

Demonstrative Pronouns and Propositional Attitudes¹

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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 (2016), we show that DPros are anti-logophoric pronouns whose behaviour is similar (though not identical) to that of epithets (Dubinsky and Hamilton 1998, Schlenker 2005, and Patel-Grosz 2014). In particular, we argue that while Hinterwimmer and Bosch (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 in Hinterwimmer and Bosch (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.

Keywords: Demonstrative Pronouns, Propositional Attitudes, Perspective, Binding, Anti-Logophoricity, de re / de se.

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 pro-

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nouns (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,i}} klug ist.
 Peter believes that he_i{PPro/DPro}MASC.NOM.SING smart is
Peter_i believes that he {PPro_i/DPro_{j,i}} is smart.
- b. [Jeder Mann]_i glaubt, dass {er_i/der_{j,i}} klug ist.
 Every man believes that he {PPro/DPro}MASC.NOM.SING smart is
[Every man]_i believes that he {PPro_i/DPro_{j,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 clause²: The posses-

² 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

sive 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 Section 4.2 below for discussion) to epithets (Dubinsky and Hamilton 1998, Schlenker 2005 and 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 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 con-

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).

tent 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_i
 {Paula/each of the musicians-FEM.NOM.PL} seemed to Claudia_i
 als würden deren_i Fähigkeiten [ihre eigenen]_j bei weitem
 as-if would DPro.fem.gen. abilities her own by far
 übersteigen.
 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 items³. 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

³ 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.

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 Section 2 we present the crucial empirical evidence against the claim the DPros can never be bound by the subjects of propositional attitude verbs. In Section 3.1 we briefly review the data that motivated the informal account of Hinterwimmer and Bosch (2016) and its basic assumptions. In Section 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 Section 2. In Section 3.3 a modified formal account is developed and shown to account for the full range of relevant data. In Section 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 (to appear). 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 and 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 Section 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 male⁴ individual.

- (4) a. Peter_i glaubt, {er_{i,j}/der_{j,i}} könne besser Schach spielen
 Peter believes he DPro.MASC.NOM.SING could better chess play
 als Maria
 than Maria

⁴ 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 – *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.

Peter_i believes he {PPro_{i,j}/DPro_{j,i}} could play chess better than Maria.

- b. [Jeder von Marias_j Kollegen]_i glaubt, {er_{i,k}/der_{k,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*]_i believes he {PPro_{i,k}/DPro_{k,i}} could 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,i}} Tochter sei klüger
 Peter believes his {PPro/DPro} MASC.GEN.SING daughter was smarter
 als Marias.
 than Maria's
Peter_i believes his {PPro_{i,j}/DPro_{j,i}} daughter was smarter than Maria's.

- b. [Jeder von Marias_j Kollegen]_i glaubt, {seine_{i,k}/dessen_{k,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*]_i believes his {PPro_{i,k}/DPro_{k,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 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) do⁵.

- (6) a. Maria_i behauptet, dass Peter_j glaubt, {er_j/der_j} könne besser
 Maria claims that Peter believes he {PPro/DPro} could better
 Schach spielen als sie_i.
 chess play than she

⁵ 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.

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/DPro} could play chess better than her_i.*

(7) a. Maria_i behauptet, dass Peter_j glaubt, {seine_j/dessen_j} Tochter sei
 Maria claims that Peter believes his {PPro/DPro} daughter was
 klüger als ihre_i.
 smarter than hers
*Maria_i claims that Peter_j believes his {PPro/DPro} 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/DPro} daughter was smarter than hers_i.*

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-i}} könne besser
 Maria claims that Peter believes she {PPro/DPro} could better
 Schach spielen als er_j.
 chess play than he
*Maria_i claims that Peter_j believes she {PPro_i/DPro_{k-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-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-i}} could play chess better than him_j.*

(9) a. Maria_i behauptet, dass Peter_j glaubt, {ihre_i/deren_{k-i}} Tochter sei
 Maria claims that Peter believes her {PPro/DPro} daughter was

klüger als seine_j.
 smarter than his
*Maria_i claims that Peter_j believes that her {PPro_i/DPro_{k*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*i*}} Tochter sei klüger als seine_j.
 her {PPro/DPro} daughter was smarter than his
*Maria_i claims that [every colleague of hers]_i believes that her
 {PPro_i/DPro_{k*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 Section 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 Section 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,i}} klug ist.
 Peter believes that he {PPro/DPro}MASC.NOM.SING smart is
Peter_i believes that he {PPro_i/DPro_{j,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 Section 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 (to appear, Footnote 16) 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_i glaubt, der_i kann das
 DPro.MASC.NOM.SING believes DPro.MASC.NOM.SING can that
 alles – dem zeige ich’s jetzt.⁶
 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.

