

# Features on bound pronouns: an argument against syntactic agreement approaches\*

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## 1. Introduction and Overview

As first observed by Partee (1989), when a pronoun gets a bound interpretation, its  $\phi$ -features (person, gender, number) can be semantically ‘ignored’. For example, on the bound reading of (1) *my* must correspond to a variable that isn’t restricted to the speaker. Similarly, on the bound reading of (2) *her* corresponds to a variable that doesn’t have to be restricted to female individuals.

- (1) Only I did **my** homework  
     $\rightsquigarrow$  *bound reading*: no one other than me did **their** homework
- (2) Only Mary did **her** homework  
     $\rightsquigarrow$  *bound reading*: no one other than Mary, **male or female**, did their homework

The question of what mechanism allows  $\phi$ -features on bound pronouns to be semantically inert has received a number of answers in the literature. According to a popular approach (Heim, 2008; Kratzer, 2009), a bound pronoun doesn’t carry interpreted  $\phi$ -features at all; its morphological realization is merely an overt exponent of an abstract syntactic agreement with its binder. Alternative approaches deny syntactic agreement, and employ special semantic mechanisms to explain the seeming mismatch between the form of the pronoun and its interpretation in (1)-(2).

This paper provides an empirical argument against agreement-based approaches. We show that such approaches systematically undergenerate cases of uninterpreted  $\phi$ -features on **donkey** (**‘E-type’**) **anaphora** - pronouns that are co-dependent on an (intra-sentential) antecedent but arguably don’t stand in the pre-requisite structural relationship with it necessary for syntactic agreement. An example of our core data is in (3):

- (3) Only the woman who is dating  $ME_F$  says **I** make her happy      ( $\checkmark$  *co-variation reading*)

We explain why data like (3) constitute a challenge for agreement approaches to (1)-(2), and show that an alternative approach can straightforwardly account for it with independently argued-for mechanisms. We furthermore present another advantage of the alternative approach over the agreement one, coming from ‘split-binding’ configurations (Rullmann, 2004).

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The structure of the paper is as follows. In section 2 we lay out in detail the challenge that the data in (1) and (2) pose. In section 3 we present two current approaches, the **morphosyntactic agreement** approach and the **semantic** approaches, to deal with the challenge. In section 4, we compare the two approaches in light of data like (3), showing that such examples furnish an argument for the semantic approach and against the morphosyntactic approach. Section 5 discusses split-binding, and section 6 addresses two open issues for future research.

Before moving on, a brief caveat is in order. This paper deals exclusively with focus constructions like (1)-(2), and will not cover other constructions that have been said to also involve uninterpreted  $\phi$ -features on bound pronouns, and whose proper analyses have been debated in the literature. In particular, the paper will not deal with the original construction mentioned by Partee (1989, fn.3) given in (4) (see Kratzer 2009; Jacobson 2012; Wurmbrand 2017) that shows adjectival *only* rather than the focus-associating adverbial *only*, nor with cases where number features on pronouns bound by distributive quantifiers seem to be uninterpreted, as illustrated in (5) (see Rullmann 2004; Heim 2008; Sauerland 2013; Sudo 2014).

- (4) I am the only one who did **my** homework  
 $\rightsquigarrow$  *bound reading*: No one other than me did **their** homework
- (5) The boys each thought that **they** were the only person in the room  
 $\rightsquigarrow$  *bound reading*: Each<sub>*i*</sub> of these boys thought that **he<sub>*i*</sub>** is the only person in the room

## 2. The challenge

### 2.1 Background on $\phi$ -features and pronouns

Our starting assumption is that the semantic contribution of  $\phi$ -features (i.e. when they appear on free/deictic pronouns) is presuppositional: they introduce presuppositions on the value of the index they attach to (Cooper 1979; Charnavel 2017). This is illustrated in (6)-(7). In (7) we only give the interpretation of person features, on which we primarily focus, but our discussion extends throughout to gender features as well (number will be mostly irrelevant until section 5). In (8) we illustrate this simple analysis for a 1ST person pronoun in English.

