had made a mess of things, as usual.'

This variation raises the basic question of what guides the choice of one form over the other? In this paper, I consider three possible explanations: (i) a register-based account based on the different anaphoric paradigms of standard Finnish and colloquial Finnish/spoken dialects, (ii) a prominence-based account based on the claim that different referential forms refer to antecedents with different levels of prominence in the discourse and (iii) an account related to the notion of logophoricity that builds on the observation that the personal pronoun *hän* 's/he' has a special logophoric use in reported speech in spoken Finnish dialects (Setälä 1883; Kuiri 1984; Laitinen 2002, 2005, inter alia). It will become clear over the course of the discussion that although the first account is not incorrect, it is not sufficient to explain the use of *hän* and *se*. The second account, based on prominence, does not receive any support from the data. The third account is the most promising, and I use it as the foundation for my approach.

After reviewing these three possibilities, I discuss the use of *se/hän* in free indirect discourse and illustrate how (at least at first glance), the referential properties of both *hän* and *se* appear to change depending on whether we are dealing with reported speech or free indirect discourse. However, I claim that we do not need to assume that *hän* and *se* each have two different sets of referential properties. Instead, I show that we can derive the referential behavior of these forms from a single generalization as long as we take into account (i) the fact that reported speech and free indirect discourse are 'logophoric' in that they involve reporting a person's thoughts/speech but differ in the size of their logophoric domains, (ii) the fact that the default pronominal forms are different in standard Finnish and colloquial Finnish and (iii) the fact that FID, by its very nature, mimics properties of spoken language. The relevant basic generalization is that *hän* refers to the logophoric antecedent (see Setälä 1883; Kuiri 1984; Laitinen 2002, inter alia for earlier discussion). Furthermore, I show that we do not need to posit an additional

association between *se* and anti-logophoricity (contra Kaiser 2008), and that the referential behavior of *se* can be derived from the three observations above (see also Hinterwimmer and Bosch 2016 for related data on German d-pronouns, which dislike logophoric referents).

The discussion of *hän* and *se* also brings us to another referential form, the demonstrative *tämä* 'this', which can also be used for humans in Finnish. Comparing *tämä* and *se* allows us to investigate the relation between prominence/salience and logophoricity. Many researchers have found that anaphoric forms are sensitive to the prominence of their antecedents. How does this prominence sensitivity interact with logophoricity? As we will see, in contexts with multiple non-logophoric referents, prominence guides the use of *se* and *tämä*. Thus, in order to capture the referential properties of these forms, we need to consider both salience and (non/anti-)logophoricity.

In order to better understand the role of 'default forms', I also consider reference to non-human animals, which by default are referred to with *se* 'it'. What happens when a nonhuman referent is involved in FID and reported speech? In Finnish, the association between logophoricity and *hän* is able to 'overcome' the association between *hän* and human referents: *hän* – typically regarded as the human third person pronoun – can be used for animals if the animal is conceptualized as the character whose thoughts are being conveyed, even in contexts where use of *hän* cannot be attributed to personification (see Laitinen 2002).

As a whole, the data presented in this paper highlight the need for models of reference resolution that integrate different kinds of information, including prominence, (non/anti-) logophoricity, and register variation, and are in line with the form-specific, multiple-constraints approach proposed by Kaiser and Trueswell (2008).

1.1 Finnish Third-Person Pronominal Paradigm

Before we can start to explain the pronoun variation patterns in ex.(1), let us consider some background information about the pronominal paradigms of Finnish, in particular the split between standard and colloquial Finnish. Standard Finnish is the 'official' form of the language and used in formal writing (e.g. newspapers, magazines, non-fiction, textbooks, some fiction) and public/official speech (TV newscasts, speeches etc.). Standard Finnish is also the form on which dictionaries are based. However, in more informal spoken communication and casual writing, people use dialects of colloquial Finnish, which differ from standard Finnish in various aspects of their lexicon, morphology, syntax and phonology/phonetics (e.g. Karlsson 1999). There exist various regional dialects of colloquial Finnish, but as discussed below, the phenomena relevant to us here occur in the majority of dialects and thus (for ease of presentation) I group these together under the label of 'colloquial Finnish.' The vast majority of native Finnish speakers can be described

as bidialectal in that they can produce and comprehend both standard Finnish and at least one dialect of colloquial Finnish.

In standard Finnish, third-person human referents are referred to with the gender-neutral personal pronoun *hän* 's/he' (ex.1a). Non-human animals and inanimates are referred to with *se* 'it' (ex2a,b). Although I translate *se* as 'it', *se* is often regarded as somewhat of a hybrid that has properties of both anaphoric and demonstrative pronouns (e.g. Larjavaara 1990). In contrast to the proximal demonstrative *tämä* 'this' that expresses proximity to the speaker and the distal demonstrative *tuo* 'that' that expresses distance from the speaker, *se* has been analyzed as placing the referent in the addressee's sphere and being unmarked/neutral with respect to the speaker (see Laury 2005). *Se* can also occur on its own or as a prenominal modifier, in which case its meaning is similar to English 'the' or 'that', as in ex(2c) (see Laury 1997 on how *se* is becoming grammaticalized in some dialects as a kind of definite article. S*e* is also used for discourse deixis (Hakulinen and Karlsson 1989: 316).

(2a) Kissani$_i$ nukkuu suurimman osan päivästä. Aamulla **se$_i$** kuitenkin herää aina samaan aikaan kuin minäkin.
'My cat$_i$ sleeps most of the day. In the morning, though, **it$_i$** always wakes up at the same time as me.'

(2b) Ostin uuden hienon kissanlelun$_i$. **Se**$_i$ on täytetty kissanmintulla.
'I bought a fancy new cat toy$_i$. **It$_i$** is filled with catnip.'

(2c) **Se** hieno lelu oli aika kallis.
'**The/that** fancy toy was quite expensive.'

Furthermore, even in Standard Finnish *se* can also be used to refer to humans in certain contexts, in particular in otherwise 'headless' relative clauses (ex.3). Here, *se* is not used in a typically anaphoric manner, but the fact that it can be the head of a relative clause with a human referent suggests that its features may not be entirely incompatible with human referents.

(3a) Se voittaa, joka ensimmäisenä on purjehtinut 100 meripeninkulmaa.
(adapted from Hakulinen and Karlsson 1988: 314)
It-NOM win-3sing, who-NOM first is sailed 100 nautical-mile-PART
'The first one to sail 100 nautical miles, wins.'

(3b) Pekka on se, jota etsit.
Pekka-NOM is it-NOM, who-PART look-for-2sing
'Pekka is the one you are looking for.' (Sulkala and Karjalainen 1992: 120)

In sum, although it might be easy to describe *se* simply as the inanimate pronoun in Standard Finnish, it is a rather multi-functional hybrid element that has properties of demonstratives, anaphors and determiners, and that can, in some constructions, have human referents.

So far we have been focusing mostly on standard Finnish. The anaphoric paradigms in dialects of colloquial Finnish are quite different. In the majority

of regional dialects, *se* is the default form for human antecedents (as well as animals and inanimates), with the exception of some south-eastern and south-western dialects (e.g., Vilppula 1989). Indeed, Kallio (1978: 65, cited by Suonperä 2012) states that the use of *se* when referring to human referents is so frequent in colloquial language, excepting only the most formal settings, that no specific proof is needed for this observation.

In sum, there is a tension between the pronominal systems of standard Finnish and colloquial Finnish: Whereas *hän* 's/he' is the default pronoun for human antecedents in standard Finnish, *se* 'it' is the default pronoun for human antecedents in colloquial dialects. Given that the vast majority of Finnish speakers are bidialectal – i.e. can produce and comprehend both Standard Finnish and at least one dialect of colloquial Finnish – this means that Finnish speakers have, in some sense, two distinct grammatical systems for reference to human antecedents. (In this paper, I focus on the singular forms *hän* 's/he' vs. *se* 'it', but it seems that the plural forms *he* (they human) vs. *ne* (they non-human) show the same patterns.) Now, armed with this background, let us return to the pronoun alternation illustrated in ex.(1).

2 A Register Difference?

Having considered the differences between standard Finnish and colloquial Finnish, let us now turn to what might, at first glance, seem like the most straightforward account for the *hän/se* alternation in (1): a register difference. As we saw above, in standard Finnish, the *hän* 's/he' is the default for humans, but in colloquial Finnish, *se* 'it' is the default:

(4) Antti tuli eilen kotiin keskiyön jälkeen. $\text{Hän}_{\text{standard}}/\text{se}_{\text{colloquial}}$ nukkuu nyt.
'Antti came home yesterday after midnight. He/it is sleeping now.'

Based on these differences, one might be tempted to describe the distribution of *hän* vs. *se* as register-driven, dependent on whether the utterance is in standard or colloquial Finnish. However, it rapidly becomes clear that a purely register-based story is insufficient. As illustrated in (5a,b), from novels by Hannu Raittila and Antti Tuuri, and (5c) from colloquial Finnish, alternating forms (for the same referent) can be used within one register.[1] (*Hiän* in (5c) is a dialectal form of *hän.*) So, though

[1]One could try to maintain a register-based account by claiming that these kinds of examples involve register shifts in mid-sentence, such that the utterance starts out entirely in colloquial Finnish (and uses *se*) and then shifts entirely into standard Finnish for the rest of the utterance (and uses *hän*). However, such a 'full-blown' register shifting approach does not seem to be appropriate. Intuitively, there is no sense of a full register shift/formality shift here. There are also no morphological or phonological indications of register change. (In Finnish, certain sound combinations change somewhat depending on register, and thus can be used as a tool to detect register shifts.) However, it is worth emphasizing that lack of a 'full-blown' register shift does not have to preclude the possibility of referential patterns from one register being borrowed into

the forms differ in their default formality level, the use of *hän* vs. *se* cannot be satisfactorily explained by register differences alone.

(5a) **Snell**$_i$ ei käsittänyt kuinka tavarat saataisiin pois torilta proomulla. **Se**$_i$ kyseli oliko **hän**$_i$ ymmärtänyt oikein. (Raittila 2003: 115)
'**Snell**$_i$ didn't understand how the objects could be transported away from the square by tugboat. **It**$_i$ asked whether **she**$_i$ had understood (the plans) correctly.'

(5b) Sanoin, että voisimme vaihtaa paikkoja, mutta sitä **vanha mies**$_i$ ei halunnut; **sen**$_i$ mielestä ikkunapaikan saaminen oli kuin arpajaisvoitto, eikä **hän**$_i$ halunnut ottaa minulta sitä voittoa pois. . . . . **Se**$_i$ esitteli minulle kameraansa. (Tuuri 1993: 16).
'I said that we could change seats, but the **old man**$_i$ didn't want that. According to **it**$_i$, getting a window seat was like winning the lottery, and **he**$_i$ didn't want to take that away from me. . . . **It**$_i$ showed me its camera.'

(5c) **se**$_i$ sano jotta kyllä **hiän**$_i$ suapi tämän paranemmaan. (Kuiri 1984: 120)
'**It**$_i$ said that **he**$_i$ will indeed get this to improve.'

It is important to point out that Finnish novels differ in terms of whether they use *se* or *hän* as the default pronoun for human referents. Some of the examples we encounter from novels pattern like colloquial Finnish in the sense of having *se* as the default form for humans – for example, ex.(5c) is a spoken example from a dialect of Finnish, and shows the same pattern as in ex.(5a) from a novel where *se* being used in the matrix clause and *hän* being used in the embedded clause. Thus, in this paper, we are *not* defining register simply in terms of whether the example comes from spoken Finnish or written Finnish, since written Finnish in novels may be written in a colloquial style (and spoken Finnish could be very formal and employ the standard version of the language). Instead, for all data sources, one should independently assess what the default form is in that particular case.

3 A Prominence Difference?

Another factor that might be behind the choice of *hän* 's/he' vs. *se* 'it' is the salience/prominence of the antecedent. Perhaps one form is used to refer to the most salient referent, and the other is used for less salient referents? For example, given that *se* has some demonstrative-like qualities whereas *hän* is more clearly anaphoric, we might expect, based on hierarchies such as Ariel (1990), that *hän* would prefer more salient/prominent antecedents than *se*. In order to test this idea, we need some way of measuring salience. Prior research suggests that entities realized in subject

another register. We return to this idea in Sect. 6 (see also Maier 2015 for related work). The key point of the Sect. 2 is simply that *register alone* does not capture the properties of the *hän/se* variation.

position are more salient than those in object position (e.g. Chafe 1976, Brennan, Friedman and Pollard 1987, inter alia), and so we might expect to see correlations between choice of *hän* vs. *se* and the antecedent's grammatical role. However, this expectation is not supported by the corpus data I have examined. Both *hän* and *se* can be used to refer to preceding subjects (e.g. ex.(1a), (5a,b)). Further, as exemplified by (6a) from Raittila (2003: 216), and (6b) from Raittila (2003: 44), both *hän* and *se* can also be used to refer to non-subjects. Based on the corpus I examined (see Sources section at the end of the paper), there doesn't seem to be any straightforward link between the grammatical role of the antecedent and choice of *hän* vs. *se.*

(6a) Pyysin **dosenttia$_i$** väistämään. **Se**$_i$ meni sängylle makaamaan.
'I asked the **lecturer$_i$** to get out of the way. **It**$_i$ lay down on the bed.

(6b) Huomautin **dosentille**$_i$, että **hän$_i$** oli yhtäkkiä tuonut puheeseensa kolmen henkilön nimet aivan kuin ne olisivat yhteisiä tuttujamme.
'I told the **lecturer$_i$** that **he$_i$** had suddenly mentioned in his tale the names of three people as if they were our shared acquaintances.'

Additional evidence for the lack of connection between *hän* vs. *se* and the salience of the antecedent comes from a translation comparison that I conducted with Raittila's novel *Canal Grande* which has been translated into German by Stefan Moster (2006, BTB Verlag). Out of 12 randomly-chosen occurrences of *hän*, all 12 are translated into German with a personal pronoun (*er* 'he' or *sie* 'she'). Out of 33 randomly-chosen occurrences of human-referring *se*, 32 are translated into German with a personal pronoun (*er/sie*, ex(7a-b)) and one is translated with the demonstrative form *dieser* 'this one' (ex.(7c-d)). (Translations into English are by me.)

(7a) German translation
Der Dozent$_i$ sah mich über seine kleine Brille hinweg wie ein Vorschullehrer. **Er$_i$** würde es schon dazu sagen, wenn er$_i$ eine Jahreszahl vor Christus meinte. Überhaupt empfahl **er$_i$** mir, mein Gehirn etwas anzustrengen und **ihm$_i$** zu folgen. (Raittila, German translation, pp. 30–31)
'**The lecturer$_i$** looked at me over his small glasses like a primary school teacher. **He$_i$** would let me know if he$_i$ meant a date before Christ (B.C.). **He$_i$** recommended that in general I try to use my brain and follow what **he$_i$** is saying.'

(7b) Finnish original
Dosentti$_i$ katsoi silmälasien yli kuin pikkukoulun opettaja. **Hän$_i$** kyllä sanoo silloin, kun vuosiluku merkitsee aikaa ennen Kristusta. **Se$_i$** käski minua muutenkin käyttämään vähän aivojani ja pysymään mukana. (Raittila, Finnish original, p. 29)
'**The lecturer$_i$** looked over his glasses like a primary school teacher. **He$_i$** will specify, when the date is Before Christ (B.C.). **It$_i$** told me to use my brain a little, in general, and to follow along.

(7c) German translation
Plötzlich schnautzte der Bootsführer **Heikkilä$_i$** an. Verlegen hörte **dieser$_i$** sofort auf, über die Geschichte der unsichtbaren Häuser am Kanal zu dozieren. (Raittila, German translation, p. 10)
'Suddenly the boat captain snapped at **Heikkilä$_i$**. Embarassed, **he$_i$** immediately stopped lecturing about the history of the invisible houses on the canal.'

(7d) Finnish original
Yhtäkkiä venekuski ärähti jotain **Heikkilälle**. Nolona **se** lakkasi selostamasta kanavanvarren näkymättömien talojen historiaa. (Raittila, Finnish original, p. 10)
'Suddenly the boat captain grumbled something to **Heikkilä$_i$**. Embarassed, **it$_i$** immediately stopped lecturing about the history of the invisible houses on the canal.'

It has been suggested that in German, personal pronouns refer to topics and so-called d-pronouns (*der/die*) refer to non-topics (e.g. Bosch and Umbach 2006). One might also expect that non-topics could be referred to with the group of longer *diese(r/s)* demonstratives. However, we find an overwhelming preference for both Finnish forms to be translated into German with personal pronouns (100% of *hän* and 97% of *se*). Thus, there is no clear evidence that the choice between *hän* and *se* is determined by the salience/topicality of the referent.

4 Use of *hän* 's/he' in Reported Speech

The preceding sections showed that register differences between standard Finnish and colloquial Finnish do not fully capture the choice of *hän* vs. *se*, and that the use of these two forms does not appear to be conditioned by the salience/prominence of the antecedent (at least not if we probe in terms of grammatical role or by comparing pronoun patterns in Finnish and German). In this section we consider a third account, which has been discussed in prior literature on Finnish dialects, and which hinges on the observation that *hän* has a special use in reported speech in many varieties of colloquial Finnish.

In addition to using *se* as the default third person pronoun for human referents, many dialects of Finnish use *hän* in a specific, restricted contexts – namely in reported speech/thought (e.g. Setälä 1883, Kuiri 1984, Ylikahri 1996, Laitinen 2002, 2005, inter alia). Laitinen (2002) calls this a logophoric use, and I will follow her in using this term. A logophoric pronoun is one that refers to the subject of consciousness, the entity "whose speech, thought, feelings or general state of consciousness are reported" (Clements 1975: 141; term coined by Hagège 1974). Adapting a term used by Sells (1987), we can say that a logophoric pronoun refers to SELF. For Finnish, Laitinen (2002) notes that the pronoun *hän* "appears in reported

speech or thought and is coreferential with the subject of the speech act or mental verb used to introduce it" (Laitinen 2002: 327). For example, in (8a), *hän* 's/he' is used inside the reported speech context to refer to the matrix subject (realized with *se* 'it') whose speech is being reported. The same pattern can be seen in (8b,c). These examples are all from colloquial Finnish (signaled by morphological patterns and other grammatical cues).

(8a) [Context: talking about good fishing spots]
Kundi$_i$ luulee omistavansa sen paikan, vaikka mä olin aamulla jo tuntia ennen sitä sillä paikalla. **Se$_i$** sano, että **hän$_i$** on tään paikan alun perin löytänyt. (www.jippii.fi/jsp/forum/thread.jsp?b=kalastus&t=570)
'**The guy$_i$** thinks he owns the place, although I was already there in the morning an hour before it. **It$_i$** said that **he$_i$** had originally found this place.'

(8b) [Context: talking about good places to use a metal detector to find jewelry]
kerroin **kouluttajalle$_i$**, että on tosi huonoja rantoja kun on vaan yksi kulta löytynyt ni **se$_i$** sano, että **hän$_i$** tietää yhden hyvän rannan missä käy usein rikkaita
(http://www.aarremaanalla.com/foorumi/viewtopic.php?t=6722, May 2012)
'I told **the trainer$_i$** that these are really bad beaches since only one gold object has been found so **it$_i$** said that **he$_i$** knows a good beach where rich people often go'

(8c) [Context: waiting to hear back about a possible job as a tractor driver]
kohta vissiin **sen miehen$_i$** pitäs soittaa... että koska meidän pitäs tavata.. sen tiian että tänään mutta **se$_i$** sano että **hän$_i$** soittelee lähempänä viittä
(http://johndeere.suddenlaunch2.com/index.cgi?action=print&board=Traktorit&num=1044200355, March 2003)
'the man$_i$ should probably call soon... about when we should meet... I know it's some time today but **it$_i$** said that **he$_i$** will call closer to five o'clock'

4.1 Types of Reported Speech/Thought Configurations

In addition to the straightforward embedding contexts seen in the preceding section, *hän* also occurs in more complex reported speech/thought contexts. For example, in (9a), *hän* is in a relative clause embedded inside the subordinate clause under the speech verb in the matrix clause. Thus, the speech verb does not need to be in the immediately higher clause. Relatedly, (9b) shows that the speech verb that embeds the clause with *hän* does not need to be the highest/matrix clause of the sentence. (These examples are from a novel by Antti Tuuri where *se* is the default pronoun for humans.) Nevertheless, in these kinds of examples, *hän* is in the scope of the speech/mental verb in a higher clause and coreferential with the subject of that speech/mental verb.

(9a) [Context: Nick had too much to drink the night before, and a conversation over breakfast the following day reveals that he does not remember all the events of the preceding evening]
Se$_i$ *kysyi*, oliko eilen minun mielestäni tapahtunut jotakin, jota **hän$_i$** ei ollut rekisteröinyt muistiinsa. (Tuuri p. 56)
'**It$_i$** *asked* whether in my opinion something had happened yesterday that **he$_i$** had not recorded into his memory'

(9b) [Context: A group of people, including the narrator, has just met a government minister in Cuba, as part of their attempts to research Ernest Hemingway]
Minäkin kättelin **ministerin$_i$**, joka *sanoi* minua neidiksi ja pyysi soittamaan **hänelle$_i$** henkilökohtaisesti, jos jotakin vaikeuksia Kuubassa oleskeluni aikana ilmaantuisi. (Tuuri, p. 63)
'I also shook hands with the **minister$_i$** who *called* me miss and told me to call **him$_i$** directly if any difficulties arose during my time in Cuba'

Crucially, *hän* is not used in all embedded contexts. In a context with an embedded clause that has a third person subject that is *not* coreferential with the speaker/thinker, *hän* is not used and instead the default *se* is employed. This is shown in ex.(9c), where the subject of the matrix sentence is the first-person narrator, but the subject of the embedded clause is Nick, one of the characters in the novel.

(9c) [Context: The narrator is surprised by how much Nick claims to know about his family.]
Kysyin nyt, paljonko **se$_i$** minusta oikein tiesi ja mistä **se$_i$** tietonsa oli saanut (Tuuri, p. 24)
'I asked now, how much **it$_i$** actually knew about me and how **it$_i$** had gotten its information'

Furthermore, *se* can even be used inside a logophoric domain without being antilogophoric, as noted by Hakulinen et al. (2005). They present the examples in (10b,c) to show that *se* can be embedded under a verb of saying (or thinking) and can still be coreferential with the subject of saying/thinking.

(10a) **Se$_i$** katsoi vettä ja siltaa ja sanoi että **se$_i$** yöpyy usein tässä hotellissa työreissulla. (Hakulinen et al. 2005, p. 1409, example from a novel using 'se' as default)
'**It$_i$** looked at the water and at the bridge and said **it$_i$** often stays in this hotel on business trips.'

(10b) **Se**$_i$ sano et ***se$_i$*** tykkää siit$_j$ hirveesti (Hakulinen et al. 2005, p. 1409, from colloquial Finnish)
'**It$_i$** said that **it$_i$** likes it$_j$ an awful lot'.

This is important, because it shows that Finnish is not a 'pure' logophoric language: According to Culy (1994), many West African languages are pure logophoric languages, meaning that a regular pronoun inside a logophoric domain is antilogophoric, i.e., cannot be coreferential with the person whose thoughts/speech are being reported (Culy 1994: 1080). However, Finnish *se* is not like this, as it can still be coreferential with the speaker/thinker in examples like (10).

4.2 Probing Logophoricity with Evaluative Adjectives and Epithets

Given that *se* is not anti-logophoric and can be used under verbs of saying/thinking with a coreferential subject, one might wonder whether, in a context where *se* is the default for human antecedents, there is a difference between sentences with *se* and sentences with *hän* in the embedded clause. In other words, since we have sentences with a $se_i \ldots se_i$ configuration (ex.10) and sentences with a $se_i \ldots hän_i$ configuration (ex.8-9), is there a difference between them?

In this section, I present data which indicate that, in colloquial Finnish contexts where *se* is the default for humans, use of the more marked form *hän* in contexts of reported speech/thought carries more logophoric meaning than use of default *se.* In particular, it seems that use of *hän* suggests that the speech/thoughts of the logophoric center are more concretely reproduced (closer to the actual verbatim speech/thoughts), whereas *se* seems to allow for a greater level of abstraction. (The issues explored here relate in intriguing ways to the *de se/de re* distinction, which is unfortunately beyond the scope of this paper.) This idea can be illustrated with evaluative adjectives and with epithets. Example (11), with the evaluative adjective 'pretty', shows that when the embedded sentence does not match the expressive content of what was actually said/thought, *se* seems to be preferred over *hän*. Imagine a context in which the conversation in (11a) has just occurred between Laura and Tiina (example adapted from Potts' (2003) work on expressive attributive adjectives). Later, Tiina shows the blue vase to her friend Liisa and reports Laura's comment by saying (11b). In (11b), *se* is preferred, because Laura did not refer to the blue vase as being beautiful. (I use # with *hän* to indicate infelicity, but *hän* is not completely out in this context, it is simply less preferred than *se.*) A variant of the same sentence but without the evaluative adjective is fine with both *se* and *hän* (ex.11c).

(11a) Laura: This blue ceramic vase is really ugly. The orange glass vase is much more stylish. Since I can only fit one of them on my shelf, I plan to throw away the ugly blue vase.
Tiina: But I think the blue vase is beautiful! You shouldn't throw it away.
Laura: Hey, do you want it? Here, take it, it's yours.

(11b) Tiina: **Se$_i$** sano että **se$_i$/#hän$_i$** aikoo heittää tämän kauniin maljakon roskiin!
'**It$_i$** said that **it$_i$/#she$_i$** plans to throw away this beautiful vase!'

(11c) Tiina: **Se$_i$** sano että **se$_i$/hän$_i$** aikoo heittää tämän maljakon roskiin!
'**It$_i$** said that **it$_i$/she$_i$** plans to throw away this vase!'

A similar effect occurs with epithets. Imagine a context where the conversation in (12a) has occurred between Laura and Tiina, from which we can tell that Tiina considers Mikko an idiot but Laura likes him. Later, Tiina reports part of what Laura said by saying (12b). Here, *se* seems to be preferred over *hän* because Laura did not use the epithet that Tiina employs in her report (and would in fact disagree with it). A neutral version is fine with both pronouns (ex.12c).

(12a) Laura: Do you know Mikko Läntinen? I just moved, and now I live right next door to Mikko. We ran into each other and talked for a long while yesterday. We even made plans for a date on Saturday!
Tiina: Oh, the tall guy who works downtown? I think Mikko's a real idiot.

(12b) Tiina: **Se$_i$** sano että **se$_i$/#hän$_i$** asuu nyt sen idiootin naapurissa.
'**It$_i$** said that **it$_i$/#she$_i$** now lives right next door to that idiot.'

(12c) Tiina: **Se$_i$** sano että **se$_i$/hän$_i$** asuu nyt sen Mikon naapurissa.
'**It$_i$** said that **it$_i$/she$_i$** now lives right next door to that Mikko.'

We also see something similar with expressions of locative deixis, as in ex.(12d). Here, the embedded clause uses the expression *tässä* ('here') which is defined relative to when the reported speech was uttered (i.e. when the person she likes said 'I am staying here', note also the use of the present tense) and not relative to the location at which the speaker/writer wrote the sentence. Indeed, it is worth noting that in the preceding clause that does not involve reported speech, the speaker/writer uses *siihen* 'there' (an illative-case-marked form of *se*), and later on uses *tässä* 'here' (an inessive-case-marked form of *tämä*, 'this') in the reported speech context. Thus, this example corroborates the idea that use of *hän* in reported speech contexts is associated with a high level of 'directness' in terms of how accurately the reported speech is conveyed.[2]

[2]Broadly speaking, the different patterns observed with *hän* and *se* in contexts involving evaluative adjectives, epithets and locative deixis relate in interesting ways to the *de se/de re* distinction. The specifics are unfortunately beyond the scope of the present paper and offer an important avenue for future work.

(12d) [Context: a young woman is talking about how students were asked to line up in school and her crush wanted to stay in his position next to her instead of moving forward in line]
Eli siis poikien piti mennä neljä tyttöö eteenpäin ja sit **mun ihastus$_i$** tuli mun kohdalle ja jäi siihen vaikkakin sen ois pitänyt jatkaa vielä matkaa ja **se$_i$** sano, et **hän$_i$** pysyy tässä ja tuuppi muita poikia ohitseen. (http://this-life-is-made-just-for-me.blogspot.com/, blog entry from Dec 2012)
'So the boys had to move forward by four girls [i.e. stand by the girl four girls ahead of where they were] and then **my crush$_i$** got to where I was standing and stayed there even though **it** should have continued onwards and **it$_i$** said that **he$_i$** stays here and pushed other boys past (him).'

In sum, in reported speech contexts in colloquial Finnish, (i) *hän* 's/he' acts as a marker triggering a logophoric interpretation and refers to the matrix subject (subject of the speech act or mental verb), and (ii) *se* 'it' is the unmarked pronoun. It might be best described as nonlogophoric but not antilogophoric, given that it can be used in embedded clauses when coreferential with the matrix subject in reported speech contexts.

It is worth noting that, so far, we have focused on reported speech in colloquial Finnish (including written text written in colloquial style/register), which clearly exhibits the *hän/se* alternation. What about standard Finnish? Reported speech in 'pure' standard Finnish does not show the *hän/se* alternation: *se* is not used to refer to humans in reported speech, and *hän* is used in both the main clause and the embedded clause (unlike colloquial Finnish). This can be explained straightforwardly by the fact that *hän* is the default form in standard Finnish.

However, although we are making progress towards explaining the choice of *hän* vs. *se*, this conclusion regarding reported speech contexts does not explain the *hän/se* alternation in contexts that have no speech act/mental verb, like the examples above in (1) (see also Saukkonen 1967, Hakulinen 1988). In (1a), *hän* refers to one of the main characters, Tiina. In (1b), *se* is used to refer to the same character.

5 Use of *se/hän* in Free Indirect Discourse

To understand contexts like ex.(1) where *hän* and *se* seem to alternate in the absence of speech act or mental verbs, let us consider the notion of free indirect discourse (FID), compared to direct speech and indirect speech/reported speech. In direct speech, e.g. *Peter said, 'I will go home tomorrow'* the words of the speaker are quoted directly and inside the quoted segment, the first-person pronoun refers to the speaker. In indirect speech/reported speech, e.g. *Peter said that he would go home tomorrow*, the speaker is referred to with a third person pronoun. In free indirect discourse, there is no matrix clause with a verb of speaking/thinking, and instead

the text represents a character's thoughts directly. A third-person pronoun can be used to refer to the thinker: *Peter was tired of sleeping on Tim's couch. How could anyone sleep on that old thing, with a mattress as hard as a brick? He would go home tomorrow. No one was going to make him change his mind about that.*

As Saukkonen (1967) notes, in Finnish *hän* is used in FID to refer to the speaker/thinker, who I refer to as the SELF (see Sells 1987). More specifically, my corpus data show the following basic patterns: In free indirect discourse, the person whose thoughts are being represented is referred to with *hän* 's/he'. Furthermore, *se* 'it', when used, refers to the NON-SELF, i.e. a referent other than the one whose thoughts the free indirect discourse represents (see also Saukkonen 1967; Hakulinen 1988; Kaiser 2008). Intriguing related data is discussed for German d-pronouns (vs. personal pronouns) by Hinterwimmer & Bosch (2016), who note that in German, d-pronouns (*der, die)* cannot refer to the individual whose perspective is being assumed for the sentence that contains the d-pronoun: It seems that German d-pronouns resemble the behavior of Finnish *se* in FID contexts.

The referential patterns of free indirect discourse are exemplified by the following excerpt from a novel (Polva 1989: 60). This is a context where Juha has just seen his girlfriend Tiina in an ice-cream parlor with some other boys, and as he was watching them through the window, Tiina turned around and saw him watching. As indicated by the subscripts, *hän* 'he' here is used to refer to Juha, whose thoughts we are hearing, and *se* 'it' to Tiina. This passage creates a strong effect of free indirect discourse; the reader sees things from Juha's perspective. (It is important to note that the examples of free indirect discourse discussed in this paper are from contexts where *hän* is the default form for human antecedents.)

(13a) Juha oli lähtenyt tiehensä pitkin harppauksin, mutta kun hän$_{\text{JUHA}}$ oli varma, että häntä$_{\text{JUHA}}$ ei nähty enää baarin ikkunasta, hän$_{\text{JUHA}}$ hiljensi menonsa matelemiseksi. Tiina saisi hänet$_{\text{JUHA}}$ helposti kiinni, jos se$_{\text{TIINA}}$ lähtisi heti liikkeelle, ja tottakai se$_{\text{TIINA}}$ lähtisi, siitä hän$_{\text{JUHA}}$ oli varma.
'Juha had started walking away with long steps, but when he$_{\text{JUHA}}$ was sure that he$_{\text{JUHA}}$ was no longer visible from the bar, he$_{\text{JUHA}}$ slowed his walking down to a crawl. Tiina could easily catch him$_{\text{JUHA}}$, if it$_{\text{TIINA}}$ left right away, and of course it$_{\text{TIINA}}$ would, of that he$_{\text{JUHA}}$ was sure.'

The same kind of pattern is exemplified in ex.(13b) from a novel by Joensuu (1983). In this extract, one of the characters, Mikael, is coming downstairs very quietly from his bedroom and listening to see who is at home. Mikael – the SELF, from whose perspective we see and hear things from – is referred to with *hän* 'he', and his mother with *se* 'it'. In ex.(13b), as in ex.(13a), the *hän/se* alternation is no longer constrained by the syntactic frame that was central for the reported speech uses. In FID, both *hän* and *se* can be used in a variety of syntactic contexts.

(13b) Mikael tuli portaat alas niin hiljaa kuin osasi.
Eteisessä oli hämärää. Hän$_{MIKAEL}$ seisoi aloillaan, pidätti henkeä ja kuunteli.
Äiti oli keittiössä. Se$_{MOTHER}$ silitti pyykkiä. Hajusta sen tiesi – ilmassa oli kiva, lämmin haju – ja siitä että äiti hyräili hiljaa. (Joensuu 1983: 31)
'Mikael came downstairs as quietly as possible.
The foyer was dark. He$_{MIKAEL}$ stood still, held his breath and listened.
Mother was in the kitchen. It$_{MOTHER}$ was ironing. One could tell from the smell – there was a nice, warm smell in the air – and from mother's quiet humming.'

If we compare ex.(13a) and (13b) to the examples of reported speech in colloquial Finnish that we have been focusing on so far, we observe broader syntactic environments in which the *hän/se* alternation is possible. Unlike the reported speech examples in the preceding sections where *se* was in a matrix clause with a speech/thought verb and *hän* was in a subordinate clause, we now observe both *se* and *hän* in matrix clauses, as can be seen in (13a) and (13b). In FID, the *hän/se* alternation is *not* restricted to explicit reported/speech thought configurations involving syntactic embedding.

At this point in the paper we can also revisit examples (1a) and (1b), repeated below. Ex.(1a) comes from the very start of the novel and does not involve FID. *Hän* is used for reference back to Tiina since it is the default form in standard Finnish. However, once we take a closer look at the context of example (1b) – added below in the longer version (1b') – it becomes clear that this example contains free indirect discourse from the perspective of Tiina's mother. In this example, following an exchange where Tiina and her brother have been telling their parents about what happened at school, the reader hears the mother's thoughts about her daughter. The sense of Tiina being the NON-SELF is especially strong in the second and third sentences of ex.(1b') below, where the form *se* 'it' is used to refer to Tiina.

(1a) Tiina juoksi kotiin niin nopeasti kuin jaloillaan pääsi. Hän$_{TIINA}$ hengitti puuskuttaen . . . (Polva 2011: 7)
'Tiina ran home as fast as her legs would carry her. She$_{TIINA}$ was out of breath . . . '

(1b') Äiti ei tiennyt mitä sanoa ja mitä oikein ajatella; oliko Tiina tehnyt jotain rangaistavaa, vai oliko hän$_{TIINA}$ syytön. Sekasotkua se$_{TIINA}$ joka tapauksessa oli saanut aikaan, kuten tavallisesti. Siellä missä Tiina oli, siellä tapahtui aina jotakin, vaikkei se$_{TIINA}$ olisi tehnyt muuta kuin seisonut hiljaa paikallaan. (Polva 2011: 29)
'Mother didn't know what to say or quite what to think, had Tiina done something wrong, or was she$_{TIINA}$ innocent. In any case, it$_{TIINA}$ had made a mess of things, as usual. Wherever Tiina was, something was always happening there, even if it$_{TIINA}$ wasn't doing anything more than standing still.'

However, use of *se* in free indirect discourse for the NON-SELF referent is not obligatory; *hän* can also be used (see Rouhiainen 2000). In (13c), which comes from a longer extract of the Finnish translation of "Women in Love" D.H. Lawrence that is discussed by Rouhiainen (2000: 118), we hear the thoughts of one of the protagonists, Gudrun, about her lover Gerald, and *hän* refers to the NON-SELF referent Gerald. (The larger context of this extract makes it clear that we are heading Gudrun's thoughts, that she is the SELF.) Perhaps relatedly, in the longer version of ex.(1b') given above, *hän* is also used to refer to Tiina, although it is not entirely clear whether this use occurs inside FID or not.

(13c) **Geraldin** pitäisi päästä sellaiseen asemaan, missä **hän$_{\textbf{GERALD}}$** tahdonvoimallaan ja ylivertaisella käytänöllisellä älyllään voisi ratkaista nykyajan teollisuuden pulmat. (Lawrence 1980: 541)
'**Gerald** should achieve a position where **he$_{\textbf{GERALD}}$**, with his force of will and supreme practice intelligence, would be able to solve the problems of modern industry.'

These observations are in line with earlier corpus work by Rivinoja (2006), who found that out of 29 references to SELF in Finnish FID (in novels originally written in Finnish), the human pronoun *hän* was used 83% of the time and proper names were used 17% of the time. She did not find any cases of *se* being used to refer to SELF in FID. Rivinoja also analyzed 46 occurrences of reference to NON-SELF in Finnish FID and found that 11% are accomplished with *hän*, 35% with a proper name, 26% with *se*, 24% with nouns of various types and 4% with other kinds of expressions.

In sum, we see that inside FID contexts, *hän* can be used to refer to SELF (ex.13a,b) or to NON-SELF (13c) and *se* is used to refer to NON-SELF (13a) but not to SELF. The seemingly 'mysterious' alternation in examples (1a) and (1b) at the start of the paper can now be attributed to *se* being used for the NON-SELF.

As mentioned earlier, the examples of free indirect discourse discussed in this paper are from contexts where *hän* is the default form for human antecedents – i.e., from standard Finnish. When we consider the question of what happens with free indirect discourse in *colloquial* Finnish, the picture becomes more complex. As will become clear in the course of this paper, my approach predicts that in colloquial Finnish, free indirect discourse will resemble reported speech, in that inside logophoric domains, *hän* will only be used for reference to SELF. Vilppula (1989)'s discussion of dialectal corpus data seems compatible with this. However, further work is needed to test the validity of my prediction in detail. It is also worth noting that FID is presumably much less frequent in colloquial registers than in formal literature – thus, in this paper, our discussion of FID is limited to standard Finnish only.

Reported speech (colloquial Finnish)	*Free indirect discourse (standard Finnish)*
hän => logophoric/SELF	hän => nonlogophoric (unmarked)
se => nonlogophoric (unmarked)	se => antilogophoric/NON-SELF

Fig. 1 Referential properties of *hän* 'he/she' and se 'it'

5.1 Two Forms with Different Behaviors in Different Contexts

The data we have seen so far suggests that when *hän* and *se* are used inside reported speech contexts (Sect. 4) in colloquial Finnish, (i) *hän* is logophoric and (ii) *se* is unmarked/nonlogophoric in that it can be used to refer the person whose thoughts/speech are being reported, as well as other referents. In contrast, in free indirect discourse (Sect. 5) in standard Finnish, (i) *hän* is unmarked/nonlogophoric in that it can be used for SELF but also for other referents, but (ii) *se* is antilogophoric in that it cannot be used to refer to SELF and picks out some other referent. This is summarized in Fig. 1.

To better understand the different uses of *hän* 's/he' and *se* 'it', let us consider an example where the interpretation of *hän* depends on whether the sentence is interpreted as reported speech or free indirect discourse. Consider ex.(14a). This could be reported speech: Imagine that Tiina's mother is talking about Tiina's travels, including one occasion where Tiina hopped on a train and thought that she hadn't paid for her ticket (when in fact a friend had paid for it). Here, *hän* in the embedded clause is coreferential with the matrix subject (14b).

(14a) **Se** luuli, että **hän** ei ollut maksanut lippuaan.
'**It** thought that **s/he** hadn't paid for its/her/his ticket.'

(14b) Tiina's mother says:
Se$_{\textbf{TIINA}}$ luuli, että **hän**$_{\textbf{TIINA}}$ ei ollut maksanut lippuaan.
'**It**$_{\textbf{TIINA}}$ thought that **she**$_{\textbf{TIINA}}$ hadn't paid for her ticket.'

Now let us imagine a context where (14a) is inside a stretch of free indirect discourse, as in (14c). Imagine this context: Tiina pays for her train ticket, but sees the train starting to pull out of the station and forgets $10 worth of change on the ticket counter when she starts running towards the train. The person selling tickets calls out after her. Tiina hears someone shouting "Stop! The money!" but she is already on the train when she realizes that it was the ticket seller trying to get her attention. Just then, she sees a policeman hop into the train.

(14c) Tiina watched incredulously as the angry-looking policeman hopped onto the train and walked directly into the compartment where she was sitting. Why did this stuff always happen to her?
. . . . **Se$_{\text{POLICEMAN}}$** luuli, että **hän$_{\text{TIINA}}$** ei ollut maksanut lippuaan.
. . . .'**It$_{\text{POLICEMAN}}$** thought that **she$_{\text{TIINA}}$** hadn't paid for her ticket.'

Here, we are hearing Tiina's thoughts, and the pronoun *hän* in the embedded sentence refers to her. *Se* refers to the NON-SELF, i.e. the policeman. Thus, if (14a) is an example of reported speech (ex.14b), *se* and *hän* are coreferential, but if we interpret the same string of words as being free indirect discourse (ex.14c), then *hän* and *se* are disjoint.

In fact, this 'minimal pair' simply highlights a pattern we already saw earlier: We already saw examples of *se* and *hän* coreferring in reported speech contexts in Sect. 4 (e.g. ex.(8a-c)). We already saw disjoint reference of *hän* vs. *se* in FID contexts in examples (13a,b). (When considering these examples, it is important to keep in mind that in FID contexts, use of *hän* to refer to SELF and *se* to refer to NON-SELF also occurs in contexts (such as (13a,b)) that do *not* involve syntactic embedding under verbs of speaking/thinking.) In the current section, ex.(14c) uses a case of reported thought – embedded inside FID – to create a minimal pair with ex.(14b), to highlight the difference in how the referential forms are interpreted. But the cases of FID that we are interested in are not confined to cases of syntactically embedded reported speech/though inside FID, as we already saw in ex.(13a,b).

The differences between (14b) and (14c) could be taken to imply a conclusion where the two forms *hän* 's/he' and *se* 'it' have different referential properties when used in FID and when used in reported speech/thought contexts without FID, as shown in Fig. 1—but is this a desirable conclusion? In Sect. 6, I propose a more unified approach.

6 Unifying the Referential Behavior of *hän* and *se*

In this section, I argue that we can reconcile the seemingly disparate patterns in Fig. 1 by taking into consideration (i) the size of the logophoric domain, (ii) the default form in the register, and (iii) the fact that FID, by its very nature, mimics properties of spoken language.

First, let us consider the size of the logophoric domain. If we compare reported speech (14b) and free indirect discourse (14c), we can see that the logophoric domain (the part that represents the thoughts/speech of a particular character, marked with [. . .] below) is larger in free indirect discourse (15b) than reported speech (15a):

(15a) Tiina's mother: "**Se$_{\text{TIINA}}$** thought that [**hän$_{\text{TIINA}}$** hadn't paid for her ticket]."
Tiina thinks: "**I$_{\text{TIINA}}$** haven't paid for my ticket."

(15b) Narrator: Tiina: [**Se$_{\text{POLICEMAN}}$** thought that **hän$_{\text{TIINA}}$** hadn't paid for her ticket].
Tiina thinks: "**He$_{\text{POLICEMAN}}$** thinks **I$_{\text{TIINA}}$** haven't paid for my ticket."

In particular, in reported speech, the matrix subject (realized with *se* in ex.14b/15a) is not inside the logophoric domain, but the embedded subject (realized with *hän*) is inside the logophoric domain. However, in free indirect discourse (14c/15b), both the matrix subject (realized with *se*) and the embedded subject (realized with *hän*) are inside the domain. Before saying more about this difference, let us also think back to the register differences between colloquial and standard Finnish: In standard Finnish *hän* is the default third person pronoun, and *se* is normally only used for nonhuman referents. In colloquial Finnish, *se* can be used for human referents, and in fact is the default third person pronoun. Recall also that our discussion of FID focuses on standard Finnish, and our discussion of reported speech focuses on colloquial Finnish.

If we combine these observations about (i) the size of the logophoric domain and (ii) register defaults, we can represent the referential properties illustrated in Fig. 1 in a more unified way, as shown in Fig. 2.

This approach lets us represent the referential properties that *hän* and *se* display in reported speech in colloquial Finnish and free indirect discourse in standard Finnish, while requiring only one statement about logophoricity, namely that *hän* is associated with reference to SELF. As I will show below, we do not need to posit an association between *se* and NON-SELF, as this can be derived from independent properties of FID. (In earlier work, Kaiser 2008, I proposed a more complex approach involving two associations, one linking *hän* to SELF and the other linking *se* to NON-SELF. The current proposal does not require the second association).

Let us now consider how this approach can capture examples like (14) and (15). In a context where the default pronoun for human antecedents is *se* (i.e., colloquial Finnish, including fiction written in the colloquial register), use of *hän* inside a

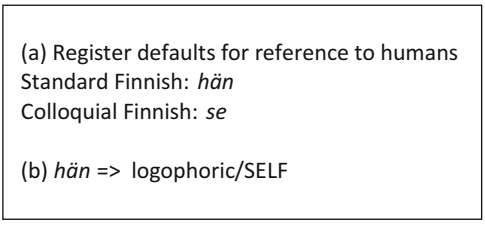

Fig. 2 Referential properties of *hän* 'he/she' and se 'it'

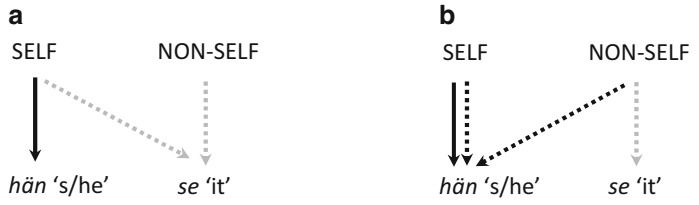

Fig. 3 Interplay of register defaults and the logophoricity of *hän*. (**a**) Colloquial Finnish, reported speech. (**b**) Standard Finnish, FID

logophoric domain is associated with reference to SELF, as in the reported speech example in (15a). The default form *se* can also be used in such contexts (precisely because it is the default form in the register), as shown by examples like (9c,10), but does not appear to carry the same perspectivizing effect, as we saw in ex.(11–12). These patterns are illustrated in part (a) of Fig. 3, where the (gray) dotted lines show the default mappings that arise because *se* is the default in the colloquial register, and the solid line represents the link between *hän* and SELF. Due to the register default, the result is that *hän* is only used when referring to SELF.

In contrast, in a context where the default pronoun for human antecedents is *hän* (i.e. standard Finnish), *hän* can be used to refer to SELF (in accordance with Fig. 2 part (b)), as we saw in FID examples like (13a). However, *hän* can also be used for reference to NON-SELF, as in examples like (13c), because it is the default form in the register. This is illustrated in part (b) of Fig. 3, with dark dotted lines. I have also included the solid line that reflects the mapping between *hän* and SELF, but since *hän* is the default in this register anyway, there are no detectable effects of the link between *hän* and SELF in Standard Finnish. (Thus, I assume the mapping between *hän* and SELF exists in both registers, simply for reasons of parallelism/simplicity, but the effects are only detectable in the colloquial register).

This bring us to the question of how to capture the fact that in FID examples like (13a), *se* is associated with reference to the NON-SELF. Nothing in Fig. 2 directly links *se* to NON-SELF, so how can we explain this? In earlier work, I argued for an explicit association between *se* and NON-SELF (Kaiser 2008), in addition to the association between *hän* and SELF. However, in this paper I claim that such an association is not necessary: The association between *se* and NON-SELF in FID contexts can be derived by combining the well-known fact that FID mimics spoken language (e.g. Tiittula and Nuolijärvi 2013 and many others, see also footnote 3), with the fact that in colloquial Finnish, *se* is the default form. This is shown in part (b) of Fig. 3 with the gray dotted line. Crucially, we do not need to posit a special link between se and NON-SELF – that link 'comes for free' from the default pattern of colloquial Finnish. More concretely, consider ex.(14c) and (15b), repeated below:

(14c) Tiina watched incredulously as the angry-looking policeman hopped onto the train and walked directly into the compartment where she was sitting. Why did this stuff always happen to her?
.... **Se$_{\text{POLICEMAN}}$** luuli, että **hän$_{\text{TIINA}}$** ei ollut maksanut lippuaan.
....'**It$_{\text{POLICEMAN}}$** thought that **she$_{\text{TIINA}}$** hadn't paid for her ticket.'