- (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 is the smartest.*

We believe that the factors exemplified by (13) and the ones exemplified by (14a) are related: We will argue in Section 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

⁶ <http://www.akademie-fuer-ganzheitsmedizin.de/heilpraktiker-pruefungsprotokoll.php>

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 Section 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 Section 3.1, and then propose a formal implementation in Section 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, Paul⁷.

- (15) Paul_i wollte mit Peter_j laufen gehen. Aber {er_{i,j}/der_j} war
 Paul wanted with Peter run go But he {PPro/DPro} was
 leider erkältet.
 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 clear-

⁷ 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 Pete_j
 Paul wanted go run with Peter.GEN
 no u {nego_{i,j}/togo_j} byla prostuda.
 but at {PPro/DPro} GEN was cold

ly 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.

- b. Was Otto_i betrifft, den_i mochte Karin_j noch nie

What Otto concerns DPro.MASC.ACC.SING liked Karin PART never

{Der_i/Er_i} hat sie_j schon als Kind immer geärgert.

He {DPro/PPro} has her already as child always teased

*As for Otto_i, Karin_j never liked him_i [DPro_i]. He {DPro_i/PPro_i} al
ready 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/Er_i} musste erst mal drei Stunden putzen.

{DPro/PPro} must first PART three hours clean

He {DPro_j/PPro_j} first had to clean for three hours.

- b. {Der_j/Er_i} hatte doch gestern erst aufgeräumt.

{DPro/PPro} had part yesterday part cleaned-up

He {DPro_j/PPro_j} had only tidied up yesterday, after all.

- c. {Der_j/Er_i} kann sich einfach nicht gegen seinen

{DPro/PPro} can himself simply not against his

Mitbewohner durchsetzen.

flatmate stand-his-ground

He {DPro_j/PPro_j} 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 Section 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}} sucht
 Paul wanted with Peter run go {PPro/DPro} searches
 sich immer Leute als Trainingspartner aus, die nicht richtig fit
 himself always people as training partner out who not really fit
 sind.
 are
*Paul_i wanted to go running with Peter_j. He {DPro/PPro} 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 Section 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 sub-

sets of the sets of worlds compatible with and thus representing the subject's beliefs/claims etc.

In Section 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 Section 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 Section 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 (to appear), whose aim is to derive the complete distribution of DPros from a general pragmatic constraint, as we shall see in Section 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 c , where 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 c , where the value of 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, c is resolved to the context representing the perspective of that individual. If the speaker or narrator is the only perspective holder, in contrast, 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 *Maximize 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 $\langle e, \langle s, t \rangle \rangle$.

$$(19) \text{ a. } [[er]]^{g,C} = \lambda s. \lambda P_{\langle e, \langle s, t \rangle \rangle} : \exists! x [male(x)(s) \wedge P(x)(s)], \\ \iota \{x : male(x)(s) \wedge P(x)(s)\}.$$

$$\text{b. } [[[er_{sn} NP_m]]]^{g,C} = \iota \{x : male(x)(g(s_n)) \wedge g(P_m)(x)(g(s_n))\}.$$

- c. $[[\text{der}]]^{\text{g},C} = \lambda s. \lambda P_{\langle e, \langle s, t \rangle \rangle}: \exists! x [\text{male}(x)(s) \wedge P(x)(s) \wedge \text{distinct_from}(x)(g(\alpha))(s)].$
 $\iota\{x: \text{male}(x)(s) \wedge P(x)(s) \wedge \text{distinct_from}(x)(g(\alpha))(s)\}.$
- d. $[[[\text{der}_{s_n} \text{NP}_m]]]^{\text{g},C} = \iota\{x: \text{male}(x)(g(s_n)) \wedge g(P_m)(x)(g(s_n)) \wedge \text{distinct_from}(x)(g(\alpha))(g(s_n))\},$