- (6) **Syntax** (Cooper 1979, Dowty & Jacobson 1989, Heim 2008, Charnavel 2017):

$$\text{pro}_j \equiv [\text{PERS} [\text{GEN} [\text{NUM } x_j]]]$$

- (7) **Semantics** (person features):

- a.  $\llbracket \text{1ST} \rrbracket^{g_c} = \lambda x : x$  includes the speaker in  $c$ .  $x$   
 b.  $\llbracket \text{2ND} \rrbracket^{g_c} = \lambda x : x$  excludes the speaker and includes the addressee in  $c$ .  $x$   
 c.  $\llbracket \text{3RD} \rrbracket^{g_c} = \lambda x : x$  excludes the speaker and addressee in  $c^1$ .  $x$

- (8) *Structure and interpretation for I / me / my*:

$$\llbracket \text{I}_7 / \text{me}_7 / \text{my}_7 \rrbracket = \llbracket \llbracket \text{1ST } [\emptyset [\text{SG } x_7]] \rrbracket \rrbracket^{g_c} = \begin{cases} g_c(7) & \text{if } g_c(7) \text{ is the speaker in } c \\ \text{undefined} & \text{otherwise} \end{cases}$$

<sup>1</sup>Many assume that 3RD person (and PL number) are semantically vacuous and that they convey the inferences associated with them due to competition with the other feature values, via *Maximize Presupposition* (Sauerland 2003, a.o.). The paper is compatible with this view, but we opt for the simple version in the text to facilitate presentation.

## 2.2 Illustrating the challenge

We now work through what happens if (8) is a bound pronoun, as in (1) *only I did my homework*. For concreteness, suppose this sentence has the Logical Form (LF) in (9b): *my* is bound by the focused pronoun  $I_F$ , and *only* is a sentence-level focus-sensitive operator.<sup>2</sup>

$$(9) \quad \text{only } [I_F [\lambda_7 [t_7 \text{ did } \underbrace{[\mathbf{1ST-SG } x_7]}_{\mathbf{my}} \text{ homework}]]]]^3$$

The variable  $x_7$  is bound by  $\lambda_7$ , which forms predicate abstraction. Standardly, the mechanics of predicate abstraction turns any presupposition in the scope of the  $\lambda$  into definedness condition on the resulting predicate, restricting the range of possible arguments it can take (Heim & Kratzer, 1998). Thus, because of the presuppositional contribution of the features, the predicate abstract in (9) is interpreted as in (10), being defined only for the speaker.

$$(10) \quad [[\lambda_7 [t_7 \text{ did } \underbrace{[\mathbf{1ST-SG } x_7]}_{\mathbf{my}} \text{ homework}]]] = \lambda x : x \text{ is the speaker. } x \text{ did } x\text{'s homework}$$

The fact that (10) is only defined for the speaker is innocuous when (10) composes with its argument, the subject  $I$ . The result is that the speaker did the speaker's homework, and this is the meaning of the sister of *only* (the 'prejacent' of *only*) in (9). But a problem arises at the level of focus alternatives, which the focus feature on  $I$  invokes and *only* operates on. As usual, a focused phrase introduces focus alternatives (Rooth, 1992), represented in (11). However, none of those alternatives (except for  $I$ ) can successfully combine with (10), as we illustrate in (12).

$$(11) \quad \text{Alt}(I_F) = \{I, \text{Mary, John, ...}\}$$

$$(12) \quad \text{The set of alternatives of the sister of only in (9):}$$

{ $[\lambda x : x \text{ is the speaker. } x \text{ did } x\text{'s homework}](\mathbf{I})$ },	
$[\lambda x : x \text{ is the speaker. } x \text{ did } x\text{'s homework}](\mathbf{mary})$ ,	Undefined!
$[\lambda x : x \text{ is the speaker. } x \text{ did } x\text{'s homework}](\mathbf{john})$ ,	Undefined!
...	}

Due to the undefinedness, the set of alternatives in (12) that *only* is supposed to quantify over cannot contain anything but the meaning of the prejacent itself (*I did my homework*). Since the alternative set is trivial, (1) is predicted to produce only an unusable/uninformative meaning, contrary to fact. In the case of gender features the set of alternatives will contain more than just the prejacent; it will include any alternative that corresponds to the specified gender on the bound pronoun. But this is still not enough – as we saw in (2), a bound *her* in focus contexts can intuitively range also over male individuals.

It is perhaps obvious what is going wrong: we would like the presupposition contributed by the relevant  $\phi$ -feature, e.g. person in (12), not to be present across focus alternatives. In the next section, we present two ways previously given in the literature to derive this desideratum.

<sup>2</sup>Nothing crucial depends on the assumption that *only* attaches to the whole clause at LF; everything we say here carries over with minor modifications if one takes *only I<sub>F</sub>* to be a separate constituent.

<sup>3</sup>The focused pronoun in (9) of course also carries  $\phi$ -features, but those don't matter to illustrate the point. To reduce clutter, throughout the paper we omit representing  $\phi$ -feature nodes explicitly if they are irrelevant.