(15b) (i) Narrator: Tiina: [**Se$_{\text{POLICEMAN}}$** thought that **hän$_{\text{TIINA}}$** hadn't paid for her ticket].
(ii) Tiina thinks: "**He$_{\text{POLICEMAN}}$** thinks **I$_{\text{TIINA}}$** haven't paid for my ticket."

Let's start with line (ii) of example (15b). Tiina's original though is that "He thinks I haven't paid for my ticket." When this is realized as FID, the SELF-referring "I" is realized as *hän*. The NON-SELF-referring pronoun 'he' is realized as *se*, simply because FID mimics properties of colloquial language and *se* is the default form in colloquial Finnish. Thus, we end up with a surface form where *hän* refers to SELF and *se* to NON-SELF, as shown in (14c) and (15b, i). In sum, I build on the observation that FID mimics properties of spoken language and use that to derive the pattern that in FID contexts, *se* refers to NON-SELF.[3]

7 Adding a Third Form to the Mix: Demonstrative *tämä* 'This'

In addition to *hän* 's/he' and *se* 'it', human antecedents in Finnish can also be referred to with the proximal demonstrative *tämä* 'this'. In this section I show that *se* and *tämä* can both be used for reference to NON-SELF, but differ in the salience of their antecedents: When there are multiple NON-SELF referents present, *se* is used for the most salient one and *tämä* for less salient ones. Existing research characterizes *tämä* (in its human anaphoric use) as referring to background characters/nonsalient referents, which are often objects, obliques, etc. (e.g. Varteva 1998; Halmari 1994; Kaiser 2003; Kaiser and Trueswell 2008), as in (16a). *Tämä* is also used to refer to humans in colloquial Finnish (e.g. Etelämäki 2005), but in this section we focus on standard Finnish.

[3]One possible avenue for formalizing this intuition about colloquial Finnish patterns persisting in FID could be Maier's unquotation analysis (e.g. Maier 2015): If we regard FID as essentially a type of direct speech, with SELF-referring pronouns having been 'unquoted', then NON-SELF-referring pronouns could potentially maintain their 'colloquial properties' simply by virtue of their origins in direct speech which would be in colloquial Finnish. Under this approach, NON-SELF pronouns would not be unquoted.

(16a) FIA julkaisi keskiviikkona tiedotteen, jossa se kummasteli **Ecclestonen$_i$** lausuntoa. **Tämä$_i$** väitti taistelleensa jo vuosia F1-sääntöjen tiukkuutta vastaan. (from the newspaper Helsingin Sanomat 21.20.1999)
'FIA published on Wednesday an announcement in which it expressed surprise at **Ecclestone$_i$**'s statement. **This$_i$** claimed to have been fighting for years against the strictness of the F-1 regulations.'

These kinds of examples do not have any logophoric flavor, and a salience-based account works well. However, a salience-based story is not sufficient for all occurrences of *tämä*. In certain contexts, *tämä* is used to refer to a preceding subject or an otherwise salient referent. More specifically, this kind of use is possible in antilogophoric, FID-type contexts (see Varteva 1998). E.g., in (16b), the woman referred to with *tämä* is described from the miller's perspective; the miller is SELF. Similarly, in (16c), Tina is described from Antti's perspective; Antti is SELF.

(16b) [Context: The miller hears someone call his name and turns to look:]
Mylläri kääntyi äänen suuntaan. Kaunis **nainen** seisoi sillalla. **Tämä** oli riisunut huivinsa ja heilutti sitä kiehtovasti.
'The miller turned towards the direction of the sound. A beautiful **woman** stood on the bridge. **This** had taken off her scarf and waved it in a captivating fashion.' (Paasilinna 1998: 19)

(16c) [Context: Antti and Tina are sitting in a restaurant, having dinner. But Antti can't relax; he feels there is something wrong with Tina.]
Tinan pirteydessä oli jotain pakotettua. **Tämä** yritti peittää jotakin hurmaavuudellaan, mutta silmissä oli oudon surumielinen katse.
'There was something forced about **Tina's** cheerfulness. **This** was trying to hide something by being so charming, but her eyes looked strangely melancholy.' (Remes 2001: 21)

7.1 What Is the Relation Between tämä 'This' and se 'It'?

The use of *tämä* for NON-SELF referents in standard Finnish perspectivizing contexts, as illustrated above, brings up the question of how *tämä* and *se* relate to each other. Are they simply two functionally equivalent ways of referring to NON-SELF referents? If we follow the approach that ranks referential expressions on a salience/accessibility scale (e.g. Ariel 1990, Gundel, Hedberg and Zacharski 1993), we predict that *se* 'it' will refer to more salient entities than *tämä* 'this', since pronouns are predicted to refer to more salient entities than (anaphoric) demonstratives.

To test this, consider the examples below, which have two NON-SELF referents. These are FID-type contexts, in that we are presented with the thoughts of a character in a narrative, in this case a woman called Tiina. Imagine a situation

like the train-ticket scenario in (14), except that now, instead of seeing an angry policeman hop into the train, Tiina sees an old lady on the train eyeing her curiously, and then the old woman gets up and goes to speak to a policeman who is already sitting on the train. Now, consider (17a). Here, in the free indirect discourse, Tiina is the SELF, and there are two NON-SELF referents: the old lady and the policeman. Assuming that subjects are more salient than objects/obliques (e.g. Chafe 1976, Brennan, Friedman and Pollard 1987), in (17a), *the policeman (subject) is, crucially, more salient than the old lady (object possessor)*. Let us now consider two possible continuation sentences, shown in (17b) and (17c). The subsequent sentence (17b) contains both *se* and *tämä*, and verb semantics make it clear that *tämä* (in subject position) refers to the old lady, *se* (in oblique object position) to the policeman, and *hän* to Tiina. Ex.(17c) has the same verbs but now *se* is in subject position and *tämä* is the oblique argument:

(17a) Tiina katseli ihmeissään, kun poliisi kuunteli vanhan rouvan kiihkeää selitystä.
'Tiina looked on, surprised, as the policeman listened to the old lady's impassioned explanation.'

(17b) **Tämä** ilmeisesti selitti **sille**, että hän matkusti pummilla.
'**This** was apparently explaining to **it** that she(Tiina) was traveling without paying.'

(17c) # **Se** ilmeisesti selitti **tälle**, että hän matkusti pummilla.
'**It** was apparently explaining to **this** that she(Tiina) was traveling without paying.'

Crucially, while (17b) is judged to be fine, (17c) is infelicitous. In other words, the referential mapping that is felicitous is the one where *tämä* refers to the old lady (the genitive of the object in the preceding sentence), and *se* refers to the policeman (the preceding subject). This suggests that *se* is used to refer to more salient NON-SELF referents than *tämä*.

When the grammatical roles of the policeman and the woman are reversed, as in (18a), so that the policeman is less salient, the interpretation of *tämä* and *se* is also correspondingly reversed. A subsequent sentence where *tämä* refers to the old lady, *se* to the policeman, and *hän* to Tiina, which was judged to be felicitous in (17b), is now infelicitous (18b). In contrast, a sentence where *tämä* refers to the policeman, *se* to the old lady, and *hän* to Tiina, is now felicitous (18c). So, the referential mapping judged to be felicitous is one where *tämä* refers to the policeman (the object in the preceding sentence), and *se* refers to the old lady (the subject of the preceding sentence). This supports the observation that in contexts with multiple NON-SELF referents, the referential labor between *tämä* and *se* is divided based on salience, with *se* referring to more salient entities than *tämä*.

(18a) Tiina katseli ihmeissään, kun vanha rouva selitti jotain kiihkeästi poliisille.
'Tiina looked on, surprised, as the old lady explained something excitedly to the policeman.'

(18b) # **Tämä** ilmeisesti selitti **sille**, että hän matkusti pummilla.
'**This** was apparently explaining to **it** that she(Tiina) was traveling without paying.'

(18c) **Se** ilmeisesti selitti **tälle**, että hän matkusti pummilla.
'**It** was apparently explaining to **this** that she(Tiina) was traveling without paying.'

These data show that in logophoric contexts—just like in nonlogophoric contexts—referent prominence has an effect on how the NON-SELF referents are referred to. The prominence difference (*se* > *tämä*) is revealed in the presence of multiple NON-SELF referents. These patterns are compatible with the approach outlined in Figs. 2 and 3, because *tämä* is not the default/unmarked third person anaphoric form in either standard or colloquial Finnish. Thus, its use would not 'override' the register-related defaults or the association that *hän* has with logophoricity.

8 Non-human Animates: When the Default Pronoun Is Different Due to [-Human] Feature

So far we have focused on situations where the pronouns *hän* 's/he' and *se* 'it' refer to humans in reported speech contexts and FID contexts. However, there are also situations where the relevant referent is a non-human animal, for example in children's stories. These contexts differ from the human contexts in one critical and very relevant dimension: In these contexts, *se* is the default pronoun for the referent in both standard Finnish and colloquial Finnish, simply because *se* is the basic non-human pronoun, like English 'it' – i.e., *se* is the default not due to register-related factors but due to a featural property of the referent. By looking at cases where the identity of the default form is due to something other than register, we can get a better understanding of how the *general* notion of 'default form' contributes to the interpretation of *hän* and *se.*

It is worth noting right away that, as in English, the traditional "*se* = non-human/*hän* = human" mapping can be violated when animals are personified. This is can be easily observed in fiction written in standard Finnish. For example, in the Finnish translation of Paddington Bear by Michael Bond (2015), the pronoun *se* is initially used when Paddington is first found by Mr. and Mrs. Brown (ex.19a), but as soon as they give him a name, the Finnish translation switches to the pronoun *hän* (ex.19b). After this point, *hän* becomes the default pronoun for Paddington.

(19a) [Context: Mrs. Brown takes her first close look at the still-unnamed bear]
Hän tirkisteli karhua tarkemmin. **Se** ei ollut mikään tavallinen karhu. **Se** oli ruskea – varsin likaisenruskea – ja **sillä** oli hyvin merkillinen, leveälierinen hattu juuri niin kuin herra Brown oli sanonut. (Bond, 4/67)
'She observed the bear more closely. **It** was not a regular bear. **It** was brown – rather dirty brown – and **it** had a very odd, broad-rimmed hat just like Mr. Brown had said.'

(19b) [Context: Right after Mr. and Mrs. Brown have decided to name the bear Paddington, after the station where he was found]
Paddington nuoli huuliaan. – Minulla on hirveä jano, **hän** sanoi. (Bond, 7/67)
'Paddington licked his lips. "I'm *very* thirsty," **he** said.'
(Bond 1958/2003, English original, ch. 1)

However, the kinds of contexts we are interested in are stories written in Standard Finnish where humans are by default referred to with *hän* 's/he' and, crucially, animals are by default referred to with *se* 'it'. We want to see what happens in these contexts if and when a nonhuman referent is involved in FID and reported speech. Will we see patterns similar to FID and reported speech in colloquial Finnish, with *se* being the default and *hän* being used in logophoric contexts? Or will the non-humanness of the referent block use of the human pronoun *hän*?

8.1 Use of hän with Non-human Animates

In reported speech/thought contexts, as Laitinen (2002) notes, *hän* can be used for animals, (ex.20). Laitinen emphasizes that this is "not a case of secondary personification" and states that the "referent of the logophoric pronoun (. . .) *hän* can be any being whose behavior the speaker is able to understand" (Laitinen 2002: 333). The observation that *hän* can be used to refer to SELF even when SELF is non-human challenges the view that *hän* is associated with [+human] referents (or humanized/personified referents).

(20) Mut koera jos ottaa ni se tietää että mihinkä **hän** viep (example from Laitinen 2002; colloquial Finnish)
'But if the dog takes (something), it knows where **s/he** takes (it)'

Similar to what we see in reported speech/though contexts, corpus data show that *hän* can be used in FID contexts to refer to the logophoric SELF, even if it is an animal. The examples I discuss here are from a young adult novel called "Bernie ja Tiina" (Kukkanen, 2014). The novel is written in standard Finnish, and the default pronoun for humans is *hän* and the default for animals is *se*. The story is about a dog, Bernie, that is sent down from "dog heaven" to help a young girl convince her parents that she should be allowed to get a dog. Crucially for our purposes, the

default pronoun for animals in this novel is *se*. Ex.(21a) shows that even in contexts where Bernie is personified and engaging in mental activities (e.g. thinking and planning an upcoming speech), the nonhuman pronoun *se* is used:

(21a) **Bernie$_i$** meni suihkuhuoneeseen ja väänsi veden täysillä valumaan. Mielessään **se$_i$** jo suunnitteli puhettaan koko koirayleisön edessä. **Se$_i$** mietti myös millainen tarinan loppu voisi olla . . . (Kukkanen, p. 50)
'**Bernie$_i$** went into the shower room and turned the water on full. Mentally, **it$_i$** was already planning its speech in from of the whole dog community. **It$_i$** also wondered about how everything would turn out . . . '

Although *se* is the default for referring to Bernie (and other dogs), there are numerous examples of *hän* being used for Bernie inside FID contexts, as in (21b,c) below. However, the default *se* is also used in FID, as in ex.(21d):

(21b) [Context: Tiina's mother had commented on the odd size relation between Bernie, who is very big, and the size of his dog food bag, which is rather small]
Taas **Bernietä$_i$** ihmetytti. Mitä suhdetta siihen tarvittiin? Ei muuta kuin ruoka kuppiin, niin kyllä **hän$_i$** sille suhteita osoittaisi. Suorinta tietä vatsaan ja sillä hyvä (Kukkanen, p. 23)
'**Bernie$_i$** was confused again. What kind of relation did that need? Just put the food in the cup, and **he$_i$** would show it the right kind of relation. Straight to the stomach and that's it.'

(21c) [Context: Bernie has been locked into the kitchen to sleep at night]
Huokaisten **Bernie$_i$** istahti miettimään. Ei ollut ollenkaan mukavaa nukkua yksin keittiössä. Mikä kyökkipiika **hän$_i$** muka oli?! Iso ja komea berninpaimenkoira poika . . . (Kukkanen, p. 35)
'With a sigh, **Bernie$_i$** sat down to think. It was no fun to sleep alone in the kitchen. What kind of scullery maid was **he$_i$**? A big and handsome Bernese mountain dog . . . '

(21d) [Context: Tiina's father and brother find an announcement for a dog that went missing in Lahti, and think that maybe Bernie is that missing dog]
Berniekin$_i$ ihmetteli. Miten ihmeessä **se$_i$** olisi voinut kadota Lahdessa perjantaina, kun **se$_i$** oli poistunut vasta sunnuntaina Koirien Taivaasta? (Kukkanen, p. 40)
'**Bernie$_i$** was surprised too. How on earth could **it$_i$** have disappeared in Lahti on Friday, when **it$_i$** had only left the Dogs' Heaven on Sunday?

In sum, these FID examples are in line with Laitinen's (2002) observations from colloquial Finnish, and show that *hän* can be used logophorically for non-human referents also in standard Finnish.[4] Nevertheless, the fact that *se* is also used in

[4]In addition to being used to refer to SELF in FID and reported thought contexts, it seems that *hän* can also be used for non-human animals in other contexts, at least by some authors. E.g., a

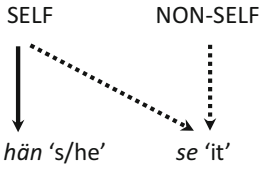

Fig. 4 Interplay of the logophoricity of *hän* and the use of *se* for non-human referents

FID contexts (ex.21d) shows that it is still the default form for non-human animals. So, we have seen that with non-human referents, *se* – which is the default – can be used in non-logophoric as well as in logophoric contexts, but the non-default human pronoun *hän* is only used when referring to SELF, in FID or reported speech contexts. These patterns are illustrated in Fig. 4: The dotted lines show that the default (not due to register, but features of the referent) here is *se*, since we are talking about reference to animals. As before, the solid line illustrates the association between *hän* and SELF, in the same way as in the preceding diagrams. Crucially, the SELF usage of *hän* cannot be attributed to personification, since contexts that involve personification without FID or that are not in the scope of reported speech/thought do not involve use of *hän* (ex.21a).

Put together, the evidence from animal referents provides strong evidence that *hän* is associated with a logophoric/SELF interpretation, as posited in Figs. 2 and 3. One might thus speculate that perhaps *hän* is not associated with [+human] at all but *only* with [+SELF], as this would explain why it can be used to refer to human and non-human SELF referents. However, this cannot be the case, since other evidence shows that *hän* is indeed the default form for human referents in standard Finnish even when they are NON-SELF (ex.13c). Instead, it seems that *hän* is associated with both a [+human] feature and a SELF feature, and that the SELF feature is higher ranked/more influential than the [+human] feature: A [-human] SELF referent can be referred to with *hän* thanks to its SELF status.

9 Conclusions

This paper explores the use of different referential forms in Finnish, where humans can be referred to with three different anaphoric forms, *hän* 'she/he', *se* 'it' and *tämä* 'this'. We took as our starting point the question of what guides the use of *hän* vs. *se*. Even though it may at first glance look like *hän* and *se* change their referential properties depending on whether we are dealing with reported speech or free indirect speech, I argue that the *hän/se* variation can be derived from a basic

children's book by Elina Karjalainen ("Uppo-Nalle ja Setä Tonton") mostly uses *se* when talking about the main characters – teddy bears and other animals – and uses *hän* only very rarely. Based on my analyses so far, Karjalainen's uses of *hän* for animals, however, do not refer to SELF, but are nevertheless related to perspective-taking. This merits further research.

generalization, as long as we take into account (i) the size of the logophoric domain and (ii) the different defaults of standard Finnish and colloquial Finnish. The basic generalization is that *hän* refers to a SELF antecedent (see also Setälä 1883; Kuiri 1984; Laitinen 2002, 2005, inter alia). Furthermore, I show that we do not need to posit an additional association between *se* and NON-SELF (contra Kaiser 2008), because the referential behavior of *se* can be derived from the size of the logophoric domain and the register defaults, as long as we keep in mind the basic observation that free indirect discourse mimics properties of spoken language (i.e., the colloquial register).

I also investigate the relation of *se* to another NON-SELF form, the demonstrative *tämä* 'this', which can also be used anaphorically for human antecedents in Finnish. I conclude that in the presence of multiple NON-SELF referents, the division of labor between *tämä* and *se* depends on the prominence of the antecedent, with *tämä* being used for less prominent antecedents. Thus, to capture the referential properties of the three forms investigated in this paper, we need to consider (i) logophoricity (whether the antecedent is SELF or not), (ii) what the register defaults are, and (iii) how prominent/salient the antecedent is. These findings are in line with the form-specific, multiple-constraints approach proposed by Kaiser and Trueswell (2008), according to which different referring expressions can differ in how sensitive they are to varying kinds of information.

Furthermore, the data regarding reference to non-human animals shows that the association between logophoricity and *hän* is able to 'override' the association between *hän* and human referents: *hän* – typically regarded as the human third person pronoun – can be used for animals, even in the absence of personification, if the animal is conceptualized as the character whose thoughts we are being presented with (SELF). This suggests that in addition to taking into account multiple types of information as mentioned above, the system also needs to be able to reflect the relative ranking/weighting of different kinds of information (e.g., being SELF matters more than being (non)human).

Taken as a whole, the data presented here suggest that the referential properties of different anaphoric forms cannot be reduced to a single factor. Our model of anaphora resolution must be flexible enough to incorporate different kinds of information, including prominence, (non)logophoricity, and register variation.

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Demonstrative Pronouns and Propositional Attitudes

Stefan Hinterwimmer and Peter Bosch

Abstract In this paper we take a close look at the behaviour of German demonstrative pronouns (DPros) in the complement clauses of propositional attitude verbs. Building on and partially revising Hinterwimmer and Bosch (Demonstrative pronouns and perspective. In: Patel P, Patel-Grosz P (eds) The impact of pronominal form on interpretation, Studies in generative grammar. De Gruyter, Berlin/New York, 2016), we show that DPros are anti-logophoric pronouns whose behaviour is similar (though not identical) to that of epithets (Dubinsky and Hamilton, Ling Inq 29:685–693, 1998; Schlenker, Proc SuB 9:385–416, 2005; Patel-Grosz, Epithets as De re pronouns. In: Piñón C (ed) Empirical issues in syntax and semantics 10, 2014). In particular, we argue that while Hinterwimmer and Bosch (Demonstrative pronouns and perspective. In: Patel P, Patel-Grosz P (eds) The impact of pronominal form on interpretation, Studies in generative grammar. De Gruyter, Berlin/New York, 2016) were right in assuming that DPros are prohibited from being bound by or co-referring with the currently most prominent perspective holder, they were wrong in assuming that the subjects of propositional attitude verbs are necessarily the most prominent perspective holders with respect to the DPros contained in their complement clauses. Evidence for this comes from two sources: First, in cases where a sentence with a propositional attitude verb is the complement of another propositional attitude verb in the matrix clause, a DPro contained in the complement clause of the lower propositional attitude verb can be bound by the subject of that verb, but not by the subject of the higher one. Secondly, if the speaker makes her own perspective particularly prominent by using an evaluative expression in referring to (the individual denoted by) the subject of a propositional attitude verb α, a DPro contained in the complement clause of α can at least for some speakers be interpreted as bound by the subject of α. We therefore now propose a pragmatic strategy that determines the most prominent perspective holder not only for the novel data discussed in this paper, but also for the data discussed

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in Hinterwimmer and Bosch (Demonstrative pronouns and perspective. In: Patel P, Patel-Grosz P (eds) The impact of pronominal form on interpretation, Studies in generative grammar. De Gruyter, Berlin/New York, 2016). Finally, we argue that the allergy of DPros against (maximally prominent) perspective holders is related to their status as demonstrative items which as such require an external reference point.

1 Introduction

In this paper we take a close look at the binding options of German demonstrative pronouns (henceforth: DPros) of the *der/die/das* series that are contained in the complement clauses of propositional attitude verbs. In contrast to personal pronouns (henceforth: PPros), they cannot be interpreted as being bound by the subject of the propositional attitude verb in sentences like (1a,b), but only as referring to some other contextually salient individual. If no such individual is available, the respective sentence is perceived as deviant.

(1) a. Peter$_i$ glaubt, dass {er$_i$/der$_{j\neq i}$} klug ist.
Peter believes that he{PPro/DPro}MASC.NOM.SING smart is
Peter$_i$ believes that he {PPro$_i$/DPro$_{j\neq i}$} is smart.

b. [Jeder Mann]$_i$ glaubt, dass {er$_i$/der$_{j\neq i}$}
Every man believes that he {PPro/DPro}MASC.NOM.SING
klug ist.
smart is
[*Every man*]$_i$ *believes that he {PPro$_i$/DPro$_{j\neq i}$} is smart.*

On the basis of such data, Wiltschko (1998) claimed that DPros in contrast to PPros are full referential DPs – more concretely, the spell-out of a DP consisting of an overt definite determiner and a covert NP. As such they are (a) subject to Principle C of Binding Theory (Chomsky 1981), i.e., they cannot not be co-indexed with DPs c-commanding them on the surface, and (b) they cannot be interpreted as variables directly bound by quantificational DPs. Rather, they can only refer to perceptually salient individuals (possibly in combination with a pointing gesture), co-refer with individuals that have been introduced in the previous discourse or be interpreted as donkey pronouns, i.e., pick up individuals that were introduced by an indefinite DP that does not have scope over them because it c-commands them neither on the surface nor at LF.

In Hinterwimmer (2015) it is argued on the basis of novel empirical data that the claim that DPros cannot be interpreted as variables directly bound by quantificational DPs is wrong and has to be replaced by a principle prohibiting them from being interpreted as depending on the most prominent DP available. Crucially, in (potential) binding configurations, prominence is defined in purely structural terms, with grammatical subjects being the structurally most prominent DPs (while in non-binding configurations, prominence is defined in discourse terms,

with topical DPs ending up as the most prominent ones). Accordingly, DPros cannot be bound by grammatical subjects, while nothing prevents them from being bound by direct objects, indirect objects, or DPs contained in prepositional or adverbial phrases (with the latter two occupying a position where they c-command the DPro only at LF, after Quantifier Raising has applied). In addition to that, in Hinterwimmer and Brocher (to appear) experimental evidence is provided which shows that DPros can even be bound by DPs that not only clearly c-command them on the surface, but are even contained in the same finite clause[1]: The possessive form *dessen* of the DPro *der*, can as easily be interpreted as bound by the DP functioning as the indirect object and thus c-commanding it on the surface already (see Grewendorf 2002 and the references cited therein for evidence that indirect objects c-command direct objects in German) as the possessive form *seinen* of the PPro *er*, in sentences like (2):

(2) Martin$_i$ hat {Otto$_j$/[jedem Gast]$_j$} {seinen$_{i,j}$/dessen$_{j,*i}$}
Martin has {Otto/every guest} his {PPro/DPro}MASC.GEN.SING
Lieblingscocktail serviert.
favourite cocktail served
Martin$_i$ served {Otto$_j$/[every guest]$_j$} his {PPro$_{i,j}$/DPro$_{j,*i}$} favourite cocktail.

Finally, in Hinterwimmer and Bosch (2016) the observation that DPros in sentences like (1a, b) cannot be interpreted as bound by the subject of the propositional attitude verb is accounted for in an entirely different way: Novel empirical evidence shows that DPros, contra Bosch and Umbach (2006) and Hinterwimmer (2015), can be interpreted as co-referential with DPs clearly functioning as aboutness topics, but not as coreferential with DPs that refer to agents from whose perspective the event or state introduced by the clause containing the DPro is intuitively understood as being perceived, or agents who function as the authors of a thought whose content the sentence with the DPro expresses in Free Indirect Discourse (Banfield 1982; Doron 1991; Schlenker 2004; Eckardt 2014; Maier 2015). On the basis of this evidence, Hinterwimmer and Bosch (2016) propose that DPros are in effect anti-logophoric pronouns that behave similarly (though not identical; see Sect. 4.2 below for discussion) to epithets (Dubinsky and Hamilton 1998; Schlenker 2005; Patel-Grosz 2014): They are subject to a principle that prohibits them from being identical with the individual functioning as the current Perspectival Centre (PC). This principle is argued to naturally account for data like (1a, b) as well, since the

[1]Hinterwimmer and Brocher (to appear) report the results of a self-paced reading study where subjects had to read sentences (word by word) that contained the possessive versions of either PPros or DPros that (due to the respective gender features) could only be interpreted as either bound by the subject or the (direct or indirect) object. The reading times for sentences where the binders were (direct or indirect) objects were almost identical for the versions with the PPros and DPros, while for sentences where the binders were subjects the versions with the DPros were read significantly slower than the versions with the PPros (cf. also Footnote 4).

subjects of propositional attitude verbs are the PCs for the respective propositional attitude verb's content. Concerning the contrast between PPros and DPros with respect to the option of being bound by grammatical subjects (see (2) above), Hinterwimmer and Bosch (2016) assume that in the absence of any clear indication to the contrary, the individuals denoted by grammatical subjects are taken as PCs by default. When the two notions clearly come apart though, as in (3), where the object of the complex verb *wirken auf* ('give the impression'), Claudia, and not the referent of the grammatical subject, is the experiencer, and the content of the complement clause accordingly expresses the content of a mental state of hers, the DPro can easily be interpreted as bound by the DP functioning as the grammatical subject.

(3) {Paula$_i$ /[Jede von den Musikerinnen]$_i$} wirkte auf Claudia$_j$
{Paula/each of the musicians-FEM.NOM.PL} seemed to Claudia
als würden deren$_i$ Fähigkeiten [ihre eigenen]$_j$ bei
as-if would DPro.fem.gen. abilities her own by
weitem übersteigen.
far surpass
{*Paula$_i$* / [*each of the (female) musicians*]$_i$} *gave Claudia$_j$ the impression that her$_i$ [DPro] abilities would surpass her$_j$ own [PPro] by far.*

We now want to show that it is not strictly speaking true that DPros cannot be bound by the subjects of propositional attitude verbs like *glauben* ('believe'). The account of Hinterwimmer and Bosch (2016) thus must be modified and refined accordingly. First, in cases where a sentence with a propositional attitude verb is the complement of another propositional attitude verb in the matrix clause, a DPro contained in the complement clause of the lower propositional attitude verb can be bound by the subject of that verb, but not by the subject of the higher one. Secondly, if speakers push their own perspective into the foreground by using an evaluative expression in referring to the individual denoted by the subject of a propositional attitude verb α, a DPro contained in the complement clause of α can, at least for some informants, be interpreted as bound by the subject of α. In order to account for these new observations, as well as for the data discussed in Hinterwimmer and Bosch (2016), we argue that what counts as the relevant PC with respect to a DPro is determined by a resolution strategy that favours hierarchically superordinate DPs to subordinate ones and agents that are singled out as PCs by being the authors of secondary, fictional, contexts whose introduction is enforced by the presence of linguistic indicators to other agents that are the author of the only implicitly present external context.

While avoidance of the most prominent PC is understood in this paper, for simplicity's sake, as hard-wired in the lexical entry of DPros, it is quite likely that this property of DPros is non-accidentally related to their status as demonstrative

items.[2] The primary function of demonstratives is to direct the addressee's attention to an entity that is in the shared visual field of speaker and hearer – often, but not necessarily by pointing (see Bosch and Hinterwimmer 2016 and the references cited there for further discussion). In our view, there are two ways in which PC-avoidance can plausibly be related to this function. First, since individuals presumably have to be highly prominent in a discourse in order to function as PCs, using a demonstrative to refer to them would be very uneconomical – what reason should there be to direct the addressee's attention to an individual that is already at the centre of her attention anyway? Secondly, it intuitively makes little sense to direct the addressee's attention to an individual that functions as a reference point itself insofar as the content of the sentence containing the demonstrative is evaluated from the perspective of that individual.

The paper is structured as follows. In Sect. 2, we present the crucial empirical evidence against the claim the DPros can never be bound by the subjects of propositional attitude verbs. In Sect. 3.1, we briefly review the data that motivated the informal account of Hinterwimmer and Bosch (2016) and its basic assumptions. In Sect. 3.2, we first give a formal implementation of the analysis informally sketched in Hinterwimmer and Bosch (2016) and then show why it does not capture the data introduced in Sect. 2. In Sect. 3.3, a modified formal account is developed and shown to account for the full range of relevant data. In Sect. 4, some open questions and remaining problems are addressed and our account of DPros is compared to a recent proposal by Patel-Grosz and Grosz (2017). Finally we take up the issue of how DPros, which are lexically specified as avoiding the most prominent PCs, are related to logophoric pronouns, which are lexically specified as requiring PCs as their binders (see Sundaresan 2012; Pearson 2013, 2015 for detailed discussion and references), on the one hand, and epithets, which have been claimed to be anti-logophoric pronouns (Dubinsky and Hamilton 1998; Patel-Grosz 2014), on the other.

2 New Data

Recall from Sect. 1 that in sentences like (1a, b) or (4a, b), the DPro contained in the complement clause of the propositional attitude verb in contrast to the PPro cannot be interpreted as bound by the subject, but only as referring to some other contextually salient male[3] individual.

[2]We thank one of the anonymous reviewers for urging us to make a connection between our analysis and the general properties of demonstratives in the paper and for offering suggestions as to how it could be stated.

[3]It is a simplification to speak of a "male" individual, correct only when the referent is conceptualized as a human or at least an animate. Properly speaking, pronoun gender in German is determined by the *gender* of the relevant (possibly not explicitly mentioned) descriptive noun. Also in the case of inanimate referents, the relevant noun may be of masculine or feminine gender –

(4) a. Peter$_i$ glaubt, {er$_{i,j,}$/der$_{j\neq i}$} könne besser Schach
Peter believes he DPro.MASC.NOM.SING could better chess
spielen als Maria.
play than Maria
Peter$_i$ believes he {PPro$_{i,j}$/DPro$_{j\neq i}$} could play chess better than Maria.

b. [Jeder von Marias$_j$ Kollegen]$_i$ glaubt, {er$_{i,k}$/der$_{k\neq i}$}
Every of Maria's colleagues believes he{PPro/DPro}MASC.NOM.SING
könne besser Schach spielen als sie$_j$.
could better chess play than she
[Every colleague of Maria's$_j$]$_i$ believes he {PPro$_{i,k}$/DPro$_{k\neq i}$} play chess better than her$_j$.

The same holds for the variants in (5a, b), which contain the possessive variants of the DPro *der* and the PPro *er* in the respective complement clauses.

(5) a. Peter$_i$ glaubt, {seine$_{i,\,j}$/dessen$_{j\neq i}$} Tochter sei
Peter believes his {PPro/DPro}MASC.GEN.SING daughter was
klüger als Marias.
smarter than Maria's
Peter$_i$ believes his {PPro$_{i,j}$/DPro$_{j\neq i}$} daughter was smarter than Maria's.

b. [Jeder von Marias$_j$ Kollegen]$_i$ glaubt, {seine$_{i,k}$/dessen$_{k\neq i}$}
Every of Maria's colleagues believes his {PPro/DPro}MASC.GEN.SING
Tochter sei klüger als ihre$_j$.
daughter was smarter than hers
[Every colleague of Maria's$_j$]$_i$ believes his {PPro$_{i,k}$/DPro$_{k\neq i}$} daughter was smarter than hers$_j$.

But if we now turn (slightly modified variants of) the sentences into complement clauses of another propositional attitude verb, as in (6a, b) and (7a, b), the picture

Tisch (table) is masculine, for example, and a definite DP such as *der Tisch* (the table) can thus only be picked up by a masculine pronoun (not by a neuter or feminine one), although the relevant referent is certainly neither male nor in any sense conceptualized as male. We permit ourselves this simplification throughout this paper because all data considered are limited to referents that are humans.

changes: For the authors of this paper as well as for many of the speakers they consulted, a bound reading of the DPro becomes available in all four sentences. For some speakers, in contrast, the DPros in (6a, b) still do not allow bound readings, while the possessive variants in (7a, b) do.[4]

(6) a. Maria$_i$ behauptet, dass Peter$_j$ glaubt, {er$_j$/der$_j$} könne
Maria claims that Peter believes he {PPro/DPro} could
besser Schach spielen als sie$_i$.
better chess play than she
Maria$_i$ claims that Peter$_j$ believes he {PPro$_j$/DPro$_j$} could play chess better than her$_i$.

b. Maria$_i$ behauptet, dass [jeder von ihren$_i$ Kollegen]$_j$ glaubt,
Maria claims that everyone of her colleagues believes
{er$_j$/der$_j$} könne besser Schach spielen als sie$_i$.
he {PPro/DPro} could better chess play than she
Maria$_i$ claims that [every colleague of hers$_i$]$_j$ believes he {PPro$_j$/DPro$_j$} could play chess better than her$_i$.

(7) a. Maria$_i$ behauptet, dass Peter$_j$ glaubt, {seine$_j$/dessen$_j$} Tochter
Maria claims that Peter believes his {PPro/DPro} daughter
sei klüger als ihre$_i$.
was smarter than hers
Maria$_i$ claims that Peter$_j$ believes his {PPro$_j$/DPro$_j$} daughter was smarter than hers$_i$.

b. Maria$_i$ behauptet, dass [jeder von ihren$_i$ Kollegen]$_j$ glaubt,
Maria claims that every of her colleagues believes
{seine$_j$/dessen$_j$} Tochter sei klüger als ihre$_i$.
his {PPro/DPro} daughter was smarter than hers.
Maria$_i$ claims that [every colleague of hers$_i$]$_j$ believes his {PPro$_j$/DPro$_j$} daughter was smarter than hers$_i$.

[4]Hinterwimmer and Brocher (to appear) report a self-paced reading study where the reading times of sentences like (7) are compared with those of sentences like (9). For cases like (7), there is no big difference between the versions with the DPro and the ones with the PPro, while for cases like (9) the versions with the DPro are read slower than the ones with the PPro.

Crucially, the DPros in the most deeply embedded clause can only be interpreted as bound by the subject of the sentence that is the complement of the propositional attitude verb in the matrix clause, not by the subject of the matrix clause:

(8) a. Maria$_{i}$ behauptet, dass Peter$_{j}$ glaubt, {sie$_{i}$/die$_{k\neq i}$} könne
Maria claims that Peter believes she {PPro/DPro} could
besser Schach spielen als er$_{j}$.
better chess play than he
Maria$_i$ claims that Peter$_{j}$ believes she {PPro$_i$/DPro$_{k\neq i}$} could play chess better than him$_j$.

b. Maria$_{i}$ behauptet, dass [jeder von ihren$_{i}$ Kollegen]$_{j}$ glaubt,
Maria claims that every of her colleagues believes
{sie$_{i}$/die$_{k\neq i}$} könne besser Schach spielen als er$_{j}$.
she {PPro/DPro} could better chess play than he
Maria$_i$ claims that [*every colleague of hers$_i$*]$_{j}$ *believes she {PPro$_i$/DPro$_{k\neq i}$} could play chess better than him$_j$.*

(9) a. Maria$_{i}$ behauptet, dass Peter$_{j}$ glaubt, {ihre$_{i}$/deren$_{k\neq i}$} Tochter
Maria claims that Peter believes her {PPro/DPro} daughter
sei klüger als seine$_{j}$.
was smarter than his
Maria$_i$ claims that Peter$_{j}$ believes that her {PPro$_i$/DPro$_{k\neq i}$} daughter is smarter than his$_j$.

b. Maria$_{i}$ behauptet, dass [jeder von ihren$_{i}$ Kollegen]$_{j}$ glaubt,
Maria claims that every of her colleagues believes
{ihre$_{i}$/deren$_{k\neq i}$} Tochter sei klüger als seine$_{j}$.
her {PPro/DPro} daughter was smarter than his
Maria$_i$ claims that [*every colleague of hers$_i$*]$_{j}$ *believes that her {PPro$_i$/DPro$_{k\neq i}$} daughter is smarter than his$_j$.*

It is thus not simply the presence of a higher propositional attitude verb which allows DPros contained in the complement clauses of propositional attitude verbs to receive bound readings. While we do not have an explanation for the fact that for some speakers only the possessive versions of DPros allow for bound readings in the configuration under discussion, the contrast between the binding options of the matrix subject and the subject of the sentence that is the complement of the matrix verb will be crucial for the account that we propose in Sect. 3.

Before we turn to a second factor that makes available bound readings for DPros contained in the complement clauses of propositional attitude verbs, we would like to point out that the issue under discussion is orthogonal to the contrast between *de se* and *de re* readings of pronouns (Kaplan 1968; Lewis 1979). A pronoun in a sentence like (10a) is interpreted *de se* if a special relation holds between the thought whose content is expressed by the embedded clause and the individual thinking it (i.e., the subject of the propositional attitude verb): The latter must be prepared to refer to herself with a first person pronoun if she were asked to report the content of her thought. Accordingly the sentence in (10a) is only true on its *de se* reading if Peter would be prepared to utter the sentence in (10b) if he were asked to report the content of the thought of his corresponding to the embedded clause in (10b).

(10) a. Peter believes that he is smart.
b. I am smart.

Now consider the following scenario: Peter, a famous philosopher, is listening to an interview he gave some weeks ago on the radio in his hotel room at night. He is so drunk that he does not recognize his own voice, but since he is deeply impressed by the arguments of the guy on the radio who he assumes to be some brilliant philosopher that is inexplicably unknown to him, he says to himself: "That guy is smart". In such a situation, the sentence in (10a) is intuitively true since the complement clause in (10a) is a faithful representation of Peter's thought. Still, Peter would not be prepared to utter the sentence in (10b) if he were asked to report the content of that thought. Consequently, the sentence in (10a) is false on its *de se* reading in the sketched scenario. It must therefore have a second reading, which is called *de re*. English personal pronouns are obviously not sensitive to the contrast between *de se* and *de re* readings, but there arguably is a covert pronoun in English, PRO, which is assumed to occupy the subject position of infinitival clauses or gerunds, and which only allows a *de se* reading if it is contained in the complement clause of a propositional attitude verb (Morgan 1970; Chierchia 1990): The sentence in (11) would only be true if Peter were prepared to report the content of his thought by uttering the sentence in (10b), but false in the hotel room scenario where he does not recognize his own voice.

(11) Peter believes to be smart.

Secondly, there are many languages (Clements 1975; Kuno 1987; Sells 1987; Sundaresan 2012; Pearson 2013, 2015; Nishigauchi 2014) that have a special pronoun type, so-called *logophoric pronouns*, which can only be used in clauses expressing the content of some salient individual's mental states or speech acts or describing events or states as perceived from such an individual's perspective. Until recently, logophoric pronouns contained in propositional attitude reports have

universally been assumed to only allow for *de se* readings, but Pearson (2013, 2015) has shown convincingly that at least in Ewe they are compatible with *de re* readings as well – a point to which we will return in Sect. 4. But for the moment, let us just see if the behaviour of DPros contained in propositional attitude verbs is related to the *de re* – *de se* distinction. As it turns out, this is not the case: First, the variant of (1a) with the DPro interpreted as bound by the subject, repeated here as (12), is unacceptable even if it is uttered in the scenario sketched above, in which (10a) is true on a *de re* reading, but false on a *de se* reading. Similarly, the DPros in (8) and (9) disallow bound *de re* as well as *de se* readings.

(12) Peter$_i$ glaubt, dass {er$_i$/der$_{j\neq i}$} klug ist.
Peter believes that he {PPro/DPro}MASC.NOM.SING smart is
Peter$_i$ believes that he {PPro$_i$/DPro$_{j\neq i}$} is smart.

Secondly, the DPros in the sentences in (6) and (7) on their bound readings are most naturally understood *de se*, just like the PPros. This shows that DPros are at least not anti-logophoric in the naïve sense of obligatorily being construed *de re*. We will return to the relation between logophoric pronouns and DPros in Sect. 4.

Let us now turn to the second factor that makes available bound readings for DPros contained in the complement clauses of propositional attitude verbs. As pointed out by Patel-Grosz and Grosz (2017, Footnote 24) by citing the naturally occurring example in (13), such DPros can be interpreted as bound by the subject of the matrix clause if the latter is a DPro itself. Likewise, DPros can be bound by subject DPs whose NPs are or contain evaluative expressions, as shown in (14a). The extent to which this carries over to quantificational DPs varies among speakers – while for the two authors of this paper and some of the speakers they consulted sentences like (14b) sound quite good, they are perceived as odd by some others. Clearly, more empirical work is required to settle the issue.

(13) Der$_1$ glaubt, der$_1$ kann das
DPro.MASC.NOM.SING believes DPro.MASC.NOM.SING can that
alles – dem$_1$ zeige ich's jetzt.[5]
everything DPro.masc.dat.sing show I-it-CL now
He {DPro$_i$} believes that he {DPro$_i$} can do all of that – I'll show him {DPro$_i$}.

[5] http://www.akademie-fuer-ganzheitsmedizin.de/heilpraktiker-pruefungsprotokoll.php

(14) a. Otto$_i$ ist wirklich unglaublich blöd. [Dieser Idiot]$_i$ glaubt,
Otto is really incredibly stupid This idiot believes
der$_i$ kann mich öffentlich beleidigen und
DPro.MASC.NOM.SING can me in-public insult and
sich dann Geld von mir ausleihen.
himself then money from me borrow
Otto$_i$ is really incredibly stupid. [*This idiot*]$_i$ *believes that he* {*DPro$_i$*}
can insult me in public and then borrow money from me.

b. Meine neuen Kollegen sind alle fürchterlich arrogant.
My new colleagues are all terribly arrogant
(?)[Jeder von diesen Angebern]$_i$ glaubt, der$_i$
Every of these show-offs believes DPro.MASC.NOM.SING
sei der Schlaueste.
was the smartest
My new colleagues are all terribly arrogant. [*Everyone of these*
show-offs]$_i$ *believes that he* {*DPro$_i$*} *ist he smartest.*

We believe that the factors exemplified by (13) and the ones exemplified by (14a) are related: We will argue in Sect. 3.2 that the fact that the speaker is able to use a DPro in referring to the individual under discussion in a sentence like (13) indicates that this individual is evaluated by the speaker, and that it is the saliency of the speaker's perspective which makes subject binding of the respective DPro available in sentences like (13) and (14a), and at least for some speakers, also in (14b).

Let us summarize the results of this section: We have seen that the ban against bound readings of DPros contained in the complement clauses of propositional attitude verbs is not as strict as has been assumed in previous research. There are at least two factors that make such readings in principle available (although native speakers' judgements are not as clear as one might wish): First, if the entire sentence is turned into the complement of another propositional attitude verb, the respective DPro can be interpreted as bound by the subject of the clause that is the complement of the matrix propositional attitude verb, but not by the matrix subject. Secondly, DPros can be bound by subjects that are DPros themselves or contain clearly evaluative expressions (at least if they are referential expressions – for quantifiers, the data are less clear). In Sect. 3.3 we will argue for a unified account of these observations, which builds on the analysis of Hinterwimmer and Bosch (2016). But let us first sketch the motivation for this account and its main assumptions in Sect. 3.1, and then propose a formal implementation in Sect. 3.2.

3 The Analysis

3.1 The Account of Hinterwimmer and Bosch (2016)

Hinterwimmer and Bosch (2016) observe that there are many counterexamples against the assumption argued for in Bosch and Umbach (2006) and Hinterwimmer (2015) on the basis of examples like (15) that DPros cannot be interpreted as co-referential with individuals functioning as discourse or aboutness topics (see the two papers for evidence that it is actually topicality, not grammatical subjecthood which is decisive). In (15) the DPro, in contrast to the PPro, can only be interpreted as picking up Peter, but not as picking up the individual presumably functioning as the topic, Paul.[6]

(15) Paul$_i$ wollte mit Peter$_j$ laufen gehen. Aber
Paul wanted with Peter run go But
{er$_{i,j}$/der$_j$} war leider erkältet.
he {PPro/DPro} was unfortunately with-a-cold
Paul$_i$ wanted to go running with Peter$_j$. But he {PPro$_{i,j}$/DPro$_j$} had a cold unfortunately. (from Bosch et al. 2003)

But now consider the examples in (16): In both (16a) and (16b) the DPro can easily be interpreted as co-referential with Otto, in spite of the fact that Otto has clearly been marked as the topic of the following discourse segment by the respective initial sentence.

(16) a. Lass uns mal über Otto$_i$ reden. Otto$_i$ ist der fähigste Verkäufer, den ich kenne.
Let's talk about Otto$_i$. Otto$_i$ ist he most gifted salesman I know.
{Der$_i$ /Er$_i$} könnte sogar einem Blinden
He {DPro/PPro} could even [a blind]MASC.DAT.SING
einen HD-Fernseher verkaufen.
[an HD TVset] NEUT.ACC.SING sell
He {DPro$_i$/PPro$_i$} could even sell an HD TV set to a blind man.

[6]We thank an anonymous reviewer for pointing out that exactly the same contrast as in (15) holds in Russian between the personal pronoun "on" and the demonstrative "tot":

(i) Pasha$_i$ hotel pojti begat' s Petej$_j$ no u {nego$_{i,j}$/togo$_j$}
Paul wanted go run with Peter.GEN but at {PPro/DPro}GEN
byla prostuda.
was cold

b. Was Otto$_i$ betrifft, den$_i$ mochte Karin$_j$
What Otto concerns DPro.MASC.ACC.SING liked Karin
noch nie. {Der$_i$/Er$_i$} hat sie$_j$ schon als Kind
PART never He {DPro/PPro} has her already as child
immer geärgert.
always teased
As for Otto$_i$, Karin$_j$ never liked him$_i$[DPro$_i$]. He {DPro$_i$/PPro$_i$} already always teased her as a child.
(from Hinterwimmer and Bosch 2016)

At the same time, the contrast between (17a, b) on the one hand, and (17c) on the other, in the context provided by the opening sentence in (17), shows that it is not the case that whenever there is no choice among potential antecedents, DPros are free to pick up the only available potential antecedent, irrespective of its status as a topic.

(17) Als Peter$_i$ abends nach Hause kam, war die Wohnung wieder in einem fürchterlichen Zustand.
When Peter$_i$ came home in the evening, the flat was in a terrible state again.

a. {Der$_{j\neq i}$/Er$_i$} musste erst mal drei Stunden putzen.
{DPro/PPro} must first PART three hours clean
He {DPro$_{j\neq i}$/PPro$_i$} first had to clean for three hours.

b. {Der$_{j\neq i}$ /Er$_i$} hatte doch gestern erst aufgeräumt.
{DPro/PPro} had part yesterday part cleaned-up
{DPro$_{j\neq i}$/PPro$_i$} had only tidied up yesterday, after all.

c. {Der$_i$/Er$_i$} kann sich einfach nicht gegen seinen
{DPro/PPro} can himself simply not against his
Mitbewohner durchsetzen.
flatmate stand-his-ground
He {DPro$_i$/PPro$_i$} is simply unable to stand his ground against his flatmate.
(from Hinterwimmer and Bosch 2016)

Hinterwimmer and Bosch (2016) propose the following account of the pattern exemplified by (17): While Peter has been established as the topic of the following discourse segment with respect to all three continuations in (17), it is only in (17a) and (17b), but not in (17c), that the content of the respective sentence is plausibly

understood as expressing a thought of Peter's. Let us start with the contrast between (17b) and (17c), which is particularly clear: First, (17b) contains the speech act particle *doch*. *Doch p* (very roughly) expresses the speaker's surprise that *p* and some contextually salient proposition *q* are both true at the same time (where in our case *q* is most likely the proposition denoted by the opening sentence of (17)). Now, it is extremely implausible that the abstract narrator in (17b) is surprised about the events reported by herself. It is much more natural to attribute such a feeling to the main protagonist, Peter, whose expectations concerning the state of his flat can plausibly be assumed to conflict with the flat's actual state. Similarly, the temporal adverbial *gestern* ('yesterday') is most likely interpreted not with respect to the narrator's context, but rather with respect to the context in which Peter is located (i.e. the situation introduced in the opening sentence). The continuation in (17b) can thus plausibly be considered as an instance of *Free Indirect Discourse* (henceforth: FID), which is a mixture of *Direct Discourse* (henceforth: DD) and *Indirect Discourse* (henceforth: ID): On the one hand, elements such as *tense marking* and *personal pronouns* are interpreted with respect to the narrator's context. On the other hand, items such as *temporal adverbs* and *speech act particles* that are normally tied to the utterance context (i.e., to the speaker and the time of utterance respectively) are interpreted with respect to some salient protagonist's (fictional) context (see Doron 1991; Schlenker 2004; Sharvit 2008; Eckardt 2014 and Sect. 3.2 below). In the case of (17b), the author of the fictional context with respect to which the speech act particle *doch* and the temporal adverbial *gestern* are interpreted, is Peter. Peter is thus the PC with respect to the proposition denoted by (17b). The continuation in (17c), in contrast, clearly expresses an evaluation of Peter's character in the light of the state of affairs reported by the opening sentence that is made from the narrator's perspective, as is made evident by the content in combination with the switch from past tense to present tense. Accordingly the narrator is the PC in (17c).