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 $[\text{der}_{s_n} \text{NP}_m]$ is c-commanded by a constituent at LF that denotes a quantifier over a set of worlds whose anchor is an individual β , $g(\alpha) = \beta$,
 $[[[\text{der}_{s_n} \text{NP}_m]]]^{\text{g},C,c} = \iota\{x: \text{male}(x)(g(s_n)) \wedge g(P_m)(x)(g(s_n)) \wedge \text{distinct_from}(x)(\beta)(g(s_n))\}.$
- ii. If $[\text{der}_{s_n} \text{NP}_m]$ 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 , $g(\alpha) = \text{author}(c)$, i.e.,
 $[[[\text{der}_{s_n} \text{NP}_m]]]^{\text{g},C,c} = \iota\{x: \text{male}(x)(g(s_n)) \wedge g(P_m)(x)(g(s_n)) \wedge \text{distinct_from}(x)(\text{author}(c))(g(s_n))\}.$
- iii. If neither (i) nor (ii) applies, $g(\alpha) = \text{author}(C)$, i.e. $[[[\text{der}_{s_n} \text{NP}_m]]]^{\text{g},C} = [[[\text{er}_{s_n} \text{NP}_m]]]^{\text{g},C} = \iota\{x: \text{male}(x)(g(s_n)) \wedge g(P_m)(x)(g(s_n)) \wedge \text{distinct_from}(x)(\text{author}(C))(g(s_n))\}.$

Let us now go through some of the examples discussed in Section 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 (19b) is in order. Let us start with the first 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 second 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 and Sharvit 2008 for different implementations of the same basic idea, which goes back to Banfield 1982 and Doron 1991, and Maier 2014 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*}/Er_{*i*}} hatte doch gestern erst aufgeräumt.
 {DPro/PPro} had part yesterday part cleaned-up
 *He {DPro_{*j*}/PPro_{*j*}} 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/PPro} 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 Section 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 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 Section 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 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 2013 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,i}}klugist.
Peter_i believes that he {PPro_i/DPro_{j,i}} is smart.

- b. [Jeder Mann]_i glaubt, dass {er_i/der_{j,i}}klug ist.
 [Every man]_i believes that he {PPro_i/DPro_{j,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).

$$(24) \lambda w. \forall w' \in B_{\text{peter}, w, \text{time}C} [\exists s \leq w' [\text{smart}(s, \iota\{x: \text{male}(x)(s) \wedge \text{identical_to}(x)(\text{peter})(s)\}) \wedge \tau(s) \subseteq \text{time}_C]],$$

where $B_{\text{peter}, w, \text{time}C}$ 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 himself⁸. Concerning *de re* readings, we just have 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).

$$(25) \lambda w. \forall w' \in B_{\text{peter}, w, \text{time}C} [\exists s \leq w' [\text{smart}(s, \iota\{x: \text{male}(x)(w) \wedge \text{identical_to}(x)(\text{peter})(w)\}) \wedge \tau(s) \subseteq \text{time}_C]]$$

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 Section 2 above).

⁸ 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 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 alternative property the (individual denoted by the) subject of the propositional attitude verb can plausibly be assumed to ascribe to himself in the respective context.

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 (19b) 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. $\lambda w. \forall w' \in B_{\text{peter}, w, \text{time}_C} [\exists s \leq w' [\text{smart}(s, \iota\{x: \text{male}(x)(s) \wedge \text{identical_to}(x)(\text{peter})(s) \wedge \text{distinct_from}(x)(\text{peter})(s)\}) \wedge \tau(s) \subseteq \text{time}_C]]$
- b. $\lambda w. \forall w' \in B_{\text{peter}, w, \text{time}_C} [\exists s \leq w' [\text{smart}(s, \iota\{x: \text{male}(x)(w) \wedge \text{identical_to}(x)(\text{peter})(w) \wedge \text{distinct_from}(x)(\text{peter})(w)\}) \wedge \tau(s) \subseteq \text{time}_C]]$

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.