### 3. Two approaches

#### 3.1 The morphosyntactic approach

According to the first approach – the so-called morphosyntactic approach – (Kratzer 1998; von Stechow 2003; Schlenker 2003; Heim 2008; Kratzer 2009; Wurmbrand 2017, a.o.),  $\varphi$ -features on bound pronouns are not interpreted; at LF the pronoun consists of a bare, featureless index: (a ‘minimal pronoun’, Kratzer 2009):

- (13) LF: only I [ $\lambda_7 t_7$  did  $x_7$  homework]  
Interpretation of the predicate abstract: [ $\lambda x : x \in D_e. x$  did  $x$ 's HW]

This solves the problem with (12), since the restriction to the speaker is now removed from the predicate abstract. To predict why bound pronouns nevertheless appear on the surface with overt  $\phi$ -features, proponents of this approach hypothesize an abstract syntactic agreement relationship between binders and bindees that results in spell out of the binder's feature on the bound pronoun at Phonological Form (PF). For concreteness, we illustrate this approach with Heim (2008)'s proposal, whose gist is in (14).

- (14) FEATURE TRANSMISSION UNDER VARIABLE BINDING (Heim, 2008):  
 At PF, features on a DP are transmitted to all the variables that the DP binds.

The FEATURE TRANSMISSION rule ensures that the bound pronoun in (13) will be spelled out as first person, since its binder is first person. Note that (14) presupposes a suitable definition of ‘binding’. Standardly, one condition that has to be met for  $\alpha$  to bind  $\beta$  is that  $\alpha$  c-command  $\beta$  at LF (the importance of this detail will be evident in section 4). In (13)  $I$  indeed c-commands  $my$ .

#### 3.2 The semantic approach

There are alternative analyses of (1)-(2) that don't rely on anything like a Feature Transmission mechanism. We focus here on one such alternative, according to which the inertness of  $\phi$ -features in sentences (1)-(2) arises because of the special properties of focus semantics – the so-called semantic approach. The idea here is that  $\varphi$ -features are *always* interpreted on bound pronouns, even in (1)-(2), but that they don't ‘project’ their semantic contribution to the level of focus alternatives (see Sauerland 2013, Jacobson 2012, Spathas 2010).<sup>4</sup> This view comes down to the proposal in (15), where  $\llbracket \cdot \rrbracket^g$  is the ordinary semantic value function, and  $\llbracket \cdot \rrbracket_f^g$  is the focus semantic value function that builds focus alternatives (Rooth, 1992).

- (15) *Conjecture*:  $\varphi$ -features aren't interpreted in focus alternatives
- a.  $\llbracket [1\text{ST-SG}] \rrbracket^g = \lambda x : x$  **is the speaker.**  $x$
  - b.  $\llbracket [1\text{ST-SG}] \rrbracket_f^g = \{\lambda x : x \in D_e. x\}$

On the semantic approach, when a pronoun is bound its  $\varphi$ -features do serve to restrict the range of its possible binders, but only at the level of the ordinary semantic value, as shown in (16)-(17).

<sup>4</sup>While these authors all share this idea, their implementations vary significantly from each other and from the version we implement. We abstract away from these differences for the purposes of this paper.

- (16) a.  $\llbracket \text{my}_7 \rrbracket^g = \llbracket \text{1ST-SG } x_7 \rrbracket^g = g(7)$  **presupposition:  $g(7)$  is the speaker**  
 b.  $\llbracket \text{my}_7 \rrbracket_f^g = \llbracket \text{1ST-SG } x_7 \rrbracket_f^g = \{g(7)\}$  **no presupposition**
- (17) a.  $\llbracket \lambda_7 [t_7 \text{ did } [\text{1ST-SG } x_7]\text{'s homework}] \rrbracket^g = \lambda x : \mathbf{x \text{ is the speaker. } } x \text{ did } x\text{'s homework}$   
 b.  $\llbracket \lambda_7 [t_7 \text{ did } [\text{1ST-SG } x_7]\text{'s homework}] \rrbracket_f^g = \{\lambda x : \mathbf{x \in D_e. } x \text{ did } x\text{'s homework}\}$

The result in (17) avoids the problem encountered in (12): applying (17) to the focused pronoun  $I_F$  derives a non-trivial set of alternatives, since  $\phi$ -features don't project their meanings to focus alternatives. This is shown in (18). This approach, then, has no problem predicting the morphological shape of the bound pronoun based on its (ordinary) semantics, and a PF agreement rule as in (14) is rendered unnecessary.