Finally, although the continuation in (17a) is not such a clear instance of FID as the one in (17b), Peter is still most likely construed as the PC in (17a): First, both the deontic modal verb *musste* ('had to') and the speech act particles *erst* and *mal* are easily understood as relating to Peter's views, i.e., it is he himself who is the source of the obligation to clean his room before he can do anything else. Secondly, in contrast to (17c), (17a) does not contain any indication of an involved narrator bringing his or her own views or evaluations into play. The crucial observation is thus that in (17a, b), where Peter is not only the discourse topic, but also the PC, the DPro cannot be used to refer to him, while in (17c), where he is only the discourse topic, it can.

Concerning the discourses in (16a, b), it is quite obvious that they express statements and evaluations that are made from the speaker's perspective, not from the perspective of the respective discourse topic, Otto. The observation that the DPro

can in both cases be used to refer to him thus fits the pattern, and the following generalization suggests itself: DPros cannot be used to refer to individuals that are the PCs with respect to the propositions denoted by the sentences containing them. It is only when discourse topics coincide with PCs, which often happens in narrative structures, that DPros cannot be used to refer to them. Hence the observation that the DPro in a case like (15) cannot be used to refer to the discourse topic, Paul, is taken as an indication that he is the PC as well.

The assumption that this idea about the role of PC is on the right track is supported also by the following observation regarding our earlier example (15). In (18), where the original final sentence from (15) with the DPro has been replaced by a sentence that clearly expresses the speaker's/narrator's view (analogously to (17c)), the DPro can easily be understood as picking up Paul.

(18) Paul$_i$ wollte mit Peter$_j$ laufen gehen. {Er$_{i,j}$/Der$_{i,j}$}
Paul wanted with Peter run go {PPro/DPro}
sucht sich immer Leute als Trainingspartner aus,
searches himself always people as straining partner
die nicht richtig fit sind.
out who not really fit are
Paul$_i$ wanted to go running with Peter$_j$. He {DPro$_j$/PPro$_j$} always picks people as training partners who are not really fit.
(from Hinterwimmer and Bosch 2016).

Finally, Hinterwimmer and Bosch (2016), who are not yet taking into account the new data discussed in Sect. 2, but are simply assuming (on the basis of examples like (1) and (4) above) that DPros contained in the complement clauses of propositional attitude verbs can never be interpreted as bound by the subjects of those verbs, informally suggest an extension of the anti-PC constraint to propositional attitude verbs along the following lines: DPros cannot be interpreted as bound by the subjects of propositional attitude verbs because propositional attitude verbs quantify over contexts compatible with the respective subject's beliefs/claims etc. (Schlenker 2003). On such an analysis the subjects of propositional attitude verbs are perspective holders in the same sense as the authors of the fictional contexts in FID. Note, however, that even if one sticks with a more conservative and less controversial analysis of propositional attitude verbs as quantifiers over possible worlds (Hintikka 1969), the subjects of those verbs still are perspective holders with respect to the proposition denoted by the respective complement clause in a very intuitive sense: After all, those propositions are subsets of the sets of worlds compatible with and thus representing the subject's beliefs/claims etc.

In Sect. 3.2 we will propose a formal implementation of the informal account just sketched, which serves as a basis for the final analysis to be proposed in Sect. 3.3. But let us first address an issue that might be the source of misunderstandings: Neither the account just sketched and further developed in the next section nor the account proposed in Sect. 3.3 are meant to capture the complete distribution of DPros. As argued in detail in Hinterwimmer and Bosch (2016), since DPros are presumably the marked pronoun variant in German, while PPros are the unmarked one, it is to be expected that in cases where there are two potential antecedents none of which is the PC, DPros are employed to pick up the one that is less prominent with respect to the categories topicality (in non-binding configurations) and subjecthood (for binding configurations). The only difference to the analysis in Hinterwimmer (2015) concerning such cases is thus that subject avoidance and topic avoidance no longer follow from a lexical presupposition of DPros, but rather from a basic pragmatic mechanism that as such can be violated (evidence that this is indeed the case is provided in Hinterwimmer and Bosch 2016). Still, there remain important differences to the analysis proposed by Patel-Grosz and Grosz (2017), whose aim is to derive the complete distribution of DPros from a general pragmatic constraint, as we shall see in Sect. 4.

3.2 A Formal Implementation of Hinterwimmer and Bosch (2016)

Although Hinterwimmer and Bosch (2016) do not provide a formal implementation of their analysis, the most straightforward way of doing so would be to stick with the analysis of DPros as definite descriptions consisting of an overt determiner and a covert NP assumed in Hinterwimmer (2015) (following the analysis of pronouns as definite descriptions in disguise argued for in Elbourne 2005), but replace the condition effectively prohibiting the individuals they denote from being identical with the currently most prominent entity (defined in terms of grammatical subjecthood in potential binding configurations and with topicality otherwise) by one prohibiting them from being identical with the current PC. The notion of PC could then simply be equated with the notion of being the author of a context $\boldsymbol{c}$, where $\boldsymbol{c}$ is a meta-variable ranging over the fictional contexts introduced in FID, the ones quantified over by propositional attitude verbs and the context of the respective speaker or narrator, C.

The only difference between PPros and DPros would then be that DPros are prohibited from being identical with the author of $\boldsymbol{c}$, where the value of $\boldsymbol{c}$ is determined according to a strategy that can informally be stated as follows: Whenever there is a perspective holder different from the speaker or narrator, $\boldsymbol{c}$ is resolved to the context representing the perspective of that individual. If the speaker or narrator is the only perspective holder, in contrast, $\boldsymbol{c}$ is resolved to the

speaker's or narrator's context. Concerning the fact that neither PPros nor DPros in standard cases can be interpreted as being identical with either the speaker or the addressee, we follow Schlenker (2003), Heim (2008) and Sauerland (2008) in assuming that this is not encoded as a lexical presupposition, but rather follows from the general pragmatic principle *Maximize Presupposition*! (Heim 1991): Since there are pronoun variants which are presuppositionally stronger (i.e. presuppose more) insofar as they presuppose identity with the speaker or the addressee – namely first and second person pronouns – , the speaker would in standard cases (but see the references above for exceptions concerning PPros) violate *Maximizie Presupposition*! if she used a (third person) PPro or DPro to refer to either the speaker or the addressee. Consequently, (third person) PPros and DPros are standardly automatically interpreted as being distinct from either the speaker or the addressee.

Attractive as the approach just sketched might seem, we will not pursue it. Instead we will suggest a slightly different implementation which does not rely on an analysis of propositional attitude verbs as quantifiers over contexts (Schlenker 2003), but rather on the more conservative assumption that they are quantifiers over possible worlds (Hintikka 1969). The reasons for this will be spelled out below, when we turn to a detailed discussion of sentences with propositional attitude verbs, but let us already mention the most important one: There is very little empirical evidence that context shifting occurs in the complement clauses of propositional attitude verbs in languages like German and English, since the vast majority of context-sensitive expressions that can be shifted in FID cannot be shifted in indirect discourse.

Our implementation therefore relies on the assumption that the subjects of propositional attitude verbs are PCs with respect to the propositions denoted by the respective complement clauses since those propositions are required to be subsets of the sets of worlds representing the subject's beliefs, claims etc. Let us call the individual denoted by the subject of a propositional attitude verb the *anchor* of the set of worlds representing his/her beliefs or claims for convenience (see (19d) below). Sticking with the assumption that the individuals denoted by DPros are not just prohibited from being identical with the author of the respective utterance context, but also with any individual functioning as a perspective holder with respect to the proposition denoted by the clause containing the DPro, we get the lexical entry for the DPro *der* given in (19c) and (19d) for the result of applying *der* to a covert pronoun introducing a free situation variable and a covert pronoun introducing a free variable ranging over predicates. The entry for the PPro *er* is given in (19a) for comparison, as well as the result of applying *er* to the two parallel covert pronouns in (19b). Note that all predicates are assumed to be relativized with respect to situations or possible worlds (the latter being maximal situations, i.e. situations that are not proper parts of any other situations; see Kratzer 1989), i.e. they are of type $<e,<s,t>>$.

(19) a. $[[\text{er}]]^{g,C} = \lambda s.\ \lambda P_{<e,<s,t>>}: \exists!x[\text{male}(x)(s) \wedge P(x)(s)]_{\cdot}$
$\iota\{x: \text{male}(x)(s) \wedge P(x)(s)\}$.

b. $[[\ [\text{er}_{sn}\ \text{NP}_m]\ ]]^{g,C} = \iota\{x: \text{male}(x)(g(s_n)) \wedge g(P_m)(x)(g(s_n))\}$.

c. $[[\text{der}]]^{g,C} = \lambda s.\ \lambda P_{<e,<s,t>>}: \exists!x[\text{male}(x)(s) \wedge P(x)(s)$
$\wedge\ \text{distinct\_from}(x)(g(\alpha))(s)]_{\cdot}$
$\iota\{x: \text{male}(x)(s) \wedge P(x)(s) \wedge \text{distinct\_from}(x)(g(\alpha))(s)\}$.

d. $[[\ [\text{der}_{sn}\ \text{NP}_m]\ ]]^{g,C} = \iota\{x: \text{male}(x)(g(s_n)) \wedge g(P_m)(x)(g(s_n))$
$\wedge\ \text{distinct\_from}(x)(g(\alpha))(g(s_n))\}$,

where g is the assignment function, C is the context of utterance, P_m is a free predicate variable bearing the index m, s_n is a free situation/world variable bearing the index n, and α is a variable ranging over individuals whose value, $g(\alpha)$, is determined in accordance with the strategy outlined in (i) – (iii).

i. If $[\text{der}_{sn}\ \text{NP}_m]$ is c-commanded by a constituent at LF that denotes a quantifier over a set of worlds whose anchor is an individual β, $g(\alpha) = \beta$, $[[\ [\text{der}_{sn}\ \text{NP}_m]\ ]]^{g,C,c} = \iota\{x: \text{male}(x)(g(s_n)) \wedge g(P_m)(x)(g(s_n))$
$\wedge\ \text{distinct\_from}(x)(\beta)(g(s_n))\}$.

ii. If $[\text{der}_{sn}\ \text{NP}_m]$ is part of a constituent that is interpreted not only with respect to a context C, but also with respect to a second context c, $g(\alpha) = \textit{author}(c)$, i.e., $[[[\text{der}_{sn}\ \text{NP}_m]\ ]]^{g,C,c} = \iota\{x: \text{male}(x)(g(s_n)) \wedge g(P_m)(x)(g(s_n)) \wedge \text{distinct\_from}(x)(\text{author}(c))(g(s_n))\}$.

iii. If neither (i) nor (ii) applies, $g(\alpha) = \textit{author}(C)$, i.e. $[[\ [\text{der}_{sn}\ \text{NP}_m]\ ]]^{g,C} = [[\ [\text{er}_{sn}\ \text{NP}_m]\ ]]^{g,C} = \iota\{x: \text{male}(x)(g(s_n)) \wedge g(P_m)(x)(g(s_n)$
$\wedge\ \text{distinct\_from}(x)(\text{author}(C))(g(s_n))\}$.

Let us now go through some of the examples discussed in Sect. 3.1 that motivated the analysis of DPros on which the lexical entry in (19b) is based. But first some clarification concerning the two conditions (i) and (ii) in (19d) is in order. Let us start with the second condition, i.e., the case where the DPro is part of a constituent that is interpreted with respect to a second context c, and turn to the first case later, when we discuss the examples with propositional attitude verbs. The introduction of c is motivated by the observation that in FID all context-sensitive expressions apart from first and second person pronouns and tenses are interpreted not with respect to the context of the narrator, but the (fictional) context of some salient fictional protagonist (Banfield 1982; Doron 1991; Schlenker 2004; Eckardt 2014). Consider the sentence in (20) for illustration.

(20) Tomorrow was Monday, Monday, the beginning of another school week! (Lawrence, Women in Love, p. 185, London, Heinemann 1971; cited in Banfield 1982, Doron 1991, and Schlenker 2004).

The co-occurrence of past tense marking on the copula verb and the temporal adverbial *tomorrow* would be contradictory if they were interpreted with respect to a single context. Eckardt (2014) assumes that linguistic expressions can potentially

be interpreted not only with respect to the speaker's or narrator's context *C*, but also with respect to a second context *c*, which is the fictional context of some salient protagonist (see Schlenker 2004; Sharvit 2008 for different implementations of the same basic idea, which goes back to Banfield 1982; Doron 1991; see Maier 2015 for an entirely different analysis of FID according to which it is a special case of mixed quotation). As in Kaplan (1977), contexts consist (at least) of the individual being the author of the respective context (i.e., the speaker or thinker), the time interval and possible world where the speech or thought act is located, and possibly an addressee (which will be ignored throughout for the purposes of this paper).

The idea now is that whenever a stretch of discourse is plausibly interpreted as representing the thoughts of some salient protagonist, a second context *c* is introduced whose author is the respective protagonist, whose time coordinate is the temporal location of the situation in which that protagonist thinks her thoughts and whose world coordinate is the world containing the respective situation. Crucially, the introduction of *c* has two consequences: First, some context-sensitive expressions (the shiftable ones) are interpreted with respect to parameters of *c*, not *C*. Second, when a proposition is added to the *common ground* (CG), it is added as representing the beliefs of the author of *c*. While tense markings and first and second person pronouns are non-shiftable, i.e., they are lexically specified as always being interpreted with respect to *C*, all other context-sensitive items are interpreted with respect to *c*. While the situation in (20) is thus interpreted as being in the past with respect to the context of the narrator *C*, the temporal adverbial *tomorrow* is interpreted with respect to the relevant protagonist's context *c*, i.e. it refers to the day after the day where that protagonist thinks the thought in (20).

With these assumptions in place, let us now return to the contrast between (17b) and (17c), repeated here as (21a) and (21b), respectively.

(21) a. {Der$_{j\neq i}$ /Er$_i$} hatte doch gestern erst aufgeräumt.
{DPro/PPro} had part yesterday part cleaned-up
He {DPro$_{j\neq i}$/PPro$_i$} had only tidied up yesterday, after all.

b. {Der$_i$/Er$_i$} kann sich einfach nicht gegen seinen
{DPro/PPro} can himself simply not against his
Mitbewohner durchsetzen.
flatmate stand-his-ground
He {DPro$_i$/PPro$_i$} is simply unable to stand his ground against his flatmate.

Let us assume that the opening sentence in (21) not only establishes Peter as the topic of the following stretch of discourse, but also introduces a situation potentially providing the coordinates for a fictional context of thought *c* differing from the narrator's context – namely the situation *s* of Peter coming home in the evening, with the external argument of *s* being the author of *c*, the temporal location of *s* being the time of *c* and the world containing *s* being the world coordinate of *c*. Now, as already discussed in Sect. 3.1 (see Hinterwimmer and Bosch 2016 for additional details), the continuation in (21b) contains several elements which are most plausibly interpreted

not with respect to *C*, but with respect to the coordinates provided by the situation introduced in the opening sentence: the speech act particles *doch* and *erst* and the temporal adverbial *yesterday*. A second context *c* is thus introduced, and both the two speech act particles and the temporal adverbial are interpreted with respect to *c*, while the past perfect marking is interpreted with respect to *C*. In order to avoid unnecessary complications that are not directly relevant for our current purposes, let us ignore the speech act particles and consider the simplified representation of the version of (21b) with the DPro in (22). Let us assume for the sake of discussion that it was possible to resolve the free predicate variable introduced by the covert NP of the DPro to the property of being identical to Peter, while the situation variables of the DPro are bound by the existential quantifier that also binds the situation variable of the verbal predicate.

(22) $\lambda w.\ \exists s \leq w\ [\text{clean\_up}(s, \iota\{x: \text{male}(x)(s) \wedge \text{identical\_to\_Peter}(x)(s) \wedge \text{distinct\_from}(x)(\text{author}(c))(s)\}) \wedge \tau(s) < t^* < \text{time}_C \wedge \tau(s) \subseteq \text{day\_before\_time}_c]$,
where t^* is a salient time interval (in our case, the temporal location of the situation introduced by the opening sentence), $\tau(s)$ is the temporal location of s, $time_c$ is the time coordinate of c and $time_C$ the time coordinate of the speaker's/narrator's context C, and $<$ and $\subseteq$ stand for temporal precedence and inclusion, respectively.

The problem with (22) is that the denotation of the DPro is undefined, due to a presupposition failure (i.e., a semantic object like (22) does not actually exist): Since Peter is the author of *c*, there can be no single individual that is both identical to Peter and distinct from the author of *c* and the existence presupposition of the iota-operator is violated, i.e., the function denoted by *der* cannot be applied to the predicate denoted by the covert NP if the free variable it introduces is resolved to the property of being identical to Peter. Given that there is no other salient individual that could serve as an antecedent for the DPro (in providing a suitable value for the free predicate variable), the variant of (21b) with the DPro referring to Peter is infelicitous, i.e., there is no way to avoid a presupposition failure. No such problem arises for the variant with the PPro, since there is no requirement for the individual it denotes to be distinct from the author of *c*.

Concerning the continuation in (21c), there is no indication that the sentence might be reporting a thought of Peter's, since it does not contain any context-sensitive elements that are plausibly interpreted with respect to a context different from the narrator's context; the sentence simply expresses a thought of the speaker/narrator and no second context *c* is introduced. There is thus no contradiction between the assumption that the individual denoted by the DPro is identical with Peter and distinct from the author of $\boldsymbol{c}$, since the latter is identical to the author of *C*, i.e., the speaker/narrator. Hence both the variant with the PPro and the one with the DPro, interpreted as referring to Peter, are fine.

Similar considerations apply to the contrast between (17a) and (17c) and between (15) and (18) from Sect. 3.1: In each case, the sentence where the DPro is referentially more restricted than the PPro suffers from a presupposition failure since the individual effectively serving as the antecedent of the DPro is at the same time the author of c. In the sentences where the DPro is not thus restricted, no second context c is introduced since those sentences are not interpreted as the thoughts of the respective topical protagonist, but rather as thoughts of the speaker/narrator (which is also true of all the sentences in (16)). Accordingly no presupposition failure arises since there is no conflict between the DPro being identical with the topical protagonist and being distinct from the author of $\boldsymbol{c}$, who is the author of C, i.e., the speaker/narrator.

Let us now turn to the sentences with DPros embedded under propositional attitude verbs considered in Hinterwimmer and Bosch (2016). In that paper, as already mentioned, we had decided not to analyse propositional attitude verbs as quantifiers over contexts (along the lines of Schlenker 2003), but rather stick with a more traditional analysis of propositional attitude verbs as quantifiers over possible worlds. The main motivation for Schlenker's (2003) analysis, which goes against Kaplan's (1977) famous ban on monsters, comes from the following observation: In many languages there are context-sensitive expressions that can not only be interpreted with respect to the speaker's/narrator's context when they are embedded in the complement clauses of propositional attitude verbs, but also with respect to a context whose author is the subject of the respective propositional attitude verb, whose time coordinate is the time of the respective belief, claim, etc. The most striking case is the Amharic first person pronoun, which normally, as would be expected, refers to the speaker, but which can optionally pick out the subject of a propositional attitude verb when it is contained in the complement clause of such a verb. The Amharic equivalent of a sentence such as *John says that I am a hero*, for example, can thus either be interpreted as saying that John says that he himself is a hero, or that John says that the speaker/narrator is a hero.

Schlenker (2003) generalizes from such cases and assumes that propositional attitude verbs always quantify over contexts, also in languages like English and German. In order to account for the fact that the vast majority of context-sensitive expressions is not shiftable in those languages (in fact, the only indexical expression in English that Schlenker argues to be context-sensitive is *ago*), he assumes that it is lexically specified for each indexical expression whether it can only be interpreted with respect to the speaker's/narrator's context or also with respect to the contexts quantified over by propositional attitude verbs. The situation is further complicated by the fact that the class of indexical expressions that can be shifted in FID is not the same as the one that can be shifted under propositional attitude verbs, i.e., in indirect discourse: Temporal adverbials like *today*, *yesterday,* and *tomorrow*, for example, can be shifted in FID, but not in indirect discourse (see Banfield 1982 for extensive discussion). In addition, even in those languages that do allow a wide array of context-sensitive expressions to be shifted under verbs of communication

such as *say*, *tell,* etc., this does usually not generalize to other propositional attitude verbs like *believe* (see Sundaresan 2012 for discussion). For those reasons, we do not want to commit ourselves to the assumption that propositional attitude verbs, in general, quantify over contexts, but rather stick with the more traditional assumption that they are quantifiers over possible worlds.

Hinterwimmer (2015), following Elbourne (2005), assumes bound readings of both DPros and PPros to come about as follows: First, an indexed variable-binding operator is inserted directly beneath the binder DP at LF, which has the effect of turning every free variable in its scope into a lambda-bound variable (just as in Heim and Kratzer 1998). Secondly, the free predicate variable denoted by the hypothetical covert NP of the PPro or DPro is resolved to the property of being identical to (the value of) a variable bearing the same index as the respective variable-binding operator. When the denotation of the binder DP α is then combined with the denotation of its (LF-)sister constituent β – either by applying the denotation of α to the denotation of β (if the former is a quantifier), or the other way round (if it is a referential expression) – the PPro or DPro contained in β is interpreted in exactly the same way as a simple variable bound by α.

If we now make use of the option of interpreting the free situation variable contained in the PPro/DPro as a variable effectively bound by the respective propositional attitude verb, the account just sketched, in combination with an analysis of propositional attitude verbs as quantifiers over worlds, automatically gives us *de se* readings for PPros or DPros contained in the complement clauses of propositional attitude verbs. To see this, let us turn to the examples in (1), repeated here as (23a,b).

(23) a. Peter$_i$ glaubt, dass {er$_i$/der$_{j\neq i}$}klug ist.
Peter$_i$ believes that he {PPro$_i$/DPro$_{j\neq i}$} is smart.
b. [Jeder Mann]$_i$ glaubt, dass {er$_i$/der$_{j\neq i}$}klug ist.
[Every man]$_i$ believes that he {PPro$_i$/DPro$_{j\neq i}$} is smart.

Let us start with the variant of (23a) containing the PPro. Its *de se* reading is given (in simplified form) in (24).

(24) $\lambda w.\ \forall w' \in B_{peter,\ w,\ timeC}\ [\exists s \leq w'[smart(s, \iota\{x:\ male(x)(s)$
$\wedge\ identical\_to(x)(peter)(s)\}) \wedge \tau(s) \subseteq time_C]]$,
where $B_{peter,\ w,\ timeC}$ is the set of worlds compatible with Peter's beliefs at the time of the speaker's/narrator's context.

Note that, since the property of being identical to Peter has to hold in situations that are parts of the worlds compatible with Peter's beliefs at the utterance time, the sentence on this reading is only true in a situation where Peter believes of himself that he is smart, and not of some guy that is in fact identical to him, but whom he does not recognize as himself.[7] Concerning *de re* readings, we just have

[7] As pointed out to us by an anonymous reviewer, this analysis runs into problems when it is applied to sentences like (i), since it can not account for the observation that such sentences allow for *de*

to assume that the situation variable contained in the DPro is resolved to the world variable abstracted over at the root level (recall that we assume possible worlds to be maximal situations), as shown in (25).

(25) $\lambda w.\ \forall w' \in B_{peter,\ w,\ timeC}\ [\exists s \leq w'[smart(s, \iota\{x:\ male(x)(w) \wedge identical\_to(x)(peter)(w)\}) \wedge \tau(s) \subseteq time_C]]$

This has the following consequence: The individual denoted by the DPro is no longer required to be identical to Peter in Peter's belief worlds, but, ultimately, only in the worlds in which the proposition denoted by the sentence is true. On the reading shown in (25) the sentence is thus true in a scenario where the individual whom Peter considers as smart is in fact identical to him although he is not aware of this (see Sect. 2 above).

Let us now turn to the DPro variant of (23a). Since the DPro is in the scope of a quantifier over possible worlds that has an individual anchor, Condition (i) from (19d) above applies, and the free individual variable α has to be resolved to the individual serving as that individual anchor, Peter. The resulting hypothetical, but non-existent, *de se* and *de re* readings are given in (26a) and (26b), respectively.

(26) a. $\lambda w.\ \forall w' \in B_{peter,\ w,\ timeC}\ [\exists s \leq w'[smart(s, \iota\{x:\ male(x)(s) \wedge identical\_to(x)(peter)(s) \wedge distinct\_from(x)(peter)(s)\}) \wedge \tau(s) \subseteq time_C]]$

b. $\lambda w.\ \forall w' \in B_{peter,\ w,\ timeC}\ [\exists s \leq w'[smart(s, \iota\{x:\ male(x)(w) \wedge identical\_to(x)(peter)(w) \wedge distinct\_from(x)(peter)(w)\}) \wedge \tau(s) \subseteq time_C]]$

On both readings, the DP fails to denote because the existence presupposition of the iota-operator is violated, i.e. the function denoted by *der* cannot be applied to the predicate denoted by the covert NP if the free variable it introduces is resolved to the property of being identical to Peter: Concerning (26a), there is no individual that is both identical to Peter in (the situations that are part of) Peter's belief worlds and distinct from him. Likewise, concerning (26b), there is no individual that is both distinct from and identical to Peter in the worlds where the proposition is true. A bound reading of the DPro is therefore unavailable on both a *de se* and a *de re* reading, which is exactly what we want, and the DPro can only be interpreted as referring to some other contextually salient male individual, where in the absence of such an individual the sentence is perceived as weird.

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se readings on which the (individual denoted by the) subject of the propositional attitude verb does not have a contradictory belief.

(i) Peter believe that he is not Peter.

We tentatively suggest that in such cases the free predicate variable contained in the PPro is resolved to some alternatve property the (individual denoted by the) subject of the propositional attitude verb can plausibly be assumed to ascribe to himself in the respective context.

The same reasoning applies to the two variants of the quantified sentence in (23b). The *de se* and *de re* readings of the PPro version (where it is rather difficult to come up with a plausible scenario for the latter) are given in (27a) and (28a), and the ill-formed (and thus non-existent) *de se* and *de re* readings of the DPro version in (27b) and (28b), respectively.

(27) a. $\lambda w.\ \forall y\ [man(y)(w) \rightarrow \forall w' \in B_{y,\ w,\ time_C}\ [\exists s \leq w'[smart(s, \iota\{x: male(x)(s) \wedge identical\_to(x)(y)(s)\}) \wedge \tau(s) \subseteq time_C]]]$

b. $\lambda w.\ \forall y\ [man(y)(w) \rightarrow \forall w' \in B_{y,\ w,\ time_C}\ [\exists s \leq w'\ [smart(s, \iota\{x: male(x)(s) \wedge identical\_to(x)(y)(s) \wedge distinct\_from(x)(y)(s)\}) \wedge \tau(s) \subseteq time_C]]]$

(28) a. $\lambda w.\ \forall y\ [man(y)(w) \rightarrow \forall w' \in B_{y,\ w,\ time_C}\ [\exists s \leq w'[smart(s, \iota\{x: male(x)(w) \wedge identical\_to(x)(y)(w)\}) \wedge \tau(s) \subseteq time_C]]]$

b. $\lambda w.\ \forall y\ [man(y)(w) \rightarrow \forall w' \in B_{y,\ w,\ time_C}\ [\exists s \leq w'\ [smart(s, \iota\{x: male(x)(w) \wedge identical\_to(x)(y)(w) \wedge distinct\_from(x)(y)(w)\}) \wedge \tau(s) \subseteq time_C]]]$

Having proposed a concrete implementation of the analysis sketched in Hinterwimmer and Bosch (2016) that is able to account for the data discussed in that paper, let us now return to the new data discussed above in Sect. 2: The sentences in (6) – (9), repeated here as (29) – (32) show that when a DPro is contained in the complement clause of a propositional attitude verb *x* that is itself contained in the complement clause of another propositional attitude verb *y*, the DPro can be interpreted as bound by the subject of *x*, but not by the subject of *y*.

(29) a. Maria$_i$ behauptet, dass Peter$_j$ glaubt, {er$_j$/der$_j$} könne besser Schach spielen als sie$_i$.
Maria$_i$ claims that Peter$_j$ believes he {PPro$_j$/DPro$_j$} could play chess better than her$_i$.

b. Maria$_i$ behauptet, dass [jeder von ihren$_i$ Kollegen]$_j$ glaubt, {er$_j$/der$_j$} könne besser Schach spielen als sie$_i$.
Maria$_i$ claims that [every colleague of hers$_i$]$_j$ believes he {PPro$_j$/DPro$_j$} could play chess better than her$_i$.

(30) a. Maria$_i$ behauptet, dass Peter$_j$ glaubt, {seine$_j$/dessen$_j$} Tochter sei klüger als ihre.
Maria$_i$ claims that Peter$_j$ believes his {PPro$_j$/DPro$_j$} daughter was smarter than hers$_i$.

b. Maria$_i$ behauptet, dass [jeder von ihren$_i$ Kollegen]$_j$ glaubt, {seine$_j$/dessen$_j$} Tochter sei klüger als ihre$_i$.
Maria$_i$ claims that [every colleague of hers$_i$]$_j$ believes his {PPro$_j$/DPro$_j$} daughter was smarter than hers$_i$.

(31) a. Maria$_i$ behauptet, dass Peter$_j$ glaubt,{sie$_i$/die$_{k\neq i}$} könne besser Schach spielen als er$_j$.
Maria$_i$ claims that Peter$_j$ believes she {PPro$_i$/DPro$_{k\neq i}$} could play chess better than him$_j$.

b. Maria$_i$ behauptet, dass [jeder von ihren$_i$ Kollegen]$_j$ glaubt,{sie$_i$/die$_{k\neq i}$} könne besser Schach spielen als er$_j$.
Maria$_i$ claims that [every colleague of hers$_i$]$_j$ believes she {PPro$_i$/DPro$_{k\neq i}$ } could play chess better than him$_j$.

(32) a. Maria$_i$ behauptet, dass Peter$_j$ glaubt, {ihre$_i$/deren$_{k\neq i}$}Tochter sei klüger als seine$_j$.
Maria$_i$ claims that Peter$_j$ believes that her {PPro$_i$/DPro$_{k\neq i}$} daughter is smarter than his$_j$.

b. Maria$_i$ behauptet, dass [jeder von ihren$_i$ Kollegen]$_j$ glaubt, {ihre$_i$/deren$_{k\neq i}$} Tochter sei klüger als seine$_j$.
Maria$_i$ claims that [every colleague of hers$_i$]$_j$ believes that her {PPro$_i$/DPro$_{k\neq i}$} daughter is smarter than his$_j$.

The analysis developed above does not predict any contrast between the DPro variants of the sentences in (29) and (30) on the one hand, and (31) and (32) on the other: A bound reading of the DPro should be prohibited in all these sentences, and accordingly they should be unacceptable in the absence of another contextually salient male individual that can be picked up by the DPro. Let us start with (29) and (30): Since the DPro in both sentences is in the scope of a quantifier over possible worlds that have an individual anchor, namely the embedded token of *glauben*, Condition (i) from (19d) applies and the DPro has to be interpreted as distinct from the relevant anchor, Peter. Since there can be no individual that is at the same time distinct from and identical to Peter in either Peter's belief worlds or the worlds where the proposition denoted by the entire sentence is true, both sentences should give rise to a presupposition failure if the DPro is interpreted as bound by *Peter* on both a *de se* and a *de re* reading, contrary to fact. In the case of (31) and (32), Condition (i) from (19d) is satisfied with respect to the first quantifier over possible worlds with an individual anchor that has scope over the DPro, but not with respect to the second one. Both sentences thus give rise to a presupposition failure, which is in accordance with our intuitions.

Let us finally turn to the two sentences in (13) and (14), repeated here as (33) and (34). They are all predicted to disallow a bound reading of the DPros as well, since condition (i) from (19d) should force the respective DPro to be interpreted as distinct from the respective individual anchor of the quantifier over possible worlds, contrary to fact – at least for (33) and (34a), while (34b) is indeed unacceptable for some speakers; see Sect. 2 above.

In the following section we will propose a modification of the analysis developed above, which not only captures the data discussed in Hinterwimmer and Bosch (2016), but also explains the contrast in acceptability between (29),(30) and (33), (34), on the one hand, and (31), (32), on the other.

(33) Der_1 glaubt, der_1 kann das alles – dem_1 zeige ich's jetzt.
He {DPro$_i$} believes that he {DPro$_i$} can do everything – I'll show him {DPro$_i$}.

(34) a. Otto_i ist wirklich unglaublich blöd. [Dieser Idiot]$_i$ glaubt, der_i kann mich öffentlich beleidigen und sich dann Geld von mir ausleihen.
Otto$_i$ is really incredibly stupid. [*This idiot*]$_i$ *believes that he {DPro$_i$} can insult me in public and then borrow money from me.*

b. Meine neuen Kollegen sind alle fürchterlich arrogant. $^{(?)}$[Jeder von diesen Angebern]$_i$ glaubt, der_i sei der Schlaueste.
My new colleagues are all terribly arrogant. [*Everyone of these show-offs*]$_i$ *believes that he {DPro$_i$} ist he smartest.*

3.3 A Modified Analysis

In the last section we have seen that an account which assumes that DPros in general cannot be interpreted as bound by the subjects of propositional attitude verbs is not flexible enough to account for the wellformedness of sentences such as (29), (30), (33) and (34) on a bound reading of the respective DPro. Intuitively, what distinguishes these cases from the ones that motivated the analysis sketched in Hinterwimmer and Bosch (2016) is that while in the latter there is always only one salient perspective holder available – namely either the protagonist that is the author of the fictional context *c*, or the subject of the respective propositional attitude verb – in the former there are two potential perspective holders: The subjects of the two propositional attitude verbs in (29) and (30), and the speaker and the subject of the propositional attitude verb in (33) and (34). While the first case is self-evident, the second requires some discussion. The idea here is that the speaker/narrator, although always implicitly present in the sense of being the author of *C*, is not automatically a salient perspective holder, especially in narrative texts that just describe sequences of events or states of affairs quasi-objectively, i.e., without any indication of the narrator's physical or emotional involvedness. Both the resolution mechanism in (19d), and our claim that discourse topics are default perspective holders in narrative texts (see Sect. 3.1 above), are based on this assumption.

The subjects of propositional attitude verbs, by contrast, are always salient perspective holders insofar as it is overtly indicated (by the very fact that they are the subjects of propositional attitude verbs) that they are the anchors of the set of worlds quantified over by the respective propositional attitude verb. Now, none of the sentences with propositional attitude verbs discussed in Sect. 3.2, with the exception of (33) and (34), contain any indication of an involved speaker/narrator, i.e., in no case is there any reason to assume that the speaker/narrator is a salient perspective holder. The sentences in (33) and (34), by contrast, make the speaker's

perspective salient. This is especially obvious in (34a) where the speaker already gives a negative evaluation of Otto's intellectual capacities in the opening sentence and then refers to him in the following sentence via an epithet, i.e., an anaphoric DP consisting of a definite or demonstrative determiner and an NP complement headed by a noun that expresses the speaker's evaluation of the individual referred to by the DP (see Postal 1972; Dubinsky and Hamilton 1998; Aoun and Choueiri 2000; Potts 2005, 2007; Patel-Grosz 2014 for discussion). Basically the same reasoning applies to (34b), the only relevant difference being that the speaker is now not referring to an individual but rather to a group of individuals in the first sentence and then quantifies over its members in the second. The difference between the rather straightforward act of referring to an individual in the case of (34a) and the more indirect one of referring to the group of individuals quantified over might be responsible for contrast in acceptability between (33) and (34a), on the one hand, and (34b), on the other (recall from Sect. 2 that while all native speakers we consulted shared our intuition that (33) and (34a) are fine, only some found (34b) fully acceptable): Perhaps the default process of identifying the subject of the propositional attitude verb as the most salient perspective holder can be overwritten if the subject DP denotes an individual and the speaker refers to that individual in a way that makes the speaker's own perspective salient, but not if the subject is a quantifier and the speaker only refers to the group of individuals it quantifies over.

Finally, in the case of (33) the speaker is a salient perspective holder simply in virtue of the fact that the sentence contains an expression by which she refers to herself, namely the first person pronoun *ich* ('I'). Secondly, and more importantly, by using a DPro as the subject of the propositional attitude verb, which (if our analysis is on the right track) is lexically specified as being distinct from the most salient perspective holder, the speaker explicitly signals that the individual she is thereby referring to is not the most salient perspective holder, but rather the speaker herself. This is in line with the content of the sentence, which expresses a conclusion of the speaker concerning her future behaviour towards the individual she is referring to that is based on an implicitly negative evaluation of that individual's attitude. Accordingly the speaker becomes the most salient perspective holder in (33) too, and the DPro contained in the complement clause of the propositional attitude verb can be interpreted as bound by the subject of that verb.

It thus seems that DPros can be interpreted as bound by the subjects of propositional attitude verbs in sentences where the speaker's/narrator's perspective becomes salient – at least if the subjects are non-quantificational. The sentences in (33) and (34) together with the ones in (29) and (30) thus provide evidence that the individuals denoted by DPros are not required to be distinct from *perspective holders in general*. Rather, they are required to be distinct from the individuals that function as the most salient *perspective holder with respect to the proposition denoted by the sentence that contains the DPro*. What counts as the most salient

perspective holder is in turn determined by a process that can be described along the following lines: When there are one or more sentence-internal and thus overtly realized perspective-holders, then it is normally the individual referred to or quantified over by the hierarchically highest DP that functions as a sentence-internal perspective holder which counts as the most salient perspective holder. This default can only be overwritten if the speaker makes her own perspective salient by referring to the individuals denoted by or quantified over by the hierarchically highest DP functioning as a sentence internal perspective holder in a manner highlighting the speaker's own perspective – i.e., by using an evaluative expression or an expression which explicitly signals that the respective individual is not the most salient perspective holder. If there is no sentence-internal perspective holder and if c is non-empty, the author of c counts as the most salient perspective holder.

With these assumptions in place, we will now propose a modified lexical entry for *der*[8]: The DPro is no longer required to be distinct from the value of a variable α that is reserved for PCs, as in (19c). Rather, it is required that there is an individual or a restrictor set of a quantifier that is distinct from the individual x denoted by the DPro and that is more prominent than x. For an individual y to be distinct from x just means that y is not identical to x. For the restrictor set Y of a quantifier to be distinct from x means that x is not an element of Y. Relative prominence is determined by the following hierarchy: If the author of C is salient in virtue of being instantiated in the proposition denoted by the respective sentence, the author of C is most prominent, while if the relevant sentence is interpreted with respect to c, the author of c is most prominent (recall from above that c is only introduced if there is a clear indication that the respective sentence is interpreted from the perspective of some protagonist – a situation that we assume to be incompatible with the narrator's perspective being salient). Ranking second in prominence is the individual or restrictor set of a quantifier that serves as the anchor for the set of worlds quantified over by the highest quantifier over possible worlds contained in the respective sentence (if the sentence contains such a quantifier). All other individuals are less prominent. We thus propose the modified lexical entry for *der* given in (35a). The result of applying *der* to a covert pronoun introducing a free situation variable and a covert pronoun introducing a free variable ranging over predicates is given in (35b).

[8]We thank an anonymous reviewer for suggesting a reformulation of the modified lexical entry we originally proposed along these lines.

(35) a. $[[\text{der}]]^{g,C,c} = \lambda s.\ \lambda P_{<e,<s,t>>}: \exists!x \exists Y[\text{male}(x)(s) \wedge P(x)(s) \wedge \text{PersProm}(Y) > \text{PersProm}(x) \wedge \text{distinct\_from}(x)(Y)].\ \iota\{x: \text{male}(x)(s) \wedge P(x)(s) \wedge \text{PersProm}(Y) > \text{PersProm}(x) \wedge \text{distinct\_from}(x)(Y)\}.$

b. $[[\ [\text{der}_{sn}\ \text{NP}_m]\ ]]^{g,C,c} = \iota\{x: \text{male}(x)(g(s_n)) \wedge g(P_m)(x)(g(s_n)) \wedge \text{PersProm}(Y) > \text{PersProm}(x) \wedge \text{distinct\_from}(x)(Y)(g(s_n))\}.$

where *g* is the assignment function, *C* is the context of utterance, *c* is the context of some prominent protagonist, *Y* is a variable ranging over objects of type *e* as well as ones of type <*e,t*>, P_m is a free predicate variable bearing the index *m,* s_n is a free situation/world variable bearing the index *n* and *PersProm*(*Y*) > *PersProm*(*x*) iff *Y* is perspectivally more prominent than *x*. If *Y* is of type *e*, *Y* is distinct from *x* iff *Y* and *x* are not identical. If *Y* is of type <*e,t*>, *Y* is distinct from *x* iff $x \notin Y$.

Perspectival Prominence is determined by the following hierarchy:

Author(*C*) (if salient in virtue of being instantiated), Author(c) > highest anchor (iff the highest anchor is of type *e*)/restrictor set of highest anchor (iff the highest anchor is of type <<*e,t*>,*t*>) > other.

Note that this modified lexical entry, apart from being flexible enough to account for all the data discussed in this paper (as we will see in detail in a minute), also has the advantage of being more clearly connected to the primary function of demonstrative items in oral conversations, which is to direct the addressee's attention to an entity that is in the shared visual field of speaker and hearer and which thus requires an external reference point.[9]

In the examples in (29a) and (30a), repeated here as (36a) and (37a), the free predicate variable can be resolved to the property of being identical to Peter without violating a presupposition in both the variants with a PPro and the ones with a DPro since there always is an individual *Y* that is perspectivally more prominent than Peter, namely Maria: Maria is the highest anchor contained in the sentence in virtue of the proper name *Maria* being the subject of the matrix propositional attitude verb. Basically the same reasoning applies to (29b) and (30b), repeated here as (36b) and (37b), the only difference being that the subject of the embedded clause

[9]We thank an anonymous reviewer for making this point. The reviewer also mentions that the analysis proposed in this section would allow establishing a connection with the "anti-uniqueness" effect observed with complex demonstratives – they cannot be used unless there exists at least one other individual satisfying the NP description (cf. ?"I will feed this dog", uttered in a situation where there is only one dog in the house). Interestingly, this anti-uniqueness effect can be overwritten if the sentence containing the complex demonstrative expresses a clear positive or negative evaluation of the individual to which the demonstrative refers (cf. "I love/hate this dog", uttered in a situation where there is only one dog in the house), cf. Lakoff (1974), Wolter (2006), and Acton and Potts (2014). We leave a further exploration of the connections between our analysis of DPros and these observations concerning complex demonstratives as a topic for future research.

is a quantifier and the free predicate variable is accordingly resolved to the property of being identical to the variable bound by that quantifier.

(36) a. Maria$_i$ behauptet, dass Peter$_j$ glaubt, {er$_j$/der$_j$} könne besser Schach spielen als sie$_i$.
Maria$_i$ claims that Peter$_j$ believes he {PPro$_j$/DPro$_j$} could play chess better than her$_i$.

b. Maria$_i$ behauptet, dass [jeder von ihren$_i$ Kollegen]$_j$ glaubt, {er$_j$/der$_j$} könne besser Schach spielen als sie$_i$.
Maria$_i$ claims that [every colleague of hers$_i$]$_j$ believes he {PPro$_j$/DPro$_j$} could play chess better than her$_i$.

(37) a. Maria$_i$ behauptet, dass Peter$_j$ glaubt, {seine$_j$/dessen$_j$} Tochter sei klüger als ihre.
Maria$_i$ claims that Peter$_j$ believes his {PPro$_j$/DPro$_j$} daughter was smarter than hers$_i$.

b. Maria$_i$ behauptet, dass [jeder von ihren$_i$ Kollegen]$_j$ glaubt, {seine$_j$/dessen$_j$}Tochter sei klüger als ihre$_i$.
Maria$_i$ claims that [every colleague of hers$_i$]$_j$ believes his {PPro$_j$/DPro$_j$} daughter was smarter than hers$_i$.

Concerning the sentences in (31) and (32), repeated below as (38) and (39), by contrast, the problem is that in the absence of another contextually salient female individual the only property that the respective free predicate variable could be resolved to is the property of being identical to Maria. Resolving it to that property would lead to a presupposition failure in the variants with the DPro, though: Since the author of *C* is not salient in either of the sentences, and *c* is not instantiated, Maria is the perspectivally most prominent individual in each case, i.e. there is no perspectivally more prominent individual or quantifier *Y* available that is distinct from Maria.

(38) a. Maria$_i$ behauptet, dass Peter$_j$ glaubt,{sie$_i$/die$_{k\neq i}$} könne besser Schach spielen als er$_j$.
Maria$_i$ claims that Peter$_j$ believes she {PPro$_i$/DPro$_{k\neq i}$} could play chess better than him$_j$.

b. Maria$_i$ behauptet, dass [jeder von ihren$_i$ Kollegen]$_j$ glaubt,{sie$_i$/die$_{k\neq i}$} könne besser Schach spielen als er$_j$.
Maria$_i$ claims that [every colleague of hers$_i$]$_j$ believes she {PPro$_i$/DPro$_{k\neq i}$ } could play chess better than him$_j$.

(39) a. Maria$_i$ behauptet, dass Peter$_j$ glaubt, {ihre$_i$/deren$_{k\neq i}$}Tochter sei klüger als seine$_j$.
Maria$_i$ claims that Peter$_j$ believes that her {PPro$_i$/DPro$_{k\neq i}$} daughter is smarter than his$_j$.

b. Maria$_i$ behauptet, dass [jeder von ihren$_i$ Kollegen]$_j$ glaubt, {ihre$_i$/deren$_{k\neq i}$} Tochter sei klüger als seine$_j$.
Maria$_i$ claims that [*every colleague of hers$_i$*]$_j$ *believes that her* {*PPro$_i$/DPro$_{k\neq i}$*} *daughter is smarter than his$_j$.*

Finally, in (33) and (34a), repeated here as (40) and (41a), resolving the free predicate variable to the property of being identical to the individual denoted by the subject of the respective matrix verb is unproblematic in the variants with a PPro as well as the ones with a DPro: In each case there is a perspectivally more prominent individual *Y* available – namely the author of *C*, i.e., the speaker, who is salient in virtue of being instantiated in the respective proposition. The DPro contained in the complement clause of the propositional attitude verb can accordingly be interpreted as being identical to the individual referred to by the subject of the propositional attitude verb. Concerning (34b), repeated here as (41b), the sentence is acceptable only for those speakers for whom the act of referring to the group of individuals quantified over by the subject of the propositional attitude verb in a perspective-dependent way is sufficient to make the author of *C* sufficiently salient. For all others, the restrictor set of the quantifier denoted by the subject of the matrix propositional attitude verb is the perspectivally most prominent *Y* available, and resolving the free predicate variable to the property of being identical to a variable bound by that quantifier would thus lead to a presupposition failure (since each value of that variable would be an element of *Y*, and thus non-distinct from *Y*). In the absence of another potential antecedent, the sentence is perceived as awkward.

(40) Der$_1$ glaubt, der$_1$ kann das alles – dem$_1$ zeige ich's jetzt.
He {*DPro$_i$*} *believes that he* {*DPro$_i$*} *can do all of that – I'll show him* {*DPro$_i$*}.