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. $\lambda w. \forall y [\text{man}(y)(w) \rightarrow \forall w' \in B_{y, w, \text{time}_C} [\exists s \leq w' [\text{smart}(s, \iota\{x: \text{male}(x)(s) \wedge \text{identical_to}(x)(y)(s)\}) \wedge \tau(s) \subseteq \text{time}_C]]]$
- b. $\lambda w. \forall y [\text{man}(y)(w) \rightarrow \forall w' \in B_{y, w, \text{time}_C} [\exists s \leq w' [\text{smart}(s, \iota\{x: \text{male}(x)(s) \wedge \text{identical_to}(x)(y)(s) \wedge \text{distinct_from}(x)(y)(s)\}) \wedge \tau(s) \subseteq \text{time}_C]]]$
- (28) a. $\lambda w. \forall y [\text{man}(y)(w) \rightarrow \forall w' \in B_{y, w, \text{time}_C} [\exists s \leq w' [\text{smart}(s, \iota\{x: \text{male}(x)(w) \wedge \text{identical_to}(x)(y)(w)\}) \wedge \tau(s) \subseteq \text{time}_C]]]$
- b. $\lambda w. \forall y [\text{man}(y)(w) \rightarrow \forall w' \in B_{y, w, \text{time}_C} [\exists s \leq w' [\text{smart}(s, \iota\{x: \text{male}(x)(w) \wedge \text{identical_to}(x)(y)(w) \wedge \text{distinct_from}(x)(y)(w)\}) \wedge \tau(s) \subseteq \text{time}_C]]]$

$$\wedge \tau(s) \subseteq \text{time}_c]]]$$

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 Section 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_i.
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-i}} könne besser Schach spielen als er_j.
Maria_i claims that Peter_j believes she {PPro_i/DPro_{k-i}} could play chess better than him_j.
- b. Maria_i behauptet, dass [jeder von ihren_i Kollegen]_j glaubt, {sie_i/die_{k-i}} könne besser Schach spielen als er_j.
Maria_i claims that [every colleague of hers_i]_j believes she {PPro_i/DPro_{k-i}} could play chess better than him_j.
- (32) a. Maria_i behauptet, dass Peter_j glaubt, {ihre_i/deren_{k-i}} Tochter sei klüger als seine_j.
Maria_i claims that Peter_j believes that her {PPro_i/DPro_{k-i}} daughter is smarter than his_j.

- b. Maria_i behauptet, dass [jeder von ihren_i Kollegen]_j glaubt, {ihre_i/deren_{k*i*}} Tochter sei klüger als seine_j.
*Maria_i claims that [every colleague of hers]_j believes that her {PPro_i/DPro_{k*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 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 (19b) 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 (19b) 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 (19b) 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 Section 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) Der₁ glaubt, der₁ kann das alles – dem zeige ich's jetzt.
He {DPro_i} believes that he {DPro_j} can do everything – I'll show him {DPro_j}.
- (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 Section 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 Section 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 and Patel-Grosz 2012, 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 Section 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*⁹: 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).

- (35) a. $[[\text{der}]]^{\text{g},C,c} = \lambda s. \lambda P_{\langle e, \langle s, t \rangle \rangle}: \exists! x \exists Y [\text{male}(x)(s) \wedge P(x)(s) \wedge \text{PersProm}(Y) > \text{PersProm}(x) \wedge \text{distinct_from}(x)(Y)].$
 $\iota\{x: \text{male}(x)(s) \wedge P(x)(s) \wedge \text{PersProm}(Y) > \text{PersProm}(x) \wedge \text{distinct_from}(x)(Y)\}.$
- b. $[[[\text{der}_{\text{sn}} \text{NP}_m]]]^{\text{g},C,c} = \iota\{x: \text{male}(x)(g(s_n)) \wedge g(P_m)(x)(g(s_n)) \wedge \text{PersProm}(Y) > \text{PersProm}(x) \wedge \text{distinct_from}(x)(Y)(g(s_n))\}.$

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 $\langle e, t \rangle$, P_m is a free predicate variable bearing the index m , s_n is a free situation/world variable bearing the index n and $\text{PersProm}(Y) > \text{PersProm}(x)$ iff Y is perspectively more prominent

⁹ We thank an anonymous reviewer for suggesting a reformulation of the modified lexical entry we originally proposed along these lines.

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 $\langle e, t \rangle$, 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 $\langle \langle e, t \rangle, t \rangle$) > 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 point¹⁰.

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 perspectively 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 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.