- (18) a.  $\llbracket [I_5]_F \lambda_7 [t_7 \text{ did } [\text{1ST-SG } x_7]\text{'s homework}] \rrbracket^g = \text{the speaker did the speaker's HW}$   
 b.  $\llbracket [I_5]_F \lambda_7 [t_7 \text{ did } [\text{1ST-SG } x_7]\text{'s homework}] \rrbracket_f^g =$   
 $\{[\lambda x : \mathbf{x \in D_e. } x \text{ did } x\text{'s homework}](\llbracket I \rrbracket),$   
 $[\lambda x : \mathbf{x \in D_e. } x \text{ did } x\text{'s homework}](\text{mary}),$  Defined  
 $[\lambda x : \mathbf{x \in D_e. } x \text{ did } x\text{'s homework}](\text{john}),$  Defined  
 $\dots$  }  $= \{x \text{ did } x\text{'s homework} : \mathbf{x \in D_e}\}$

### 3.3 Intermediate summary

The morphosyntactic and semantic approaches give sharply different analyses of (1) and (2). On the former approach, the semantic inertness of bound  $\phi$ -features in (1) and (2) is a result of the fact that  $\phi$ -features are simply not interpreted on bound pronouns. On the latter, it is because  $\phi$ -features - regardless of whether the pronoun is bound or not - are not interpreted at the level of focus alternatives, but they are *always* interpreted at the dimension of the ordinary meaning. Both analyses come with a cost: the morphosyntactic approach needs to postulate a syntactic agreement mechanism in order to explain the surface realization of bound pronouns, and the semantic approach postulates that  $\phi$ -features don't 'project' their meaning to focus alternatives.<sup>5</sup>

## 4. Features on Donkey pronoun

### 4.1 Donkey pronouns

In the cases we have examined thus far, the predictions of the semantic and morphosyntactic approaches have lined up almost exactly. In this section, we turn our attention to a case where the accounts make divergent predictions: configurations that don't involve (classical)<sup>6</sup> binding.

Famously, there is a class of pronouns that show co-variance with another element in the sentence without being (classically) bound by it. Such pronouns are often called **donkey pronouns**

<sup>5</sup>There are other approaches to the problem of  $\phi$ -features on bound pronouns in cases like (1)-(2), which don't fall into either of the the two approaches we considered here. See e.g. Sudo (2012:161-164) and Cable (2005) for two different proposals that deny the morphosyntactic approach and adopt a more semantic perspective, but do not locate the problem in the special properties of focus semantics. As far as we can see, Neither Sudo's or Cable's analyses can straightforwardly explain the donkey anaphora data we discuss in section 4.2.

<sup>6</sup>The reservation to *classical* binding is meant to exclude the possibility of *dynamic* binding. See section 4.4.

(after Geach 1962) and they are illustrated in (19). The interpretation of *it* co-varies with the choice of value for its antecedent *a donkey*, even though the latter doesn't c-command former, and therefore cannot be said to bind it in the classical sense. As is well-known, raising *a donkey* at LF to a position that c-commands the pronoun not only violates constraints on movement but also would not yield the right truth conditions (see e.g. Heim 1982).

- (19) a. Every farmer who owns a donkey greeted **it**  
 b. If a farmer owns a donkey, he greets **it**

Donkey pronouns are attested also in focus and ellipsis contexts (see Tomioka 1999), where the pronoun is anteceded by a focused phrase rather than an indefinite. For example, (20) has a reading where the focused phrase *phonology* co-varies in interpretation with *it*, as the paraphrase indicates. Crucially, *phonology* is inside a relative clause which are islands for (LF-)movement, so it cannot formally bind the co-varying pronoun which is outside of the relative clause (see section 4.4 for discussion of the option of island-insensitive focus movement).

- (20) Only the student who took PHONOLOGY thought **it** was cool (✓ co-variation)  
 ~ No  $x \neq$  phonology: the student who took  $x$  thought  $x$  was cool

Before showing how configurations like (20) can be used to tease apart the two approaches to  $\phi$ -features on bound pronouns, we need to take a small detour into the analysis of donkey sentences in general. Broadly speaking, there are two main strategies in the literature for dealing with donkey pronouns: (i) dynamic binding theories (Kamp 1981, Heim 1982, Groenendijk & Stokhof 1991, Chierchia 1992, a.o.) and (ii) E-type theories (Parsons 1978, Cooper 1979, Evans 1980, Heim 1990, Elbourne 2005). We will be assuming an E-type framework for dealing with data like (20) due to its relative simplicity. It should be noted that many of the points we will be making depend on our choice to go with E-type rather than dynamic framework, but we believe that our main argument is not affected by it. In section 4.4 we briefly comment on possible dynamic approaches to our data.