(41) a. Otto$_i$ ist wirklich unglaublich blöd. [Dieser Idiot]$_i$ glaubt, der$_i$ kann mich öffentlich beleidigen und sich dann Geld von mir ausleihen.
Otto$_i$ is really incredibly stupid. [*This idiot*]$_i$ *believes that he* {*DPro$_i$*} *can insult me in public and then borrow money from me.*
b. Meine neuen Kollegen sind alle fürchterlich arrogant. $^{(?)}$[Jeder von diesen Angebern]$_i$ glaubt, der$_i$ sei der Schlaueste.
My new colleagues are all terribly arrogant. [*Everyone of these show-offs*]$_i$ *believes that he* {*DPro$_i$*} *ist he smartest.*

The modified analysis proposed in this section accounts for all the other cases discussed in Sects. 3.1 and 3.2 as well: In the cases where an additional context *c* is introduced, the free predicate variable of the DPro can never be resolved to the author of *c* without violating a presupposition, since the latter is always the perspectivally most prominent individual, and there would hence be no perspectivally more prominent individual or restrictor set of a quantifier *Y* distinct from the author of *c*. In the cases where there is only one propositional attitude verb, whose subject is consequently the highest anchor contained in the respective sentence, and where the author of *C* is not salient, the free predicate variable cannot be resolved to the

property of being identical to the individual denoted by the matrix subject or the property of being identical to a variable bound by the quantifier denoted by the matrix subject without violating a presupposition: In each case, there would not be an individual or restrictor set of a quantifier *Y* that is perspectivally more prominent and distinct from the individual denoted by the respective DPro. Concerning cases like (16a,b), repeated here as (42a, b), note that they are automatically understood as being uttered in an oral conversation. We assume that in oral conversations the author of *C*, i.e. the speaker, is guaranteed to be salient. Hence, as long as the DPro is not interpreted as being identical to the speaker (which is precluded by the pragmatic blocking principle mentioned above anyway), there is always a perspectivally more prominent individual distinct from the referent of the DPro that guarantees the presupposition of the DPro to be satisfied. Our modified analysis thus accounts naturally for the general observation that DPros are used more often in oral conversations than in written texts.

(42) a. Lass uns mal über Otto$_i$ reden. Otto$_i$ ist der fähigste Verkäufer, den ich kenne. {Der$_i$ /Er$_i$} könnte sogar einem Blinden einen HD-Fernseher verkaufen.
Let's talk about Otto$_i$. Otto$_i$ is the most gifted salesman I know. He {DPro$_i$/PPro$_i$} could even sell an HD TV set to a blind man.

b. Was Otto$_i$ betrifft, den$_i$ mochte Karin$_j$ noch nie.{Der$_i$/Er$_i$} hat sie$_j$ schon als Kind immer geärgert.
As for Otto$_i$, Karin$_j$ never liked him$_i$[DPro$_i$]. He {DPro$_i$/PPro$_i$} already always teased her as a child.

Concerning narrative texts, in contrast, we predict DPros to be only acceptable if there is an external reference point available in the form of an intrusive narrator, a salient protagonist who is the author of a fictional context, or the individual denoted by the subject of a propositional attitude verb. Whether this (rather strong hypothesis) can actually be maintained remains to be seen. If it should turn out that there are cases where a DPro is used to pick up a non-topical referent, but where the topical referent can still not plausibly be regarded as a PC in the sense of being the author of a fictional context *c*, and where there is furthermore no salient, intrusive narrator, our analysis could easily be modified in such a way that it naturally accounts for such cases. One would only need to replace the term *perspectival prominence* by the general term *prominence* and modify the hierarchy with respect to which relative prominence is determined as shown in (43):

(43) Author(C) (if salient in virtue of being instantiated), Author(c) > highest anchor (iff the highest anchor is of type *e*)/restrictor set of highest anchor (iff the highest anchor is of type <<*e,t*>,*t*>) > topic > other.

We leave it as a topic for future research whether such a modification is really required.

4 Remaining Issues

4.1 A Comparison to the Analysis Proposed by Patel-Grosz and Grosz (2017)

In this section we briefly compare the analysis developed in Sect. 3 to the one proposed by Patel-Grosz and Grosz (2017). Patel-Grosz and Grosz (2017) concentrate on the question of whether both PPros and DPros are to be analysed as full DPs with a covert NP complement (as assumed in Hinterwimmer 2015 as well as in the present paper), or whether there is convincing evidence to analyse only DPros as DPs and PPros as involving only the projection of agreement-features and thus lacking a covert NP (as assumed by Wiltschko 1998). Mainly based on ellipsis data they argue (in our view convincingly) that there is no convincing evidence for such an assumption, and that both PPros and DPros are to be analysed as DPs. Still, they assume that the two types of pronouns differ morpho-syntactically insofar as DPros come with an additional functional layer on top of the DP-shell, the projection of a deictic determiner. The deictic determiner introduces a covert free variable ranging over individuals whose value is to be determined by the assignment function, where the individual denoted by the DPro is required to be identical to that variable, i.e. Patel-Grosz and Grosz (2017) assume a DPro such as *der* to be analysed as shown in (44).

(44) $[[\ [_{\text{DeixP}}\ 1\ [_{\text{DP}}\ \text{der}_{\text{sn}}\ \text{NP}_{\text{m}}]]\ ]]^{g} =$
$\iota\{x\text{: male}(x)(g(s_n)) \wedge g(P_m)(x)(g(s_n)) \wedge x = g(1)\}$
(based on Patel-Grosz and Grosz 2017:262, ex. (8b))

The main evidence for such an analysis (but see Patel-Grosz and Grosz (2017) for additional arguments) comes from the observation that DPros differ from PPros insofar as they require an explicitly introduced antecedent, and not just one whose existence can be inferred from the context, as can be seen by the following contrast:

(45) Manche Frauen sind schon seit mehr als zwanzig Jahren verheiratet und wissen noch immer nicht, was {sein /*dessen} Lieblingsbier ist.
*Some women have been married for more than twenty years and still do not know what his {PPro/*DPro}(= the husband's) favorite beer is.*
(adapted from Patel-Grosz and Grosz 2017:274, ex. (38b), which is in turn based on Roelofsen 2008: 122 and adapted from Patel-Grosz and Grosz 2010: 348)

Patel-Grosz and Grosz (2017) relate this difference between DPros and PPros to the difference between the weak and the strong version of the definite determiner which is by many researchers (see Schwarz 2009 and the references cited therein) assumed to exist in German and many other languages (but not in English): More concretely, they assume DPros to be the spell-out of a definite DP with a covert NP-complement that is headed by the strong definite article, and PPros to be the

spell-out of a definite DP with a covert NP-complement that is headed by the weak definite article. The interested reader is referred to Patel-Grosz and Grosz (2017) for detailed justification of this assumption, which involves parallels in behavior concerning contraction with prepositions as well as the necessity of an explicit antecedent.

So far, nothing about the analysis argued for by Patel-Grosz and Grosz (2017) is in conflict with the analysis developed in Sect. 3 of this paper, i.e., we could simply add the assumption that DPros come with an additional functional layer introducing a covert free variable over individuals whose value is to be determined by the context. Such an analysis would not even be in conflict with an analysis of DPros as the spell-out of a definite DP with an empty NP complement that is headed by the strong definite determiner, since it is well known that definite descriptions cannot denote the respective perspective holder in FID (Schlenker 2004; Eckardt 2014).[10]

Patel-Grosz and Grosz (2017) explicitly argue against the view that there is any hard-wired semantic difference between DPros and PPros apart from the introduction of a free individual variable, however. Rather, they assume that the differences in distribution discussed in Bosch and Umbach (2006) and Hinterwimmer (2015) are due to a purely pragmatic principle which is based on Schlenker's (2005) *Minimize Restrictors*! and which (very roughly) precludes the use of a lexical item if using an alternative item with less functional structure does not lead to any differences in truth conditions and there is no other benefit. Patel-Grosz and Grosz (2017) consider three situations where such a benefit arises: Emotivity, disambiguation, and register. Let us set register aside, since a fruitful discussion of how DPros are used in non-standard registers and dialects requires serious empirical work that is beyond the scope of this paper, and concentrate on emotivity and disambiguation. Patel-Grosz and Grosz (2017) cite the contrast between the continuation of the opening sentence in (46a) and the one in (46b) (taken from Hinterwimmer 2015, where this case is discussed as problematic for the anti-topicality constraint assumed in that paper) as evidence that otherwise illicit uses of DPros become acceptable if they convey positive or negative emotions. They attribute this to a correlation between marked forms and marked interpretations, following Davis and Potts (2010) and Potts and Schwarz (2010).

[10]Concerning the question of why full definite descriptions contained in the complement clauses of propositional attitude verbs can never (i.e. also in the cases discussed in this paper where DPros do receive bound readings) be interpreted as bound by the subjects of these verbs, additional assumptions need to be made – for example, a pragmatic reconstruction of Principle C along the lines of Schlenker 2005. Another open question is why PPros in contrast to definite descriptions (and DPros, of course) *can* denote perspective holders in FID if they are the spell-out of a definite description with an empty NP-complement that is headed by the weak definite determiner. But that problem is not specific to our proposal – it is an open question for Patel-Grosz and Grosz (2017) as well.

(46) a. Gestern hatte Paul$_i$ eine gute Idee: {Er$_i$/$^{??}$Der$_{j\neq i}$} beschloss, Maria in die Oper einzuladen.
Yesterday, Paul$_i$ had a good idea. He {PPro$_i$/$^{??}$DPro$_{j\neq i}$} decided to invite Maria to the opera.

b. Gestern hatte Paul$_i$ eine gute Idee. {Er$_i$/Der$_i$} hat einfach immer die besten Ideen!
Yesterday, Paul$_i$ had a good idea. He {PPro$_i$/DPro$_i$} simply always hast the best ideas!

The contrast between the two continuations is automatically accounted for by the analysis developed in Sect. 3 as well. In fact, it is parallel to the contrast between the two continuations of the opening sentence from (21) above: The opening sentence establishes Paul as the most salient potential perspective holder, and in the continuation in (46a) it is plausible to assume that his perspective is retained. The continuation in (46b), in contrast, clearly expresses a thought of the speaker/narrator, who is thereby established as the most salient perspective holder. At the same time, the discourse in (16b)/(42b), repeated here as (47) is unproblematic on our account, since the speaker (or alternatively Karin) is plausibly the most salient perspective holder, while it is difficult to see how the acceptability of the DPro variant could be reconciled with the economy-based approach of Patel-Grosz and Grosz (2017): It is neither plausible to assume that emotivity (at least in the strong sense of leading to a marked interpretation) nor that disambiguation is involved (since there is only one potential antecedent).

(47) Was Otto$_i$ betrifft, den$_i$ mochte Karin$_j$ noch nie. {Der$_i$/Er$_i$} hat sie$_j$ schon als Kind immer geärgert.
As for Otto$_i$, Karin$_j$ never liked him$_i$[DPro$_i$]. He {DPro$_i$/PPro$_i$} already always teased her as a child.

Likewise, none of the contrasts involving DPros in doubly-embedded complement clauses of propositional attitude verbs discussed in Sect. 3.2 is expected on an economy-based account, since there is always only one potential binder (since the other one does not agree with the DPro in gender features). Hence disambiguation is not at issue (and emotivity is not plausibly involved either). We thus conclude that our approach captures the relevant data better than a purely economy-based approach.

4.2 DPros and (Anti-)Logophoricity

It is well known that there are many languages which have a special type of pronoun that is only acceptable in sentences that report the thoughts, feelings or perceptions of an individual and can only be interpreted as picking up the respective individual. Such pronouns are called *logophoric pronouns*, and they have been argued to exist in East-African languages such as Ewe, as well as in Japanese, Chinese, Tamil, and

Icelandic (Clements 1975; Kuno 1987; Sells 1987; Nishigauchi 2014; Sundaresan 2012). Until recently, logophoric pronouns were assumed to be compatible only with *de se* readings, but Pearson (2013) has shown convincingly that at least in Ewe they allow for *de re* readings as well if plausible scenarios are provided. Given the distribution of DPros discussed in this paper it is attractive to assume them to instantiate the concept of anti-logophoricity: Whereas logophoric pronouns can only be interpreted as being identical with individuals functioning as perspective holders, anti-logophoric ones have to be interpreted as being distinct from the most salient perspective-holders. Now, if it was true that logophoric pronouns only allow *de se* readings, the fact that DPros cannot even be interpreted as being identical with individuals functioning as perspective holders on *de re* readings would speak against treating them as anti-logophoric pronouns. If logophoric pronouns allow for *de re* readings as well, however, nothing speaks against such an assumption, i.e., we can plausibly assume them to instantiate the mirror-image of a concept, logophoricity, that is well-attested in the languages of the world. It would be interesting to see whether demonstrative pronouns in languages such as Finnish and Dutch or the overt pronouns in Romance languages (which contrast with null pronouns), both of which at first glance seem to have a distribution that is similar to German DPros (see Kaiser and Trueswell 2008; Kaiser 2010, 2011, 2013; Mayol and Clark 2010, among many others), can be subsumed under the concept of anti-logophoricity as well – keeping in mind, as already pointed out in Sect. 2 above and in greater detail in Hinterwimmer and Bosch (to appear) that an additional pragmatic mechanism is very likely to be involved in cases where there is a choice among several potential antecedents or binders none of which is a perspective holder: In such cases, the marked pronoun is automatically interpreted as picking out the antecedent or binder that is less prominent in terms of topicality (in non-binding configurations) or subjecthood (in binding configurations). A comparison of German DPros to demonstrative pronouns in other languages or to overt pronouns in languages that allow covert ones in finite sentences is beyond the scope of the present paper, though, and we thus have to leave this as a topic for future research.

We would like to end this paper by a brief comparison of DPros to another type of DPs that have been assimilated to anti-logophoric pronouns – namely epithets. Dubinsky and Hamilton (1998) and Patel-Grosz (2014) claim that epithets are not subject to Principle C of Binding Theory and thus in principle allow for bound readings. The observations in (48a) (from Dubinsky and Hamilton 1998) and (49a) (from Patel-Grosz 2014) seem to support this claim.

(48) a. John$_i$ ran over a man who was trying to give [the idiot]$_i$ directions.
(49) a. $^{?OK}$ John$_i$ convinced the panel that [the idiot]$_i$ is smart.[11]

Although the lack of a corresponding intuitively "anaphoric" relation between the epithet and the intended antecedent in corresponding versions with a quantifier

[11]The judgement as "?OK" is Patel-Grosz's and may not be universally shared by English native speakers.

antecedent (cf. the (b) versions below) may make one doubt that (48a) and (49a) represent cases of true binding, the notion that epithets may be bound is still fundamentally correct, as is demonstrated by (50a), an epithet version of a sentence we discussed in Hinterwimmer and Bosch (2016) and also by its English translation (50b):

(48) b. *Nobody$_i$ ran over a man who was trying to give [the idiot]$_i$ directions.

(49) b. *Nobody$_i$ convinced the panel that [the idiot]$_i$ is smart.

(50) a. [Jeder Mathematiker]$_k$ machte auf Maria$_i$ den Eindruck, [der blöde Kerl]$_k$ wäre klüger als sie$_i$.
b. [Every mathematician]$_k$ made Maria$_i$ believe that [the dumb bugger]$_k$ was smarter than her$_i$.

The binding of epithets, as in (50), however, is subject to the perspectival constraints we have discussed and not any old epithet embedded under a propositional attitude verb is bound, as we see in (51a). Here the explicit subject of the propositional attitude is the PC, and hence it cannot bind the epithet any more than it could bind a DPro in German (cf. (51b).[12]

(51) a. John$_i$ said that he$_i$ ran over a woman while she was trying to give [the idiot]$_{j\neq i}$ directions.
b. John$_i$ sagte, er habe eine Frau überfahren als sie {[dem Idioten]$_{j\neq i}$ /dem$_{j\neq i}$} den Weg zeigen wollte.

Comparison of (51) with (52), however, shows that once the subject of the propositional attitude is demoted from its rank as PC, i.e., the rank of the most prominent perspective holder, and another perspective holder takes its place as PC, the intuitions become far less clear: For some speakers the "anaphoric" relations in the sentences in (52) are acceptable on the intended readings, while others consider them to be almost as awkward as those in (51).[13] It is thus unclear at present whether epithets are subject to the same perspectival constraints as DPros or a stricter constraint which precludes them from being bound by the subjects of propositional attitude verbs in general. We therefore have to leave that as an open question to be clarified by further empirical research.

(52) a. Mary told me that John$_i$ said that he$_i$ ran over a woman while she was trying to give [the idiot]$_i$ directions.
b. Maria erzählte mir, John$_i$ habe gesagt, er$_i$ habe eine Frau überfahren als sie {[dem Idioten]$_i$/dem$_i$} den Weg zeigen wollte.

[12]We are changing "a man" to "a woman" here, thus introducing a gender difference, in order to remove an irrelevant potential ambiguity that might influence semantic judgements.

[13]The two authors of this paper also have different intuitions concerning the German version in (52b).

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Null Pronouns in Russian Embedded Clauses

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Abstract While in matrix clauses pronouns are almost never dropped in Russian, null pronouns are licensed in almost all kinds of embedded clauses. Null pronouns in such positions share similarities with PRO, but they also differ from PRO in many respects. In this paper, I show that there are two kinds of environments in which such pronouns can appear. The first kind of environment includes complements of attitude verbs, where there is strong evidence for a syntactic relation between the null pronoun and its antecedent. In the second kind of environment, which includes sentential adjuncts and embedded wh-questions, the nature of this relation seems to be different. I propose that Russian possesses a minimally specified silent pronoun which is phonologically deficient and must cliticize onto a higher projection and thus can only be found in the presence of an overt complementizer. I adopt the idea proposed in (Holmberg A. Linguist Inq 36(4):533–564, 2005) that a major feature of pro-drop phenomena is the valuation of the D feature of the null pronoun. I propose that in Russian the null pronoun is unable to value this feature inside the clause where it is merged and therefore must probe outside the clause to get the D feature valued. The difference between properties of silent pronouns in the two kinds of environments is derived from the exact mechanism by which the valuation takes place. In the case of complements of attitude verbs, the valuation takes place as a result of an agree relation, in other cases the valuation takes place via a topic-chain.

1 Introduction

Russian has been described as a non-pro-drop language (Franks 1995), (Fehrmann & Junghanns. 2008). Indeed, in most cases the pronoun in the subject position is obligatory. Russian can therefore be contrasted with languages like Italian where the subject of the matrix can be easily omitted as long as it can refer to a salient referent in the discourse. However, in many embedded clauses, Russian allows the optional omission of the subject pronoun:

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(1) Boris$_i$ skazal čto (on$_i$) pridët
Boris said that he will.come
'Boris said that he would come'

To account for this difference, previous research (Livitz 2014) (Tsedryk 2012) has proposed that a special syntactic relation holds between the null pronoun and its antecedent in sentences like (1), which makes the licensing of a null pronoun possible. Such a proposal is largely justified: there is strong evidence for the syntactic nature of this relation in such sentences. When a clause is embedded under the verb *skazat'* 'say', – or any other attitude verb, the relation between the silent pronoun and its antecedent must be strictly local and the silent pronoun is construed as a bound variable. Since many properties of null pronouns resemble those of PRO, some researchers have tried to reduce the phenomena in question to finite control (Tsedryk 2012).

However, these PRO-like properties do not hold for all pronouns in embedded clauses. As the example (2) shows, in some cases a silent pronoun may be contained within a clause which is separated from its syntactic antecedent by more than one clause boundary, (2) exists in sharp contrast to constructions like (3), where the antecedent cannot be farther than one clause away from the silent pronoun:

(2) Miša$_i$ uznal, [čto nužno delat' [kogda (on) pridët domoj]]
Misha learnt what necessary do.INF when he come.FUT home
'Misha learnt what is to be done when he comes home'

(3) Saša$_i$ dumaet, [čto eto xorošo, [čto *(on$_i$) ne budet žit' odin]]
Sasha thinks that this good that he NEG FUT live.INF alone
'Sasha thinks that it's good that he won't live alone'

Under further scrutiny, some other important differences between cases like (2) and cases like (3) can be found. For instance, in the former case the silent pronoun contained in the embedded clause is not bound. Yet, there are important similarities between the two cases which makes totally independent accounts of these facts undesirable. I argue that although differences between those two cases are significant we deal with the same pronoun in both cases.

I propose that the subject position in both (2) and (3) is occupied by a minimal pronoun which gets its D feature valued by either agreeing with its antecedent or by entering a topic chain. This difference in the valuation of the D feature results in different properties of these two cases. The pronoun is also assumed to be a clitic that needs to have an adjacent, phonologically overt host; this accounts for the fact that null pronouns in Russian almost universally occur in the vicinity of complementizers.

The rest of the paper is organized as follows. In Sect. 2, I provide a list of properties exhibited by null pronouns when embedded under attitude verbs and verify the claim, made by several researchers, viz. (Livitz 2014), (Tsedryk 2012),

that silent pronouns found under attitudes are in a relation with their syntactic antecedent in the matrix clause; in Sect. 3, I list the differences between silent pronouns found under attitudes and those found elsewhere and conclude that they must be considered two separate subclasses of null pronouns. In Sect. 4, I review critically the possibility that null pronouns in attitude contexts can be reduced to PRO and show that such reduction would be problematic; in Sect. 5, I propose a unified analysis for both silent pronouns found under attitudes and silent pronouns found in other environments; in Sect. 6, I explore an implication my analysis might have; Sect. 7 concludes the paper.

A short note on definitions and abbrevations. I will refer to Null Pronouns in Embedded Clauses as NPEC; more specifically, to null pronouns found in the complements of attitude verbs as ATT-NPEC and to NPEC found in other positions as Less Local NPEC (LL-NPEC).

2 NPECs Under Attitudes Are Bound with Their Antecedent via a Syntactic Relation

In Russian same-subject complement clauses embedded under an attitude verb can – in most cases[1] – be introduced in two ways: with an overt subject (4) or with a silent subject (5), which I will notate as '_':

(4) Nina skazala, čto ona pridët
Nina said that she will.come
'Nina said she would come'

(5) Nina_i skazala, čto $\__i$ pridët
Nina said that will.come
'Nina said she would come'

These facts have been discussed several times in the literature, e.g. (Livitz 2014) (Tsedryk 2012), with the main conclusion being that despite the minimal difference, the sentences (4) and (5) have different structure. For example, Livitz (2014) addresses these facts and proposes that the silent pronoun enters an agree relation with its syntactic antecedent, while Tsedryk (2012) proposes a movement relation between them. In this section I will show that although these authors' main conclusion is correct – the relation between the null pronoun and its antecedent in (5) is indeed syntactic and thus different from (4) – their description of the distribution of null pronouns is only partially correct.

For example, Livitz (2014) observes, that unlike their overt counterparts, silent pronouns are referentially dependent. A silent pronoun can only refer to the subject of the matrix clause, while overt pronouns are more free in reference. Thus, in

[1] See discussion of several exceptions below.

example (6) the pronoun *ona* 'she' can refer to an individual other than Nina – the subject of the matrix clause – while the silent pronoun cannot, as the example (7) shows:

(6) Nina$_i$ skazala, čto ona$_j$ pridët
Nina said that she will.come
'Nina$_i$ said that she$_j$ would come'

(7) *Nina$_i$ skazala, čto _$_j$ pridët
Nina said that will.come
'Nina$_i$ said that she$_j$ would come'

Furthermore, Livitz (2014) correctly observes that NPECs must (i) be c-commanded by their antecedents and (ii) have an antecedent in the next clause up. The former condition prohibits configurations like (8) where NPEC is not c-commanded by its antecedent the DP *prezidenta*. The latter condition prohibits the null pronoun in the lowest clause in example (9) from referring to the potential antecedent *Petja* which is more than one clause away from it.

(8) *[Doč' prezidenta]$_j$ ob"javila [čto _$_j$ vystupit s dokladom]
daughter president.GEN announced that will-perform.3SG with speech
'The president's daughter announced that she will give a speech.'
[Livitz 2014:72]

(9) *Petja skazal [čto Masha podumala [čto *(on) ploxo
Petja said that Maša thought.SG.FEM that (he) badly
igral v futbol]]
played.SG.MASC in soccer
'Petja thinks that Masha said that he plays soccer badly[2]'

As for the properties of the clause itself, Livitz remarks that apart from the matrix predicate 'say' overt pronouns may alternate with covert ones in "a range of matrix embedding predicates, including *think*, *promise*, *forget*, and *insist*" [Livitz 2014:69]

[2]The example (9), however, is not sufficiently informative. One could argue that in such cases the silent pronoun is unavailable because a more local potential antecedent, 'Masha', in this case is an intervener. For this reason, we have to check cases where no potential intervener is present:

Saša$_i$ dumaet, čto eto xorošo, čto *(ona$_i$) ne budet žit' odna
Sasha thinks that this good that she NEG FUT.3SG live.INF alone

These conditions can be summarized as follows:

(10) Null pronouns are licensed in complements of the verb 'say' and a range of other embedding predicates only if it has a c-commanding antecedent in the next clause up.

The dependence of the null pronoun on the properties of the embedding predicate, its sensitivity to c-command and its semantic boundness strongly indicate that we are dealing with a syntactic relation. However, the generalization (10) appears not to be entirely accurate. I will show that these conditions have not been stated correctly and that null pronouns exhibit other properties that have not been reported in the literature. However, this data does not undermine the evidence for a syntactic account of licensing silent pronouns in Russian.

First of all, when embedded under directive predicates, such as *say, order* etc., null pronouns can have a dative object as a syntactic antecedent.

(11) Ja$_i$ skazal jemu$_j$, [čtoby _$_j$ prixodil poskoree]
I said him.DAT SUBJ came soon
'I told him to come soon'

Unlike all other NPECs that we have seen so far, the addressee-oriented NPECs must be contained in a subjunctive complement. However, apart from this difference, other properties of such sentences are similar to those of ATT-NPEC. Thus, in this case the NPEC must be c-commanded by its antecedent. Sentence (12), in which the antecedent is more than one clause away, and sentence (13), in which the NPEC is not c-commanded by its antecedent, are both ungrammatical:

(12) *Dima$_i$ rasporjadilsja, [čtoby bylo objavleno, [čtoby _$_i$
Dima made.arrangements SUBJ was declared SUBJ he
pokinul stranu]]
left country
'Dima$_i$ saw to it that it was publicly declared that he$_i$ should leave the country'

(13) *Dima skazal [otcu Kirilla$_i$], čtoby _$_i$ prixodil poskoree
Dima said father.DAT Kirill.GEN SUBJ came soon
'Dima told Kirill's father to come soon'

In addition to that, the null pronoun is construed as a bound variable, since the ellipsis resolution allows only sloppy readings:

(14) Dima$_i$ skazal svoemu otcu$_j$, [čtoby _$_j$ prixodil poskoree], i
Dima said his father.DAT SUBJ came soon and
Nina tože[3]
Nina too
'I told him to come soon'

[3]I take Gribanova's (2013) position that such constructions indeed are instances of ellipsis. See, however, (Bailyn 2014) for the opposite view.

We will take this as evidence that null pronouns in sentences like (7) and the null pronouns in sentences like (11) are of the same nature.

Another potential problem for the generalization (10) is the fact that silent pronouns appear in adjuncts, as in (15):

(15) Marina$_i$ budet zavtra uvolena [potomu čto (ona$_i$) často otsutstvuet
Marina FUT tomorrow fired because she often is absent
na rabote]
on work
'Marina will be fired tomorrow because she is often absent from office'

If sentence (15) is a sentence of the same kind as the ones containing silent pronouns in complements of attitude verbs, then the question arises why locality is respected in some cases and not in others. If, on the other hand, these are two different types, one may wonder what the exact distribution of each type is.

In the next section I will show that null pronouns in sentential adjuncts differ systematically in their properties from ATT-NPECs, although they also show some important similarities with them. Moreover, I will demonstrate that null pronouns of embedded wh-complements pattern with LL-NPECs. I will also show that taken together, NPECs can be used in any embedded clause, as long as the clause contains an overt complementizer and the finite verb in the embedded bears inflection.

3 Local NPEC vs ATT-NPEC

As we have seen, silent pronouns can be licensed in sentential adjuncts:

(16) Marina$_i$ budet zavtra uvolena [potomu čto (ona$_i$) často otsutstvuet
Marina FUT tomorrow fired because she often is absent
na rabote[4]]
on work
Marina will be fired tomorrow because she is often absent from office'

This is also true for all relative clauses, as the following examples show:

(17) Marina$_i$ razbila vazu [kotoruju (ona$_i$) kupila nakanune]
Marina broke vase which she bought the previous day
'Marina broke the vase which she had bought the previous day'

I will show below the NPECs in these environments exhibit different properties compared to ATT-NPECs. Thus, LL-NPEC may have an antecedent more than one clause away, are not bound variables, and can only have a nominative antecedent.

[4]In sentences where sentential adjuncts bear the same tense value as the matrix clause NPEC exhibit different properties. I don't have a satisfactory account for this contrast.

Let's start with locality constraints. In all those cases, the silent pronouns do not respect the locality condition, i.e. the antecedent can be more than clause away from its antecedent, as the following examples show:

(18) Mišha$_i$ ne skazhet [čto eto neobxodimo poskol'kui
Misha NEG will say that it necessary because
[užhe govoril ob etom.
already said about this[5]]]
'Misha won't say it's necessary because he has already said it'

(19) Saša$_i$ ne znaet [čto delat' s vazoj [kotoruju
Sasha NEG knows what do.INF wit vas which
_$_i$ nakanune polučil v podarok]]
the day before got in gift
'Sasha doesn't know what he should with the vase that he got as a present the day before'

This is not only true for silent pronouns in sentential adjuncts. Silent pronouns are also licensed in embedded wh-questions and share the same properties (see 20), and in these environments silent pronouns show the same properties:

(20) Miša$_i$ zavtra uznaet, [kogda _$_i$ byl začislen]
Misha tomorrow will.learn where was enrolled
'Misha will learn tomorrow when he was enrolled

The sentence below shows that a silent pronoun in an embedded wh-question can have an antecedent more than one clause away from it.

(21) Miša$_i$ byl rasstroen poskol'ku neozhidanno vyjasnilos'
Misha was upset because suddenly became.clear
skolko vremeni _$_i$ budet provodit' na rabote
how.much time FUT spend on work
'Misha was upset because it suddenly became clear how much time he would spend in the office.'

[5]One might argue that it is the implicit subject *emu* he.DAT which is the antecedent of the NPEC. The following example, however, shows that it cannot be the case:

*Miše$_i$ neizvestno, [čto nužno delat' kogda _$_i$ pridët domoj]
Misha.DAT learnt what necessary do.INF when come.FUT home
'Misha doesn't know what is to be done when he comes home'

This sentence is minimally different in that the antecedent in the matrix clause is marked with dative instead of nominative. The sentence is ungrammatical which suggests that this DP is indeed the syntactic antecedent, (as well as that the antecedent of NPEC in such cases must be nominative subjects).

The next two examples demonstrate that NPECs are not bound variables. In (22) a VP-ellipsis in a wh-complement with a NPEC in the subject position allows strict readings (in the sense of Morgan 1970).

(22) Miša$_i$ zavtra uznaet, [kogda _$_i$ byl začislen], i Nina tože
Misha tomorrow will learn where was enrolled and Nina too
'Misha will learn tomorrow when he was enrolled and so will Nina'

(23) shows that a NPEC in adjuncts cannot be bound by a quantifier and thus cannot be a bound variable.

(23) *[Každyi rabotnik etogo otdela] budet zavtra
every employee this.GEN department.GEN FUT tomorrow
uvolen [potomu čto _$_i$ často otsutstvuet na rabote]
fired because often is.absent on work
'Every employee of this department will be fired tomorrow because he/she is frequently absent from the office'

Finally, unlike ATT-NPECs, NPECs of this type always have a nominative antecedent.

(24) Dime prišlos' segodnja mnogo rabotat' [poetomu *(on)
Dima.DAT had.to today much to.work that's.why he
uže spit]
already sleeps
'Dima had to run much today, that's why he is already sleeping'

In this case, the antecedent of the NPEC is a dative argument, and the sentence is ungrammatical. This is also true for every other sentence where a LL-NPEC has a dative antecedent.

We have seen that, on one hand, silent pronouns in adjuncts and in embedded wh-questions form a natural class and, on the other hand, less local NPECs are different from NPECs under attitudes in at least three respects: they cannot have non-nominative antecedents, they cannot be construed as bound variables and they are not subject to the locality constraints. This suggests that different cases of pro-drop in embedded clauses in Russian do not constitute a homogenous class and the two cases must be dealt with separately.

The fact that NPECs are licensed both in sentential adjuncts and in sentential complements means that there is no major class of embedded contexts where silent pronouns are impossible. In other words, any kind of an embedded clause can potentially contain NPECs given that other licensing conditions are met.

Let us now spell out once more what we have seen so far. Russian allows silent pronouns in embedded clauses which, show different properties in different

Table 1 Properties of NPECs

	Distribution	Locality	Boundness	Dative antecedents
ATT-NPEC	[non-wh] complements of attitude verbs	yes, must have in a strictly local antecedent (no more than one phase boundary)	yes	yes, under directive verbs
LL-NPEC	wh-complements; adjuncts	locality conditions are more lax	no	no

configrations. When contained in a complement of an attitude verb, NPECs require a strictly local antecedent, are construed as a bound variable and can have a dative or a nominative antecedent. In all other embedded environments, NPECs may have a less local antecedent, are not bound variables and can only have nominative antecedents.

These properties are summarized in Table 1.

Nonetheless, there is evidence, that these two phenomena are not completely unrelated. Apart from the trivial fact that both kinds of pronouns are licensed in embedded clauses, there are at least two properties in which ATT-NPEC and LL-NPEC are similar: dependence on overt complementizers and the ban on null copula.

Let's consider each requirement in more detail. In Russian, present tense copular sentences have no overt copula. In those cases the null subject in an embedded clause is not possible although minimally different sentences with an overt pronoun are grammatical. This holds for both ATT-NPECs (25) and LL-NPECs (26),

(25) Vova$_i$ skazal, [čto *(on$_i$) student]
Vova said that he student
'Vova said that he was a student'

(26) Vova budet uvolen, potomu čto *(on) samyj ploxoj rabotnik
Vova FUT fired because he most bad employee
'Vova will be fired because he is the worst employee'

The example (27) shows that licensing conditions cannot be attributed to lexical properties of a verb. In the past tense where the copula is overt, an NPEC is licensed:

(27) Dima znaet, čto byl studentom
Dima knows that was student.INSTR
'Dima knows that he was a student[6]'

[6]This sentence is not strictly speaking a minimal pair to (27) since the noun in the predicate position bears instrumental case, unlike its counterpart in the sentence (25), where it is marked with nominative. However, I see no conceivable way how this difference might relate to the licensing of the silent pronoun.

An interesting contrast can be found between sentences with long adjectives and short adjectives in the predicate position. While clauses with long adjectives in the position of a nominal predicate don't allow null pronouns (29), those that contain short adjectives in that position do, (28). This pattern can be easily explained if one takes Bailyn's (1994) view the long/short adjective distinction, according to which clauses with long adjectives contain a copula, while in sentences with short adjectives the short adjective is in the finite verb position and hence the sentence contains no copula:

(28) Vova$_i$ skazal, čto (on$_i$) bogat
Vova said that he rich.SF
'Vova said he was rich' (SF)

(29) Vova$_i$ skazal, čto *(on$_i$) bogatyj
Vova said that he rich.LF
'Vova said that he was rich' (LF)

Based on this evidence, I assume that NPECs are sensitive to the presence of inflectional morphology. Indeed, the null copula is the only form in all paradigms of Russian verbs which doesn't bear inflection. I will show in Sect. 4 how this assumption can be implemented.

The second property that both LL-NPECs and ATT-NPECs share is the obligatoriness of an overt complementizer in the embedded clause. In sentence (32) where the complementizer is not superficially present due to complementizer drop which would be possible in that configuration if the subject was overt (31), NPEC in this sentence is not allowed. If the complementizer is overt, however, as in (30), the null pronoun is possible:

(30) Dima$_i$ skazal, [čto _$_i$ zajdt večerom]
Dima said that will.come.over in.the.evening

(31) Dima$_i$ skazal, [on$_i$ zajdt večerom]
Dima said he will.come.over in.the.evening

(32) *Dima$_i$ skazal,[_$_i$ zajdt večerom]
Dima said will.come.over in.the.evening
'Dima said that he would come over in the evening'

The dependence of LL-NPEC on the overtness of the complementizer is harder to test since complementizers in adjuncts usually don't drop. However, there is one complementizer licensed in non-complement environments that can drop,[7] viz. the

[7]I take no stand on whether in comp-less cases there is no complementizer or whether it is null. This doesn't matter for given purposes since, as I will propose in Sect. 5, the condition on the presence of a complementizer is phonological.

complemetizer *to* 'then' of conditional constructions. As the following example to (33) shows, this complementizer is used in matrix rather than embedded clauses. However, the pattern is the same: when the complementizer is overt, the null pronoun is licensed, when it is not, the null pronoun cannot be used:

(33)	[Jesli	on$_i$	dejstvitel'no	idt	po	toj	ulice]
	If	he	really	walks	along	that	street
	*(to)		_$_i$ skoro	uvidit		stanciju	
	then		soon	will.see		station	

'If he is really walking that street then he'll see the station soon'

This means that null pronouns can be licensed in environments other than embedded clauses. Moreover, it suggests that for LL-NPEC the embeddedness of the clause in which it is contained is not the crucial condition. The fact that null pronouns are almost universally found in embedded clauses is due to the fact that complementizers almost always appear in embedded clauses. In Sect. 4 I will argue that LL-NPEC are bound with their antecedent via a discourse relation meaning that structural relations do not play an important role in those cases.

In summary, I propose that the relevant constraint governing the distribution of null pronouns must be the following:

(34) Null pronouns are licensed if they are adjacent to an overt complementizer (given that other conditions are met).

We have seen that while the two types of NPEC in Russian have quite different properties in different contexts, they also share some important similarities. ATT-NPEC are bound by a syntactic relation with its antecedent. LL-NPEC are not bound variables and are not subject to such strict locality restrictions. Despite these differences, ATT-NPEC and LL-NPEC share two important similarities; they require an overt complementizer and are not allowed in sentences with a null copula.

In the next section we turn to reviewing analyses of NPEC and show that neither NPEC as a whole nor ATT-NPECs in particular can be reduced to PRO.

4 Against the Control Analyses of ATT-NPEC

As we have seen in the previous chapter, null pronouns in embedded clauses in Russian do not form a uniform class but fall into (at least) two major categories. This distinction has never been made in the literature, to my knowledge, even though null pronouns in embedded clauses as a whole have been studied in many works. This is likely because the examples that researchers discuss in their consideration of null pronouns are almost universally ATT-NPECs.[8] Consequently, theories that

[8]To the authors' defense, it must be said that LL-NPEC are somehow less salient in the language, at least in the formal register. Some speakers judge sentences with LL-NPEC as belonging to

researchers propose for NPECs in Russian are designed to capture the syntactic nature of ATT-NPECs, and I will consider the theories which are (implicitly) assumed to account for all instances of null pronouns in embedded clauses as theories of ATT-NPEC.

One especially persistent intuition found in many works is that the relation found in sentences with ATT-NPEC can be reduced to control. Indeed, similarities between ATT-NPEC and PRO are significant and difficult to ignore. The embedded and referentially dependent pronoun is null, just as most instances of PRO; in ATT-NPEC sentences there is a syntactic relation between a null pronoun and the superordinate clause and, the null pronoun is always a subject and is construed as a bound variable, as in controlled constructions.

In this section I will discuss these proposals and show that not only these particular analyses fail to account for the data adequately, but also that NPEC-phenomena cannot be reduced to control. To put it once again, I will consider only ATT-NPEC, although the distinction between ATT-NPEC and LL-NPEC is not articulated in any of these works. I will consider two most articulate accounts of NPEC sentences up to date: (Livitz 2014) and (Tsedryk 2012).

In his 2012 paper, Tsedryk proposes that NPEC phenomena can be reduced to finite control. The work is written in the Movement Theory of Control [although the author considers the possibility that control can involve agree derivation in other cases (Tsedryk 2012: 40)], and assumes that the controlled subjects and their antecedents are connected by a movement relation. Tsedryk correctly observes that NPEC bear many similarities with controlled subjects. Thus, they must be local, they are construed as bound variables and they are subject to locality conditions. Tsedryk assumes that the null pronoun and its antecedent are connected via an A-movement relation. The movement moves to the matrix clause to receive a theta-role and to agree with the matrix T.

This, in the author's view, accounts for the locality condition since A-movement must be local. The boundness of silent pronouns is derived in the same spirit: it is assumed that traces are always bound variables.

While the proposal suffers from certain conceptual issues (such as the idea that the same syntactic element can be case-marked twice, although with the same case value) I will put them aside and argue that Tsedryk's system does not account for the empirical facts.

First of all, the system predicts that the NPECs and their antecedents may not bear different case: as the author himself remarks, in such cases one and the same element is case-marked twice which is assumed to be impossible.

As we have seen in Sect. 2 this generalization is wrong: NPEC can have dative antecedents:

colloquial register although sentences with ATT-NPEC seem to never be judged so. However, stylistic differences must be subtle, since LL-NPEC are found in abundance in written documents. I leave sociolinguistic and quantitative inquiries of NPEC-phenomena for future work.

(40) Ja skazal jemu$_j$, [čtoby _$_j$ prixodil poskoree]
I said him SUBJ came soon
'I told him to come soon'

Secondly, Tsedryk's system fails to account for the overt complementizer condition. There is nothing in Tsedryk's system that would prevent such structures, as in (35):

(35) *Dima$_i$ skazal, _$_i$ [zajdt večerom]
Dima said will come over in the evening
'Dima said that she would come over in the evening'

Finally, if one adopts the movement approach, it is not clear what the status of LL-NPEC in this system should be. LL-NPECs are found in island environments, for instance, in adjuncts, and the movement derivation of such sentences is problematic. We could argue, of course, that LL-NPEC involve a completely different derivation. Such a position is not impossible, of course, but is quite undesirable. Moreover, it is quite suspicious that two different phenomena share some important common properties: reliance on the overt complementizer and the constraint on null copulas.

Another work in which NPEC-phenomena are claimed to be control constructions is Livitz (2014), who observes that in Russian overt pronouns are in free variation with their silent counterparts both in finite clauses (36) and infinitival wh-complements (37).

(36) Petja$_i$ skazal čto vesnoj on$_{i/j}$ poedet v Pariž
Petja said that spring he will-go.3.sg in Paris
'Petja said that he will go to Paris in the spring'

[Livitz 2014:6]

(37) Petja$_i$ ne znaet čto (emu$_i$) skazat' načal'niku
Petja NEG knows that he.DAT say.INF boss
'Petja doesn't know what he should tell his boss'

[Livitz 2014:6]

Livitz observes several similarities between these two kinds of constructions. For instance, in both cases the overt pronoun seems to be a simple pronominal which may or may not refer to the subject of the matrix clause, while the silent pronoun is referentially dependent on the matrix subject. Livitz's argumentation goes as follows. Since the two constructions in question share similarities and must have the same nature, and since, wh-infinitivals have been shown to be control constructions (Landau (2007); consequently, NPEC-sentences and control constructions (including 'canonical' control constructions, such as 'I want to PRO quit') are constructions of the same nature and must be accounted for in the same way. In other words, Livitz considers NPEC sentences a subclass of controlled constructions.

In order to account for these facts, Livitz develops a theory of defective goals, borrowing from Roberts (2010). Under this theory, defective goals are φ-deficient

pronouns which agree with another DP in order to get its φ-features valued and are subject to deletion. Livitz proposes that both the NPEC and PRO of infinitival constructions are defective goals. This – quite straightforwardly – accounts for the free variation between overt and silent pronouns in the discussed constructions. In those constructions where the subject is overt – it enters the derivation with its φ-features already valued; on the other hand, in the cases where the subject is silent, it enters the derivation with unvalued features, values them in the course of the derivation and then is deleted as a defective goal.

Here is how the derivation goes, step by step:

1. The embedded C – which has an uninterpretable feature bundle – agrees with its subject in its φ-features, the features, however, remain unvalued. The phase is extended since the features are not valued.
2. When a vP is merged, the v head, after having agreed with the subject in its specifier, values the embedded C and, subsequently, the embedded T. The embedded subject is deleted as a defective goal.

Below I will show that, firstly, this system overgenerates non-existing structures, and, secondly, that it fails to explain several properties of ATT-NPECs, most importantly, the complementizer condition and the ban on null copulas.

To show that Livitz's system overgenerates, let's once again list the conditions where, in Livitz's system, we would expect a deletion of a defective goal. In order for a φP to delete, it must occupy the subject position, be adjacent to the C projection, and, additionally, the matrix verb must carry φ-features to evaluate the embedded C.

The first problematic point follows from the fact that the defective goal, in the present system, may bear different case from its antecedent, as the following example shows.

(38) Ja znaju [kuda (mne) poexat']
I.NOM know where I.DAT go.INF
'I know where I should go'

It means, among other things, that the ungrammatical structures, where the NPEC in nondirective context bears a different case than its antecedent, like the following, must also be tolerated:

(39) On skazal, [čto *(emu) xolodno]
he said that he.DAT cold
'He said that he was cold'

(40) *Emu kazhetsja, [čto *(on) znaet otvet]
he.DAT seems that he.NOM knows answer
'He thinks that he knows the answer'

In addition to generating non-existing structures, Livitz's system also generates structures where silent pronouns can be licensed, but in which such pronouns must

be LL-NPEC rather than ATT-NPEC. It concerns finite embedded clauses with a wh-word, like for instance, the following example:

(41) Miša$_i$ zavtra uznaet, [kogda _$_i$ byl začislen]
Misha tomorrow will.learn where was enrolled
'Misha will learn tomorrow when he was enrolled

Since defective goals are allowed in wh-infinitivals (see (37)), wh-words by themselves cannot block the agree relation.

Although this sentence is grammatical, Livitz's theory predicts that we should see evidence of a syntactic relation between a silent pronoun and its antecedent. As I showed in detail in Sect. 2, this prediction is not borne out.

Again, as in the previous analysis, we are faced with the following dilemma. We can assume that Livitz's analysis is applicable only to ATT-NPEC, in which case the system would overgenerate, or, alternatively, we can assume that Livitz's theory should take as its empirical domain all NPECs, in which case we have to conclude that system is not fine-grained enough to account for discrepancies found between ATT-NPECs and LL-NPECs. As I showed in Sect. 2 such discrepancies are significant and difficult to ignore.

Livitz's system, like Tsedryk's account, also fails to explain why licensing of NPEC in embedded clauses is not possible in sentences with a null copula, such (42):

(42) Vova$_i$ skazal, [čto *(on$_i$) bogatyj]
Vova said that he rich.LF
'Vova said that he was rich'

To recall, defective goals are licensed in infinitival clauses where embedded predicates bear no inflection, which means that the valuation of features of the embedded subject must not be dependent on the presence of φ-features on the embedded predicate. This means that it is hardly conceivable that the absence of φ-features on the verb is what makes the sentence ungrammatical. Moreover, in Livitz's system the defective goal seems to be independent of the properties of the embedded predicate, which makes it hard to account for this constraint.

Another potential problem for the Livitz's analysis is the overt complementizer condition. Recall that NPECs are impossible whenever there is no phonological material in C. This position is very different from what we find in control constructions, where the C region does not contain any overt elements (in Russian). Thus there is no straightforward way to rule out (43), in Livitz's system:

(43) *Dima$_i$ skazal, [_$_i$ zajdt večerom]
Dima said will.come.over in.the.evening
'Dima said that he would come over in the evening'

Having discussed particular analyses, I will list several independent reasons against reducing NPEC of any kind to PRO.

First of all, it has been established in recent literature that control phenomena can be divided into two classes: logophoric control and predicative control (Landau 2015). Logophoric control is observed in complements of attitude verbs and predicative control is observed in other environments such as sentential adjuncts. It is clear that the range of contests where ATT-NPECs are observed is quite similar to that of logophoric control.

However, reducing the ATT-NPEC phenomena to logophoric finite control is still problematic. Firstly, controlled predicates, both finite and non-finite, always impose restrictions on the temporal interpretations of their complements, see (Landau 2004) (Grohmann 2003); (Wurmbrand 2001); (Todorović & Wurmbrand 2015), among others. This contrasts with ATT-NPEC clauses which are always free in their temporal interpretation.

Secondly, null subjects in finite control constructions never alternate freely with overt pronouns (apparent counterexamples involve focused PRO (see (Szabolcsi 2009); (Lee 2009); (Landau 2015)), which is not the case in the discussed phenomenon.

Lastly, no language, to my knowledge, possesses logophoric finite control constructions while lacking predicative finite control.

All this does not prove in the strict sense that NPEC sentences are not control constructions. However, positing that Russian NPEC-clauses are instances of finite control would mean that we have a highly typologically unusual kind of finite control, which clearly has different properties from established cases of finite control – the fact which is analytically undesirable.

Let's now summarize what has been discussed in this section. The relation between ATT-NPEC and their antecedent is clearly syntactic and shares many similarities with control, but reducing these phenomena to control is problematic. However, sentences with ATT-NPEC share many similarities with those with LL-NPEC where the syntactic nature of anaphoric relations is less obvious and which share less similarities to control.

5 Proposal

Before proceeding to the proposal, let's review the empirical data that we want to account for. We have seen that Russian can optionally drop subjects in clauses with overt complementizers. The silent pronouns found in these positions divide into two types: complements of attitude verbs and a more heterogeneous class of adjuncts and embedded wh-sentences. In the first case the relation is purely syntactic. We also have seen that ATT-NPEC cannot be reduced to PRO despite the similarities of NPEC sentences and control structures. Finally, both phenomena can share several similarities, including the requirement on an overt complementizer and obligatoriness of inflection on the embedded predicate.

Below I will present an analysis which can account for these facts. I will argue that in all NPEC-structures the subject position of the embedded clause is a minimal pronoun[9] with unvalued φ-features and an unvalued D feature. This pronoun is a clitic and must cliticize onto a phonologically overt projection on its left.

My main theoretical assumptions will be the following. I will adopt Holmberg's (2005), and Holmberg and Sheehan's (2010) idea that apart from φ-features null pronouns also bear a D feature. The inherent presence of a D feature is what distinguishes a referential pronoun from an impersonal one: all referential pronouns, by definition, must have its D feature valued by the end of the derivation.