¹⁰ 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.

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.
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 perspectively most prominent individual in each case, i.e. there is no perspectively 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-i}} könne besser Schach spielen als er_j.
Maria_i claims that Peter_j believes she {PPro_i/DPro_{k-i}} could play chess better than him_j.

b. Maria_i behauptet, dass [jeder von ihren_i Kollegen]_j glaubt, {sie_i/die_{k-i}} könne besser Schach spielen als er_j.
Maria_i claims that [every colleague of hers_i]_j believes she {PPro_i/DPro_{k-i}} could play chess better than him_j.

(39) a. Maria_i behauptet, dass Peter_j glaubt, {ihre_i/deren_{k-i}} Tochter sei klüger als seine_j.
Maria_i claims that Peter_j believes that her {PPro_i/DPro_{k-i}} daughter is smarter than his_j.

b. Maria_i behauptet, dass [jeder von ihren_i Kollegen]_j glaubt, {ihre_i/deren_{k-i}} Tochter sei klüger als seine_j.
Maria_i claims that [every colleague of hers_i]_j believes that her {PPro_i/DPro_{k-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 perspectively 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 are both fine since α is resolved to the speaker and 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 perspectively 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_i glaubt, der_i kann das alles – dem zeige ich’s jetzt.
He {DPro}_j believes that he {DPro}_j can do all of that – I’ll show him {DPro}_j.
- (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}_j can insult me in public and then borrow money from me.
- b. Meine neuen Kollegen sind alle fürchterlich arrogant. ⁽⁹⁾[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}_j ist he smartest.

The modified analysis proposed in this section accounts for all the other cases discussed in sections 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 perspectively most prominent individual, and there would hence be no perspectively 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 re-

solved 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 perspectively 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 perspectively 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 ist he 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 $\langle\langle e, t \rangle, t \rangle$) > 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 (to appear)

In this section we briefly compare the analysis developed in Section 3 to the one proposed by Patel-Grosz and Grosz (to appear). Patel-Grosz and Grosz (to appear) 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 (to appear) assume a DPro such as *der* to be analysed as shown in (44).

$$(44) \quad [[[_{\text{DeixP}} \text{I} [_{\text{DP}} \text{der}_{\text{sn}} \text{NP}_m]]]]^{\text{g}} = \\ \iota\{x: \text{male}(x)(g(s_n)) \wedge g(P_m)(x)(g(s_n)) \wedge x = g(1)\} \\ \text{(based on Patel-Grosz and Grosz to appear: 3, ex. (8b))}$$

The main evidence for such an analysis (but see Patel-Grosz and Grosz (to appear) 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 to appear: 15, ex. (38b), which is in turn based on Roelofsen 2008: 122 and adapted from Patel-Grosz and Grosz 2010: 348)

Patel-Grosz and Grosz (to appear) relate this difference between DPros and PPros to the difference between the weak and the strong version of the definite deter-

miner 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 (to appear) 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 (to appear) is in conflict with the analysis developed in Section 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).¹¹

Patel-Grosz and Grosz (to appear) 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) is 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 (to appear) 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 (to appear) 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-

¹¹ 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 (to appear) as well.

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).

- (46) a. Gestern hatte Paul_i eine gute Idee: {Er_i/??Der_j≠_i} beschloss, Maria in die Oper einzuladen.
Yesterday, Paul_i had a good idea. He {PPro_i/??DPro_j≠_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 has the best ideas!

The contrast between the two continuations is automatically accounted for by the analysis developed in Section 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 (to appear): 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 section 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 2013, 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 and 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 Section 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.¹²

Although the lack of a corresponding intuitively "anaphoric" relation between the epithet and the intended antecedent in corresponding versions with a quantifier 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 & 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)¹³.

- (51) a. John_i said that he_i ran over a woman while she was trying to give [the idiot]_{j*i*} directions.
 b. John_i sagte, er habe eine Frau überfahren als sie {[dem Idioten]_{j*i*} /dem_{j*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)¹⁴. It is thus unclear at present whether epithets are subject to the same perspectival constraints as DPros or a

¹² The judgement as "?OK" is Patel-Grosz's and may not be universally shared by English native speakers.

¹³ 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.

¹⁴ The two authors of this paper also have different intuitions concerning the German version in (52b).

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.

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