The main idea of E-type theories is that donkey pronouns are underlyingly definite descriptions that *contain* a bound variable, but aren't themselves bound variables. Following tradition, we henceforth call donkey pronouns **E-type** pronouns. In broad strokes, E-type theories analyze (20) as in (21), where the e-type pronoun *it* is at some level of representation a full DP *the class they<sub>7</sub> took*, with *they<sub>7</sub>* bound by the subject:

- (21) Only [the student who took PHONOLOGY]<sub>7</sub> thought the class they<sub>7</sub> took was cool  
it

To spell this out formally, it is sufficient for our current purposes to adopt the simple structure in (22) along the lines of Cooper (1979) (but see section 6 for an important proviso). The free variable  $R_6$  supplies a contextually salient relation which can be resolved as in (23a). The overall resulting meaning is in (23b), where the interpretation of the E-type pronoun *it* ends up co-varying with the interpretation of *phonology* across focus alternatives, even though there is no structural binding relationship between the two - there is formal binding only between a phrase that *contains* the antecedent and a variable *inside* the E-type pronoun.

(22) LF: Only [[the student who took phonology<sub>F</sub>]  $\lambda_7 t_7$  thought  $\underbrace{[\text{the } [R_6 \ x_7]]}_{\text{it}}$  was cool]<sup>7</sup>

- (23) a.  $g(R_6) = \lambda x. \lambda y. x$  took the subject  $y$   
 b.  $[[22]] =$  the student who took phonology thought phonology was cool  
 $\wedge \neg$  the student who took syntax thought syntax was cool  
 $\wedge \neg$  the student who took semantics thought semantics was cool

#### 4.2 Comparing the two approaches to $\phi$ -features using donkey pronouns

Now, observe that the  $\phi$ -features on E-type pronouns in focus are semantically inert, just like  $\phi$ -features on ‘normally’ bound pronouns. Consider (24):

- (24) a. Only the woman who is dating ME says **I** make her happy. ( $\checkmark$  *co-variation*)  
 $\rightsquigarrow$  No  $x \neq me$ : the woman who is dating  $x$  says  $x$  make her happy  
 b. Only if  $I_F$  misbehave will the teacher call **my** parents. ( $\checkmark$  *co-variation*)  
 $\rightsquigarrow$  No  $x \neq me$ : if  $x$  misbehaves the teacher will call  $x$ 's parents.

Because of the importance of these examples, it's worth working them through in some detail. To this end, observe first that in (24a), the intuitive antecedent of the first person E-type pronoun  $I$  is the pronoun *me*, which is embedded in a relative clause. Given that relative clauses are generally islands for movement, *me* cannot be said to take scope over  $I$  at LF, and thus is not in a position to bind it. The co-variation between *me* and  $I$  therefore obtains without binding, so  $I$  is indeed an E-type pronoun. The logic applies analogously to (24b), with the island being the *if*-clause.

We argue that (24) pose a serious problem for the morphosyntactic approach<sup>8</sup>, but are readily accounted for by the semantic approach. The reason is this: on the morphosyntactic approach, for a pronoun to bear semantically inert features the pronoun must be formally bound by its antecedent (cf. the Feature Transmission rule, (14)), and thus must be c-commanded by it at LF. Since E-type pronouns are not formally bound by the element they co-vary with, the morphosyntactic approach predicts that the 1ST-SG feature on the E-type pronouns in (24) must be based generated and semantically interpreted. And since 1ST-SG feature is only compatible with one individual (the speaker), this theory undergenerates the co-variation reading.

The semantic approach, on the other hand, does not suffer from this problem;  $\phi$ -features can in principle yield a covariation reading for their pronoun even if that pronoun is not formally bound by its intuitive antecedent. As we show in detail in the next subsection, the semantic approach in fact straightforwardly derives co-variation readings in (24) without extra stipulations.

The same point holds for gender features. The sentence in (25) (based on Tomioka 1999:238) yields a co-variation reading that doesn't have to be restricted to female individuals; it can be used to deny my promise to help **male** individuals as well. This again is problematic for the morphosyntactic approach, since there is no binding configuration between *Sue* and *her*.