This feature is argued to play an important role in accounting for the variation of the null subject parameter crosslinguistically. In consistent pro-drop languages, such as Italian, T has an unvalued D feature which can be valued as a result of agreeing with a topic position. In another group of languages, which the authors call partial pro-drop languages, T is assumed to be devoid of the D feature. In those languages null pronouns can be licensed only in the presence of a local antecedent.[10]

I will assume that in Russian a minimal pronoun, a φP, enters the derivation with the following featural specifications: it is specified with unvalued φ-features and an unvalued D feature.

(44) featural specification of φP: φP [uD: uφ:]

The pronoun enters the derivation with an unvalued φ-feature and the D feature and needs to value them. In order to value its φ-features the pronoun agrees with the finite verb, which – in most cases – enters the derivation with valued features. The only case when a finite verb in Russian bears no inflectional morphology, to my knowledge, is the case of a null copula. In those cases we can assume that the valuation goes in the opposite direction: the pronoun values the finite verb.

There are two important implications from this. Firstly, we now can account for subjecthood of NPEC: since in Russian only subjects agree with verbs, no other argument but the subject can potentially value its φ-features via am agree relation. Secondly, it is clear that under this assumption, a φP cannot be licensed in a sentence with a null copula. In this way, the ungrammaticality of sentences like (45) is captured.

(45) Vova$_i$ skazal, [čto *(on$_i$) student]
Vova said that he student
'Vova said that he was a student'

Apart from bearing unvalued φ-features, a φP also bears an unvalued D feature. I assume that Russian T lacks a D feature, and the φP cannot value its D feature

[9]I understand the notion 'minimal pronoun' in the sense of (Kratzer 2006) as a pronoun born without a complete set of features.

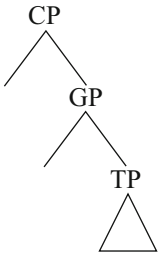
[10]These languages share important similarities with Russian (see Tsedryk (2012) or Bizzarri (2015) for an overview), however, the detailed comparison of such languages with Russian is outside the scope of this paper.

by agreeing with T. I will assume that for a language where T is not specified with a D feature there are two other ways a φP can get its feature valued: by entering a topic-chain or by agreeing with a C which, in its turn, agrees with a matrix vP. Let's consider each case separately.

Let's start with topic chains. Topic chains are a standard tool used to analyze pro-drop phenomena (See (Frascarelli 2007) among others). Although details differ, the general idea behind this family of analyses is the following. In many consistent pro-drop languages, subjects of adjacent sentences in the discourse may move to the topic positions on the left periphery. These topic positions form a chain in which, by chain reduction, only the first copy is pronounced.

As argued by Frascarelli (2007), the only kind of topic position consistently present in embedded clauses is a givenness topic position. I assume that in Russian there is a topic position designated for givenness. I follow (Kučerová 2012) who observes that given elements in Russian always linearly precede new elements. She proposes that given elements are moved to the left periphery by a G(ivenness)-operator. I label the position where such elements move GP, although nothing crucial depends on this label. Importantly, this position is below the CP since given elements never precede the complementizer.

(46) The proposed structure of left periphery:



I depart from Holmberg and Sheehan (2010) in assuming that the (G-)topic-chain is a discourse, rather a syntactic phenomenon (although I will retain the term 'chain'). I propose that once an element has entered a topic chain, it can receive a D feature from linearly preceding elements of the chain. Crucially, this mechanism is not syntactic, which explains its ability to operate intersententially.

This assumption is a stipulation but in many respects it is less problematic than the idea that DPs in a topic-chain are deleted by chain-reduction. Chain-reduction must resort to syntactic notions (Bobaljik 2002) while elements of a topic chain are often contained in different sentences, and no syntactic relation between them holds. In our system, transmission of D-feature within a topic chain is understood as a discourse phenomenon. I propose that D feature is transmitted with the same mechanism with which φ-features, viz., masculine gender and singular number, are transmitted from the antecedent, *Vova,* and the pronominal *on*, 'he', in example (47).

Another important point in which my analysis differs from Holmberg & Sheehan's is that in my analysis there is no reduction of the chain. More than

one overt element can enter the chain (as long as their D-features match, see below) and there is no operation of reduction at any point. The silence of the NPEC is due to the lexical property of the φP.

(47) <$_G$Vova> včera prixodil. <$_G$On> byl očen' rasstroen
Vova yesterday came.over he was very upset
'Vova came over yesterday. He was very upset'
The G-topic chain:
<Vova>; <on>

Let's now turn to phonological requirements on the φP. I assume φP to be a PF-clitic (in the sense of (Bošković and Lasnik 2003)) which must have phonological material in the adjacent projection up (see similar proposals for null clitics in the C domain: Pesetsky (1991), Richards (1999), Landau (2008)). Since the GP is assumed to be adjacent to the CP the φP with all its features valued can now cliticize onto an adjacent higher projection given that there is phonologic material in the C area; otherwise the derivation crashes.

My system can, among other things, account for the fact that null pronouns are almost[11] never found in matrix clauses. Note that apart from the phonological requirement of the φP nothing else prevents φPs from appearing in matrix clauses on the condition that there is a sufficiently local referential antecedent. Since elements of a topic-chain can be sufficiently far from each other, the locality conditions are rather loose, as in the following sentence:

(48) **<$_G$Saša$_i$>** ne znaet čto delat' s vazoj kotoruju
Sasha NEG knows that do.INF with vase which
<$_{G\_i}$> nakanune polučil v podarok
the.day.before got in gift
'Sasha doesn't know what he should with the vase that he got as a present the day before'

However, once the chain is disrupted with a G-topic with another value of the D feature, the valuation is blocked:

(49) **<$_G$Saša$_i$>** ne znaet čto **<$_G$Nina$_j$>** sdelala s vazoj kotoruju
'Sasha NEG knows that Nina do.INF with vase which
<$_{G\_*i/j}$> nakanune polučila v podarok
the.day.before got in gift
'Sasha doesn't know what Nina did to the vase that she got as a present the day before'

[11]The intricate properties and apparent discourse-sensitivity of pro-drop in matrix clauses suggest that a proper analysis of these facts must resort to discourse and semantics-pragmatics interface; such an analysis is outside the scope of this work. The same holds for peripherial adjunct clauses.

Several questions arise at this point. Firstly, why cannot a φP enter a G-chain and value its features in the same way as in the previous case? The explanation of this fact may appeal to the principle of Intrasentential Coreference (Reinhart and Grodzinsky 1993), according to which coreference applies only when it is motivated. In our case, both mechanisms (the discourse mechanism and the syntactic mechanism) would yield the same results, so binding is preferred.

Let's now see how optionality is achieved. A clause can merge either a standard pronominal (or an R-expression) in subject position or a null φP. If the former option is chosen, the subject, being referential, does not need to value its D feature (it is assumed that DPs have their D feature inherently valued). Since such subjects are not clitics and are not phonologically deficient, they may be licensed even in the absence of a complementizer, like in the following example:

(50)	[[Jesli	Dima_i	dejstvitel'no		idët	po	toj	ulice]
	If	he	really		walks	along	that	street
			on	skoro	uvidit		stanciju]	
			he	soon	will.see		station	

'If Dima is really walking that street then he'll see the station soon'

Turning to complements of attitude verbs, recall that there is evidence that a null pronoun is bound with its antecedent via a syntactic relation. I propose that in these cases the subject position of the embedded clause is also occupied a φP. As in the case of LL-NPECs, this pronoun must value its φ-features from the finite verb and the pronoun must cliticize onto a higher projection which accounts for the no-null copula condition and the overt-complementizer condition.

Three major points in which ATT-NPECs are different from LL-NPECs are different are therefore the following: in these cases the subject is a bound variable, the subject can be controlled by a dative argument and the antecedent must be local. I want to argue that the first two conditions are due to the fact that the φP and its antecedent are bound by an agree relation. A persistent intuition that one might have when looking at ATT-NPEC clauses is that although they are referentially dependent, they are dependent on neither tense nor φ-features (unlike control constructions). Following this intuition I want to argue that although an φP values its features clause-internally, it agrees with its D-features with the matrix clause. I will adopt Livitz's idea that the underspecified pronoun in the embedded clause agrees with the higher projection in order to get its features valued. However, I will assume that these two elements agree in D feature and not in φ-features. I will also assume, following Livitz, that the phase may extend when defective. As in the previous case, the φP enters the derivation with its D feature unvalued and, as in the previous case, it gets its from its antecedent. However, I propose that in this case the valuation goes indirectly, via a C head.

As we saw, the idea of agreement via the C head was adopted, among other works, in Livitz (2014). In the system presented here, the driving force of this agree relation is a need for the subject of the embedded clause to value its D feature. Here is how the derivation goes, in more detail. The φP enters the derivation with

φ-features and the D feature unvalued. The φP agrees with the finite verb of the embedded clause and gets its φ-features valued. To get its D-feature valued, it needs to probe up. By the time the complementizer is merged, the φP agrees with it. Now φP and the C head are in an agree relation, but the D features of C are not valued. Once the matrix vP projection is merged, it can value the embedded C with the value of a D feature.

I assume that only the complementizer *čto* 'that' can bear the φ-feature and the D feature and thus mediate the agree relation. Wh-words cannot bear such features and thus the agreement with the matrix clause is blocked.

Let's now turn to the cases of addressee-oriented null pronouns. To recall, the ATT-NPEC can refer to the dative argument of the matrix predicate when this predicate is directive.

(51) Ja$_i$ skazal jemu$_j$, [čtoby _$_{*i/j}$ prixodil poskoree]
I said him SUBJ came soon
'I told him to come soon'

A natural question which arises here is why antecedent is the dative and not the nominative argument. The problem is very reminiscent of the problem of the choice of the controller of PRO, which has been widely discussed (Landau 2010) (Hornstein and Polinsky 2010). There is evidence, however, that the mechanism of the choice of the antecedent in these cases is independent from the mechanism of the derivation of the silent pronoun. Sentence (52) which is different minimally from (53) in having an overt pronoun instead of a null one, is ungrammatical, which suggests that irrespective of the properties of the subjunctive complement of the directive verb, its subject must be addressee-oriented.

(52) *Ja$_i$ skazal jemu$_j$, [čtoby ja$_j$ prixodil poskoree]
I said him SUBJ I came soon
int. 'I told him that I should come'

(53) Ja$_i$ skazal jemu$_j$, [čto pridu zavtra]
I said him that will.come tomorrow
int. 'I told him to come soon'

But saying just this is not enough. If we suggest that the agreement of the NPEC with an object is possible, we have to account for the ungrammaticality of (54), in which the matrix predicate is not directive and the null pronoun is coreferential with the dative argument of the matrix clause. However, null pronouns cannot appear in non-directive contexts.

(54) *Ja$_i$ skazal jemu$_j$, čto pridët zavtra
I said him that will.come tomorrow
int. 'I told him to come soon'

Since the structures of the matrix clauses in (51) and (54) seem to be identical, it is highly unlikely that we are dealing with a structural difference here that affects the antecedent choice. Instead, the following explanation can be proposed.

Following Landau (2015), I assume that the C in the attitude contexts is endowed with an 'author' or an 'addressee' feature. Here, I depart from Landau's proposal in assuming that the feature is encoded on the complementizer itself rather than projected as a pronoun in the SpecCP. This feature must match the φ-features and the D feature of the C in such a way that if they are inherited from a DP with a different feature, the derivation crashes. Directive verbs select for subjunctive complements which bear the 'addressee' feature (see Kempchinsky (2009) for the account for this fact); in all other cases the complement with an 'author' feature is selected. It means that the embedded C can potentially agree with both the subject or the dative argument, and it is an independent mechanism that rules out one of those options in each case.

Here is how the distributional facts of ATT-NPEC-sentences are derived.

The locality condition follows from the locality of Agree relation (see for example Rackowski & Richards 2005). In the cases where the null pronoun is contained in an adjunct clause the φP cannot value its D feature from the matrix clause because elements contained in matrix clauses are unavailable to Agree operations.

This analysis also has the following prediction: the pronoun and its syntactic antecedent cannot be separated by more than one phase boundary. This is indeed the case. In the following example the null pronoun is separated from its syntactic antecedent by more than one phase boundary.

(55) Stëpa$_i$ pročital [prikaz generala$_j$, [čto *(on$_{i/j}$) poedet v drugoj gorod]]
Styopa read order general that he will.go in other city
'Stepa$_i$ read general's order that he$_i$ would go to another city'

In this sentence the silent pronoun is contained within a complex DP, and, in order to agree with the potential antecedent it needs to cross two phase boundaries.

I don't attempt to develop a semantic theory of null pronouns here, but I assume that boundness of null pronouns is achieved due the fact that they achieve their features as a result of a syntactic relation (see Reuland 2010).

As we have seen, this theory can account for seemingly diverse phenomena once several assumptions are made. However, the theory also has some conceptual and empirical problems, which, as I hope, are not crucial but nevertheless deserve being mentioned. Let's start with conceptual points. First of all, the current analysis relies on the presence of a D feature. Such assumption is by no means novel (see, for example Holmberg (2005)), however, it remains problematic for several reasons. It is not quite clear what the value of this feature is. If this indeed is an indexical feature whose value is an index then it is not quite clear in what relation this feature might be with φ-features. Another important issue is the independent motivation for the D feature. If this feature is a syntactic feature number, gender etc. we would want do see morphological reflexes of this feature.[12]

[12] Although evidence for this might be found in sign languages, see Schlenker (2014).

Secondly, it is unclear why the D feature can be intersententially transmitted only along the G-topic chain. Finally, since the theory of G-topic formation is not explicitly developed here it might leave many contrasts hardly falsifiable.

Turning to empirical issues the following must be mentioned. This account doesn't explain why silent pronouns in Russian are – under severe constraints – licensed in matrix clauses (more severe constraints and less regular patterns might suggest that we deal with a different phenomenon (see (Haegeman 1990) on the so-called 'diary pro-drop' in English which might be a similar phenomenon)).

6 Impersonal Pronouns as φP

In this section I briefly explore several implications the proposed account might have. In addition to two null referential pronouns, which distribution, as we have seen, is almost universally limited to embedded clauses, Russian has an impersonal null pronoun which can appear in matrix clauses quite freely.

(56) Zdes' ne l'ub'at čužakov
here NEG love.3PL foreighners
'Foreigners are unwelcome here'

It has been observed that these constructions have a following requirement: the null subject cannot occupy the leftmost position in the clause.

(55) *Ne l'ub'at zdes' čužakov
NEG love.3PL here foreigners
int.'Foreigners are unwelcome here'

This constraint has been standardly analyzed as the EPP requirement of T which cannot be satisfied by a null pronoun. I instead suggest that in this case we are dealing with the same pronoun we saw in embedded clauses (which is, however, devoid of the D feature) but that the motivation behind this requirement is different, namely that the silent pronoun in this case requires phonological material in the next projection up thus reducing it to the same condition that prevents referential silent pronouns from occurring. I will also assume that all referential DPs move to the SpecGP position while impersonal pronouns don't.

The pattern can be then explained in the following way. (55) is ruled out because the subject clitic fails to cliticize onto a higher projection. The adjacency requirement is crucial. When there is more than one projection between the clitic and its potential host, cliticization is blocked. One may wonder what happens if the clause like (55) is embedded under a complementizer, in (56):

(55) *On skazal [čto ne l'ub'at zdes' čužakov]
He said that NEG love here foreigners
int.'Foreigners are unwelcome here'

The ungrammaticality of this example might be problematic since one could say that the silent pronoun can cliticize onto the complementizer. I assume that cliticization in such cases is blocked because there is a G projection intervening between the null pronoun and the complementizer to which the φP cannot move because it is not referential, hence adjacency is not satisfied.

7 Conclusion

In this paper, I argued that null pronouns in Russian embedded clauses should be categorized into two major subclasses. When embedded under attitude verbs, NPECs participate in a close syntactic relation with their syntactic antecedent. In other cases, there is no evidence for a syntactic relation and the phenomenon seems to have non-syntactic nature. I argued that contrary to many claims, neither all NPECs nor the subclass found under attitudes can be reduced to PRO. An alternative analysis was proposed, according to which the NPECs are phonologically deficient minimal pronouns with unvalued φ-features and an unvalued D feature. The pronoun gets its φ-features valued from an inflected embedded verb, while the D feature must be valued by the antecedent, either directly or indirectly. Most empirical facts have been shown to be accounted for by the analysis.

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Deriving Null, Strong and Emphatic Pronouns in Romance *Pro*-Drop Languages

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Abstract It is well-known that overt subject pronouns in Romance Null Subject Languages display properties with respect to information structure and interpretation that set them apart from overt weak pronouns in a non-Null Subject Language like English. On the one hand, overt subject pronouns in a language like Spanish have been argued to be reluctant to occur in a bound construal in finite embedded contexts, as is expressed by Montalbetti's (After binding. Doctoral dissertation, Massachusetts Institute of Technology, 1984) *Overt Pronoun Constraint*. On the other hand, several studies indicate that the ban against a bound construal of overt pronominal forms is not categorical in focal or contrastive positions. Furthermore, overt pronominal forms can apparently be bound in certain complement control infinitives if they bear emphasis. This indicates that the bound/free alternation of subject pronouns in Romance Null Subject Languages is influenced by notions relating to information structure. In this paper, Spanish subject pronouns will be analyzed as 'topic/focus morphemes' which spell-out post-syntactically in combination with agreement features. In particular, it will be argued that null, strong, and emphatic pronouns enter the syntactic component lexically underspecified and are derived by entering dependencies with AGR as well as features relating to the pragmatic interface points *v* and C. The fact that overt realization of subject pronouns depends on [topic]/[focus] features in a Romance *Pro*-Drop Language like Spanish has the consequence that their referential construal is influenced by these features as well.

1 Introduction

It has long been discussed that the *pro*-drop parameter does not only make available the option of leaving subjects phonetically unrealized in languages like Italian, Spanish, European Portuguese (EP), and Catalan, but that further correlating properties appear in the grammar of Romance Null Subject Languages

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(see Chomsky 1981, 1982; Rizzi 1982; see Camacho 2013 for recent discussion). One property that has been argued to be influenced by the possibility of null realization of the subject position concerns the interpretative nature of overt subject pronouns. Thus, in his seminal work, Montalbetti (1984) argues that overt subject pronouns in the Null Subject Language (NSL) Spanish behave differently from null *pro* with respect to the possibility of a bound construal (see also Luján 1985):

(1) a. Nadie cree que él es inteligente.
nobody believe.3SG that he is intelligent
'Nobody believes that he is intelligent.'
b. Nadie cree que *pro* es inteligente. (Sp.; Montalbetti 1984: 83)

Montalbetti (1984) argues that both – null and overt pronouns – can be interpreted as free, i.e. they can be interpreted as referring to a discourse antecedent, but that only the null pronoun in (1b) is ambiguous in also allowing a bound interpretation:

(2) (No x: x a person) x believes that x is intelligent
(Montalbetti 1984: 83)

This is different from the non-NSL English, where both the bound and free interpretation is available for overt subject pronouns:

(3) Nobody$_i$ believes that he$_{i/j}$ is intelligent.

Furthermore, in Spanish, overt pronouns can be bound if they are not in subject position, i.e. in contexts where no overt/covert alternation arises, as inside PPs (cf. Montalbetti 1984; Luján 1985; Rigau 1988; Alonso-Ovalle and D'Introno 2001; Spanish example (4) from Montalbetti 1984: 87):

(4) Nadie$_i$ quiere que María hable de él$_i$.
nobody wants that Mary speak.SUBJ of him
'Nobody wants Mary to talk about him'.
(5) María habló de (él/**pro*).
Mary spoke of him/*Ø
'Mary spoke about him'.

This situation has been captured by Montalbetti's *Overt Pronoun Constraint*:

(6) *Overt Pronoun Constraint* (OPC; Montalbetti 1984: 94)
Overt pronouns cannot link to formal variables iff the alternation overt/empty obtains.

Similar data have been reported for other NSLs (see Solà 1992; Barbosa 1995, among others). The possibility of a subject pronoun to be bound is thus conditioned by the *pro*-drop property, which creates an overt/empty alternation in finite domains, making the phonetically most reduced element – *pro* – the only option for binding.

The impossibility of binding overt subject pronouns in Romance NSLs has further been regarded as part of more general (economy) principles which favor phonetically and/or structurally reduced forms over more complex ones, as e.g. Chomsky's (1981) *Avoid Pronoun*, Bonet's (1991) *Avoid Pronoun Strength*, or Cardinaletti and Starke's (1999) *Economy of Representation*. Given that *pro* is the phonetically most reduced form, it should be the unmarked option for binding if it competes with an overt pronoun.[1]

However, bound overt pronouns in potential overt/covert alternations are only predicted to be strictly impossible if Montalbetti's (1984) OPC is defined as a grammatical principle (cf. also Alonso-Ovalle et al. 2002 for discussion), but not necessarily if it is the result of an interface strategy of economy. In fact, several empirical studies show that there is considerable variation with respect to the acceptability of bound overt pronominal forms in Romance NSLs like Italian (cf. Carminati 2002) or Spanish (cf. Alonso-Ovalle et al. 2002), rather than strict impossibility. In particular, the results of these studies indicate that there is a preference for a bound construal with null pronouns (as predicted by the OPC), but that it is not impossible with overt pronouns for all speakers. Thus, rather than considering the (anaphoric) properties of subject pronouns in embedded contexts of Romance NSLs to be the result of a [±] grammatical principle, Carminati (2002) argues that they follow from a general *preference* of null pronouns to link to antecedents which are higher in the syntactic structure (in Spec,IP) while overt pronouns prefer antecedents in a lower position (cf. Carminati's 2002 *Position of Antecedent Hypothesis*; cf. also Alonso-Ovalle et al. 2002 for Spanish).

If the OPC derives from a more general economy principle, another prediction is that less economical strategies might be available and chosen if further interface factors intervene. For example, it has been observed that the ban against a bound construal of strong subject pronouns in finite embedded clauses is not categorical in Spanish if we consider information structural notions like contrast or emphasis. Thus, a contrastive interpretation or focalization of the subject is one context in which a referential dependency between an overt pronominal form and a matrix QP antecedent becomes available (cf. Luján 1986, 1999; Alonso-Ovalle and D'Introno 2001; Bosque and Gutiérrez-Rexach 2009; Eguren 2014):

[1] Another account of the preference of null pronouns can be found in hierarchies such as Gundel et al.'s (1993) *Givenness Hierarchy*. These approaches share that a (phonetically and/or structurally) more reduced form is the preferred option for encoding binding and co-reference, while disjoint reference is triggered by a more complex form, as is also expressed in Levinson (1987):

(i) Lexical NP > pronoun > Ø (Levinson 1987: 384)

(7) a. [Todo estudiante]$_i$ [piensa que él$_j$ es inteligente].
every student$_i$ thinks that he$_j$ is intelligent
'Every student$_i$ thinks that he$_j$ is intelligent.'

b. [Todo estudiante]$_i$ [piensa que él$_i$ (y no otros$_j$) es inteligente].
every student$_i$ thinks that he$_i$ (and not others$_j$) is intelligent
'Every student$_i$ thinks that he$_i$ (and not others$_j$) is intelligent.'
(Sp.; Bosque and Gutiérrez-Rexach 2009: 555 [my glossing])

At first sight, one could say that the contrastive pronoun *él* in (7b) behaves like a strong pronoun with respect to its phonological content, but like null *pro* with respect to its binding properties, with the difference that a contrastive interpretation is not involved in the latter case.

If overt subject pronouns in Romance NSLs could only be construed as (co-)referential in embedded clauses, a further puzzle would arise in control complements. Here, PRO can be overtly realized if associated with an emphatic or contrastive interpretation (cf. Burzio 1986; Cardinaletti 1999; Belletti 2005; Livitz 2011 for Italian; Hernanz 1982; Piera 1987; Alonso-Ovalle and D'Introno 2001; Herbeck 2015b for Spanish; Solà 1992 for Catalan; Barbosa 1995, 2009a for EP; cf. Szabolcsi 2009 for cross-linguistic discussion and Sundaresan 2010 for Tamil):

(8) Le prometió encargarse él mismo del asunto.
CL(him) promised.3SG take-care-of.INF-SE he self of-the matter
'He$_i$ promised him$_j$ to take care of the matter himself$_i$.'
(Sp.; Hernanz 1982: 344 [my glossing])

The following example demonstrates that these 'emphatic pronouns' (cf. Burzio 1986; Piera 1987) can apparently be bound by a matrix QP in control contexts for some Spanish speakers (cf. Szabolcsi 2009 for Italian, Barbosa 2009a for EP):

(9) Ningún vecino$_i$ promete hacer él$_i$ (mismo) la cena.[2]
no neighbor promises do.INF he self the dinner
'No neighbor$_i$ promises to prepare the dinner himself$_i$.'

What is interesting is that, quite similarly to what we have seen in (7b), the emphatic pronoun in (9) seems to behave like an *empty category* (i.e. PRO) for LF construal but like a full strong pronoun with respect to PF realization. Thus, some authors

[2]There is some speaker variation with respect to the configurations that allow bound emphatic pronouns with Neg-QP antecedents inside infinitives. For example, out of six informants I consulted, one did not accept it. Furthermore, two speakers preferred the element *él mismo* with the intensifier *mismo* while others accepted it without the intensifier.

have claimed that we are dealing with an 'overt PRO' element (see e.g. Mensching 2000: 62; Livitz 2011, 2014; Herbeck 2015a, b). In the same vein, it could be argued that we are dealing with an 'overt *pro*' in a finite clause like (7b).

If we consider these pronominal forms in the context of the OPC, one potential problem that arises is that, if there is in fact an overt/covert alternation in Spanish nonfinite control domains, a strict interpretation of this principle would predict only co-referent, but not bound overt pronouns to be possible. If the reasoning up to now is on the right track, overt pronominal forms in contexts with potential overt/covert alternations in embedded finite as well as some nonfinite control clauses seem to share that a bound interpretation is not categorically ruled out, but it is crucially conditioned by the notions of emphasis and/or contrast.

The subject position in Spanish (and other Romance NSLs) thus poses interesting questions, both for the theory of *empty categories* as well as for the concept of 'pronoun' more generally: on the one hand, if notions like contrast or emphasis influence the possibility of a bound construal of overt subject pronouns, it is not only the phonological shape, but also the referential status of pronominal forms that is conditioned by notions relating to information structure. Thus, these notions rather than the internal structure of the relevant pronominal form seem to have a direct impact on how the bound/free alternation of Spanish subject pronouns is derived. On the other hand, overt realization of pronominal subjects has traditionally been linked to notions like emphasis and contrast as well. Importantly, this holds for finite as well as nonfinite structures, which indicates that the principles governing the overt/covert alternation in the two configurations are not fully dissociated from one another.

In this paper, I build on Alonso-Ovalle and D'Introno's (2001) application of the concept of zero/minimal pronouns (Kratzer 1998, 2009) to Spanish in order to account for subject pronouns in finite and nonfinite embedded contexts of a Romance NSL. However, I extend this approach arguing that null, emphatic, as well as strong subject pronouns *generally* derive from a lexically underspecified, PRO-like element (Landau's 2015 $D_{[\phi:\_]}$). Different occurrences of this element arise through 'control' strategies mediated by the AGR *and* C-heads and the assignment of topic/focus features in the high and low left periphery (Rizzi 1997; Belletti 2004). Thus, overt and null as well as bound and free subject pronouns are 'built' by context-linkers in the C-domain (in the sense of Uriagereka 1995; Bianchi 2003; Sigurðsson 2011, 2014; Landau 2015, among others) as well as interpretable AGR (Rizzi 1982; Barbosa 2009a, b).[3] I further argue that null and overt 'bound' subject pronouns should not be fully collapsed. However, the differences between the two forms do not arise from their lexical specification, but from topic/focus assignment, which imposes restrictions on how the subject can be 'built' by C.

[3]See also Borer (1989), Kratzer (2009), and Sigurðsson (2014), among others, for discussion of how different pronominal forms may arise through association with C and/or AGR.

This paper is structured as follows: first, I discuss the main theoretical background with respect to strong and emphatic pronouns in Romance NSLs. In particular, I outline Alonso-Ovalle and D'Introno's (2001) approach to bound overt subject pronouns in terms of Kratzer's (1998) *Zero Pronoun Hypothesis*. Thereafter, I point to some problems for a reduction of overt bound pronouns to focused minimal pronouns. The main objection comes from the observation that emphatic pronouns and PRO/*pro* behave differently depending on the type of matrix antecedent and depending on the type of matrix control verb. Then, I briefly discuss the relation between overt subject pronouns and the notions of topic and focus. This shall lay out the background for the analysis outlined in Sect. 3: while nominative Case might be a factor for overt realization of subject pronouns in finite clauses of English (as is expressed by the traditional Case Filter), the *pro*-drop property and, in particular, pronominal agreement features on the verb (see e.g. Rizzi 1982; Barbosa 1995; Alexiadou and Anagnostopoulou 1998; Kato 1999), will be argued to have the consequence that nominative Case is not obligatorily assigned to the subject position in a language like Spanish. This way, features relating to information structure replace the function of Case in the organization and functioning of post-syntactic morphological insertion rules (adopting *late insertion* as in Distributed Morphology (DM); Halle and Marantz 1993 and related work). While a (universal) default null insertion rule into pronominal subjects is blocked by a combination of agreement features and nominative Case in English, the default rule must be blocked by an alternative trigger in Spanish, namely information structural notions like topic and focus. Strong and emphatic subject pronouns are thus analyzed as 'topic/focus morphemes' which are spelled-out in combination with agreement features. Given that morphological insertion rules into pronominal subjects depend on the notions of topic and focus, the possibility of a bound construal of these elements becomes susceptible to these notions as well. This will be argued to be in line with the assumption that the OPC might be regarded, not as a [±] grammatical principle (see Carminati 2002; Alonso-Ovalle et al. 2002), but as governed by notions relating to information structure.[4] The bound construal is more easily available with null than with overt subject pronouns because focus assignment to a pronominal form enforces a discourse identification strategy and blocks (more economical) syntactic identification.

[4]Duguine (2008: 328) also hints at the possibility that differences between null and overt subject pronouns with respect to the (un-)availability of a bound construal in Spanish might derive from information structural constraints. While the proposal of this paper is similar in spirit in considering information structure a crucial factor for explaining 'bound' strong pronouns, it does not assume that null pronouns are the result of ellipsis of specified nominal elements (for discussion of deletion approaches to null subjects, see e.g. Holmberg 2005, 2010; Sheehan 2007; Roberts 2010; Fernández Salgueiro 2011, among many others). Furthermore, it will be argued that a theory of subject pronominal forms has to take into account Case as well as Focus in that the latter is only relevant in contexts where the former can be 'absorbed'.

2 Strong Subject Pronouns in a Romance NSL

In this section, I outline some main properties of null and overt subject pronouns in a Romance NSL, focusing on Spanish with some remarks on Catalan and EP.

2.1 Bound Strong Pronouns in Romance NSLs

As we have seen, reluctance towards a bound construal of strong pronouns is apparently not categorical in some Romance NSLs. Empirical studies show that, even though a bound construal is preferred with null pronouns, it is not impossible with overt pronouns for all speakers of Spanish (cf. Alonso-Ovalle et al. 2002) or Italian (cf. Carminati 2002). For example, Alonso-Ovalle et al. (2002: 158f) investigated the anaphoric properties of overt and null pronouns in embedded contexts in Spanish. In this study, sentences comparable to (10), with a QP antecedent in the matrix clause and a null subject in the embedded clause, received a bound variable interpretation in 86.1% of the cases. Even though the result was significantly lower with an overt subject pronoun in Alonso-Ovalle et al.'s study – 63.3% – this demonstrates that a bound construal was not impossible for all speakers (cf. Alonso-Ovalle et al. 2002: 158f for full discussion):

(10) Ningún estudiante cree que (*pro*/él) pasó el examen.
no student believes that he passed the exam

In fact, for some native speakers of Spanish, there seem to be patterns of preference rather than a clear-cut dichotomy: with a null subject, there is a preference for binding by a matrix neg-quantifier if no further context is provided, but a disjoint interpretation is possible if a topic antecedent is explicitly introduced:

(11) En cuanto a Juan$_i$, nadie piensa que *pro*$_i$ pasó el examen.
'As for John$_i$, nobody thinks that (he$_i$) passed the exam.'

Furthermore, as was noted in the context of (7), even though a strong pronoun triggers preference for a disjoint interpretation, contrastive or focal use of strong pronouns apparently makes a bound construal possible. The following example demonstrates a similar situation:

(12) *Ningún estudiante*$_i$ piensa que (sólo) *ÉL*$_{i/j}$ pasó el examen.
no student believe.3SG that (only) he passed.3SG the exam
'No student$_i$ believes that only he$_i$ passed the exam.'
(Sp.; Alonso-Ovalle and D'Introno 2001: 402)

In Catalan, it has been observed that bound overt pronouns are more readily available when they are in postverbal position (cf. Solà 1992, citing Rosselló 1986; cf. Barbosa 1995 for EP and Frascarelli 2007: 716 for Italian):

(13) Tots els jugadors$_i$ es pensen que ells$_i$ aprovaran.
all the players SE think.3PL that they pass.3PL.FUT

(14) Tots els jugadors$_i$ estan convençuts que guanyaran ells$_i$.
all the players are persuaded.3PL that win.3PL.FUT they
'For any player x, x is persuaded that x will win'.

(Cat.; Solà 1992: 289f)

Solà (1992) argues that the postverbal position of the overt subject pronoun favors a bound interpretation. Note that the observations about Spanish (12) and Catalan (13)–(14) could derive from a common source: Bonet (1989: 5) points out that postverbal (non-dislocated) subjects receive contrastive focus and not presentational focus (in the sense of Rochemont 1986)[5] in Catalan.[6] Thus, the possibility of bound interpretations of overt pronominal forms might be related to the creation of a contrastive set.

2.2 *Bound Subject Pronouns as Minimal Pronouns*

Alonso-Ovalle and D'Introno (2001) derive the possibility of binding focused subject pronouns in Spanish from an application of Kratzer's (1998) *Zero Pronoun Hypothesis*. Kratzer's (1998/2009) concept of 'zero/minimal pronoun' constitutes a minimally specified nominal element, which lacks ϕ-features ([person], [number], [gender]) for interpretation (even though they are 'visible' at phonetic form):

(15) Only I got a question that I understood. (Kratzer 1998: 92)[7]

Kratzer (1998: 92) shows that this sentence can have two interpretations: in the first interpretation (the strict reading), there was no other person that got a question that the speaker understood. Here, *I* is a full pronoun that deictically refers to the speaker and is equipped with ϕ-features (first person singular) that are interpreted at LF. In the second (sloppy) reading, the interpretation is that there was no other person x that got a question that x understood (cf. Kratzer 1998: 92 for further discussion). Here, *I* is interpreted as a bound variable. Kratzer (1998) assumes that in their bound readings, pronouns are able to be generated in the syntax as reduced

[5] See also Kiss (1998) for a discussion of the difference between identificational focus and information focus.

[6] With unaccusative verbs, on the contrary, inverted subjects can bear presentational focus in Catalan (cf. Bonet 1989: 5).

[7] The example is attributed to Irene Heim (class lectures) by Kratzer (1998).

(lexically underspecified) pronominal forms, which lack ϕ-features when they are introduced into the syntax and acquire their features via transmission from a binder at PF.

In this vein, Alonso-Ovalle and D'Introno (2001) argue that overt pronouns can be zero/minimal pronouns (and hence bound) in Spanish if Focus blocks null realization. In an economy approach in the vein of Cardinaletti and Starke (1999), minimization of (structural, phonetic, etc.) content holds "up to crash". Given that 'minimal pronouns' are the structurally most reduced form, they can occur in Spanish as an overt pronoun if a phonetically more reduced, i.e. null, form is blocked. This situation arises inside PPs (see (4)), where oblique Case blocks null realization. It also arises in sentences like (7b) and (12), where focus or contrast on the subject has the consequence that null *pro* is blocked and, thus, an overt pronoun is a licit minimal pronoun because there is no phonetically more reduced form available. According to this approach, focused subject pronouns in fact fall under an extension of Montalbetti's (1984) OPC (see also Luján 1986) because focused contexts are environments in which null realization is blocked and, thus, no overt/covert alternation obtains.

We have seen in (8) that PRO can be overtly realized in Romance NSLs if associated with a focus-related marking (cf. Hernanz 1982; Belletti 2005; Barbosa 2009a; Szabolcsi 2009; Livitz 2011, 2014; Herbeck 2015a, b; Landau 2015):

(16)	Juan$_i$	quería	[hacer	él (mismo)$_i$	la	cena].
	Juan	wanted.3SG	make.INF	he self	the	dinner

One analysis considers 'emphatic pronouns' anaphors with respect to binding theory (see Burzio 1986; Piera 1987). Some evidence for this line of reasoning could be found in the fact that these morphological pronouns can optionally be associated with the anaphoric element *mismo* 'self'. However, as is well-known (see e.g. Solà 1992), emphatic pronouns are not necessarily [+anaphoric, −pronominal] elements in the sense of Government & Binding theory. Thus, they can appear in contexts where they are not locally bound:

(17)	Ell	mateix	no	ho	farà.
	he	self	not	it	do.3SG.FUT

'He himself will not do it.' (→ his lawyer will) (Cat.; Solà 1992: 61)

The element *mismo*/*mateix* can add emphasis to a pronominal form without converting it into a locally bound anaphor.

The status of 'self' as a focus particle is further demonstrated by its impossibility to associate with null elements (cf. Sánchez 1994):

(18)	a.	Ellos	mismos	pintaron	la	casa.	
		they	themselves	painted	the	house	
	b.	*(*pro*)	mismos	pintaron	la	casa.	
		(*pro*)	themselves	painted	the	house	(Sp. Sánchez 1994: 481)

Alonso-Ovalle and D'Introno (2001) argue that emphatic pronouns in obligatory control (OC) infinitives can be derived similarly to focused bound subject pronouns in finite clauses. Thus, overt realization of PRO crucially relies on the assignment of Focus which in turn blocks null realization (see also Livitz 2011; Herbeck 2015a, b).[8] Given that no overt/covert alternation obtains in focused contexts, binding of a pronoun should be possible also in control infinitives.

In fact, Kratzer (1998, 2009) and Landau (2015) propose that the null subject of OC infinitives – PRO – is just another variant of a minimal pronoun. In Landau (2015), it is a D-element with unvalued ϕ-features[9] – $D_{[\phi:\_]}$ – where ϕ-features are transmitted to the PRO-subject in the PF-component. This way, there is nothing 'inherent' in PRO that enforces null realization, but it can be phonetically realized just like minimal pronouns in other contexts (as in e.g. (15)). According to Alonso-Ovalle and D'Introno (2001), Focus on the minimal pronoun has the effect that no overt/covert alternation arises and, thus, the phonetically most reduced form for encoding PRO is in fact an overt controlled pronoun.

This approach presents an attractive option of unifying bound overt subject pronouns in finite and nonfinite domains in Spanish to the independently needed concept of minimal pronoun. In the next section, I discuss some theoretical and empirical challenges to such a reduction.

2.3 *How 'Minimal' are Bound and Controlled Overt Pronouns?*

Analyzing overt bound pronouns as minimal pronouns makes the strong prediction that they should *generally* be licit in finite and nonfinite embedded clauses in a

[8] In Livitz (2011), deletion of the subject of control infinitives can be blocked if Focus makes the features of the Goal PRO distinct from the features contained in the Probe. In Herbeck (2015b), Focus delays post-syntactic phonological insertion into the minimal pronoun until ϕ-valuation takes place at the matrix *v*P-level. See also Sundaresan (2010) for discussion of Focus and overt PRO in Tamil. See also Landau (2015) for further discussion.

[9] According to the DP hypothesis (see e.g. Abney 1987), nominal phrases like *the man* are headed by a functional D(eterminer), which projects a DP on top of the lexical NP:

(i) $[_{DP}\ [_{D}$ the $[_{NP}$ man]]]

If pronouns are a subtype of determiner (see e.g. Postal 1969, Abney 1987 for discussion), there are two ways to implement this: either pronouns are D-elements which take an empty/deleted NP complement (see Postal 1969) or pronouns can be D-elements without an NP complement (cf. Abney 1987: 281ff; see also Luján 2010 for Spanish):

(ii) a. $[_{DP}\ [_{D}$ We $[_{NP}$ Ø]]] b. $[_{DP}\ [_{D}$ We]]

A minimal pronoun would have to be further reduced, lacking an NP complement *and* ϕ-values:

(iii) $[_{DP}\ [_{D}$ ϕ:_]]

language like Spanish if they are focused. However, there is evidence that emphatic pronouns underlie several restrictions. First, Barbosa (2009a) shows that emphatic pronouns, even though they can relate to a referential DP antecedent, cannot be bound by a non-referential QP in raising structures in European Portuguese:

(19) A empregada não apareceu, mas eu fui lá e
the maid not showed-up but I went there and
*nenhum hóspede acabou por fazer ele o pequeno-almoço.
no guest ended up do.INF he the breakfast
'The maid didn't show up but I went there and no guest turned out to prepare breakfast himself.' (EP; Barbosa 2009a: 112)

(20) O João acabou por resolver ele o problema.
the João ended up solve-INF he the problem
'John ended up solving the problem himself.' (EP; Barbosa 2009a: 106)

As Barbosa (2009a) shows, some control infinitives allow binding of an emphatic pronoun by a matrix Neg-QP antecedent:

(21) Estou certa de que nenhum hóspede optará por
am certain of that no guest will-choose by
fazer ele o pequeno-almoço todos os dias.
make.INF he the breakfast every the days
'I am certain that no guest will choose to prepare his breakfast himself every day'. (EP; Barbosa 2009a: 113)

The ungrammaticality of (19) could be explained by the lack of an external θ-role of raising verbs, so that the matrix antecedent of the minimal pronoun would have to be merged in a non-argument position and would have to be a base-generated topic, which a non-referential QP does not qualify for (cf. Barbosa 2009a).

However, having a look at Spanish, even some matrix control verbs seem to be reluctant to allow an overt bound PRO element:

(22) a. ?*[Ningún marido se olvidó de [hacer **él (mismo)** la cena]].
no husband SE forgot of do.INF he self the dinner

b. [Ningún marido prometió [hacer **él (mismo)** la cena]].[10]
no husband promised do.INF he self the dinner

[10]Some speakers require the intensifier *mismo* in order to get a bound emphatic pronoun.

This is problematic if we assume that PRO can be overtly realized by means of focus-marking without further conditions.

Also in European Portuguese (EP), different types of matrix control verbs seem to show degrees of possibility of binding an emphatic pronoun by a Neg-QP antecedent. Thus, while a bound construal does not seem to be fully out with the verb *conseguir* 'manage', it is more degraded in comparison to an emphatic pronoun in the complement of the verb *decidir* 'decide':[11]

(23)	a.	???	Nenhum	hóspede	conseguiu	fazer	ele	o	jantar.
			no	guest	managed.3SG	make.INF	he	the	dinner
	b.	?	Nenhum	hóspede	decidiu	fazer	ele	o	jantar.
			no	guest	decided.3SG	make.INF	he	the	dinner

In contrast, a controlled pronoun becomes fully acceptable if its antecedent is a referential DP (cf. Barbosa 2009a):

(24)	**O**	**João**	conseguiu/decidiu	fazer	**ele**	o	jantar.
	the	John	managed/decided	make.INF	he	the	dinner

These differences are problematic if overt bound pronouns are assumed to be possible whenever focused without any further condition.

A further problem that an analysis of emphatic pronouns in terms of an overtly realized minimal pronoun faces concerns the possibility of binding and control with antecedents containing a numeral, which are not "inherent quantifiers" (in the sense of Haïk 1984).[12] Consider the following examples with a finite embedded clause containing a null or an overt subject pronoun:

(25)	a.	Tres	físicos	han	confirmado	que	*pro*	participarán
		three	physicians	have	confirmed	that	Ø	will-participate
		en	el	coloquio.				
		in	the	colloquium				

[11] Thanks to Pilar Barbosa (p.c.) for the examples in (23). All potential errors are my own.

[12] According to Haïk (1984), an inherent quantifier is defined as follows:

(i) An *inherent quantifier* is an NP that is not satisfiable by one or more objects of the domain of discourse. (Haïk 1984: 189)

Quantifiers like *everyone*, *no*, or *none* are inherent quantifiers and cannot sanction coreference with a pronoun. Numerals like *two*, *three*, etc. are not inherent quantifiers and allow coreference:

(ii) Two men$_i$ wrote to a woman yesterday. They$_i$ did not say much. (Haïk 1984: 191)

b.	Tres	físicos	han	confirmado	que	ellos	participarán
	three	physicians	have	confirmed	that	they	will-participate
	en	el	coloquio.				
	in	the	colloquium				(Sp.; Rigau 1986: 151)

Rigau (1986) states that the sentence (25a) with a null subject can have three interpretations: the null subject can be interpreted as free (i.e. referring to a discourse antecedent), coreferential (i.e. the group reading, according to which each of the three physicians confirms that they will participate in the colloquium), or bound (i.e. the reading in which each of the three physicians confirms that he/she will participate in the colloquium). According to Rigau (1986), the overt pronoun of (25b) only allows the free and coreferential interpretation in (26b), but not the bound reading in (26a), in line with Montalbetti's (1984) OPC:

(26) a. ((three x : x a physician) (x has confirmed that x will participate in the colloquium))
b. ((three x : x a physician) (x has confirmed that they will participate in the colloquium))

An interesting situation arises if we have a look at nonfinite control structures, in which an empty PRO subject is linked to an antecedent containing a numeral:

(27)	Cuatro	vecinos	prometen	PRO	hacer	la	cena.
	four	neighbors	promise.3PL		do.INF	the	dinner

Such a sentence is predicted to have two interpretations – either each of the four neighbors promises that they will prepare the dinner as a group or each of the four neighbors promises that he/she will prepare the dinner (which are informally depicted here as (28a) and (28b), respectively):

(28) a. (four x: x a neighbor) x promises to PRO prepare the dinner
b. (four x: x a neighbor) x promises to x prepare the dinner

In fact, two interpretations seem to be available with a PRO subject. This becomes clearer if the sentence is slightly changed, creating an explicit context in which the group reading (see (29)) or a 'bound' reading, in which each neighbor promises to prepare a separate dinner on his own (see (30)), is favored:[13]

[13]I thank Luis López (p.c.) for helping me with the examples (29), (30), (32), and (33). All potential errors are my own.

(29) No te preocupes por la cena esta noche, porque ahí
not CL worry.2SG for the dinner this night because there
en la cocina hay cuatro vecinos que prometen hacer la cena.
in the kitchen are four neighbors that promise.PL do.INF the dinner
'Don't worry about the dinner tonight, because there are four neighbors in the kitchen that promise to prepare the dinner.'

(30) Cuatro vecinos prometen hacer una cena esta semana:
four neighbors promise.3PL do.INF a dinner this week
Juan el lunes, Pedro el martes...
John the Monday, Peter the Tuesday
'Four neighbors promise to prepare a dinner this week: John on Monday, Bill on Tuesday, ...'

Thus, it seems to be the case that PRO can be interpreted as coreferent with the matrix antecedent (group reading) or it can be interpreted as a bound variable in Spanish.

Let us now consider an emphatic pronoun in such a control configuration:

(31) Cuatro vecinos prometen hacer **ellos (mismos)** la cena.
four neighbors promise.3PL do.INF they (self) the dinner
'Four neighbors promise to prepare themselves a dinner.'

An analysis of 'overt PRO' or of a focused 'zero/minimal pronoun' in the vein of Alonso-Ovalle and D'Introno (2001) would predict that both interpretations in (28) are equally available with overt and null subjects. However, while the group reading is readily available with an emphatic pronoun, the reading in which each of the four neighbors promises to prepare a dinner on his own seems to be degraded.[14]

(32) # Cuatro vecinos prometen hacer ellos mismos una cena
four neighbors promise do.INF they selves a dinner
esta semana: Juan el lunes, Pablo el martes . . .
this week John the Monday, Paul the Tuesday
'Four neighbors promise to prepare a dinner themselves this week: John on Monday, Paul on Tuesday,...'

[14] Again, we seem to have patterns of preference rather than a clear-cut dichotomy – out of 6 speakers, 4 preferred the group reading with an emphatic pronoun (in this case it would have a certain disambiguating function), but for 2 speakers there was no clear difference between the null and overt versions. See Sect. 4 for a possible explanation.

The preference for a group reading with 'overt PRO' might be correlated by the fact that there is another strategy to encode the bound interpretation overtly:

(33) Cuatro vecinos prometen hacer **cada uno** una cena.
four neighbors promise.3PL do.INF each one a dinner

In a non-NSL like German, both interpretations are equally available with the intensifier *selbst* 'self' according to my intuitions:

(34) Vier Nachbarn versprechen,
four neighbors promise.3PL
[diese Woche **selbst** das Abendessen zu machen].
this week self the dinner to make.INF
A: ... Hans am Montag, Mark am Dienstag, ...
John on Monday, Marc on Tuesday, ...
B: ... Sie werden es nicht bestellen.
they will it not order
'They (the group of four neighbors) won't order it.'