(25) Only if *SUE* has trouble in school I would help **her** ( $\checkmark$  *co-variation, gender ignored*)

<sup>7</sup>A more sophisticated version of the E-type analysis that incorporates situation variables into the LFs is needed to overcome some well-known difficulties with the naive version we use here. See Elbourne (2005) for discussion. We do not incorporate situation semantics into the analysis since that would make the formulas more complex than necessary.

<sup>8</sup>Yasutada Sudo in unpublished work has independently pointed out that data like (24) pose a challenge for the morphosyntactic approach, although he did not provide a working analysis for them.





*Features on bound pronouns: an argument against syntactic agreement approaches*

b. *Focus semantic value of the  $\lambda$ -abstract*

$$\llbracket \lambda_7 [t_7 \text{ says } \mathbf{[1ST-SG [the person } x_7 \text{'s dating}]] \text{ makes her}_{t_7} \text{ happy}] \rrbracket_f^g = \{ \lambda x : x \in D_e. x \text{ says the person } x \text{ is dating makes } x \text{ happy} \}$$

The fact that the  $\lambda$ -abstract in (30b) is not restricted by the content of the 1ST-person feature ensures the correct result. When (30) is composed with the meaning of the subject, in (31), we get the desired co-variation across focus alternatives, in (32).

- (31) a.  $\llbracket \text{the woman who is dating ME}_F \rrbracket_f^g = \text{the woman dating the speaker} = \text{Mary}$   
 b.  $\llbracket \text{the woman who is dating ME}_F \rrbracket_f^g = \{ \text{the woman dating me, the woman dating Sue, the woman dating Fred, ...} \} = \{ \text{Mary, Jane, Lisa, ...} \}$

- (32)  $\llbracket \text{the woman who is dating ME}_F \lambda_7 \text{ says the person } x_7 \text{ is dating make her happy} \rrbracket_f^g = \{ \text{the woman dating me says I make her happy, the woman dating Sue says Sue makes her happy, the woman dating Fred says Fred makes her happy, ...} \}$

We can now see more clearly why the morphosyntactic approach undergenerates the co-variation reading of (27). The 1ST-SG feature that surfaces on the E-type pronoun must have been base-generated there, because Feature Transmission at PF is beside the point (the antecedent to the E-type pronoun does not structurally bind it). And since the morphosyntactic approach does not distinguish between the ordinary semantic value and the focus semantic value, the feature should be interpreted in *both* levels in (30b), and the co-variation reading cannot be derived.

The same goes, *Mutatis Mutandis*, for the other E-type examples in section 4.2. Only the semantic approach can correctly capture these data.<sup>10</sup>

#### 4.4 Two ways to save the morphosyntactic approach and their problems

To conclude this section, we briefly consider two mechanisms that suggest themselves for adapting the morphosyntactic approach to handle the data we have presented. In both cases, the modifications ultimately fall short, further strengthening our point against that approach.

The first modification is to adopt the movement theory of association with focus. Specifically, for the core data in (24), the idea is that the focused pronoun moves to associate with *only* (see (33a)-(33b)), and that from this position it can directly bind – and transfer features to – the co-varying 1ST-person pronoun. On this account, the relevant examples don't involve E-type pronouns at all, just ordinary binding.

- (33) a. LF: Only ME<sub>F</sub> [ $\lambda_7$  the woman dating  $t_7$  says  $x_7$  make her happy]  
 b. LF: Only I<sub>F</sub> [ $\lambda_7$  if  $t_7$  misbehave will the teacher call  $x_7$ 's parents]

<sup>10</sup>For the case of the conditional in (24b) the E-type analysis is perhaps less straightforward, since it is not obvious what is going to be the variable inside the covert DP that the E-type pronoun spells out, and what its binder might be. One option is that the binder is the whole *if*-clause, and that it binds a world/situation variable, as below. The salient relation that  $\mathbf{R}_6$  encodes must then be something like  $\lambda s. \lambda x. x \text{ is the misbehaving child in } s$ . But see section 6.

- (i) Only [ $\llbracket \text{if I}_F \text{ misbehave} \rrbracket \llbracket \lambda_4 \text{ the teacher will call } \mathbf{[1ST [the [R}_6 \text{ s}_4]]] \text{ parents} \rrbracket]$

As mentioned before, the obvious problem with this modification is that both (33a)-(33b) involve island-violating movement. Quantifiers cannot scope out of this position:

- (34) a. The woman dating each<sub>i</sub> man says he<sub>\*i</sub> makes her happy  
 b. If each student<sub>i</sub> misbehaves, the teacher will call his<sub>\*i</sub> parents.