In contrast to Romance NSLs, where emphatic pronouns can be generated in argument position (see Barbosa 1995, 2009a; Cardinaletti 1999; Szabolcsi 2009), a non-NSL like German does not sanction overt realization of PRO but uses the strategy of VP modification:[15]

(35) Vier Nachbarn versprechen [selbst [PRO das Abendessen zu machen]].
four neighbors promise self the dinner to make

The bound variable interpretation is available in (34)/(35), because the intensifier does not interfere in the binding relation of PRO and the antecedent. In contrast, the emphatic pronoun in Spanish is located in argument position and overt realization of PRO seems to have consequences for the interpretative relation with its antecedent, favoring the group reading. At first sight, this is problematic if the overt pronoun in Spanish control infinitives is assumed to be an overt minimal pronoun, because null and overt PRO do not seem to have exactly the same interpretative properties when they refer to numeral antecedents.

To summarize so far, considering overt bound subject pronouns in Spanish finite and nonfinite domains as focused minimal pronouns can explain the existence of configurations like (7b), (8), (9), and (12) for some speakers: focus blocks null realization and, therefore, the most 'minimal' element is an overt pronoun. However,

[15] For a more detailed analysis of the German intensifier *selbst*, see e.g. Hole (2002).

there remain some unresolved problems when we consider the possibility of bound 'overt PRO' with different types of control verbs (see (22) and (23)) and with different types of matrix antecedents (Neg-QPs vs. numeral antecedents).

On the conceptual side, there is another question that an approach in terms of focused minimal pronouns raises: Alonso-Ovalle and D'Introno (2001) argue that overt pronouns can be bound whenever in focal position, which forces the subject pronoun to be overt. This way, overt bound subject pronouns fall within an extended OPC, given that focused positions are contexts without an overt/covert alternation. However, it has been observed that genuine *optional* realization of subject pronouns only holds for sentences in isolation, but not necessarily on a discourse level (see e.g. Quesada and Blackwell 2009: 118ff and references for discussion). If this is true, the question would arise to what extend (or at which level) non-focal pronouns can be argued to be subject to an overt/covert alternation while focal pronouns are not.[16]

2.4 Subject Pronouns and Focus?

It has often been pointed out in the literature that null pronouns in Romance NSLs are topic-linked (see e.g. Frascarelli 2007; Cole 2010; see also Holmberg et al. 2009 for discussion). Cole (2009) shows that in instances where agreement morphology is ambiguous between 1st and 3rd person, a 3rd person null subject is licit if its content can be recovered from a salient antecedent in context:

(36)	Juan	llegaba.	Ø	Tenía	las	llaves.
	Juan	arrive-1/3SG.IMP		have-1/3SG.IMP	the	keys
	'Juan was arriving. He had the keys.'				(Sp.; Cole 2009: 563)	

In Frascarelli's (2007) theory, Italian null pronouns are interpreted with respect to the local Aboutness-Shift Topic, which has the function of introducing a new topic or causing a topic shift (cf. Frascarelli 2007: 693). The Aboutness Topic can in turn be null if continuous. A null subject configuration is thus the result of an *Agree* relation between the (null) Aboutness Topic in the left periphery and *pro* in

[16]Furthermore, if we extend the following hypothesis from Biezma (2014) to pronominal forms, the prediction would be that not only stressed, but also unstressed, strong pronouns in subject position bear a subtype of focus:

(i) *Pro-drop hypothesis*: (Biezma 2014: 92)
Overt full DPs in subject position are focused.

If overt realization of subjects is generally related to (a subtype of) focus, the question again arises where we draw the line between contexts with a potential overt/covert alternation (making a bound construal impossible) and contexts where focus blocks null realization (rendering a bound construal possible).

argumental position (see Frascarelli 2007: 718f). This reasoning can be depicted in a simplified form as follows:

(37) $[_{TopP}$ (DP) Top $[_{TP}$ T-tenía$_i$ $[_{vP}$ *pro* t_i ... las llaves]]]

Importantly, in Frascarelli's theory, the ϕ-features of *pro* are not 'identified' (in Rizzi's 1986a terms) by means of entering a dependency with T/AGR, but through a direct *Agree* relation with the (null) Topic in the left periphery. If this is true, the ambiguity of agreement on the verb in a configuration like (36) is not problematic because *pro* can be sanctioned through a direct relation with the (null) Topic in the C-domain.

With respect to overt strong subject pronouns, an important insight of Frascarelli's study of Italian is that they are not necessarily used as a means of disambiguation on a featural, but on a discourse level (cf. Frascarelli 2007: 704). Thus, the author shows that they can be inserted to indicate a topic shift, i.e. if topic chaining is not continuous. That strong pronouns can fulfill a similar function also in Spanish could be evidenced by the following example from a written source (RAE (CREA)):[17]

(38) *"Pobres exiliados", dijo la madre. "No sé si continúan pensando en el regreso o van perdiendo las esperanzas." "Mi madre dice que ella no piensa volver mientras viva Franco", intervine yo*. (CREA corpus (RAE), 25.02.2015; (Josefina R. Aldecoa. 1994. *Mujeres de negro*. Barcelona: Anagrama))
'"**Poor exiled$_i$**", the mother said. "I don't know whether they **(=*pro*$_i$)** continue to think of returning or they **(=*pro*$_i$)** are losing their hope." "**My mother$_j$** says that **she$_j$** doesn't think of returning while Franco is alive", I intervened.' [my translation]

As indicated in the translation, *pobres exiliados* 'poor exiled' is introduced as a Topic and is resumed by a null pronoun in the following sentence, starting a topic chain. Thereafter, *mi madre* 'my mother' is introduced into the discourse and is resumed by the strong pronoun *ella* 'she' and not by *pro*. Here, the overt pronoun is not inserted for reasons of disambiguation – it co-refers with the most local antecedent 'my mother'. Furthermore, it does not necessarily express narrow contrast, given that it is left open whether the others think of returning or not. However, the strong pronoun indicates a topic shift to the newly introduced referent

[17]Given the limited scope of this paper, a written example is considered. Frascarelli's (2007) study of Italian subject pronouns relies on spoken corpora and considers prosodic factors, which are crucial for the classification of different types of topics (see Frascarelli and Hinterhölzl 2007). The more modest aim here is to show that strong pronouns are not necessarily inserted for resolving referential ambiguities nor for expressing narrow contrast, but they can arise as the consequence of [−continuous] topic chaining also in Spanish.

mi madre 'my mother'. Thus, it could be argued that the strong pronoun is inserted because topic chaining is not continuous (see Frascarelli 2007 for discussion of Italian examples).

Note that this situation partly reflects Givón's (1983: 17) *scale of continuity* and the underlying *iconicity principle*, according to which the most continuous/predictable information needs the least coding material:

(39) The more disruptive, surprising, discontinuous or hard to process a topic is, the more *coding material* must be assigned to it. (Givón 1983: 18)

This principle and Givón's (1983) *scale of continuity* predict that zero anaphora (if available in the subject position of a given language) should be the unmarked option for encoding continuous topics while overt pronominal forms and full lexical DPs are used for less continuous ones. This could be what we observe in the overt/covert alternation in contexts like (38), where a disruptive or non-continuous topic causes insertion of an overt pronominal form which resumes the newly introduced (topic) referent. In Sect. 3, I will use the feature σ with the values [±continuous] to indicate a (non-)continuous, topic-marked D-subject. If a pronoun receives the value [-continuous] in the left periphery, default null insertion will be blocked in morphology because of an incompatibility with discontinuity.

Strong pronouns have further been argued to bear Focus. Consider the following example from Brucart (1987):

(40)	A:	Quién	escribe	sonetos?	('Who writes sonnets?')
	B:	{Yo/*pro}	escribo	sonetos.	
		I	write.1SG	sonnets	(Sp.; Brucart 1987: 214 [my glosses])

Here the overt pronoun resolves a variable left open by previous discourse and a null pronoun is illicit in this context. In fact, focus is often defined as the non-presupposed part of a sentence (see e.g. Jackendoff 1972). Following this line of reasoning, the pronoun in (40) provides 'new information' which imposes a phonological requirement, as expressed by the following principle:

(41) Cualquier pronominal que aporte información nueva en el discurso debe tener realización fonética.[18] (Brucart 1987: 219)

However, a definition in terms of 'new information' is not fully unproblematic in the case of strong pronouns: in their 1st and 2nd person use, knowledge of at least the speech participants is implied. As for example Erteschik-Shir (1997: 18f, 2007: 45f) discusses, in the file card metaphor (cf. Heim 1983), the cards for the speaker and hearer are always available as topics, i.e. on top of the file. Also in the case of 3rd person pronouns, these must refer to an entity that has been previously introduced

[18] 'Any pronominal that contributes new information to the discourse must have a phonetic realization'. [my translation]

either in the linguistic or the physical context (i.e. they must count at least as *familiar* in Gundel et al.'s 1993 classification). In fact, Erteschik-Shir (2007: 45) argues that the availability of a card in the file is a precondition for a pronoun to be interpretable and to sanction co-reference. It thus follows that strong pronouns always imply at least some degree of 'known information'.

Consider in this context the following discourse with an unstressed strong pronoun in Catalan from Rigau (1989):

(42) A: Qui vol venir, tu o en Joan?
'Who wants to come, you or John?'

B: Jo vull venir.... en Joan, no ho sé.
I want.1SG come.INF the John not it know.1SG
'I want to come...I don't know about John.'

(Cat.; Rigau 1989: 193)

The context in (42A) is an alternative question[19] – it introduces the alternatives {Addressee wants to come, John wants to come} and the strong pronoun has the function of picking one alternative out of this set. Mayol (2010) in fact argues that types of strong pronouns in Catalan are contrastive topics (for further discussion of the notion of contrastive topic, see Büring 2003).

Rigau (1989: 193) further notes that a stressed strong pronoun becomes unacceptable in the context (42A):

(43) C: # JO vull venir... en Joan, no ho sé.
I want.1SG come.INF the John not it know.1SG

However, as an anonymous reviewer points out, a stressed pronoun becomes licit if the phrase 'I don't know about John' is omitted:

(44) A: Qui vol venir?
'Who wants to come?'

B: JO/jo vull venir.
'*I*/I want to come.'

Thus, stressed and unstressed strong pronouns can resolve a variable left open by previous discourse and both can be interpreted with respect to an alternative set, but the two types of pronouns differ in the way alternatives are evoked and/or excluded – in (42B), the unstressed strong pronoun picks one alternative out of the alternative set and leaves other alternatives unresolved, while the stressed pronoun in (43) negates an alternative, so that the phrase 'I don't know about John' leads to a contradiction (cf. also Mayol 2010: 2506 for further discussion).[20]

[19] I thank an anonymous reviewer for pointing this out to me.

[20] In Mayol (2010), strong pronouns with "weak contrast" convey an "uncertainty contrast".

It has often been noticed in the literature that focus has the function of indicating alternatives (see e.g. Rooth 1985, 1992; Krifka 2007):[21]

(45) Focus indicates the presence of alternatives that are relevant for the interpretation of linguistic expressions. (Krifka 2007: 18)

According to Rooth (1992: 76), linguistic expressions have an ordinary semantic value and a focus semantic value, the latter consisting of a (contextually restricted) set of alternatives from which the former is taken:

(46) a. Juan$_{\text{FOCUS}}$ escribe sonetos. ('JOHN writes sonnets.')
b. {John writes sonnets, Paul writes sonnets, Mary writes sonnets,...}

Following this reasoning, the focus semantic value of the sentence in (46a) corresponds to a set of alternative propositions *x writes sonnets* (as in (46b)) where the value of *x* can either be contextually or overtly restricted.

The difference between (40)/(44) and (42) is thus whether the restriction on the *wh*-expression is overt or not.[22] In (42), the alternative set is explicitly introduced and restricted. A stressed pronoun as in (43) further has the function of excluding a contextually or overtly established alternative. In Sect. 3, I will use the feature π with the values [±c(ontrast)][23] to indicate that the element which associates with this feature is interpreted with respect to a contextually established alternative set. Association with this feature enforces overt *morphological* realization. This feature can optionally bear the value [+c], leading to stress assignment in PF, depending on whether alternatives are eliminated.

In the case of emphatic pronouns in control infinitives, the notion of alternatives seems to be crucial for their licensing (see also Hole 2002 for a discussion of alternatives in the context of the German intensifier *selbst*):

(47)	Juan	promete	hacer	**él**	**mismo**	la	cena.
	John	promises	do.INF	he	self	the	dinner

(48) a. John promises that he will do the dinner.
b. John promises that his mother will do the dinner.
c. John promises that he and his wife will do the dinner.
d. John promises that he will order the dinner.

[21] The representations of alternatives I use in this paper are *informal* and should convey the intuition that the indication of an alternative set is crucial to trigger morpho-phonological realization of D-subjects in Spanish (without necessarily yielding contrastive stress). For formal accounts and more detailed discussion of alternatives in relation to the notions of focus and contrastive topic, see Rooth (1985, 1992), Büring (2003), and references; see Mayol (2010) for discussion in the context of Catalan strong pronouns and Kaiser (2010) for long pronouns in Estonian.

[22] Thanks to an anonymous reviewer for pointing this out.

[23] See also López (2009) for a derivational system of information structure which uses two binary features ([±a(naphoric)] and [±c(ontrast)] in his system) to explain configurations like Clitic Left Dislocation, Clitic Right Dislocation, Hanging Topic Left Dislocation, object scrambling, among others, in Spanish and Catalan.

Use of the emphatic pronoun in the control infinitive in (47) implies that there is a contextually determined set of alternatives (as informally exemplified in (48)) which are excluded by means of overtly realizing the PRO subject.

It has further been pointed out that morphologically pronominal subjects can be bound/controlled if associated with a focus-sensitive operator (like *sólo* 'only'), as the following Spanish example from Szabolcsi (2009: 32) demonstrates:

(49) No quiere ir **sólo él** a la escuela.
not wants go.INF only he to the school
'He$_i$ doesn't want it to be the case that only he$_i$ goes to school.'

Focus-sensitive operators like 'only', 'even', 'also', etc. have been observed to imply an alternative set (see e.g. Rooth 1992; Krifka 2007). The particle *sólo* 'only' in (49) has the function of excluding a set of alternative referents that is contextually evoked with respect to the referent denoted by the pronoun. Thus, even though overt pronouns *can* be controlled or topic-linked in Spanish, they can only do so if their use implies an alternative set.

If the preceding discussion is on the right track, overt subject pronouns in Spanish (and Catalan) are either [-continuous] topic pronouns or they are a combination of the notions of topic and focus and are interpreted with respect to a contextually determined set of alternatives.[24] The latter type can further be exhaustive if associated with contrastive stress.

3 Spanish Subject Pronouns Are Built by C, AGR, and *v*

In the first subsection, I offer a technical implementation of the reliance of overt subject pronouns in a Romance NSL like Spanish on notions relating to information structure. I argue that these notions directly instruct post-syntactic morphological insertion rules. Thereafter, I have a look at the syntactic derivation of bound and free subject pronouns, arguing that both derive from a lexically underspecified element, which is 'built' by the functional categories T/AGR and C.

3.1 Spanish Subject Pronouns as Topic/Focus Morphemes

We have seen that the phonological shape of subject pronouns in Romance NSLs crucially depends on the assignment of topic/focus-related features. Furthermore, the bound construal is susceptible to the subtype of Focus that is assigned (strong

[24] As e.g. Krifka (2007: 44) points out, contrastive topics are arguably the result of combining topic and focus.

contrast or emphasis), differently from a language like English. While there is a long tradition in the literature on the dependency of overt subject pronouns on notions such as contrast and emphasis (see e.g. Larson and Luján 1989; Luján 1999; cf. Mayol 2010 for further discussion), I would like to argue that the encoding of the *morphological* realization of D-subjects is more tightly related to these notions than is assumed in some of the literature on *pro*-drop.

It has been assumed that AGR in Romance NSLs, having a 'rich' specification for subject-verb agreement, is pronominal/interpretable (see e.g. Rizzi 1982). Importantly, several studies assume that pronominal AGR does not only have the function of 'identifying' or 'licensing' (in the sense of Rizzi 1986a) an inherently empty *pro*-element, but also of absorbing morpho-syntactic requirements of the T/AGR-head, such as nominative Case (see Rizzi 1982) and the EPP (see Barbosa 1995, 2009b; Alexiadou and Anagnostopoulou 1998). This way, (i) a low left periphery is made available and (ii), as I argue, it is not a morpho-syntactic feature like Case, but a discourse-sensitive one that governs the nature of morphological insertion rules into subject pronouns.

Let us turn to point (ii): In Distributed Morphology (see Halle and Marantz 1993 and related work), morpho-syntactic features like D and ϕ do not enter syntax fully specified for phonological features. Their phonological shape is determined after the syntactic computation on the way to PF (a process called *late insertion*; see e.g. Harley and Noyer 1999). Here, so-called Vocabulary Items (VIs) pair a phonological exponent with a given morpho-syntactic context of insertion (cf. Embick and Halle 2005). A natural consequence is that languages can differ with respect to the features and contexts that motivate or trigger insertion of a phonological exponent, which can be null or overt, into (abstract) subject pronouns post-syntactically.

A long tradition in the literature considers Case a necessary requirement for phonological realization of nominal phrases (as is expressed by the *Case Filter*; see Chomsky 1981). However, it has also been discussed in the literature that relating overt realization of NPs to Case might not hold without exceptions cross-linguistically (as is shown by the vast body of literature on Case-marked PRO; cf. e.g. Sigurðsson 2008 and references). In fact, concerning English and Spanish, we have to wonder whether nominative Case plays the same role in the phonological realization of subject pronouns in the two languages.

Let us have a look at the conditions under which nominative Case is assigned to the subject position. If structural Case is "a reflex of an uninterpretable ϕ-set [...]" (cf. Chomsky 2000: 122), and agreement is interpretable/pronominal in Romance NSLs, the possibility arises that structural nominative Case is actually not assigned to the subject position in these languages. This would come close to arguing that nominative Case on T can be assigned to (or absorbed by) the agreement affix in a language like Spanish by virtue of V-to-T movement (see Alexiadou and Anagnostopoulou 1998) and, thus, an overt pronominal subject either receives default nominative Case (see e.g. Kato 1999) or nominative Case is fully absent. In

English, in contrast, nominative is automatically assigned to the subject position as a consequence of uninterpretable agreement on T:[25]

(50) a. [$_{TP}$ T$_{\underline{\text{[NOM]}}}$-Duerm-e$_{\underline{[i\phi:3sg]}}$ [$_{vP}$ *pro* ~~duerm-e~~ …]

b. [$_{TP}$ He$_{\underline{[i\phi:3sg.m]}}$ T$_{\underline{\text{[NOM]}}}$ [$_{vP}$ ~~He~~ sleeps]]

If structural nominative is not assigned to the subject position in Romance NSLs, it should not play the same role in the conditioning of morpho-phonological insertion rules into pronominal subjects as in English. I would thus like to argue that the features $\sigma_{[-\text{continuous}]}$ and $\pi_{[\pm\text{contrast}]}$ emerge as an alternative to nominative Case in triggering post-syntactic morphological insertion rules into D-subjects. The differences in the relevant English and Spanish VIs can be depicted as follows:

(51) *D*
[1], [nom] ↔ /aɪ/
[2], [nom] ↔ /ju/ ... (English)

(52) *D*
[1], [π] ↔ /ɟo/
[2], [π] ↔ /tu/ ... (Spanish)

(53) *D*
[1], [−continuous] ↔ /ɟo/
[2], [−continuous] ↔ /tu/ ... (Spanish)

This reasoning reflects the view that insertion must be motivated, while null realization is the unmarked, default case (see e.g. Chomsky's 1981 *Avoid Pronoun*).[26]

In DM, the unmarked option for insertion of phonological features into abstract morphemes can be implemented by means of a default or 'elsewhere' Vocabulary Item (in the sense of e.g. Harley and Noyer 1999), where the context of insertion is simply zero. Let us thus assume that the default/elsewhere VI for insertion into D is the following for Romance NSLs as well as non-NSLs of the English type:

(54) D ↔ Ø (default/elsewhere VI)

The default VI in (54) and the higher specified VIs in (51) and (52)/(53) compete for insertion into D-subjects. In English, nominative is obligatorily assigned to Spec,T in finite clauses and the higher specified VIs in (51) automatically block the lower

[25] Already Rizzi (1982) points to the possibility that nominative Case can be absorbed in Romance NSLs. See Rosselló (2000) for the assumption that nominative Case has only a "spurious" role in Romance NSLs.

[26] See also Landau (2004: 869) for discussion of PRO as the "elsewhere case" and Sundaresan (2010: 28) for PRO as a "default element". I argue here that PRO as well as *pro* are morphological defaults if overt realization is not enforced – what differentiates English from Spanish is the trigger for blocking default null insertion, which can be morpho-syntactic or discourse-sensitive.

specified elsewhere VI for insertion into $D_{[\phi]/[NOM]}$.[27] In Spanish, the default VI can only be blocked if D receives [−continuous] or π – which, by definition, are optionally assigned, discourse-sensitive features. ϕ is thus a necessary, but not a sufficient condition for blocking the default VI in an agreement-based language (in the sense of Miyagawa 2010): if $D_{[\phi:val]}$ reaches morphology without [-continuous] or π, the VIs in (52) and (53) contain a feature which is not present in the terminal morpheme and, thus, the conditions for insertion are not met (cf. Halle's 1997 *Subset Principle*):

(55) The phonological exponent of a Vocabulary item is inserted into a morpheme in the terminal string if the item matches all or a subset of the grammatical features specified in the terminal morpheme. Insertion does not take place if the Vocabulary item contains features not present in the morpheme. Where several Vocabulary items meet the conditions for insertion, the item matching the greatest number of features specified in the terminal morpheme must be chosen. (Halle 1997: 428)

This way, only the default VI can insert content into $D_{[\phi]}$, which matches the conditions for insertion because it contains at least one feature, namely D, which is present in the terminal, and there is no higher specified VI which would match the conditions for insertion.

This approach considers Spanish subject pronouns 'topic/focus morphemes' which are spelled out in combination with ϕ. It implements the assumption that the *pro*-drop property has the consequence that a language like Spanish, Catalan, or Italian can have a *morphological* strategy for the expression of topic/focus-marked subjects, apart from a stress-based one. Interpretability of AGR thus converts a morpho-syntactic strategy of pronoun construction in an agreement-based language into a (more) discourse-based one.[28]

Evidence that discourse-sensitive features can condition morphological insertion rules is well-known from languages which have specific morphemes for encoding information structural information, such as *–nun* in Korean (see Choi 1999), *wa*/*ga*

[27] See also Neeleman and Szendrői (2007), who argue that the combination of ϕ and Case blocks elsewhere null insertion in non-NSLs (implementing a version of Kiparski's 1973 *Elsewhere Principle*), but with a different implementation. In particular, the authors argue that the combination of these features blocks Asian-type radical *pro*-drop. For Romance-type *pro*-drop a context-sensitive rule is necessary, which mentions agreement. In the approach defended here, a context-sensitive rule is not necessary because null insertion arises as the default case in Romance NSLs if the *optional*, discourse-sensitive features [-continuous] or π are not assigned.

[28] If we adopt a parameter of degree between *discourse-oriented* and *syntax-oriented* languages (see Huang 1984, citing Tsao 1977) or *topic-prominent* vs. *subject-prominent* (see Li and Thompson 1976), interpretability of AGR has the consequence that the agreement-based language Spanish is closer to a discourse-oriented or topic-prominent language than English. For discussion of Spanish in between discourse- and syntax-oriented languages, see also Díaz and Liceras (1992: 469).

in Japanese (see Kuno 1972), or the focus-marker *–nde* in Wambon (see Dik 1997, Erteschik-Shir 2007).[29]

In Spanish, morpho-syntactic requirements pertaining to the T-D relation are absorbed by pronominal AGR so that discourse-sensitive features fulfil functions with respect to morphological insertion that are fulfilled by Case in a language like English.[30] If the features [-continuous] and π are not assigned, D will be identified with respect to the current Topic in the left periphery without causing a shift or it will be bound by a matrix antecedent and remains empty per default.[31]

Let us turn to point (i): the assignment of topic/focus features is not necessarily restricted to the C-domain. Belletti (2001, 2004, 2005) argues that Romance NSLs, apart from having a high, C-related left periphery (in the vein of Rizzi 1997), project a low left periphery between *v*P and TP:

(56) ... $[_{TP}$ T $[_{TopP}$ Top $[_{FocP}$ Foc $[_{TopP}$ Top $[_{vP}$ v ...

Notice that Rizzi's (1997) high and Belletti's (2004) low left periphery correlate with phases (*v*P and CP) as interface points for interpretation (see also López 2009 for discussion).[32] The availability of topic/focus projections at the *v*P level accounts for the possibility of focused inverted subjects in Romance NSLs. English, in contrast, does not activate the low left periphery, so neither inverted focused subjects nor overt focused pronouns inside control infinitives are available:

(57) *John promised [to do he his homework].

The question, however, is why English lacks a low left periphery for subjects. Belletti (2005: 32f) tentatively links it to the non-Null Subject status of English. In fact, an answer to this question could be found in the application of V-to-T movement in Romance NSLs (see Alexiadou and Anagnostopoulou 1998): the authors convincingly argue that interpretable AGR and V-to-T movement have the

[29] Certain parallels between types of strong pronouns in Catalan and *wa*/*ga* in Japanese have already been drawn by Rigau (1989).

[30] That features pertaining to information structure can fulfil similar functions to ϕ and Case is a hypothesis well-known in the literature. A review would go beyond the scope of this paper, but I refer the reader to Erteschik-Shir (2006), who assumes that topic and focus are features assigned to elements in the Numeration, similarly to ϕ and Case, or to Miyagawa (2007) who claims that in Japanese, it is focus that is downloaded from C to T and not ϕ, as in English.

[31] Note that, in the system outlined, there is no need to postulate a separate Vocabulary Item for null insertion into [+continuous] D-subjects: adopting Halle's (1997) *Subset Principle*, a D marked for [+continuous] still matches the default Vocabulary Item, because it is the highest specified, available VI, which contains a subset of the features of $D_{[+continuous]}$.

[32] An anonymous reviewer objects that, according to phase theory, it should be VP and TP, rather than *v*P and CP, that are interface points, given that these are the units that are spelled-out. However, Chomsky (2001: 14) defines phases on the basis of "semantic-phonetic integrity" and, furthermore, Chomsky (2001: 12) states that "the whole phase is 'handed over' to the phonological component", which might indicate that phases can be interpreted as a whole (cf. also Herbeck 2015b and references for discussion).

function of absorbing a subject-related EPP-effect, making the preverbal subject position in NSLs an A'-position (cf. also Barbosa 2009b).

Note that Focus or Topic assignment to a subject at the *v*P level would only be licit if A-movement to Spec,T is not obligatorily triggered: topic or focus-marking of a DP in the low left-periphery could be argued to establish an A'-dependency while EPP-driven movement to Spec,T is A-movement. Thus, while Focus or Topic-marking of subjects in Spec,*v* should be available in English, their assignment would yield Improper Movement (A'- to A-movement).[33] In Romance NSLs, in contrast, the EPP on T is absorbed, the preverbal position is not an obligatory A-position and, thus, A'-dependencies at the *v*P level are unproblematic.

There is some evidence that *v*P-related Focus assignment plays a role in sanctioning overt 'bound' subject pronouns in Romance NSLs. It has been observed in the literature that emphatic pronouns in Romance infinitives are preferably postverbal. At the same time, high left-peripheral fronting operations like Focus Fronting are degraded (cf. Haegeman 2004; Pérez Vázquez 2007; Herbeck 2015b):

(58) *Julia quería [ella telefonear]. (Sp.; Piera 1987: 160)
Julia wanted she telephone.INF

(59) *Luis quiere CERVEZA beber (y no sidra).
Luis wants BEER drink.INF and not cider
'Luis wants BEER to drink (and not cider).' (Sp.; Gallego, 2010: 147)

Thus, overt focused pronouns inside control infinitives must be available independently of a high left periphery.

To summarize, while nominative absorption has consequences for post-syntactic morphological insertion rules into D-subjects, being governed by σ/π and not by Case, EPP absorption has the consequence that σ/π can be assigned to subject pronouns, not only in a high, but also in a low position. Both properties are consequences of the pronominal nature of AGR. In the next section, I discuss the technical syntactic derivation of bound and free pronouns.

3.2 Spanish Subject Pronouns Are Controlled by AGR and C

In the vein of Borer (1989), I assume that the binding theoretic status of (null) subjects is not an inherent property of the nominal element, but that it arises through association with verbal functional categories. This way, two different *empty categories* PRO and *pro* do not exist (at least not as lexical formatives) – null subjects are generally the result of a ϕ-underspecified PRO-element (Landau's 2015 $D_{[\phi:\_]}$), which acquires a ϕ-value through association with AGR (see Rizzi 1982; Chomsky 1982; Huang 1989; Barbosa 2009b for similar ideas; see also Sundaresan 2014 for relevant discussion) and/or C. Given that overt realization of

[33] For discussion of improper movement, see e.g. Chomsky (1995: 326ff).

subject pronouns is the result of post-syntactic insertion of morphological content, also strong and emphatic pronouns derive from this same PRO-like element, where differences derive from the assignment of discourse-sensitive features in the high and low left periphery. This approach aims at accounting for the fact that null as well as overt subject pronouns can apparently be controlled and bound, but that these options are influenced by the functional category a D-subject is associated with and by the type of discourse-sensitive features that are assigned to it.

As we have seen, the *pro*-drop property of consistent NSLs (in the sense of Holmberg et al. 2009) has frequently been linked to the presence of pronominal/interpretable subject-verb agreement morphology (see Rizzi 1982; Barbosa 1995, 2009a, b; Alexiadou and Anagnostopoulou 1998; Kato 1999, among many others). In fact, Rizzi (1982: 169) suggests that INFL 'controls' PRO in finite *pro*-drop clauses. In an *Agree*-based theory of control (see Landau 2000, 2004), null subjects in control structures are underspecified nominal elements, lacking a full ϕ-specification (implemented as $D_{[\phi:\_]}$). A ϕ-specification is provided through an *Agree* operation with a matrix antecedent, either directly or mediated by the C-head (Landau's 2000, 2004 Exhaustive vs. Partial Control distinction).

More recently, Landau (2015) argues that the contrast between the two types of control strategies is to be found in a difference between predicative and logophoric control (building on Bianchi's 2003 notion of internal logophoric centre). For reasons that will become clear in Sect. 4, I follow Wurmbrand (2001) in assuming that at least some predicative control complements are reduced VPs lacking a syntactically projected PRO-subject and, thus, they are not full propositions; logophoric control complements, in contrast, project at least a FinP layer which hosts internal *self*-coordinates, mediating the referential dependency between D and its antecedent (see Landau 2015 for further elaboration):

(60) a. Juan consiguió [$_{VP}$ hacer la cena].
John managed do.INF the dinner

b. Juan promete [$_{FinP}$ Δ_{SELF} hacer $D_{[\phi:\_]}$ la cena].
John promises do.INF the dinner

If AGR is interpretable in Romance NSLs, null subjects could be analyzed as the same D-element as in (logophoric) control infinitives and a ϕ-value is provided by AGR within the same clause (see also Barbosa 2009b):

(61) [$_{CP}$ C [$_{TP}$ $T_{[i\phi:3sg]}$- Hizo [$_{vP}$ $D_{[\phi:\_]}$ ~~hizo~~ la cena]]].
made.3SG the dinner

However, the configuration in (61) raises a non-trivial problem: while AGR is specified for person and number in Romance NSLs, it lacks gender-markings. Thus, an underspecified D-subject could not be fully 'identified' (using Rizzi's 1986a terminology) by AGR in these languages. In fact, Cole (2009: 578) introduces the notion of *morphological maximality*, according to which languages differ with

respect to the point up to which the features necessary to interpret a null pronoun can be provided by subject-verb agreement, whereas the missing features must be provided from context. In the case of Romance NSLs, only person and number, but not gender, can be provided to a $D_{[\phi:\_]}$ subject within the TP domain.

Bianchi (2003) argues that person-features are anchored in the C-domain by external ([1p], [2p], [3p]) or internal (anaphoric person) logophoric coordinates:

(62) Every clause is anchored to a Logophoric Centre: a speech or mental event, with its own participants and temporal coordinates, which constitutes the centre of deixis. (Bianchi 2003: 3)

That is, just like anaphoric AGR (cf. Borer 1989) has to be anchored to internal *self*-coordinates, 1st, 2nd, and 3rd person has to be anchored by external *speaker/addressee* coordinates in the C-domain to the participants of the speech event (see also Sigurðsson 2011). I would thus like to argue that the lack of gender-markings on T/AGR has the consequence that ϕ on the underspecified D-subject has to be completed by means of *speaker/addressee*-coordinates ($\Delta_{\pm S/\pm A}$) in C:

(63) $[_{CP}\ \Delta_{\pm S/\pm A}\ [_{TP}\ T_{[i\phi:3sg]}$-Durmió $[_{vP}\ D_{[person:\_,\ number:\_,\ gender:\_]}$ mucho]]]

Thus, 'control by AGR' is in fact always 'control by AGR + Δ'.

If ϕ of underspecified D-subjects must be completed via coordinates in C in Romance NSLs, there are at least two ways of obtaining this: either C links D to a discourse antecedent (i.e. ±speaker/±addressee in the *Common Ground*),[34] as in (64), or C links D to a matrix antecedent, yielding a bound interpretation (see (65)). In the latter case, Δ on C functions as a binder of D (for discussion of binding via C in different contexts, see e.g. Kratzer 2009 and references):

(64) DP V $[_{CP}\ \Delta_{\pm S/\pm A/}\ [_{TP}\ T_{[i\phi:3sg]}$-V $[_{vP}\ D_{[person:\_,\ number:\_,\ gender:\_]}$ … ~~V~~]]]

(65) QP V $[_{CP}\ \Delta_{ØS/ØA}\ [_{TP}\ T_{[i\phi:3sg]}$-V $[_{vP}\ D_{[person:\_,\ number:\_,\ gender:\_]}$ … ~~V~~]]]

Even though Frascarelli (2007) argues that *pro* depends on a direct matching relation with the local Aboutness-Shift Topic, there is evidence that AGR as well as C is involved in determining the interpretation of D-subjects (see Camacho 2013):

[34] I use the notion *Common Ground* in the sense of knowledge that is mutually shared between speech participants (see e.g. Krifka 2007: 15, citing Stalnaker 1974; Karttunen 1974; Lewis 1979, for discussion). See also Bianchi (2003) and Pérez Vázquez (2007) for discussion of the relation between the notions of 'external logophoric centre' and *Common Ground*.

(66) a. María y yo llegamos a casa. Yo/*pro* abrí la puerta.
Maria and I arrived to home I/pro opened.1SG the door
b. María y yo llegamos a casa. Yo/ella/**pro* tenía las llaves.
Maria and I arrived to home I/she/pro had.1SG/3SG the keys
(taken from Camacho 2013: 148, citing Sheehan 2007: 84)

As Camacho (2013: 148) and Sheehan (2007: 84), citing Cole (2000), discuss, the only relevant contrast between (66a) and (66b) is that person-agreement on the verb is unambiguous in the former, but ambiguous between 1st and 3rd person in the latter case. Furthermore, *pro* cannot be unambiguously identified by an antecedent in (66b) so that overt realization of the subject position is necessary (here, the overt pronoun is necessary to disambiguate between two potential topics).

Camacho (2013: 78f) further discusses the Spanish data in (67), in which a plural subject DP can be associated with 1st, 2nd or 3rd person agreement on the verb. Depending on the verb's ϕ-specification, the DP is interpreted as including the speaker or the addressee:

(67) Los estudiantes tenemos/tenéis/tienen mala memoria.
the students have.1PL/have.2PL/have.3PL bad memory
'We/you/the students have bad memory.'

This indicates that person specification of the verb crucially mediates linking of the subject to ±*speaker*/±*addressee* coordinates in the left periphery, i.e. AGR mediates C-peripheral linking of D-subjects.

Notice that sanctioning of apparently 'bound' overt subject pronouns in Spanish crucially involves gender-matching with the matrix QP:

(68) a. Ningún estudiante$_i$ piensa [$_{CP}$ que **él$_i$ mismo** es inteligente].
no.M student thinks that he self is intelligent
b. Ninguna estudiante$_i$ piensa [$_{CP}$ que **ella$_i$ misma** es inteligente].
no.F student thinks that she self is intelligent
(69) Nadie$_i$ piensa [$_{CP}$ que **ella$_{*i}$ misma** es inteligente].
nobody thinks that she self is intelligent

In (68), the Neg-QP is specified for [gender] markings and the bound pronoun with matching features is possible for some speakers. The same speakers, however, do not accept binding of a feminine pronoun by a bare negative quantifier, which is not overtly specified for gender markings, but contains default [3sg.m].[35]

[35] An anonymous reviewer points to the following example from English, which is problematic if ϕ-features (in particular [gender]) are acquired from a matrix antecedent in the case of bound pronouns:

(i) No student thinks that SHE is smart.

However, the matrix Neg-QP could in fact be abstractly specified for gender (as in the Spanish counterpart but without overt realization), the D-subject matching ϕ-features through C-linking.

This approach predicts that the *syntactic* configuration should make available a free and a bound construal for overt and empty subject pronouns in Spanish. Given that phonological features are provided to D after syntax, $D_{[\phi:\_]}$ should be linked to AGR on T and completed by means of left peripheral anchors, which link D either to a discourse ($\Delta_{\pm S/\pm A}$) or to a matrix antecedent ($\Delta_{\emptyset S/\emptyset A}$):

(70) *Ningún estudiante*$_i$ piensa que pasó ___$_i$ el examen.
  a. $[_{vP}\ D_{[\phi:\_]}v$-pasó$_i$ $[_{VP}\ t_i$ el examen]]
  b. *Agree* $[T_{[\phi:3sg]}$ / $D_{[\phi:\_]}]$
  $[_{CP}$ que-$\Delta_{\emptyset S/\emptyset A}$ $[_{TP}$ T-pasó$_i$ $[_{vP}\ D_{[\phi:3sg]}\ t_i$ $[_{VP}\ t_i$ el examen]]]]
  c. C-linking to matrix antecedent: $\Delta_{\emptyset S/\emptyset A[+m]} \rightarrow D_{[\phi:3sg.m]}$
  Morphology: *D* ↔ Ø (default)

(71) *Ningún estudiante*$_i$ piensa que ___$_i$ pasó el examen.
  a. $[_{vP}\ D_{[\phi:\_]}v$-pasó$_i$ $[_{VP}\ t_i$ el examen]]
  b. *Agree* $[T_{[\phi:3sg]}/D_{[\phi:\_]}]$, π-assignment to D:
  $[_{CP}$ que $\Delta_{\emptyset S/\emptyset A}$ $[_{FocP}\ D_{[\phi:3sg]/[\pi:+c]}$ $[_{TP}$ T-pasó$_i$ $[_{vP}$ ~~$D_{[\phi:\_]}$~~ ... el examen]]]]
  c. C-linking to matrix antecedent: $\Delta_{\emptyset S/\emptyset A[+m]} \rightarrow D_{[\phi:3sg.m],\ \pi[+c]}$
  Morphology: *D*, [3], [m], [π] ↔ /el/

In control infinitives in a language like Spanish, π-assignment to $D_{[\phi:\_]}$ is available in Spec,*v* as in finite clauses with the only differences that a full ϕ-specification (i.e. person, number and gender) is assigned to D from a matrix antecedent via left peripheral coordinates in the C-domain and π-assignment is not available in the high left periphery so that preverbal subjects are excluded:

(72) Ningún estudiante$_i$ promete hacer ___$_i$ la cena.
  a. Focus-assignment to the *v*P-periphery:
  $[_{vP}\ D_{[\phi:\_]/[\pi:+c]}v$-hacer$_i$ $[_{VP}\ t_i$ la cena]]
  b. Ningún estudiante promete $[_{FinP}\ \Delta_{self}$ $[_{TP}$ hacer $[_{vP}\ D_{[\phi:\_]/[\pi:+c]} \ldots$
  la cena]]]
  c. *Agree* $[QP_{[3sg.m]}$ / $\Delta_{self\ [3sg.m]}$ / $D_{[\phi:\_]}] \rightarrow D_{[\phi:3sg.m]}$
  Morphology: *D*, [3], [sg], [m], [π] ↔ /el/

That such an overtly realized PRO element is morphologically pronominal in Spanish is expected because it relies on a parallel strategy to finite *pro*-drop (cf. Herbeck 2015a, b), where a D-subject is made visible to morphological insertion by means of π-assignment in the high or low left periphery. In contrast, overt realization of the subject position is governed by ϕ *and* nominative in English (as depicted in (51)) and control infinitives notoriously lack a full specification for one of these two features, so that only the default VI can insert the Ø exponent into D.[36] In Spanish, overt realization of the subject position can be triggered by the assignment of discourse-sensitive features in the low pragmatic interface

[36]For the present purposes, it is not crucial whether it is lack of full ϕ (see Landau 2004; Sigurðsson 2008; Sundaresan 2010) or lack of nominative Case (as assumed in the Government and Binding

point Spec,*v* in finite *and* nonfinite clauses, π requiring ϕ-valuation at the matrix level in control infinitives to sanction licit VI-insertion. This way, the overt/covert alternation in nonfinite domains is conditioned by the availability of a low left periphery (in the sense of Belletti 2001, 2004, 2005), which in turn depends on V-to-T movement and lack of obligatory A-movement to Spec,T.[37]

4 Failing to Be Bound?

According to the system so far, both – the bound and the free construal of D-subjects in Romance NSLs – derive from a combination of ϕ-feature assignment from AGR and completion via C, which optionally links either to a discourse or a matrix antecedent. The *syntactic* configuration makes available both options also to overt pronouns. However, it has to be addressed why this optionality does not hold unrestrictedly with overt pronouns in Romance NSLs (contrary to English). The present section is devoted to offering a sketch of a solution to this problem. I argue that the dependency of overt realization on the notions of [−continuous] or π has the consequence that a syntactic identification strategy is blocked and discourse-identification is enforced, i.e. assignment of these features requires Δ in C to be specified as ±S/±A, linking to a salient element in the Common Ground.

4.1 Apparently 'Bound' Overt Pronouns Are Topic-Linked

I have argued that Spanish subject pronouns are 'topic/focus morphemes' which are spelled out in combination with D and ϕ. It is exactly the dependency of morphological insertion rules on the notions [−continuous] or $\pi_{[\pm\text{contrast}]}$, that makes the bound/free alternation of overt D-subjects depend on these notions as well:

(73) QP thinks [Δ that $D_{[\phi:\_]/\text{Case}}$ will come] (English)

(74) QP cree [Δ que pasó $D_{[\phi:\_]}$ el examen] (Spanish)
[p:??]

literature) that is responsible for obligatory emptiness of PRO in English. In Herbeck (2015b), π – differently from nominative, delays null insertion into D until the matrix clause. This follows from an incompatibility between Focus and null realization. If ϕ is a precondition for overt realization of subject pronouns (at least in agreement-based languages), Focus enforces delay of insertion until ϕ-valuation takes place at the matrix level.

[37] Note that V-to-T movement also arises in infinitives in Romance NSLs, in contrast to English (see e.g. Solà 1992). This predicts that PRO movement to Spec,T is not triggered in control infinitives in the former languages and D becomes susceptible to π-assignment in Spec,*v*.

It is those contexts where morphological insertion rules do not depend on features related to information structure, but on Case (inside Spanish PPs; English subject pronouns), which allow bound construal without further conditions.

Consider the following economy hierarchy from Reuland (2011):

(75) *Economy of encoding*: (Reuland 2011: 125)
Narrow syntax < logical syntax (C-I interface) < discourse

This hierarchy expresses the assumption that narrow syntactic identification is more economic than logical syntax, which is in turn more economical than a discourse identification strategy. This hierarchy is discussed in Reuland (2011: 124f) in the context of the impossibility of a pronoun to be bound in contexts where a *self*-anaphor is available:

(76) John_{i} hates $\text{him}_{*i/j}$/$\text{himself}_{i/*j}$.

Given that the option of binding with a *self*-anaphor is available, encoding the same relation via co-reference with a pronoun is less economical because it would require discourse identification while variable binding allows immediate closure of an open expression (cf. Reuland 2011: 127, building on Reinhart's 1983 *Rule I*).

Let us have a look at whether the hierarchy in (75) could be applied to the reluctance towards a bound construal of overt pronouns in embedded contexts in Spanish. For both – overt subject pronouns in English as well as null pronouns in Spanish – the bound construal via C (and correlated gender-assignment) can obtain in the syntax. In this case, $\Delta_{\text{ØS/ØA}}$ binds the D-subject to a matrix antecedent. Co-reference is possible as well (see (25))), $\Delta_{\pm\text{S/}\pm\text{A}}$ linking a $\sigma_{[+\text{continuous}]}$-marked D-subject to a referent that is prominent in the Common Ground. However, if D-subjects receive $\pi_{[\pm\text{contrast}]}$ ($+\sigma_{[\pm\text{continuous}]}$)-marking in Spec,*v* or Spec,C in Spanish and overt realization is enforced, a discourse identification strategy via the Common Ground is invariably triggered, i.e. assignment of those features that cause overt realization requires Δ to link to $\pm$S/$\pm$A in finite clauses:

(77) *Ningún estudiante* piensa que él pasó el examen.
a. $[_{v\text{P}}\ \text{D}_{[\phi:\_]}$ *v*-pasó$_{i}$ $[_{\text{VP}}\ \text{t}_{i}$ el examen]]
b. *Agree* $[\text{T}_{[\phi:3\text{sg}]}/\text{D}_{[\phi:\_]}]$, π-assignment to D:
$[_{\text{CP}}$ que $\Delta_{\text{-S/-A}}$ $[_{\text{FocP}}\ \text{D}_{[\phi:3\text{sg}]/[\pi:+\text{c}]}$ $[_{\text{TP}}$ T-pasó$_{i}$ $[_{v\text{P}}$ ~~$\text{D}_{[\phi:\_]}$~~ ... el examen]]]]
c. C-linking to discourse antecedent: $\Delta_{\text{-S/-A}[+\text{m}]} \rightarrow \text{D}_{[\phi:3\text{sg.m}],\ \pi[+\text{c}]}$
Morphology: *D*, [3], [m], [π] $\leftrightarrow$ /el/

This reasoning predicts that, even if a referential dependency between a contrastive or focal pronoun inside embedded clauses and a matrix QP is possible for a determined set of speakers of Spanish, it crucially differs from bound variable construal of null pronouns (and overt pronouns in English). Some evidence could be provided if we consider the following difference between QP and bare quantifier antecedents with respect to an apparent bound construal of overt pronominal forms (see Carminati 2002; Alonso Ovalle et al. 2002). Carminati (2002: 266–280) tested

the acceptability of bound overt and null subjects with a QP (see (78)) or a bare quantifier (see (79)) antecedent:

(78) Al colloquio per il posto di assistente di volo, ogni candidata ha detto che (Ø / lei) vorrebbe prendere le ferie ad agosto.
'At the interview for the post of air steward, every candidate (fem) has said that she would like to have (her) vacation in August.'

(79) Al colloquio per il posto di assistente di volo, ognuno ha detto che (Ø / lui) vorrebbe prendere le ferie ad agosto.
'At the interview for the post of air steward, everyone has said that he would like to take (his) vacation in August.' (It.; Carminati 2002: 268)

A null pronoun received a bound variable interpretation in 95% of the cases with a QP and in 90% with a bare quantifier in Carminati's (2002) study. Interestingly, even though the percentage was lower with an overt pronoun (as predicted by the OPC), it still received a bound variable interpretation in 75% of the cases with a QP antecedent, but the percentage dropped significantly with a bare quantifier antecedent: 54% (see Carminati 2002: 271ff for full discussion). If the overt bound subject pronoun is uniformly a focused minimal pronoun without any further condition, the question is why bare quantifier antecedents should be more reluctant to occur in a bound construal than non-bare antecedents.

Note that in the example (78), the concept of 'candidate' is explicitly introduced as part of the matrix clause and, thus, is introduced into the Common Ground. Similar considerations hold for the Spanish sentences in (7) and (12) in that the QP introduces the concept of 'student'. Contrast on the pronoun could now be argued to exclude a contextually determined set of students, as informally depicted in (81) with respect to Bosque and Gutiérrez-Rexach's (2009) example:

(80) Todo estudiante$_i$ piensa que él$_i$ (y no otros$_j$) es inteligente.

(81) {Student 1 thinks that student 1 is intelligent, Student 1 thinks that student 2 is intelligent, Student 2 thinks that student 2 is intelligent, Student 2 thinks that student 3 is intelligent, . . . }

Thus, contrastive marking of the pronoun could have the consequence that an alternative set that is evoked *with respect to the concept of 'student'* is resolved. What we could have here is, thus, a D-subject which refers to the (topic) concept of 'student'.[38]

[38] Frascarelli (2007: 728) in fact argues that the 'bound' construal of *pro* is a relation between a *type* projected by a QP (e.g. 'every student') which consists of a number of *tokens* (e.g. the individual 'students'); in the sense of Jackendoff (1983). The antecedent of *pro* is the *type* in topic-position, while the QP is in Spec,T (as in the following structure adapted from Frascarelli 2007: 728):

(i) [<As for type X> [every X thinks [(that) X is intelligent]]]

However, to capture the difference between null and overt pronouns with respect to the relevance of the salience of the 'concept' (or 'type'), I argue that a null pronoun is in fact bound by the QP via C, while an overt, focused pronoun is bound by a 'concept' in topic position, which is evoked by the QP and made salient by focus marking.