To defend this way of saving the morphosyntactic account, then, one would be forced to say that *focus* LF-movement is island-insensitive. But it isn't clear what property of focus makes it exempt from conditions on scope-taking. As Tomioka (1999) points out, putting pitch accent on *each student* does not seem to facilitate binding in (34). Further consideration against focus movement comes from scope interactions. If island-insensitive focus movement is available, we predict that the scope of phrases that undergo such movement will be as high as the position of the focus-sensitive operator that associates with them (e.g. *only*). As (35) suggests, this is not so; there is no reading where where focused *most* together with its restrictor take scope over *the woman who...*

- (35) Only the woman who is dating [MOST<sub>F</sub> men] arrived (\**most* > *the*)  
 ↗ Only for most (but not all) men *x* is it the case that the woman dating *x* arrived.

The second strategy for saving the morphosyntactic account that we consider here is to essentially broaden the notion of feature transmission so as to allow the 1ST-person feature on the embedded pronoun in (24a)-(24b) to percolate to the containing DP which binds into the E-type pronoun. This is schematized with the PF representation in (36), after feature transmission.

- (36) Only [the woman who is dating ME<sub>1ST</sub>]<sub>1ST</sub> [ $\lambda_7$  [says  $x_{7+1ST}$  make her happy]]

The problem with this approach is that other pronouns bound by the container DP do not show 1ST person features (cf. *her* in 36). It isn't clear then how this mechanism can distinguish between E-type pronouns and normally-bound pronouns and transfer percolated features only to the former.

Another variant of this approach would be to abandon the E-type analysis to donkey sentences and claim that donkey pronouns do after all stand in a structural relationship with their antecedent, one that Feature Transmission can operate on. Specifically, on **dynamic theories** it is possible to establish the required formal connection between a donkey pronoun and its antecedent by way of mere coindexation. On this view, Feature Transmission would only require *dynamic* binding, without requiring LF c-command between the transmitter and the transmittee.

In order to evaluate this line of defense, it is necessary to have at hand a more formally precise proposal for how a dynamic framework will handle donkey anaphora in focus contexts, such as (20). We are not aware of such an account in the literature, and space limitations preclude a serious attempt here. Nevertheless, we see two challenges to any such proposal. First, relaxing the c-command requirement for Feature Transmission makes this purported agreement configuration a very unique one, at best. All morphosyntactic dependencies that are usually considered to be agreement respect c-command at least, and are usually local. If binder-bindee agreement does not obey any structural constraints (besides coindexation), this raises doubts that the right approach to features on bound pronouns should involve a morphosyntactic mechanism. The second challenge to a dynamic account for our data is that it would need to be motivated independently of donkey sentences. In particular, if a dynamic approach to focus dependencies is on the right track, one would expect that focus dependencies are not only 'internally' dynamic but also 'externally' dynamic (Groenendijk & Stokhof, 1991), i.e. that focus has the option of introducing discourse references for proforms to pick up in **subsequent sentences**. But in contrast to binding by an indefinite, it isn't clear how it can be shown convincingly that focus involves such externally-dynamic binding.

## 5. Split Binding: another advantage of a semantic approach

In this section we discuss another advantage of the semantic approach which is independent of donkey pronouns, and comes from so called **Split Binding** (Partee 1989; Rullmann 2004; Heim 2008). This section follows the discussion (and to an extent, the conclusions) of Heim (2008).

‘Split Binding’ refers to cases where a pronoun has two separate antecedents, as in (37):

- (37) Every girl told John that **they** should get together  
 $\rightsquigarrow$  split-bound reading: Every girl  $x$  told  $j$  that  $x \oplus j$  should get together

Split binding can be modeled by letting a pronoun be composed of more than one index at LF:

- (38) LF: Every girl  $\lambda_7 t_7$  told john that  $\underbrace{\mathbf{pro}_{[7+8]}}_{\text{they}}$  should get together (where  $g(8) = \text{john}$ )

As Rullmann (2004) and Heim (2008) discuss, 1ST (and 2ND) person pronouns can also be split-bound. Consider (39) uttered by one of John’s ex-wives to John’s other ex-wives:

- (39) (“All of us wanted to separate from John on peaceful terms, but)...  
 Only I hoped **we** would eventually get back together” (based on ex. 50 in Heim 2008)

Again, the split-bound reading can be captured with a complex structure for the pronoun, as in the LF in (40b), where one part is bound by the focused  $I_F$  and the other one refers to John:

- (40) Only I hoped **we** would get back together  
 a. split-bound reading: No ex-wife  $x$  other than me hoped  $x+\mathbf{john}$  would be back together  
 b. LF: only  $[_{TP} I_F \lambda_7 t_7$  hoped  $\underbrace{\mathbf{pro}_{[7+8]}}_{\text{we}}$  would get back together] ( $g(8) = \text{john}$ )

Observe that the relevant reading in (40) *requires* the split-bound pronoun to surface as 1ST-person; pronouncing *you* or *they* instead of *we* loses the split-bound reading.