(82) [$_{\text{TopP}}$ **(Estudiante)** [Todo estudiante piensa [que [$_{\text{TopP}}$ D$_{[\phi:3sg]/[\pi:+c]}$ [es …]]]]]

Morphology: D, [3], [m], [π] ↔ /el/

Strong contrastive marking would have the consequence of bringing the concept of 'student' into salience, resolving alternatives that are created with respect to it. In a sentence with a bare quantifier, in contrast, the concept of student is not explicitly introduced into the Common Ground, which has the consequence that a 'bound topic' pronoun is disfavored.

Consider in this context the following English example from Partee (1978: 82):

(83) No students came to the party. They thought they weren't invited.

Even though 'they' in (83) cannot be bound by the Neg-QP 'no students' it can refer to the group of students, which is due to the fact that the QP can bring that group into salience (cf. Partee 1978: 81 for discussion). Thus, the concept of 'group of students' is introduced into the Common Ground, and the pronoun can (pragmatically) co-refer with this concept.

In apparently 'bound' focused pronouns in Spanish examples, like (7b) and (12), we seem to have a case in between the prototypical bound construal with null *pro* and the co-referential construal: π-marking of the subject pronoun requires its antecedent to be a salient element in the Common Ground with respect to which alternatives are evoked, and the apparent bound variable construal is a referential dependency between a concept evoked by the matrix QP and the D-subject.

The fact that the 'bound' construal is not the preferred option with strong subject pronouns in embedded finite clauses thus derives from the features that trigger morphological insertion into D-subjects: given the intrinsic dependency on notions relating to information structure, a discourse identification strategy is invariably triggered. Note furthermore that only a subset of the notions that are responsible for overt realization of D-subjects is compatible with co-reference and apparent binding: the feature [−continuous] causes a shift in topic and, thus, one function of a pronoun marked with this feature is to shift away from the matrix (topic) antecedent.[39] The feature π$_{[\pm c]}$, on the other hand, is assigned to the pronominal form if there is a contextually determined set of alternatives that needs to be resolved and, thus, it is not incompatible with linking to a matrix (topic) antecedent, which can be a referential DP or a concept which is projected from a matrix QP if this concept is brought into salience.

[39]The fact that a null pronoun prefers prominent antecedents while an overt pronoun relates to less prominent ones is captured in Carminati (2002: 57) by the *Position of Antecedent Hypothesis*, which states that null *pro* has a preference for relating to antecedents in Spec,IP and overt pronominal forms preferably relate to antecedents which are in a position lower than Spec, IP. However, I have followed Frascarelli (2007) in assuming that the position to which null pronouns relate is the (Aboutness-Shift) Topic position. Strong pronouns can also relate to this position if a contextually established alternative set is evoked with respect to the topic-antecedent which the π-marked pronoun needs to resolve.

For null pronouns, in contrast, two identification strategies are available, given that they can be syntactically bound by $\Delta_{SØ/AØ}$ linking directly to a matrix QP antecedent or a $\sigma_{[+continuous]}$-marked subject pronoun can related to a topic concept projected from the QP:

(84) $[_{CP}$ [Todo estudiante piensa $[\Delta_{ØS/ØA}$ que $[_{TopP}$ $D_{[\phi:3sg]}$ [es …]]]]]

(85) $[_{TopP}$ (Estudiante) [Todo estudiante piensa $[\Delta_{-S/-A}$ que $[_{TopP}$ $D_{[\phi:3sg]/[\sigma:+c]}$ [es …

Overt subject pronouns, differently from null ones, intrinsically depend on π or $\sigma_{[-continuous]}$ assignment, so that they can only be construed as topic 'bound' by virtue of the strategy in (85).

4.2 Null vs. Overt PRO

In this section, I take a look at how differences between null and 'overt PRO' can be accounted for with the line of reasoning pursued here. Recall that null and overt PRO in control infinitives do not fully behave alike with respect to the 'bound' and 'group' reading with an antecedent containing a numeral. I repeat the relevant configuration here for convenience (see (27)–(33)):

(86)	**Cuatro**	**vecinos**	prometen	hacer	**(Ø/ellos)**	la	cena.
	four	husbands	promise.PL	do.INF	they	the	dinner

Control of an emphatic pronoun preferably results in the group reading. Recall that in this configuration, 'four neighbors' is not headed by an inherent quantifier and it can be construed as a referential element and is, thus, a potential topic. This way, the group of 'four neighbors' is introduced into the *Common Ground*. Differently from a non-referential matrix quantifier, where only a concept projected from the QP can function as an antecedent of a π-marked D (see (87)), the constituent 'cuatro vecinos', containing a non-inherent quantifier, can sanction two strategies for establishing a referential dependency with an overt pronoun (see (88)):

(87) $[_{TopP}$ (vecino) $[_{TP}$ Ningún vecino promete [hacer D_{π} la cena]]].

(88) a. $[_{TopP}$ Quatro vecinos$_i$ $[_{TP}$ t_i prometen [hacer D_{π} la cena]]].

b. $[_{TopP}$ (vecino) $[_{TP}$ Quatro vecinos prometen [hacer D_{π} la cena]]].

The group reading might be preferred with an emphatic pronoun in an example like (86) because the matrix antecedent *cuatro vecinos* with a non-inherent quantifier can move to the Top position (see (88)) and, thus, the group of four neighbors is available as a prominent antecedent. In the case of null PRO, lack of Focus marking correlates with the lack of a prominence requirement on the antecedent so that both – the group and bound readings are equally available.

Thus, contrastive or emphatic marking of the pronoun requires its antecedent to be a salient referent in the Common Ground. Apparent bound variable construal of overt pronouns in a language like Spanish might be possible for a number of speakers if a focus-marked pronoun evokes alternatives which are resolved with respect to a salient 'concept'. This concept is provided by a matrix QP antecedent and made salient by the focus-marked pronoun if the antecedent XP cannot function as the topic itself (as depicted in (82) and (87)). Consider in this context the following principle:

(89) *Condition of Relative Discourse Prominence*: (Baker 1995: 80)
Intensive NPs can only be used to mark a character in a sentence or discourse who is relatively more prominent or central than other characters.

It is because overt realization of subject pronouns depends on notions related to information structure (and not on Case) in Spanish that their referential construal is influenced by these notions as well. The condition of discourse prominence on the antecedent does not obligatorily hold for subject pronouns in English embedded contexts, simply because discourse-sensitive features do not condition morphological insertion rules into D-subjects in this language.

Notice that the restrictions on the matrix antecedent of an apparently (topic-) 'bound' pronoun in a language like Spanish are not necessarily due to a left-dislocated position in the syntactic tree, at least not in the case of embedded structures. This is different from what might be happening in matrix emphatic doubling configurations, where negative QP antecedents are excluded, in contrast to some control and certain finite complementation structures:

(90) *Nenhuma criança escreveu **ela** o poema.
no child wrote.3SG she the poem
(EP; Barbosa 2009a: 110)

(91) A Teresa / ela escreveu **ela** o poema (ninguém a ajudou).
the Teresa / she wrote she the poem (no one her helped)
(EP; Barbosa 2009a: 107)

Barbosa (1995, 2009a) argues that emphatic 'doubles' in matrix clauses are impossible with non-referential QPs but licit with referential DPs because the emphatic pronoun is merged in argument position so that its antecedent must be in the same position as left-dislocated objects, from which Neg-QPs are banned:

(92) *nessuno, lo conosco in questa citta.
nobody, him know.1SG in this city (It.; Rizzi 1986b: 395)

However, we have also seen that even certain control configurations are reluctant to sanction 'bound' overt pronouns with a non-referential quantifier antecedent (see (22) and (23)). This is also problematic for an analysis in terms of focus-triggered 'overt PRO', since a referential dependency between an embedded emphatic pronoun and a QP antecedent should be possible as long as a (topic) concept can be projected from the latter.

Even though a deeper investigation of the exact types of matrix verbs that sanction 'bound' overt PRO is still pending, a first idea could be that those control structures, where a bound overt pronoun is degraded, contain an implicative verb (*olvidarse* 'forget', *conseguir* 'manage', see (22a) and (23a)), which triggers predicative control. Verbs like *prometer* 'promise', in contrast, trigger logophoric control (cf. Landau 2015; Bianchi 2003). If predicative control infinitives are properties and reduced VPs (see Wurmbrand 2001, building on Chierchia 1989), they do not contain a syntactically projected D-subject. This way, there is no D inside the infinitive that could be overtly realized by means of focus-assignment:

(93)	Nenhum	hospede	conseguiu	[$_{VP}$	fazer	o	jantar].
	no	guest	managed		make.INF	the	dinner

In (93), an overt emphatic pronoun could only be a 'matrix double' of the antecedent (similarly to (90)), which accounts for the full acceptability of referential DP antecedents, following Barbosa's (2009a) approach:

(94)	O	João	conseguiu	fazer	ele	o	jantar.
	the	John	managed	make.INF	he	the	dinner

The surface word order would be derived by means of verb movement/incorporation, which could be motivated by the fact that *conseguir* is a restructuring verb in EP (cf. Gonçalves 1999):

(95) O João conseguiu-fazer ... [$_{vP}$ **ele** ~~conseguiu-fazer~~ [$_{VP}$ ~~fazer~~ o jantar]].

An apparent 'bound' construal of overt PRO inside control infinitives has the minimal requirement that the embedded infinitive syntactically project a D-subject. If D is not externally merged in the infinitive, it must originate in the matrix clause so that the matrix Neg-QP is forced to appear in a left-dislocated position, which prevents a concept projected from the QP to appear in this same position.[40]

5 Conclusions

In this paper, I have argued that null as well as overt pronouns are externally merged as reduced, lexically underspecified D-subjects – a PRO-like element which is *derived* in the syntax and *built* by verbal functional categories as well as the

[40] I have to leave open the question why a 'bound' construal with a Neg-Q antecedent with *conseguir* is degraded but apparently not fully out in EP. A tentative suggestion could be that the verb is ambiguous between selecting a FinP (in the vein of Landau's 2015 analysis of predicative control) and a reduced VP (in the vein of Wurmbrand 2001), which might correspond to the restructuring and non-restructuring version of the verb. A further factor could be the presence vs. absence of logophoric anchors in the C-domain. Emphatic marking has often been related to logophoricity, so that the prediction would be that logophoric control allows controlled emphatic pronouns more readily than predicative control. I leave a more thorough investigation for future research.

assignment of discourse-sensitive features in the low and high left periphery. Strong and emphatic subject pronouns in Romance NSLs are thus 'topic/focus morphemes' which spell-out post-syntactically in combination with D and ϕ. This way, interpretable AGR does not have the sole function of licensing and/or identifying an inherently empty *pro*-element (in the sense of Rizzi 1986a), but also of absorbing structural requirements of T/AGR, which converts a morpho-syntactic strategy of pronoun construction in an agreement-based language (in the sense of Miyagawa 2010) to a discourse-based one. In particular, I have argued that discourse-sensitive features fulfil a parallel function in Spanish to nominative in English in conditioning post-syntactic morpho-phonological insertion rules for D-subjects, and that the dependency of the morphological construction of D-subjects on notions like topic and focus has the consequence that the referential construal of pronouns becomes sensitive to these notions as well.

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Sequence of Tense: Syntax, Semantics, Pragmatics

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Abstract A theory of embedded tense that derives SOT (Sequence of Tense) effects from an SOT rule is compared with a theory that derives SOT effects without appealing to an SOT rule, and an argument is provided in favor of the former. The argument relies mostly on examples where a tense is embedded under future-in-the-past. Such an argument was originally presented in (Abusch D, Linguist Philos 20:1–50, 1997) and later dismissed in (Altshuler D, Schwarzschild R, Moments of change, cessation implicatures and simultaneous readings. In: Chemla E, Homer V, Winterstein G (eds) Proceedings of Sinn und Bedeutung 17, ENS-Paris, 45–62, 2013a). An additional argument is provided in favor of supplementing the SOT rule with a 'de re' mechanism (as also argued for in Abusch D, Linguist Philos 20:1–50, 1997).

1 The Theoretical Status of the SOT Rule

The English sentence *John said that Mary was self-employed*, where both the matrix and embedded verbs appear in the past tense, can report that John said "Mary is self-employed" (Jespersen 1931). The very same sentence can also report that John said: "Mary was self-employed" (as in *John said that Mary was self-employed in her twenties*). The first reading of the sentence is its null past (or null, for short) reading; the second is its back-shifted reading. The null reading of *John said that Mary was self-employed* resembles the 'de se' reading of *John thinks that he is self-employed*: the latter may report that John thinks "I am self-employed".

Two theories, or families of theories, have been proposed to explain these facts. According to one family of theories, (1) – where ~~past~~ is interpreted as the present from John's perspective – is one of the LFs of *John said that Mary*

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was self-employed, and (2) – where ~~he~~ is interpreted as first person from John's perspective – is one of the LFs of *John thinks that he is self-employed*.

(1)	John past say [that [. . . ~~past~~ . . .]]	~~past~~ = "now" (from John's past perspective)
(2)	John pres think [that [~~he~~ . . .]]	~~he~~ = "I" (from John's current perspective)

According to the other family of theories, neither (1) nor (2) is generated by the grammar. The null "reading" of *John said that Mary was self-employed* is a special case of its back-shifted reading, and the 'de se' "reading" of *John thinks that he is self-employed* is a special case of its non-'de se' reading.

The LF in (1) arises via the optional application of the SOT rule, which makes past tense invisible to semantic interpretation when embedded under another past tense. My goal is to show that no theory of tense (known to me) can dispense with (1). Since the arguments I present here are applicable only to the tense domain, I take no position with respect to (2). It is quite possible that with existing theories of person pronouns we can – and maybe even should – dispense with (2).

The claim that (1) cannot be dispensed with is based on examples such as (3) – henceforth, the breakfast example – which has a null reading ((3) is constructed after similar examples from Kamp and Rohrer 1983; Abusch 1997).

(3) A week ago, John decided that in ten days, at breakfast, he would say to his mother that they were meeting for the last time.

Crucially, (3) has past tense in the matrix clause, future-in-the-past in its first embedded clause, and past in its most deeply embedded clause. Although it may have other readings, its most salient reading is the one according to which John's plan is to say: "Mom, we are meeting for the last time." Abusch (1997) claims that this reading cannot be accounted for without an SOT rule.

We will see that while the English breakfast example in (3) ***can*** be accounted for without an SOT rule, the existence of languages where the breakfast example has two acceptable counterparts with the same salient reading – one with present in the most deeply embedded clause and one with past in the most deeply embedded clause – is unexpected if such languages have no SOT rule. As we will also see, the following are also problematic for non-SOT theories: (a) variations on (3) with an embedded *before*-clause, and (b) unambiguously back-shifted variations on *John said that Mary was self-employed*.

Regarding the mechanism underlying the SOT rule itself, the literature offers various options (Transmission as in Abusch 1997 and others or as in Grønn and von Stechow 2010 and others, or Deletion as in Ogihara 1996 and others). This paper is agnostic about this issue; we are only concerned with whether the SOT rule – whatever its precise details are – can be dispensed with. For concreteness, we will assume the SOT rule is essentially tense deletion under agreement.

Section 2 presents a failed semantic attempt to dispense with (1). Section 3 presents a pragmatic attempt. Section 4 discusses the shortcomings of the pragmatic

attempt, concluding that (1) cannot be dispensed with. Section 5 discusses some consequences regarding the Upper Limit Constraint (due to Abusch 1997) for any theory of SOT effects.

2 The 'De Re' Theory and Its Failure to Dispense with the SOT Rule

Implicit in the discussion of (1) and (2) above is the assumption that the grammar treats past tense on a par with *he*. Indeed, since Partee 1973, the similarities between tenses and person pronouns have led many tense scholars to treat tenses as non-quantificational (see also Heim 1994; von Stechow 2003; Abusch 1997; Kratzer 1998; Schlenker 1999 and others). However, whether or not tenses are quantificational is orthogonal to the controversy surrounding SOT.[1] So unless otherwise specified (and in the spirit of Prior 1967; Ogihara 1996), tenses are treated here as existential quantifiers over times (which we take to be closed time intervals). Still, we include in our LFs covert pronouns that denote times or worlds and serve as arguments of tenses and verbs (for example, t_0 is a time-denoting pronoun and w_0 a world-denoting pronoun).

Additional basic assumptions include the following. A root node is interpreted relative to an utterance context $c = <W_c, T_c, g_c>$, where W_c is the utterance world, T_c is the utterance time, and g_c is a variable assignment (we ignore additional coordinates such as speaker and hearer merely for simplicity). An utterance context c is suitable for a root LF L only if $[[L]]^c$ is defined, the range of g_c consists of semantic objects that are salient in W_c at T_c, and g_c maps every free occurrence of a time-denoting pronoun in L to T_c and every free occurrence of a world-denoting pronoun in L to W_c. Tenses, which are base-generated as verbal arguments and may move to higher positions, come with covert pronominal arguments that determine an evaluation time (and covert pronominal domain restrictors along the lines of von Fintel 1994, but we omit the latter from the LFs whenever they do not play an essential role). Accordingly, *John said that Mary was self-employed* has at least LF^{PAST} in (4a) as a possible LF, where the free t_0 and the bound t_4 determine the evaluation times of the matrix and embedded clauses, respectively.[2] If English has

[1] In addition, on the assumption that pronominal tenses can be bound by a default existential operator (cf. Ogihara 1989), the difference between the two approaches is not so significant anyway.

[2] We also assume the rules Functional Application and Predicate Modification (as in Heim and Kratzer 1998), and:

(a) if α is a pronoun or a trace and i an index: $[[\alpha_i]]^c$ is defined only if $i \in Dom(g_c)$; when defined, $[[\alpha_i]]^c = g_c(i)$.
(b) $[[i\ \alpha]]^c = [\lambda z\text{: } [[\alpha]]^{c[i \to z]}$ is defined. $[[\alpha]]^{c[i \to z]}]$, where $c_{[i \to z]}$ is exactly like c except for the possible difference that $g_{c[i \to z]}(i) = z$.

An index i is a pair <n, σ>, where n is a number and σ a semantic type. We often omit σ to keep the LFs simple.

an SOT rule, the sentence also has LF$^{\text{~~PAST~~}}$ in (4b), where the embedded tense is deleted under morphological agreement with the c-commanding main tense (and ~~*PAST*~~ has no meaning).

(4) a. LF$^{\text{PAST}}$: PAST-t_0 [3 [John say-t_3-w_0 [5 4 [PAST-t_4 [2 [Mary be-t_2-w_5 self-employed]]]]]]
Back-shifted reading. If c is suitable for LF$^{\text{PAST}}$, [[LF$^{\text{PAST}}$]]^c = True iff there is a time *t* preceding T_c such that for all <*w*, *t'*> ∈ ACC(John, W_c, *t*), there is a time *t"* preceding *t'* such that Mary is self-employed in *w* at *t"*.

b. LF$^{\text{~~PAST~~}}$: PAST-t_0 [3 [John say-t_3-w_0 [5 4 [Mary be-~~PAST~~-t_4-w_5 self-employed]]]]
Null reading. If c is suitable for LF$^{\text{~~PAST~~}}$, [[LF$^{\text{~~PAST~~}}$]]^c = True iff there is a time *t* preceding T_c such that for all <*w*, *t'*> ∈ ACC(John, W_c, *t*), Mary is self-employed in *w* at *t'*.

In LF$^{\text{PAST}}$, both tenses move locally, leaving behind traces that are interpreted as bound variables. In LF$^{\text{~~PAST~~}}$, the matrix tense moves locally leaving behind a trace that is interpreted as a bound variable; the embedded tense is invisible to semantic interpretation, and its time-denoting pronominal argument is interpreted as a bound variable. The meanings of these LFs are derived from the meanings of *PAST* and *say* in (5) and (6) respectively (*t"* in (5) is a domain restrictor denoted by a pronoun which, for simplicity, is omitted from (4a,b)).

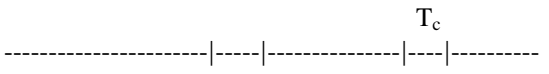
(5) For any time *t*, function *p* from times to truth values, and time *t"*, [[PAST]]^c(*t"*)(*t*)(*p*) = True iff there is a *t'* preceding *t* such that *t'* ⊆ *t"* and *p*(*t'*) = True.

(6) For any time *t*, world *w*, individual *x*, and function *q* from worlds to functions from times to truth values:
[[say]]^c(*t*)(*w*)(*q*)(*x*) is defined iff ACC(*x*, *w*, *t*) ≠ ∅ and for all <*w'*, *t'*> ∈ ACC(*x*, *w*, *t*), *q*(*w'*)(*t'*) is defined;
if defined, [[say]]^c(*t*)(*w*)(*q*)(*x*) = True iff for all <*w'*, *t'*> ∈ ACC(*x*, *w*, *t*), *q*(*w'*)(*t'*) = True.

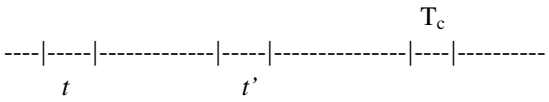
For current purposes, we make the simplifying assumption that ACC(*x*, *w*, *t*) in (6) – the set of world-time pairs accessible from *w* and *t* relative to *x* – is the set of world-time pairs which, for all *x* knows/believes in *w* at *t*, are the world and time he lives in.

A well-known attempt to derive both readings of *John said that Mary was self-employed* without appealing to an SOT rule is with a 'de re' LF, as in Abusch 1994, 1997 (cf. Enç 1987). The idea is that a 'de re' LF yields roughly the following truth conditions: Regarding some time *t* that precedes T_c, at some time *t'* that precedes T_c John said, of *t*, that Mary's self-employment is within *t*. This is indeed ambiguous, as *t* could, in principle, precede *t'* or be co-temporal with it.

(7) a. Null reading



b. Back-shifted reading



Abusch (1997) herself ultimately concluded that the 'de re' attempt is unsuccessful, because of the breakfast example mentioned in Sect. 1, with past-under-future-under-past. For example, the 'de re' LF of *A week ago, John decided that in ten days, at breakfast, he would say to his mother that they were having their last meal together* yields roughly the following truth conditions: With respect to some time *t* that precedes T_c, at some time *t'* that precedes T_c by 7 days, John decided, regarding *t*, that at a time *t"* that follows his "now" by 10 days, he says to his mother at *t"*: We are having – within *t* – our last meal together. The problem is, roughly, that no time can simultaneously precede T_c and be perceived by John as "now" at a time that he knows is in the future. This suggests that an SOT rule is needed, at the very least to account for the breakfast example.[3] Let us present this reasoning in some more formal detail.

Let us assume – temporarily – that LF^{PAST} in (4b) is not an option made available by the grammar of English. LF^{PAST} in (4a) yields the back-shifted reading only. Assuming that *PAST* can move freely, we obtain – in addition to LF^{PAST} in (4a) – $LF^{\text{PAST-DeRe}}$ in (8), where both *PAST*s scope above *say*.

(8) $LF^{\text{PAST-DeRe}}$: PAST-t_0 [2 [PAST-t_0 [3 [John say-t_3-w_0 [5 4 [Mary be-t_2-w_5 self-employed]]]]]]

But $LF^{\text{PAST-DeRe}}$ in (8) does not yield any attested reading because '4' does not bind any temporal variables.[4] Fortunately, there are more fine-grained versions of 'de re' ascription in the literature (Kaplan 1968; Lewis 1979; Cresswell and von Stechow 1982; Heim 1994; Abusch 1997; Percus and Sauerland 2003) that avoid this problem. Building on Percus and Sauerland 2003; Charlow and Sharvit 2014, we assume the definition of 'time-concept generator' in (9) (where a time-concept is a function from times to functions from worlds to times), and enrich the LF in (8) with the pronoun G_4, which is bound by *say* and whose first argument is t_2 and whose second and third arguments are t_1 and w_5 respectively. [[[G_4 t_2] t_1] w_5] in (10) occupies the position of t_2 in (8).

[3]See also Heim (1994), Ogihara (1996), von Stechow (1995), Kratzer (1998), Schlenker (1999), Ogihara and Sharvit (2012) and others.

[4]This incorrectly predicts that *John said that Mary was self-employed* cannot be used when John mistakenly located himself at a time that is after T_c and said: "Mary is self-employed now, and was never self-employed before now".

(9) A time-concept generator suitable for x in world w and time t is a function f such that:
   (a) the domain of f is the set of times that x is acquainted with in w at t; and
   (b) for any t' in the domain of f:
      (i) $f(t')$ is a suitable time-concept;
      (ii) for any $\langle w', t''\rangle \in$ ACC(x, w, t): $f(t')(t'')(w')$ is defined;
      (iii) $f(t')(t)(w) = t'$.

(10) Revised $LF^{PAST\text{-}DeRe}$: PAST-t_0 [2 [PAST-t_0 [3 [John say$^{\%}$-t_3-w_0 [4 5 1 [Mary be-[[[G_4 t_2] t_1] w_5]-w_5 self-employed]]]]]]
If c is suitable for $LF^{PAST\text{-}DeRe}$, $[[LF^{PAST\text{-}DeRe}]]^c$ = True iff there are times t and t' preceding T_c and a time-concept generator G suitable for John in W_c at t' such that for all $\langle w, t''\rangle \in$ ACC(John, W_c, t'), Mary is self-employed in w at $G(t)(t'')(w)$.[5]

A suitable time-concept corresponds to an acquaintance-based description that an attitude holder can use to describe a time to himself. An example of a suitable time-concept is 'now': the smallest function f such that for every t and w, $f(t)(w) = t$ (it is acquaintance-based because we are all acquainted with our "now"). Other examples of suitable time-concepts are 'yesterday' (the smallest function that maps every $\langle w, t\rangle$ to the day preceding the day surrounding t) and 'the closest time to now that is before now at which the earth moved'. Unsuitable time-concepts are along the lines of 'Sally's birthday' or 'May 3rd, 1952'.

By (9), (i) and (ii) hold for any t and t' preceding T_c and any G suitable for John in W_c at t': (i) if $G(t)$ = 'now', then $G(t)(t')(W_c) = t' = t$, and for all $\langle w, t''\rangle \in$ ACC(John, W_c, t'), $G(t)(t'')(w) = t''$; (ii) if G(t) = 'yesterday', then $G(t)(t')(W_c)$ $(= t)$ precedes t', and for all $\langle w, t''\rangle \in$ ACC(John, W_c, t'), $G(t)(t'')(w)$ precedes t''. The option in (i) corresponds to the null reading of *John said that Mary was self-employed* and the option in (ii) corresponds to its back-shifted reading.

This is still not satisfactory, because we have to guarantee that the time-concept generator does not pick out something like 'tomorrow'; otherwise, we predict – counter-intuitively – that *John said that Mary was self-employed* can report that John said: "Mary will be self-employed". According to Abusch, this forward-shifted reading is blocked by the Upper Limit Constraint (ULC), which here we incorporate into a revised definition of 'time-concept generator'.[6]

[5]The meaning of *say* in (6) is adjusted as follows: For any p such that p is a function from time-concept generators to functions from world-time pairs to truth values, individual x, time t and world w: $[[say^{\%}]]^c(t)(w)(p)(x)$ is defined iff ACC$(x, w, t) \neq \emptyset$ and there is a time-concept generator G suitable for x in w at t such that for all $\langle w', t'\rangle \in$ ACC(x, w, t), $p(G)(t')(w')$ is defined; if defined, $[[say^{\%}]]^c(t)(w)(p)(x)$ = True iff there is a G $\in$ {G*| G* is a time-concept generator suitable for x in w at t and for all $\langle w', t'\rangle \in$ ACC(x, w, t), $p(G^*)(t')(w')$ is defined} such that $p(G)(t')(w')$ = True.

[6]Abusch (1997) contemplates the possibility that the ULC follows from independent principles. In Sect. 5 we mention some attempts (Ogihara 1989, 1996; Bar-Lev 2015; Klecha 2016) to achieve precisely that.

(11) A time-concept generator suitable for x in world w and time t is a function f such that:
  (a) the domain of f is the set of times that x is acquainted with in w at t; and
  (b) for any t' in the domain of f:
    (i) $f(t')$ is a suitable time-concept;
    (ii) for any $\langle w', t''\rangle \in \text{ACC}(x, w, t)$: $f(t')(t'')(w')$ is defined;
    (iii) $f(t')(t)(w) = t'$;
    (iv) for any $\langle w', t''\rangle$ in the domain of $f(t')$: $f(t')(t'')(w')$ is not after t''. (ULC)

Thanks to the ULC, the time-concept generator can pick out 'now', 'today' and 'yesterday', but not 'tomorrow' or 'next week'. Consequently: (i) the back-shifted reading of *John said that Mary was self-employed* has two sources, the non-'de re' LF^{PAST}, and the 'de re' $\text{LF}^{\text{PAST-DERE}}$; and (ii) $\text{LF}^{\text{PAST-DERE}}$ also generates a null reading, but no LF generates a forward-shifted reading.

The theory has two additional important consequences, one positive and the other negative. The positive consequence is its predictions regarding *John says/is saying (now) that Mary was self employed*, with present tense in the matrix clause and past in the embedded clause.

(12) PAST-t_0 [2 [PRES-t_0 [3 [John say$^{\%}$-t_3-w_0 [4 5 1 [Mary be-[[[G_4 t_2] t_1] w_5]-w_5 self-employed]]]]]]
If c is suitable for (12), $[[(12)]]^c$ = True iff there is a t preceding T_c, a t' overlapping T_c and a time-concept generator G suitable for John in W_c at t' such that for all $\langle w, t''\rangle \in \text{ACC}(\text{John}, W_c, t')$, Mary is self-employed in w at $G(t)(t'')(w)$.

(13) $[[\text{PRES}]]^c(t'')(t)(p)$ = True iff there is a t' overlapping t such that $t' \subseteq t''$ and $p(t')$ = True.

For any t preceding T_c and t' overlapping T_c and any G suitable for John in W_c at t', (i) and (ii) hold: (i) if $G(t)$ = 'yesterday', it yields a time preceding t'' when applied to any $\langle w, t''\rangle \in \text{ACC}(\text{John}, W_c, t')$; (ii) if $G(t)$ is something like 'now', it fails to yield t when applied to $\langle W_c, t'\rangle$. Indeed, the sentence is unambiguously back-shifted (usually, but not always; we come back to this in Sect 4.1).

The negative consequence is the following. As argued in Abusch 1997, and illustrated by the breakfast example in (3) (with past-under-future-in-the-past), repeated in (14), a 'de re' analysis does not suffice to capture all attested null readings.

(14) A week ago, John decided that in ten days, at breakfast, he would say to his mother that they were meeting for the last time.

The null reading of (14) – its most salient reading – is not accounted for. This is the reading according to which John's decision is to say to his mother, at a future time: "Mom, we are meeting (now) for the last time". This led Abusch (along with many other tense scholars) to the conclusion that an SOT rule is needed after all.

As we will see in Sect. 3, Abusch's conclusion has been rejected by proponents of more pragmatic approaches to embedded tenses.

To understand Abusch's conclusion, let us look at some possible LFs of (14). For reasons that do not concern us here, when embedded under a past tense, *would* – which (we assume) is composed of past tense and the future operator *woll* – tends to be interpreted as if its past tense is "null" (implying that John's decision is of the form "I will say to my mother ..."). To keep the LFs simple, then, let us ignore the tense morphology of *would*. Accordingly, we derive (15) (where the past tense on *were meeting* moves to a position below *say*), (16) (where the past tense on *were meeting* moves to a position above *say* but below *decide*), and (17) (where the past tense on *were meeting* moves to a position above *decide*). A tense trace is "wrapped" by as many time-concept generators as there are attitude verbs in whose scope the trace is free. Accordingly, the trace of the moved *PAST* in (16) is "wrapped" by one time-concept generator (introduced by *say*), and the trace of the moved *PAST* in (17) is "wrapped" by two time-concept generators (the inner one introduced by *decide*, the outer one introduced by *say*).

(15) PAST-t_0 [3 [John decide-t_3-w_0 a week ago [5 9 [woll-t_9 in ten days [4 [John say-t_4-w_5 to his mother [7 8 [PAST-t_8 [6 [they be-t_6-w_7 meeting for the last time]]]]]]]]]]
If c is suitable for (15), $[[(15)]]^c$ = True iff there is a *t* that precedes T_c by 7 days such that for all <*w*, *t'*> ∈ ACC(John, W_c, *t*):
there is a *t"* that is 10 days after *t'* such that for all <*w'*, *t"'*> ∈ ACC(John, *w*, *t"*):
there is a $t^{\bullet}$ that precedes *t"'* and John and his mother meet in *w'* at $t^{\bullet}$.

(16) PAST-t_0 [3 [John decide-t_3-w_0 a week ago [5 9 [PAST-t_9 [6 [woll-t_9 in ten days [4 [John say$^{\%}$-t_4-w_5 to his mother [1 7 8 [they be-[[[G_1 t_6] t_8] w_7]-w_7 meeting for the last time]]]]]]]]]
If c is suitable for (16), $[[(16)]]^c$ = True iff there is a *t* that precedes T_c by 7 days such that for all <*w*, *t'*> ∈ ACC(John, W_c, *t*):
there is a $t^{\bullet}$ that precedes *t'*, a *t"* that is 10 days after *t'* and a time-concept generator H suitable for John in *w* at *t"* such that for all <*w'*, *t"'*> ∈ ACC(John, *w*, *t"*):
John and his mother meet in *w'* at $H(t^{\bullet})(t"')(w')$.

(17) PAST-t_0 [6 [PAST-t_0 [3 [John decide$^{\%}$-t_3-w_0 a week ago [2 5 9 [woll-t_9 in ten days [4 [John say$^{\%}$-t_4-w_5 to his mother [1 7 8 [they be-[[[G_1 [[[G_2 t_6] t_9] w_5]] t_8] w_7]-w_7 meeting for the last time]]]]]]]]]
If c is suitable for (17), $[[(17)]]^c$ = True iff there is a $t^{\bullet}$ that precedes T_c, a *t* that precedes T_c by 7 days, and a time-concept generator G suitable for John in W_c at *t* such that for all <*w*, *t'*> ∈ ACC(John, W_c, *t*):
there is a *t"* that is 10 days after *t'* and a time-concept generator H suitable for John in *w* at *t"* such that for all <*w'*, *t"'*> ∈ ACC(John, *w*, *t"*):
John and his mother meet in *w'* at $H(G(t^{\bullet})(t')(w))(t"')(w')$.

The non-'de re' LF in (15) is compatible only with a back-shifted reading of the most deeply embedded clause in (14), with John planning to say "Mom, we were meeting for the last time". As shown in (18), neither one of the 'de re' LFs in (16)–(17) allows the most deeply embedded clause in (14) to be null, with John planning to say "Mom, we are meeting for the last time". Likewise, neither one of the 'de re' LFs in (16)–(17) allows the most deeply embedded clause in (14) to be future-oriented, with John planning to say "Mom, we will meet/will be meeting for the last time" (even if the ULC is ignored).

(18) a. Regarding (16): For any t that is 7 days prior to T_c, all $\langle w, t' \rangle \in \overline{\text{ACC}(\text{John}, W_c, t)}$, any $t^\bullet$ preceding t', any t'' that is 10 days after t', and any H suitable for John in w at t'':
if $H(t^\bullet) =$ 'now' or $H(t^\bullet) =$ 'in n days', then $H(t^\bullet)(t'')(w)$ is t'' or some time that is after t''; this is impossible given that t'' is 10 days after t', $t^\bullet$ precedes t' and $H(t^\bullet)(t'')(w) = t^\bullet$.

b. Regarding (17): For any t that is 7 days prior to T_c, any $t^\bullet$ that precedes T_c, all $\langle w, t' \rangle \in \overline{\text{ACC}(\text{John}, W_c, t)}$, any t'' that is 10 days after t', any H suitable for John in w at t'' and any G suitable for John in W_c at t:
(i) if $G(t^\bullet) =$ 'in n days', where $n \geq 7$:
$G(t^\bullet)(t)(W_c)$ is $t+7$ $(= T_c)$ or some later time; this is impossible given that $G(t^\bullet)(t)(W_c) = t^\bullet$ and $t^\bullet$ precedes T_c;
(ii) if $G(t^\bullet)$ is 'now', 'n days ago', or 'in n days' where $0 < n < 10$:
if $H(G(t^\bullet)(t')(w)) =$ 'now' or $H(G(t^\bullet)(t')(w)) =$ 'in n days', then $H(G(t^\bullet)(t')(w))(t'')(w)$ is t'' or some time that is after t''; this is impossible given that t'' is 10 days after t', $G(t^\bullet)(t')(w)$ is earlier than $t'+10$, and $H(G(t^\bullet)(t')(w))(t'')(w) = G(t^\bullet)(t')(w)$.

Only two out of these three consequences are welcome. A back-shifted reading of the most deeply embedded clause is pragmatically odd in this particular case, but available in principle, as predicted (and evidenced by the fact that *John decided that in ten days, at breakfast, he would say to his mother that he once loved her* can mean that John is planning to say "Mom, I once loved you"). A forward-shifted reading of the most deeply embedded clause is indeed unavailable, as predicted. Crucially, the fact that no LF yields a null reading of the most deeply embedded clause shows that the grammar must generate the SOT LF in (19), where the embedded *PAST* is deleted under agreement with the matrix *PAST* (and if *would* is represented as *woll* + *PAST*, that *PAST* is also deleted under agreement with the matrix *PAST*).

(19) PAST-t_0 [3 [John decide-t_3-w_0 [5 9 [woll-(~~PAST~~-)t_9 [4 [John say-t_4-w_5 to his mother [7 8 [they be-~~PAST~~-t_8-w_7 meeting for the last time]]]]]]]]

And of course, once we concede that the breakfast example has an SOT LF, *John said that Mary was self-employed* can also have such an LF, leaving us with two sources for its null reading: the 'de re' LF in (10) and $LF^{\text{~~PAST~~}}$ in (4b). *John says that Mary was self-employed* is still correctly predicted not to have a null reading, because the SOT rule – by assumption – applies only under agreement.

Since the non-'de re' LF of *John said that Mary was self-employed* already yields the back-shifted reading and the SOT LF yields the null reading, do we still need the 'de re' mechanism? We do, at the very least in order to account for present-under-past sentences such as *John said that Mary is self-employed*. This sentence does not have a null reading, but only a "double access" reading (see, for example, Smith 1978; Enç 1987), which implies that John said something like "Mary is self-employed this week" (and so, may be unacceptable if the event of saying occurred in the distant past; for example, given that pregnancies don't last long, *Twenty years ago, John said that Mary is pregnant* is infelicitous). Assuming that the English *PRES* – unlike *PAST* – can be bound only as a consequence of the application of the SOT rule (von Stechow 1995; Ogihara 1996), *John says that Mary is self-employed* and *John said that Mary is self-employed* receive the SOT LF in (20) and the 'de re' LF in (21), respectively, but neither of them can receive the non-'de re' LF in (22).[7]

(20) PRES-t_0 [3 [John say-t_3-w_0 [5 2 [Mary be-~~PRES~~-t_2-w_5 self-employed]]]]

(21) PRES-t_0 [2 [PAST-t_0 [3 [John say$^{\%}$-t_3-w_0 [4 5 9 [Mary be-[[[G_4 t_2] t_9] w_5]-w_5 self-employed]]]]]]
If c is suitable for (21), $[[(21)]]^c$ = True iff there is a *t* overlapping T_c, a *t'* preceding T_c and a time-concept generator G suitable for John in W_c at *t'* such that for all <*w*, *t"*> ∈ ACC(John, W_c, *t'*), Mary is self-employed in *w* at $G(t)(t")(w)$.

(22) *PAST/PRES-t_0 [3 [John say-t_3-w_0 [5 2 [PRES-t_2 [3 [Mary be-t_3-w_5 self-employed]]]]]]

By (11), any time-concept generator introduced in (21) picks out a time-concept such as 'this week' or 'today'. This means that $G(t)(t")(w)$ overlaps *t"* and $G(t)(t')(W_c)$ overlaps *t'* (for any relevant G, *t*, *t'*, *t"* and *w*). Furthermore, since $G(t)(t')(W_c) = t$, *t* overlaps both T_c and *t'*, and self-employment holds throughout $G(t)(t")(w)$ (being a stative predicate, *be self-employed* has the sub-interval property; see, for example, Dowty 1977).

Thus, according to this view, the complete theory of SOT effects – which we refer to from now on as SOT+'de re' – has an SOT rule, a 'de re' mechanism, and a rule that rules out (22).

A final remark. Not all embedded predicates induce SOT effects. The generalization seems to be (see Stowell 2007) that only stative-like predicates (i.e., purely stative adjectives such as *self-employed*, as well as complex predicates containing certain operators such as the progressive) support null readings. This requirement – which we call the stativity requirement – is illustrated by the contrast in (23): the non-stative verb *leave* (when appearing without the progressive operator or the habitual operator) is non-stative-like.

[7] [PAST/PRES-t_0 [3 [John say-t_3-w_0 [5 6 [PAST/PRES-t_0 [3 [Mary be-t_3-w_5 self-employed]]]]]]], where '6' does not bind anything, is ruled out by whatever principle rules out (8).

(23) a. John said that Mary was self-employed. Stative
May report that John said: "Mary is self-employed."
b. John said that Mary left. Non-stative
May not report that John said: "Mary leaves/is leaving".
c. John said that Mary was leaving.
May report that John said: "Mary is leaving" +PROG

The stativity requirement does not follow from anything we have said so far. However, in Sect. 4 we will see that the stativity requirement is sometimes lifted anyway, so it is not so clear that we even want to make it part of the theory of SOT effects anyway.

The next section discusses another attempt to dispense with the SOT rule. This attempt builds the stativity requirement into the theory of SOT effects.

3 The Scalar Theory

The scalar theory due to Altshuler and Schwarzschild (2013a, b) dispenses not just with $LF^{\overline{PAST}}$ in (4b), as an LF of *John said that Mary was self-employed*, but also with $LF^{PAST\text{-}DeRe}$ in (10). Accordingly, *John said that Mary was self-employed* has only one semantic reading, which arises from the back-shifted (non-'de re') LF of the sentence – its only LF – and which may undergo pragmatic strengthening. The option of pragmatic strengthening makes the sentence "ambiguous". Pragmatic strengthening often results in a cessation implicature (which is a scalar implicature). Lack of pragmatic strengthening may lead to the perception – or illusion – of a null reading.

The scalar theory aims to explain the correlation between the stativity requirement (illustrated in (23) above) and the explicit mention of cessation/non-cessation in unembedded sentences. This correlation is illustrated in (24). (We note, but do not discuss any further, the fact that it is less obvious that activity predicates, which are not stative-like, show the expected pattern; cf. the unambiguously back-shifted *John said that Mary pushed a cart*).

(24) a. Mary was self employed; she no longer is. / She still is. cf. (23a)
b. Mary left; *she no longer does/is. / *She still does/is. cf. (23b)
c. Mary was leaving; she no longer is / She still is. cf. (23c)

The acceptability of both variants of (24a) suggests that the inference that self-employment has ceased (see Klein 1994; Musan 1997 and others) is a cancellable implicature of *Mary was self-employed* rather than an entailment. By contrast, the unacceptability of all variants of (24b) suggests that the inference that Mary's leaving is over is an entailment of *Mary left*, rather than an implicature. The correlation between (23) and (24) further suggests that an illusion of a null reading of embedded clauses arises only when there is no implicature that forces cessation by the local evaluation time. The challenge for such a view is to predict *John says/is saying that Mary was self-employed*, with present in the matrix clause and past in the embedded clause, to be incompatible with a situation where John says "Mary is

self-employed". Here is an attempt (which may not be entirely faithful to Altshuler and Schwarzschild 2013a, b)[8].

According to Gricean approaches to scalar implicatures, upon hearing a sentence, we tend – in the absence of conflicting information – to infer that all stronger scalar alternatives to that sentence (if there are any) are false, because – we reason – the speaker has made the strongest claim she can commit to. There are various ways to implement this idea; here we use grammatical exhaustification along the lines of Fox 2007 (this choice is driven only by the semantic transparency that grammatical exhaustification affords). Accordingly, *Mary is reading a book or a newspaper* is interpreted as 'Mary is reading a book or a newspaper but not both' whenever *exh* is present at LF because, by assumption, *and* is a lexical alternative to *or*.

(25) For any suitable utterance context c, [0 7 [Mary read-t_7-w_0 a book and a newspaper]] ∈ ALT([0 7 [Mary read-t_7-w_0 a book or a newspaper]], c), therefore, if defined:
[[exh [0 7 [Mary read-t_7-w_0 a book or a newspaper]]]]$^c(W_c)(T_c)$ = True only if [[0 7 [Mary read-t_7-w_0 a book and a newspaper]]]$^c(W_c)(T_c)$ = False.

(26) For any α and utterance context c such that [[α]]^c is a function from worlds to functions from times to truth values:
   a. for any world *w* and time *t*: [[exh α]]$^c(w)(t)$ is defined iff c is suitable for α and [[α]]$^c(w)(t)$ is defined. When defined, [[exh α]]$^c(w)(t)$ = True iff [[α]]$^c(w)(t)$ = True and for all β ∈ ALT(α, c), [[β]]$^c(w)(t)$ = False.
   b. ALT(α, c) = {β| β is a syntactic alternative to α and a negatable alternative to α relative to c}.
   c. for any β:
      (i) β is a syntactic alternative to α iff β is derivable from α by replacing at least one node γ in α with one of γ's lexical alternatives.
      (ii) β is a negatable alternative to α relative to c iff {<*w*, *t*>| [[β]]$^c(w)(t)$ is defined} ≠ ø and {<*w*, *t*>| [[β]]$^c(w)(t)$ = True} ⊂ {<*w*, *t*>| [[α]]$^c(w)(t)$ = True}.

By assumption, *exh* is inserted unless its insertion results in a contradiction, as is the case when the potential implicatures are explicitly "cancelled" (for example, *Mary is reading the book or the newspaper*; *in fact, she is reading both*).

To account for cessation implicatures along these lines, we make certain additional assumptions. We assume, as before, that c is suitable for root L only if [[L]]^c is defined, and g_c maps any free occurrence of a time-denoting pronoun in L to T_c and any free occurrence of a world-denoting pronoun in L to W_c. We also assume that the time-concept 'now' (which maps every <*w*, *t*> to *t*) is salient in any suitable c (i.e., there is at least one index n such that g_c(n) = 'now').

[8] Altshuler (2016) discusses some further implications of the scalar theory that are not addressed here. It is also worth noting that the proposal in Gennari 2003, like the scalar theory, does not acknowledge an SOT LF, but unlike the scalar theory it recognizes null and back-shifted readings as two semantically distinct readings.

In addition, we assume that the English present tense has the meaning in (27) (modified from Altshuler and Schwarzschild 2013b), which implies that it is partly "absolute" (or indexical) and partly "relative"; f is a suitable time-concept that serves here as a tense domain restrictor. The past tense has the more standard "relative" meaning in (28).

(27) $[[\text{PRES}^{\text{AS}}]]^{c}(f)(t)(w)(p)$ is defined iff: (i) there is a t' at or after T_c such that $t' \subseteq f(T_c)(W_c)$, (ii) $t \subseteq f(t)(w)$, and (iii) for all $t' \subseteq f(t)(w)$: $p(t')$ is defined. If defined, $[[\text{PRES}^{\text{AS}}]]^{c}(f)(w)(t)(p) =$ True iff for all $t' \subseteq f(t)(w)$: $p(t') =$ True.

(28) $[[\text{PAST}^{\text{AS}}]]^{c}(f)(t)(w)(p)$ is defined iff there is a $t' \subseteq f(t)(w)$ such that t' precedes t and $p(t')$ is defined.
If defined, $[[\text{PAST}^{\text{AS}}]]^{c}(f)(t)(w)(p) =$ True iff there is a $t' \in \{t'' |\ t'' \subseteq f(t)(w),\ t''$ precedes t and $p(t'')$ is defined$\}$ such that $p(t') =$ True.

The entries in (27)–(28) mimic Abusch's predictions regarding "double access" sentences such as *John said that Mary is self-employed* (see Sect. 2), without a 'de re' LF, when f1 and f8 have the same value; e.g., 'this week' (by default, the embedded restrictor is anaphoric to the matrix restrictor).

(29) (i) $\text{PAST}^{\text{AS}}\text{-}f_1\text{-}t_0\text{-}w_0$ [3 [John say-t_3-w_0 [5 6 [PRES^{AS}-f_8-t_6-w_5 [4 [Mary be-t_4-w_5 self-employed]]]]]]

(ii) c is suitable for (i) only if: there is a t at or after T_c such that $t \subseteq g_c(8)(T_c)(W_c)$, and there is a $t \subseteq g_c(1)(T_c)(W_c)$ such that t precedes T_c and for all $<w, t'> \in \text{ACC}(\text{John}, W_c, t)$, $t' \subseteq g_c(8)(t')(w)$.
If c is suitable for (i), $[[(\text{i})]]^{c} =$ True iff there is a $t^* \in \{t |\ t \subseteq g_c(1)(T_c)(W_c)$, t precedes T_c, and for all $<w, t'> \in \text{ACC}(\text{John}, W_c, t)$, $t' \subseteq g_c(8)(t')(w)\}$ such that for all $<w, t> \in \text{ACC}(\text{John}, W_c, t^*)$, for all $t' \subseteq g_c(8)(t)(w)$, Mary is self-employed in w at t'.

In addition, we assume that stative-like predicates have, in addition to the sub-interval property, the temporal profile of statives in (30). Accordingly, stative events may have a lower bound and/or an upper bound, but have no starting point or endpoint.

(30) The temporal profile of statives:[9]
For any tenseless stative clause S, if S is true at moment m, then there is a moment m1 preceding m and a moment m2 following m such that S is true at [m1,m2] (the time that begins at m1 and ends at m2).

[9]This is modified from Altshuler and Schwarzschild 2013a. See Altshuler 2016 for discussion of the progressive and the temporal profile of statives.

Finally, we assume that for any index n and temporal restrictor f, {PAST^{AS}-f$_m$| m is an index} is the set of lexical alternatives to PRES^{AS}-f$_n$, and {PRES^{AS}-f$_m$| m is an index} is the set of lexical alternatives to PAST^{AS}-f$_n$.

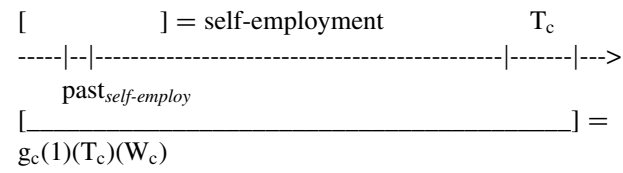
The emergence of a cessation implicature is illustrated in (31) for *Mary was self-employed*.

(31) a. [exh [0 7 [PAST^{AS}-f$_1$-t$_7$-w$_0$ [3 [Mary be-t$_3$-w$_0$ self-employed]]]]]-w$_0$-t$_7$

b. Let α = [3 [Mary be-t$_3$-w$_0$ self-employed]].
For any utterance context c suitable for (31a), and any n such that g$_c$(n) = 'now' and {<*w*, *t*>| [[PRES^{AS}-f$_n$-t$_7$-w$_0$ α]]$^{c[0\rightarrow w,7\rightarrow t]}$ = True} ⊂ {<*w*, *t*>| [[PAST^{AS}-f$_1$-t$_7$-w$_0$ α]]$^{c[0\rightarrow w,7\rightarrow t]}$ = True}:

(i) by (26b) and (27), [0 7 [PRES^{AS}-f$_n$-t$_7$-w$_0$ α]] ∈ ALT([0 7 [PAST^{AS}-f$_1$-t$_7$-w$_0$ α]], c), therefore,

(ii) by (26a), [[(31a)]]^c = True only if [[PRES^{AS}-f$_n$-t$_7$-w$_0$ α]]^c = False.



It follows that there is at least one non-self-employment time in T$_c$, whenever [[(31a)]]^c = True and there are negatable alternatives.

Since *exh* is inserted by default, and since the semantics of *be self-employed* does not entail cessation, there are two types of circumstances where *Mary was self-employed* does not implicate that Mary is no longer self-employed, as specified in (32).

(32) (i) The cessation implicature is explicitly "cancelled", so *exh* is not inserted.

(ii) *exh* is inserted but there are no relevant negatable alternatives.

Explicit "cancellation" is illustrated by *Mary was self-employed; in fact, she still is*. Vacuous exhaustification is illustrated by *I entered the room; there was a book on the table; the book was in Russian*, which (usually) does not imply that the book is no longer in Russian (cf. Klein 1994). The reason is, presumably, that c is set up in a way that gurantees that for all n, [[f$_n$]]^c is past-oriented (i.e., for all *w* and *t* in Dom([[f$_n$]]^c), [[f$_n$]]^c(*t*)(*w*) precedes *t*) or [[f$_n$]]^c = 'now', which means that for all m, {<*w*, *t*>| [[PRES^{AS}-f$_m$-t$_7$-w$_0$ [3 [the book be-in-Russian-t$_3$-w$_0$]]]]$^{c[0\rightarrow w,7\rightarrow t]}$ is defined} = ø, or {<*w*, *t*>| [[PRES^{AS}-f$_m$-t$_7$-w$_0$ [3 [the book be-in-Russian-t$_3$-w$_0$]]]]$^{c[0\rightarrow w,7\rightarrow t]}$ = True} ⊄ {<*w*, *t*>| [[PAST^{AS}-f$_1$-t$_7$-w$_0$ [3 [the book be-in-Russian-t$_3$-w$_0$]]]]$^{c[0\rightarrow w,7\rightarrow t]}$ = True}.

In addition, if *PAST^{AS}* is replaced with *PRES^{AS}*, ALT([0 7[PRES^{AS}-f$_1$-t$_7$-w$_0$ α]], c) = ø, because *PRES^{AS}* has no negatable alternatives. Furthermore, by the

semantics of *PRES*^{AS}, *Mary is self employed* entails that Mary is self-employed at T_c. If *be self-employed* is replaced with a predicate such as *leave*, which lacks the temporal profile of statives, for any n such that $g_c(n)$ = 'now', {<*w*, *t*>| [[PRES^{AS}-f_n-t_7-w_0 [3 [Mary leave-t_3-w_0]]]]$^{c[0\rightarrow w,7\rightarrow t]}$ = True} $\not\subset$ {<*w*, *t*>| [[PAST^{AS}-f_1-t_7-w_0 [3 [Mary leave-t_3-w_0]]]]$^{c[0\rightarrow w,7\rightarrow t]}$ = True}, so exhaustification never results in negating *Mary leaves/is leaving*. Furthermore, by the semantics of *leave*, *Mary left* entails – rather than implicates – that one event of Mary leaving begins and ceases pre-T_c (though there could be subsequent leaving events, pre-T_c, at T_c and post-T_c).

Since *be self-employed* is stative-like, when *Mary was self-employed* is embedded under *John said/says that* ..., cessation of self-employment by John's "now" at the saying time is never entailed, but may be implicated. The exhaustified LFs of *John said that Mary was self-employed* and *John says/is saying that Mary was self-employed* are given in (33); (34) illustrates how exhaustification works in each case: in at least one of the accessible worlds, self-employment cannot go on uninterrupted throughout John's "now".

(33) a. past-under-past:
[exh [0 7 [PAST^{AS}-f_1-t_7-w_0 [3 [John say-t_3-w_0 [5 6 [PAST^{AS}-f_8-t_6-w_5 [2 [Mary be-t_2-w_5 self-employed]]]]]]]]]-w_0-t_7

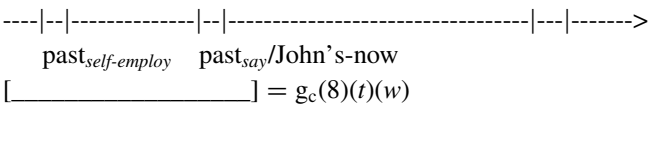
b. past-under-present:
[exh [0 7 [PRES^{AS}-f_9-t_7-w_0 [3 [John say-t_3-w_0 [5 6 [PAST^{AS}-f_4-t_6-w_5 [2 [Mary be-t_2-w_5 self-employed]]]]]]]]]-w_0-t_7

(34) Let α = [2 [Mary be-t_2-w_5 self-employed]].

a. For any utterance context c suitable for (33a), and any n such that $g_c(n)$ = 'now' and {<*w*, *t*>| [[PAST^{AS}-f_1-t_7-w_0 [3 [John say-t_3-w_0 [5 6 [PRES^{AS}-f_n-t_6-w_5 α]]]]]]$^{c[0\rightarrow w,7\rightarrow t]}$ = True} ⊂ {<*w*, *t*>| [[PAST^{AS}-f_1-t_7-w_0 [3 [John say-t_3-w_0 [5 6 [PAST^{AS}-f_8-t_6-w_5 α]]]]]]$^{c[0\rightarrow w,7\rightarrow t]}$ = True}:

(i) by (26b), (27)-(28) and the semantics of *say*, [0 7 [PAST^{AS}-f_1-t_7-w_0 [3 [John say-t_3-w_0 [5 6 [PRES^{AS}-f_n-t_6-w_5 α]]]]] ∈ ALT([0 7 [PAST^{AS}-f_1-t_7-w_0 [3 [John say-t_3-w_0 [5 6 [PAST^{AS}-f_8-t_6-w_5 α]]]]], c), therefore

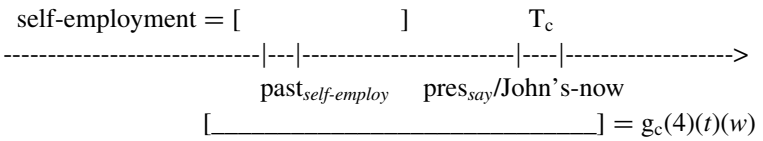
(ii) by (26a), [[(33a)]]^c = True only if [[PAST^{AS}-f_1-t_7-w_0 [3 [John say-t_3-w_0 [5 6 [PRES^{AS}-f_n-t_6-w_5 α]]]]]]^c = False.



b. For any utterance context c suitable for (33b), and any n such that $g_c(n)$ = 'now' and {<*w*, *t*>| [[PRES^{AS}-f_9-t_7-w_0 [3 [John say-t_3-w_0 [5 6 [PRES^{AS}-f_n-t_6-w_5 α]]]]]]$^{c[0\rightarrow w,7\rightarrow t]}$ = True} ⊂ {<*w*, *t*>| [[PRES^{AS}-f_9-t_7-w_0 [3 [John say-t_3-w_0 [5 6 [PAST^{AS}-f_4-t_6-w_5 α]]]]]]$^{c[0\rightarrow w,7\rightarrow t]}$ = True}:

(i) by (26b), (27)-(28) and the semantics of *say*, [0 7 [PRES^{AS}-f_9-t_7-w_0 [3 [John say-t_3-w_0 [5 6 [PRES^{AS}-f_n-t_6-w_5 α]]]]]] ∈ ALT([0 7 [PRES^{AS}-f_9-t_7-w_0 [3 [John say-t_3-w_0 [5 6 [PAST^{AS}-f_4-t_6-w_5 α]]]]]], c), therefore

(ii) by (26a), [[(33b)]]^c = True only if [[PRES^{AS}-f_9-t_7-w_0 [3 [John say-t_3-w_0 [5 6 [PRES^{AS}-f_n-t_6-w_5 α]]]]]]^c = False.



An illusion of a null reading may arise when exhaustification is vacuous. The closer the time introduced by the embedded past tense to John's "now" at the saying time is, the easier it is to obtain an illusion of a null reading.

In (33a), an illusion of a null reading easily arises because in many suitable contexts there are no relevant negatable syntactic alternatives. For example, if for all n, [[f_n]]^c is past-oriented or [[f_n]]^c = 'now', then for any m, [0 7 [PAST^{AS}-f_1-t_7-w_0 [3 [John say-t_3-w_0 [5 6 [PRES^{AS}-f_m-t_6-w_5 α]]]]]] ∉ ALT([0 7 [PAST^{AS}-f_1-t_7-w_0 [3 [John say-t_3-w_0 [5 6 [PAST^{AS}-f_8-t_6-w_5 α]]]]]], c); cf. (32(ii)). On the other hand, an illusion of a null reading cannot arise in (33b), in practice, for the following reason. For any c, [[(33b)]]^c = True only if $g_c(9)$ is present-oriented and $g_c(4)$ is compatible with past tense. By default, the embedded tense restrictor is anaphoric to the matrix tense restrictor; that is to say, $g_c(9) = g_c(4)$. A possible value for both, then, is along the lines of 'today'. Given this, [0 7 [PRES^{AS}-f_9-t_7-w_0 [3 [John say-t_3-w_0 [5 6 [PRES^{AS}-f_n-t_6-w_5 α]]]]]] ∈ ALT([0 7 [PRES^{AS}-f_9-t_7-w_0 [3 [John say-t_3-w_0 [5 6 [PAST^{AS}-f_4-t_6-w_5 α]]]]]], c) for all n such that $g_c(n)$ = 'now', and self-employment cannot go on uninterrupted throughout John's "now".

To sum up, on the assumption that *exh* is inserted by default: (a) in past-under-past sentences with embedded stative-like predicates, an illusion of a null reading easily arises because *exh*-insertion can easily result in no cessation; and (b) in past-under-present sentences with embedded stative-like predicates, an illusion of a null reading rarely – in practice, perhaps never – arises, because the embedded tense restrictor is anaphoric to the present-oriented matrix tense restrictor (and cessation is guaranteed whenever *exh* is inserted).

Importantly, an illusion of a null reading may arise not only in the simplex past-under-past *John said that Mary was self-employed*, but also in the complex past-

under-past breakfast example – *A week ago, John decided that in ten days he would say to his mother that they were meeting for the last time*. The LF that underlies this breakfast example is (35).

(35) $\text{PAST}^{\text{AS}}\text{-f}_1\text{-t}_{10}\text{-w}_0$ [3 [John decide-t_3-w_0 [5 9 [$\text{PAST}^{\text{AS}}\text{-f}_{12}\text{-t}_9\text{-w}_5$ [6 [woll-t_6 [4 [John say-t_4-w_5 to his mother [7 8 [$\text{PAST}^{\text{AS}}\text{-f}_{11}\text{-t}_8\text{-w}_7$ [2 [they be-t_2-w_7 meeting for the last time]]]]]]]]]]]

On the assumption that both *woll* and *be meeting* have the temporal profile of statives, an illusion of a null reading easily arises when c is such that (35) has no relevant negatable alternatives (in which case we may infer that John's decision was: "I will say to my mother: we are meeting for the last time").

The scalar theory has an additional positive consequence that is worth pointing out: it does not appeal to the ULC to guarantee that *John said that Mary was self-employed* has no forward-shifted reading. This simply follows from the assumption that the only LFs available for this sentence are not 'de re' LFs, but rather LFs with an embedded quantificational past.

We now compare SOT+'de re' with the scalar theory, ruling in favor of the former.[10]

4 In Defense of SOT+'de re'

We take issue with some of the main claims of the scalar theory, namely: (i) that a potential lack of cessation obviates the need for an SOT rule, (ii) that a partly "relative" English present tense obviates the need for 'de re' LFs, (iii) that the scalar theory predicts a correlation between explicit mention of cessation/non-cessation in main clauses and null readings in embedded clauses, and (iv) that stativity is a pre-requisite for the emergence of null readings in embedded clauses. As we show, SOT+'de re' makes the following predictions: (a) it predicts there to be SOT languages, non-SOT languages and "mixed" languages, challenging (i) and (ii) and vindicating Abusch's claim that no theory of SOT effects is complete without an SOT rule or a 'de re' mechansim (see Sect. 4.1), (b) it predicts the absence of a null reading in certain past-under-past sentences with stative-like predicates, challenging (iii) (see Sect. 4.2), and (c) it predicts null readings of breakfast examples with non-stative-like predicates, challenging (iv) (see Sect. 4.3).

[10] A concern regarding the scalar theory arises with respect to vacuous exhaustification of $\neg\alpha$. Cessation is not guaranteed in negated past-under-present sentences (e.g., *John isn't saying that Mary was self-employed*) and in embedded polar questions (e.g., *John is asking whether Mary was self-employed*). However, since negation also poses some non-trivial problems for 'de re' LFs (as discussed in Charlow and Sharvit 2014 and others), we refrain from comparing SOT+'de re' with the scalar theory on the basis of their predictions regarding negation.

4.1 Non-SOT Languages and "Mixed" Languages

Not all languages express a null reading in the same way. SOT+'de re' predicts the attested language typology straightforwardly, but the scalar theory does not.

There are languages where the most natural way to report that someone said "Mary lives in Paris" is with an embedded present. One instance of such a language is Modern Hebrew (see Sharvit 2003; Ogihara and Sharvit 2012, and others). The most natural way to report a past event of Dan saying "Mira lives in Paris" is with the present-under-past (36) (which need not imply that Mira's living is ongoing at T_c, according to Dan), and the most natural way to report a past event of Dan saying "Mira lived in Paris" is with the past-under-past (37).

(36)	Dan	amar	Se	Mira	mitgoreret	be-pariz
	Dan	say-past	COMP	Mira	live-pres	in-Paris
	Dan: "Mira lives in Paris"					
(37)	Dan	amar	Se	Mira	hitgorera	be-pariz
	Dan	say-past	COMP	Mira	live-past	in-Paris
	Dan: "Mira lived in Paris"					

According to SOT+'de re', this is explained as follows. English has an SOT rule and its present tense cannot be bound unless the SOT rule has applied (see (20)–(22)). Hebrew lacks an SOT rule, and its present tense has the same semantics as *PRES* (see (13)), but unlike the English *PRES*, the Hebrew $PRES^H$ can be bound when embedded. This explains why (36) has a null reading (with no obligatory "double access" effect).

(38) a. $[[PRES^H]]^c = [[PRES]]^c$

b. LF of (36) (cf. (22)): PAST-t_0 [8 [Dan say-t_8-w_0 [5 6 [$PRES^H$-t_6 . . .]]]]

This makes three additional predictions. Firstly, in the breakfast sentence in (39), a null reading of the most deeply embedded clause, according to which the subject describes an event ongoing in his "now", is available only with an embedded present tense; an embedded past tense supports only a back-shifted reading (see Sharvit 2003, 2008; Hatav 2012; this is also true of breakfast examples in Japanese, see Ogihara 1996; Ogihara and Sharvit 2012).[11]

(39)	lifney	Savua,	Dan	xaSav	Se	Miri	hayta	amura	tox asara
	before	week	Dan	think-past	COMP	Miri	be-past	supposed	in ten
	yamim	lomar	le-ima		Se	hi	mitgoreret/*hitgorera		be-pariz
	days	to-say	to-mother-hers		COMP	she	live-pres/live-past		in-Paris

Mira: "Mom, I live in Paris".

[11] I thank Moysh Bar-lev and Idan Landau for sharing with me their native speaker judgments regarding (36), (37) and (39).

Secondly, (37) does sometimes have a null reading (though subject to speaker variation). This is because a 'de re' LF of (37) is available, which is similar to the 'de re' LF of *John said that Mary was self-employed* in (10) in Sect. 2 (see Sharvit 2003, 2008, Ogihara and Sharvit 2012; Bar-Lev 2015). Importantly, a 'de re' LF cannot rescue the past variant of (39), for the same reason that it does not account for its English counterpart, as we saw in Sect. 2.

Thirdly, there are languages where a null reading arises under past, either with past or with present in the embedded clause (see Sharvit 2003). This is because SOT+'de re' does not ban languages that have both the SOT rule and a locally bindable present. Indeed, in Modern Greek (unlike English and Hebrew), both past and present can be null under past. This is illustrated by the Greek counterpart of the breakfast examples in (40), where a null reading is available with both past and present.[12,13]

(40) Prin mia evdomada o Jorghos ipe oti se
before one week the Jorghos sayPFV.past-3SG. that in
dheka meres tha eleghe stin kopela tu oti
ten days FUT past.IMPF.say-3SG. to-the girlfriend of-his that
sinadjodusan/sinadjunte ja teleftea fora
meet.pastIMPV-3PL/meet.pres-3PL for last time

Jorghos: "We are meeting for the last time"

Within the scalar theory the Hebrew present tense has no "absolute" component; it is purely "relative" as in (41a); this explains why (36) has a null reading (with no obligatory "double access" effect).

(41) a. $[[\text{PRES}^{\text{h}}]]^{c}(f)(t)(w)(p)$ is defined only if $t \subseteq f(t)(w)$ and $p(t)$ is defined. If defined, $[[\text{PRES}^{\text{h2}}]]^{c}(f)(t)(w)(p) =$ True iff there is a $t' \in \{t'' \mid t'' \subseteq f(t)(w)$ and $p(t'')$ is defined$\}$ such that $p(t') =$ True.

b. LF of (36) (cf. (29)): PAST^{AS}-f_1-t_0-w_0 [3 [Dan say-t_3-w_0 [5 6 [PRES^{h}-f_8-t_6-w_5 ...]]]]

Accordingly, English constitutes a clear violation of The Embeddability Principle (Sharvit 2003), which says (or, more accurately, implies) that every language should be able to express the proposition expressed by the Hebrew (36). The reason is this: since the English grammar lacks a purely "relative" present (and, like all languages, also lacks an SOT rule), it has the means to deliver a proposition that is compatible

[12]I thank Nikos Angelopoulos, Cleo Condoravdi, Anastasia Giannakidou, Sabine Iatridou, Pinelopi Koujianou Goldberg, Eleni Miltsakaki and Orest Xherija for sharing with me their native speaker judgments regarding (40).

[13]The modal *tha* in (40) does not have a null reading when accompanied by present tense, but this is probably due to the way it interacts with aspect (see Iatridou 2000). Regardless, the embedded verb corresponding to *meet* is good with either past or present (on the "null" reading).

with the proposition expressed by (36), but does not have the means to deliver that proposition itself (because semantically, it delivers only "double access" readings of the English counterpart of (36) and only back-shifted readings of the English past-under-past counterpart of (36)). We now question this consequence.

To account for the fact that the present-variant of both (39) and (40) supports a null reading, we have to assume that both Hebrew and Greek have *PRES*^{h}. In order to make the right prediction regarding (39) (namely, that only its present-variant supports a null reading), we must somehow ensure that the set of relevant negatable syntactic alternatives to the past-variant of (39) (i.e., alternatives whose negation causes cessation of living in Paris) is never empty. On the other hand, in order to make the right prediction regarding the Greek (40) (namely, that both present- and past-variants support a null reading), we have to ensure that the set of relevant negatable alternatives to the past-variant of (40) (i.e., alternatives whose negation causes cessation of meeting) may be empty. While it is not impossible to imagine a theory that "blames" cross-linguistic variation on whether the set of relevant alternatives may be empty, such a solution would be incompatible with (37). This suggests that the breakfast example does, after all, show that some languages have an SOT rule, that the null reading is a semantic reading in its own right, and that the Embeddability Principle is respected in English (though this may require a minor adjustment of (13)). Granted, SOT+'de re' must recognize – and explain – the emergence of a cessation inference in, for example, *Mary was self-employed*, but this does not conflict with recognizing that past-under-past sentences may have a genuine semantic null reading.

In addition, the fact that the Hebrew (37) sometimes has a null reading illustrates the need for 'de re' LFs independently of English present-under-past sentences (which, as we saw in Sect. 3, receive an alternative explanation within the scalar theory). The scalar theory cannot account for the fact that (37) may have a null reading: any mechanism for generating syntactic alternatives that guarantees cessation of living in Paris for the past-variant of (39) guarantees cessation of living in Paris for (37).[14]

It is worth noting that English, too, provides some evidence for 'de re' LFs. Consider the past-under-present in (42). The received wisdom is that it is unambiguously back-shifted.

(42) John says/is saying that Mary was self-employed.

My own impression, based on the responses of the speakers I consulted, is that it indeed never has a pure null reading, but some speakers allow – what I call – a pseudo-null reading in very special circumstances. By "pseudo-null reading" I mean: a reading that implies that John is misinformed about his temporal location

[14]The Greek counterpart of (37) has a null reading too, as expected on the assumption that Greek has an SOT rule. The Japanese counterpart of (37) does not have a null reading at all; this is unexpected on the assumption that it lacks an SOT rule but has a 'de re' LF. See Ogihara and Sharvit (2012) for a possible explanation.

(as people sometimes are; see Lewis 1979; Cresswell and von Stechow 1982), and mistakenly takes the past to be his "now" by relying on an unreliable source of information to determine his temporal location. Suppose John wakes up from a coma in a hospital, and he has just met Mary, who is on the phone talking to clients. He does not know what the date is, so he looks at the calendar on the wall. The calendar is showing January, despite the fact that it is February (because the busy hospital staff neglected to update it). John, for whom the calendar is the only source of information regarding his temporal location, says: "Mary is self-employed." While, admittedly, many speakers do not accept *John is saying that Mary was self-employed* as a faithful report of this, some speakers do.

Within SOT+'de re', an SOT LF is ruled out – due to lack of agreement between the matrix and embedded tenses – but the 'de re' LF (43) is generated ((12) in Sect. 2).

(43) PAST-t_0 [2 [PRES-t_0 [3 [John say$^{\%}$-t_3-w_0 [4 5 1 [Mary be-[[[G_4 t_2] t_1] w_5]-w_5 self-employed]]]]]]
If c is suitable for (43), $[[(43)]]^c$ = True iff there is a *t* preceding T_c, a *t'* overlapping T_c and a time-concept generator G suitable for John in W_c at *t'* such that for all $<w, t''> \in$ ACC(John, W_c, *t'*), Mary is self-employed in *w* at $G(t)(t'')(w)$.

Time-concepts such as 'now' will not work for (43), as we saw in Sect. 2. But there are other options to consider. When John is misinformed because the calendar shows January instead of February, it seems that speakers vary with respect to the range of time-concepts they admit. Some speakers admit a time-concept that assigns to every *t* and *w* the time that is presented to John as "now" in *w* at *t*. This means that $G(t)(t'')(w)$ overlaps *t''*, and $G(t)(t')(W_c)$ is *t* (for all relevant G, *t*, *t'*, *t''* and *w*), which precedes T_c. For other speakers, such a time-concept fails to meet some rigorous definition of the term "suitable".

The scalar theory predicts a cessation implicature for (42), with (33b) in Sect. 3 as its default LF, because the embedded tense restrictor is anaphoric to the matrix tense restrictor. With respect to those speakers who do not permit pseudo-null readings of (42), this is a welcome prediction. However, if we want to generate such readings (and account for those speakers who do permit these readings), we must stipulate that in a context where John relies on a "bad" source to determine his temporal location, *exh* is not inserted (or the anaphoricity requirement is suspended). The problem is that we would predict no contrast between a past-induced mistake and a future-induced mistake, contrary to fact. Imagine we are watching a video of John and reporting what is happening, in real time, to someone who has no visual or auditory access to the video. While we can use (42) to report that John is saying "Mary is self-employed" after determining his temporal location by looking at a calendar that presents last week as this week, we cannot use it to report that John is saying "Mary is self-employed" after determining his temporal location by looking at a calendar that presents next week as this week. This is not predicted, if exhaustification can be avoided whenever John uses a "bad" source. By contrast,

the 'de re' LF in (43) makes the right prediction: $G(t)(t')(W_c)$ is t itself – the time shown by the calendar – and it cannot, by the ULC, follow t'.

4.2 Unambiguous Sentences

Sentences where the embedded verb is overtly modified by a past-oriented modifier are unambiguously back-shifted. This suggests that (non-)cessation and the (un-)availability of null readings are independent of each other.

Recall that the scalar theory aims to account for the correlation between the stativity requirement of null readings in embedded clauses (illustrated by the fact that a null reading is available for *John said that Mary was sad* but unavailable for *John said that Mary left*; cf. (23)) and explicit mention of cessation/non-cessation in main clauses (illustrated by the contrast between *Mary was sad and she still is* and **Mary left and she still does/is*; cf. (24)). That correlation breaks down when the relevant verb phrase has a past-oriented overt temporal modifier (see (44)–(45)) and/or past perfect morphology (see (46)–(47)).

(44) Mary was sad two minutes ago. She still is. / She no longer is.

(45) a. A minute ago, John said that Mary was sad two minutes before.
John: "Mary was sad two minutes ago".
b. A minute ago, John said that Mary was sad (then).
John: "Mary is sad (now)".
John: "Mary was sad (then)."

(46) Mary finally went to bed. She had been upset, but she no longer was/and she still was.

(47) a. John said that Mary had been upset half an hour before.
John: "Mary was upset half an hour ago."
b. John said that Mary had always been upset.
John: "Mary has always been upset."
c. John said that Mary was upset (then).
John: "Mary is upset (now)".
John: "Mary was upset (then)".

When faced with the task of choosing between (45a) and (45b) to report that John uttered a minute ago, "Mary is sad", speakers invariably choose the latter. And when asked, "What did John say?" after being presented with (45a) and (45b), speakers never respond with "Mary is sad" to the (45a)-option (but may respond in this manner to the other option). Similarly, when faced with the task of choosing between (47a), (47b) and (47c) to report that John uttered, "Mary is upset", speakers invariably choose (47c). And when asked, "What did John say?" after being presented with (47a), (47b) and (47c), speakers never respond with "Mary is upset" to the (47a,b)-options (but may respond in this manner to the other option).

The fact that explicit mention of cessation/non-cessation is possible in (44) and (46), despite the temporal modifier/past perfect morphology, suggests that non-cessation and null readings are distinct phenomena.

Indeed, within SOT+'de re', an SOT LF is available for (45b), but ruled out for (45a), because a deleted tense (which picks out John's "now") conflicts with the past-oriented *two minutes before* (which picks out a time prior to John's "now"). A 'de re' LF is ruled out for (45a) whenever the time-concept picked out by the concept generator conflicts with the past-oriented *two minutes before* (e.g., when the concept-generator picks out the time-concept 'now'). This correctly predicts (45a) to be back-shifted. Similarly, an SOT LF is available for (47b) (but not for (47a)) with the implication that John uttered, "Mary has always been upset" (which is not the same as "Mary is upset"), and for (47c).

Notice that the fact that cessation/non-cessation can be explicitly mentioned in (48) is compatible with these predictions: back-shifted readings are compatible both with cessation and with non-cessation (on either theory).

(48) A minute ago, John said that Mary was/had been sad two minutes before, and that she still was / and that she no longer was.

The predictions of the scalar theory depend on what we take the syntactic alternatives to be. It seems plausible to assume that those alternatives may include lexical alternatives to the past tense, to the overt temporal modifiers and to the aspect markers. There are certainly many contexts suitable for (45a) in which negation of some of these syntactic alternatives results in cessation of sadness (by John's "now"). But by the same reasoning that predicts (33a) to sometimes lack relevant negatable alternatives, as well as (45b), there are also many suitable contexts in which (45a) lacks relevant negatable alternatives, and we expect the illusion of a null reading to be available. Similarly, there are many suitable contexts in which (47a) lacks relevant negatable alternatives. Any mechanism that would enforce relevant negatable alternatives in (45a) or (47a) would be ad-hoc and/or at odds with the fact that cessation is not enforced in either (44) or (46).

Given this, it perhaps comes as no surprise that stativity is not always a pre-requisite for null readings, as we show in Sect. 4.3.

4.3 SOT Effects and Non-Stative-Like Predicates

As we saw, stativity is often a pre-requisite for a null reading of a past-under-past sentence. However, the stativity requirement is lifted in certain breakfast examples.

Consider the examples in (49) and (50). In (49a), with past tense on *graduate*, graduation occurs after moving but pre-T_c (Anscombe 1964; Ogihara 1996 and others). In (49b), there is an apparent mismatch between *sold* and *tomorrow* (Dudman 1983, 1984; Iatridou 2000; Ippolito 2003 and others). In (50a), with present tense on *graduate*, graduation still occurs after moving, but it is not co-temporal with T_c. In (50b), selling is not co-temporal with T_c either.

(49) a. John moved before he graduated.
b. If John sold his stocks tomorrow, he would make a lot of money.
(50) a. John will move before he graduates.
b. If John sells his stocks tomorrow, he will make a lot of money.

Interestingly, when we embed (49a) under *John said that he would* ... and (49b) under *John said today that* ..., as in the (51), they "acquire" a future-in-the-present reading that involves John uttering "... I will ..." (see (53)), making a neutral prediction about his future, in addition to the future-in-the-past reading that involves John uttering "... I would ..." (see (52)), possibly making counterfactual/subjunctive claims.

(51) a. John said that he would move before he graduated.
b. John said today that if he sold his stocks tomorrow, he would make a lot of money.
(52) a. Future-in-the-past reading of (51a)
John said: "I would move before I graduated".
b. Future-in-the-past reading of (51b)
John said today: "If I sold my stocks tomorrow, I would make a lot of money."
(53) a. Future-in-the-present reading of (51a)
John said: "I will move before I graduate".
b. Future-in-the-present reading of (51b)
John said today: "If I sell my stocks tomorrow, I will make a lot of money."

The paraphrases of the future-in-the-present readings of (51a) and (51b) show that they are null readings with respect to *woll*, *graduate* and *sell*. Given that *woll* has the temporal profile of statives, it is conceivable that an illusion of a null reading with respect to *woll* arises because of this profile. But *graduate* and *sell* both lack the temporal profile of statives. How do the null readings arise with respect to *graduate* and *sell*, then?

Let us assume that the meaning of *before* is along the lines of Krifka 2010 (cf. Anscombe 1964), and that tenses are doubly-indexed time-denoting pronouns that may be bound by *before*, *woll*, ∃, etc.[15]

[15]We use Krifka's theory of *before* because it is advocated in Altshuler and Schwarzschild 2013a, but our point is the same within other theories of *before* (e.g., Condoravdi 2010). The decision to switch to pronominal tenses is dictated by Krifka's *before*, which introduces an existential quantifier that binds tenses. In addition, we treat the present as fully "relative" for simplicity, but our point remains the same if we make it partly "absolute" as in Altshuler and Schwarzschild 2013b (cf. (27)).

(54) a. $[[\text{before}]]^c(p)(t)$ = True iff there is no *t'* at or prior to *t* such that $p(t')$ = True.
b. For any c such that $g_c(i)$ and $g_c(j)$ are times:
$[[\text{past}_{i,j}]]^c = g_c(i)$ (where $g_c(i)$ precedes $g_c(j)$);
$[[\text{pres}_{i,j}]]^c = g_c(i)$ (where $g_c(i)$ overlaps $g_c(j)$).

The LFs in (55)–(56) account for the intuitive meanings of (49a) and (50a,b) without an SOT rule. Following Kratzer (1986), we assume that an *if*-clause restricts the quantifier that appears in the consequent clause of a conditional; in (50b), that quantifier is future-in-the-present, namely, the future operator *woll* with present tense. We also assume that a *before*-clause and its sister combine by Predicate Modification.

(55) (49a): ∃ [[1 [John move-past$_{1,0}$-w$_0$]] [before 3 [he graduate-past$_{3,0}$-w$_0$]]]
(Moving precedes graduation.)

(56) a. (50a): ∃ 2 [woll-pres$_{2,0}$ [[1 [John move-pres$_{1,1}$-w$_0$]] [before 3 [he graduate-pres$_{3,3}$-w$_0$]]]]
(Moving and graduation are post-T_c, and moving precedes graduation.)
b. (50b): ∃ 2 [[woll-pres$_{2,0}$ [1 [John sell-pres$_{1,1}$-w$_0$ tomorrow]]] [1 [he make-t$_1$-w$_0$]]]
(Selling and making money are post-T_c.)

The sentence in (49b) has a subjunctive LF – not provided here – which resolves the apparent mismatch between *sold* and *tomorrow*. The subjunctive future-in-the-past readings of (51a,b) come from subjunctive LFs as well, whatever their precise details might be.

The problem is with the future-in-the-present readings of (51a,b), whose LFs are not subjunctive LFs (recall that according to those readings, John makes neutral predictions about his future). Without an SOT rule, we may obtain (57a) for (51a) and (57b) for (51b).

(57) a. ∃ 3 [John say-past$_{3,0}$-w$_0$ [9 5 [∃ 2 [woll-past$_{2,5}$ [[1 [he move-t$_1$-w$_9$]] [before 1 [he graduate-past$_{1,5}$-w$_9$]]]]]]]
b. ∃ 3 [John say-past$_{3,0}$-w$_0$ today [9 5 [∃ 2 [[woll-past$_{2,5}$ [1 [he sell-past$_{1,5}$-w$_9$ tomorrow]]] [1 [he make-t$_1$-w$_9$]]]]]]

Thanks to the assumed stativity of *woll*, we may obtain an illusion of a null reading with respect to *woll* (cf. (35)), predicting the inference that John uttered "... I will ...". However, the readings described in (53) are still not accounted for. (57a), which implies that graduation may follow John's "now", is compatible with graduation preceding moving, because the *before*-clause fails to restrict post-John's-"now" graduations. But intuitively, moving and graduating may occur post-John's-"now". It is reasonable to assume that (57a) is ruled out on pragmatic grounds (as its truth conditions are very weak). (57b) implies that selling both precedes and follows John's "now", at least whenever John is well-informed about his temporal location,

and is therefore ruled out (crucially, the future-in-the-present reading of (51b) does not depend on John being mistaken about his temporal location).

In (57a,b), the "evaluation time" index of the embedded past tense is bound by *say*. What if it were bound by the embedded '∃', as in (58)?

(58) a. ∃ 3 [John say-past$_{3,0}$-w$_0$ [9 5 [∃ 2 [woll-past$_{2,5}$ [[1 [he move-t$_1$-w$_9$]] [before 1 [he graduate-past$_{1,2}$-w$_9$]]]]]]]

b. ∃ 3 [John say-past$_{3,0}$-w$_0$ today [9 5 [∃ 2 [[woll-past$_{2,5}$ [1 [he sell-past$_{1,2}$-w$_9$ tomorrow]]] [1 [he make-t$_1$-w$_9$]]]]]]

The LF in (58a) is completely uninformative; it says that no pre-moving graduation can be post-moving. (58b) may yield an attested and informative reading of (51b), but it must be banned because it incorrectly predicts *If John sold his stocks tomorrow, he will make a lot of money* to be well-formed. If the "evaluation time" index of the embedded past is not bound at all, informative readings depend on John being mistaken about his temporal location. But neither future-in-the-present reading in (51a,b) depends on such a mistake.

On the other hand, if the grammar of English has an SOT rule, which deletes one tense index under agreement (and, by assumption, $[[\text{past}_i]]^c = [[\text{pres}_i]]^c = g_c(i)$), the future-in-the-present readings are predicted straightforwardly: (59a), an SOT-variant of (57a), yields the reading paraphrased in (53a); (59b), an SOT-variant of (57b), yields the reading paraphrased in (53b).

(59) a. ∃ 3 [past$_{3,0}$ [4 [John say-t$_4$-w$_0$ [9 5 [∃ 2 [woll-past$_2$ [[1 [he move-t$_1$-w$_9$]] [before 1 [he graduate-past$_1$-w$_9$]]]]]]]]

b. ∃ 3 [past$_{3,0}$ [4 [John say-t$_4$-w$_0$ today [9 5 [∃ 2 [[woll-past$_2$ [1 [he sell-past$_1$-w$_9$ tomorrow]]] [1 [he make-t$_1$-w$_9$]]]]]]]]

Importantly, once we acknowledge the SOT rule, SOT LFs of (49a) and (50a,b) also become available, in principle (cf. Heim 1994; Ogihara 1996; Sharvit 2014).

(60) (49a): ∃ 4 [past$_{4,0}$ [[1 [John move-t$_1$-w$_0$]] [before 3 [he graduate-past$_3$-w$_0$]]]]

(61) a. (50a): ∃ 2 [pres$_{2,0}$ [4 [woll-t$_4$ [[1 [John move-t$_1$-w$_0$]] [before 3 [he graduate-pres$_3$-w$_0$]]]]]]

b. (50b): ∃ 2 [pres$_{2,0}$ [4 [[woll-t$_4$ [1 [John sell-pres$_1$-w$_0$ tomorrow]]] [1 [he make-t$_1$-w$_0$]]]]]

This allows us to ban identical indices on tenses (cf. (22)), thereby ruling out the LFs in (56) and the LF in (62), correctly predicting the unacceptability of *John moved before he graduates* (in English, the corresponding Japanese sentence is acceptable; see Ogihara 1996; Sharvit 2014).

(62) *∃ [[1 [John move-past$_{1,0}$-w$_0$]] [before 3 [he graduate-pres$_{3,3}$-w$_0$]]]

Notice that while the SOT LFs in (61) yield the intuitive truth conditions of (50a,b), the SOT LF in (60) yields truth conditions for (49a) that are too weak (see Kubota et al. 2011). This suggests the following (see Sharvit 2014): (a) that *say* and *woll* are SOT triggers, but *before* is not; (b) that (59a,b) (where SOT is triggered by *say/woll*) are the LFs of (51a,b), and (61a,b) are the LFs of (50a,b) (where, again, SOT is triggered by *say/woll*).[16]

Notice also that even in the subjunctive LF of (51a) (whatever its precise details might be), the past tense of *graduate* must be "deleted", as shown by the fact that (63a) (with a "non-deleted" past) allows graduation to precede moving in the counterfactual worlds quantified over by the modal (cf. (57a)), but (63b) (with a "deleted" past) requires moving to precede graduation in those counterfactual worlds.

(63) a. . . . [9 5 [MODAL . . . [6 [[1 [he move-t_1-w_6]] [before 1 [he graduate-past$_{1,5}$-w_6]]]]]]
b. . . . [9 5 [MODAL . . . [6 [[1 [he move-t_1-w_6]] [before 1 [he graduate-past$_1$-w_6]]]]]]

To sum up, while SOT+'de re' does not readily explain why the stativity requirement is lifted when *before* or *if* intervenes between past tense and *say* (or, for that matter, why the stativity requirement is there in the absence of *before/if*), it does generate the future-in-the-present readings of (51a,b), while a theory that lacks an SOT rule does not. The fact that null tenses do not always obey the stativity requirement undermines any theory that "blames" null readings on the temporal profile of statives, rather than on an SOT rule which, on its own, does not discriminate between predicates that are stative-like and predicates that are not.

5 Summary and some Remarks on the ULC

We compared the SOT+'de re' theory of embedded tense with the scalar theory and saw that while basic SOT effects are explained by both theories, complex embeddings seem to favor SOT+'de re', especially with regard to cross-linguistic variation, unambiguously back-shifted sentences, and the stativity requirement. Taken together, these facts vindicate Abusch's claim that no theory of embedded tense is complete without an SOT rule and a 'de re' mechanism.

[16]The waitress at the Los Angeles bar where parts of this paper were written once asked me: "Did you want anything from the happy hour menu before it ended?". While it is not entirely clear why *do* is in-the-past, the fact that *end* is in-the-past is expected, on the assumption that *want*, like *say*, triggers SOT.

As we saw, the ULC plays a central role in the 'de re' component of SOT+'de re'. Some tense scholars have argued that the effects of the ULC follow from more general principles and some have argued that the ULC is empirically inadequate. My own position, motivated below, is that the ULC is empirically adequate, though it is certainly desirable to derive its effects from general principles. The criticism of the scalar theory in Sect. 4 is independent of whether the ULC is an independent principle or a derived principle.

An interesting attempt to derive ULC effects from general principles is made in Klecha 2016, where the ban on forward-shifted readings of past-under-past sentences is taken to be verb-dependent rather than absolute. According to Klecha, some embedding verbs are associated with a modal base that is incompatible with forward-shifted readings, and some are associated with a modal base that is compatible with forward-shifted readings. As Klecha reports, in certain dialects of English, *John hoped that Mary was self-employed* has a forward-shifted reading. Crucially, the predictions of the ULC-based theory – regarding *say*-type verbs – match Klecha's predictions. Therefore, even if Klecha is right, and ULC effects follow from general principles, it is harmless – in the context of this paper – to talk about the ULC as if it were a principle in its own right.

A completely different approach is adopted in Bar-Lev 2015, where it is claimed that the ULC over-generates, even with *say*-type verbs. Bar-Lev observes that a past-under-past sentence with a universal quantifier in subject position does not have a mixed reading. For example, *Every man said that Mary was unemployed* has a null reading, according to which every man said "Mary is unemployed", and a back-shifted reading, according to which every man said: "Mary was unemployed". What the sentence does not have, according to Bar-Lev, is a reading according to which some man/men said "Mary is unemployed" and some man/men said "Mary was unemployed." As shown in (64), such a reading is predicted by the ULC-based 'de re' theory, because the time-concepts can vary with men. Since G_4 is bound in the scope of *every man*, some men could, in principle, be associated with the time-concept 'now' and some men with 'last month'. As shown in (65), a mixed reading is also predicted by the scalar theory, by "skolemizing" the embedded tense restrictor. Since $PAST^{AS}$-[f_4 pro_6] is in the scope of *every man* and pro_6 is bound by *every man*, some men may be associated with cessation of unemployment, and some men with non-cessation of unemployment.

(64) every man-w_0 [8 [PAST-t_0 [2 [PAST-t_0 [3 [t_8 say$^{\%}$-t_3-w_0 [4 5 7 [Mary be-[[[G_4 t_2] t_7] w_5]-w_5 unemployed]]]]]]

(65) every man-w_0 [6 [[exh [0 9 [$PAST^{AS}$-[f_1 pro_6]-t_9-w_0 [3 [t_6 say-t_3-w_0 [5 7 [$PAST^{AS}$-[f_4 pro_6]-t_7-w_5 [2 [Mary be-t_2-w_5 unemployed]]]]]]]]]-w_0-t_9]]

Bar-Lev adopts the view in Ogihara 1989, 1996, where the ULC is not recognized as a principle; rather, ULC effects follow from the way tense traces are interpreted in complement clauses of attitude verbs. Bar-Lev strengthens Ogihara's restrictions on tense traces so that 'de re' past-traces and present-traces never have a shifted reading, backward or forward (this, in Bar-lev's system, follows from the Copy Theory of Movement, along the lines of Fox 2002). Importantly, even if Bar-Lev's

observation regarding mixed readings is correct, this has no effect on the claims made here regarding the necessity to adopt an SOT rule in order to account for the facts discussed in Sect. 4. Even in Bar-Lev's system, accounting for these facts requires the application of an SOT rule.

It seems to me that *Every man said that Mary was unemployed* usually does not have a mixed reading, but I'm not convinced it never does. Consider *Every man said, on a different occasion, that Mary was unemployed during the month on the calendar in front of him* and suppose all the men who said "Mary is unemployed this month" are amnesiacs who rely on the calendars in front of them to figure out their temporal location (and it is possible that the calendars are not up-to-date). In such a state of affairs the sentence is acceptable (to some speakers, at least) even if there is also a recovered amnesiac who said "Mary was unemployed last month".[17]

Whereas Bar-Lev claims that the ULC is too weak, Altshuler and Schwarzschild (2013b) claim that it is too strong because, they say, a "double access" reading of present-under-past sentences is not obligatory (see also Bary and Altshuler 2014). This is based on the following Air Berlin baggage counter exchange, which can only be coherent if *The stewardess told me you have my bags* has a forward-shifted reading.

(66) Customer: I believe you have my bags.
Employee: Who said I have your bags?
Customer: The stewardess told me you have my bags.
Employee: When did she tell you that?
Customer: On the flight.

Since *The stewardess told me you have my bags* cannot, given the context, have a "double access" reading (during the flight, presumably, both the passenger and his bags were on the plane), its acceptability suggests that the ULC is not part of the semantics of this sentence. Indeed, according to Altshuler and Schwarzschild 2013b, the "double access" effect of present-under-past sentences is context-dependent; it arises when $PRES^{AS}$ is interpreted in the embedded clause, and need not arise when $PRES^{AS}$ is raised to the matrix clause.

I maintain that the ULC is needed, even if we concede that (66) is coherent (though there seems to be some speaker variation). This is based on the strangeness of the (made up) exchanges in (67), with *think* and *ask*, and on the contrasts in (68), which show that a forward-oriented temporal adverbial is incompatible with present-under-past ((68c) shows that, in principle, *now* could cover the telling time, but this option is pragmatically unavailable if it implies that the bags were at the baggage counter while the customer was still flying).

[17] Admittedly, this sentence requires speakers to be receptive to such a reading to begin with; as we saw in Sect. 4.1, in connection with past-under-present sentences, many speakers are not.

(67) a. Customer: I believe you have my bags.
Employee: Why do you think I have your bags?
Customer: Because the stewardess thought that you have my bags.
Employee: When did she think that?
Customer: #On the flight.

b. Customer: I believe you have my bags.
Employee: Why do you think I have your bags?
Customer: I asked the stewardess whether you have my bags and she said Yes.
Employee: When did you ask her that?
Customer: #On the flight.

(68) a. Two hours ago, on the flight, the stewardess told me that you would have my bags now.
b. #Two hours ago, on the flight, the stewardess told me that you have my bags now.
c. Ten minutes ago, I ran into the stewardess and she told me that you have my bags now.

The strangeness of (67a,b) and the contrasts in (68) indicate that there is something special about (66). I would like to suggest that *The stewardess told me that you have my bags* in (66) is a case of pseudo-'de re' (discussed in Kaplan 1977 and elsewhere). Consider (69), and assume that Bill and Jane are in a public area; Bill is a graduate student and Jane is not.

(69) Announcement: Graduate students should see the registrar.
Jane to Bill: They just said that you should see the registrar.

The announcer did not utter "Bill should see the registrar". In fact, it stands to reason that the announcer was not even acquainted with Bill during the announcement (and they were not in the same room even when the announcement was made). The acceptability of *They just said that you should see the registrar* seems to be due to the reasoning in (70).

(70) a. Given what the announcement said, if we were to say to the announcers: "This is Bill; he is a graduate student; should he see the registrar?", they would respond: "Yes".
b. Therefore, they sort of said that Bill should see the registrar.

If this reasoning is supported by the context, *They just said that you should see the registrar* receives a special 'sort of said'-interpretation, via a special LF, where *you* is not "wrapped" by a concept-generator. Notice that in the same context, *They think that you should see the registrar* is odd. Likewise, in a context where someone asks Jane "Should graduate students see the registrar?", she would need a very good reason to felicitously say to Bill *These people asked me whether you should see the registrar* (normally, this would be a very odd thing for her to ask). This suggests that the concept-generator-less LF is not the default LF (though

what exactly the restrictions on such an LF are is not entirely clear). Similarly, a concept-generator-less LF may support a pseudo 'de re' interpretation of present tense, as illustrated in (71).

(71) a. If I had said to the stewardess, at 2pm: "Suppose it's 5pm and I am at the baggage counter; do the baggage people have my bag?", she would have responded: "Yes".
b. Therefore, the stewardess sort of told me, at 2pm, that the baggage counter people have my bag (now, at 5pm).

It seems, then, that the ULC is empirically valid, at least in the verb-dependent sense of Klecha 2016, if not in the absolute sense of Abusch 1997.

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