The question that these data raises is the following: how to predict the morphological realization of split-bound pronouns? in particular, how to predict that the LF representation  $\mathbf{pro}_{[7+8]}$  must surface as 1ST in (40), but as 3RD in (38)? More generally, as Heim (2008) points out, the way that split-bound pronouns are morphologically realized follows the generalization in (41):

- (41) **Generalization about the morphological realization of split-bound pronouns:**  
 a. Whenever one part of a split-bound pronoun **refers to, or is bound by**, a 1ST person element, the split-bound pronoun is spelled out as 1ST-PL. (e.g. in 40)  
 b. Else, whenever one part of a split-bound pronoun **refers to, or is bound by**, a 2ND person element, the split-bound pronoun is spelled out as 2ND-PL.  
 c. Else, the split-bound pronoun is spelled out as 3RD-PL. (e.g. in 38)

The point is that the generalization in (41) is not easily captured by agreement approaches without stipulations, whereas it in fact falls out as a consequence of the semantic approach we defended here. In a nutshell, the reason why the semantic approach straightforwardly accounts for split-binding is the null hypothesis that features on pronouns are always semantically interpreted

(in the ordinary semantics), whether the pronoun is free, bound or split-bound. To illustrate, consider the LF in (42) of the split-bound pronoun in (40), where  $\oplus$  forms plural individuals out of atomic ones (Link, 1983) and where the index 7 is bound.

(42) *Structure of  $\text{pro}_{[7+8]}$  in (40):* [1ST-PL [7  $\oplus$  8]]

Given that all  $\phi$ -features are base-generated and interpreted, the **1ST-PL** feature combination is the *only* one we could base-generate in (42) to derive the split-bound reading. It must be PL number because of the semantics of  $\oplus$ , and it must be 1ST person because this is the only person value compatible with groups that contain the speaker (cf. 7). The reader can verify that neither 2ND nor 3RD in place of 1ST in (42) would derive the correct meaning of (40), given that the binder of index 7 is a first person pronoun and that  $\phi$ -features on bound variables ordinarily restrict the range of possible binders (cf. 17). The point generalizes: the description in (41) is *predicted* by the independent morphosemantics of  $\phi$ -features, without further stipulations.

In contrast, the morphosyntactic approach cannot derive (41) from the semantics alone. Instead, one needs to stipulate an additional mechanism at the PF branch, which operates after Feature Transmission has taken place and generates features on a split-bound pronoun based on the feature of its atomic parts, in a way that would not do much more than hard-coding (41) into the mechanism. As Heim (2008) points out, this way of “capturing” the generalization is unattractive because it doesn’t reflect the semantic naturalness of the phenomenon.

## 6. Open issues

We end the paper with two open issues that we hope to tackle in future research. The primary issue concerns the status of the core hypothesis of the approach we defended here, namely that  $\phi$ -features don’t contribute to focus alternatives (15). It remains to be seen how to derive this from something more basic. Notice that this is not in general a property of presupposition triggers; the following show that e.g. *again* and *stop* must project their presuppositions to focus alternatives.<sup>11</sup>

(43) Context: Mary talked to John before, and it’s not known whether the other people did.

*#Only Mary<sub>F</sub> talked to John again*

Presupposes: all the other people talked to John before (in clash with the set-up context)

(44) (Mary used to smoke before, and it’s not known whether the other guys did too)

*#Only Mary<sub>F</sub> stopped smoking*

Presupposes: all relevant people used to smoke (in clash with the set up context)

The second issue concerns the Cooper (1979)-style account we adopted here for E-type pronouns, according to which their content is retrieved from a relation made salient by the context of utterance (cf. section 4.1 onwards). It has long been known that this approach to E-type phenomena faces serious problems, because donkey dependencies are empirically much more grammatically constrained than what it predicts (see the ‘formal link’ problems discussed in Heim 1990, Elbourne 2005 and references therein). To appreciate the issue, consider (45) from Jacobson (2012):

<sup>11</sup>Sauerland (2013) proposes an intensional definition of the class of presupposition triggers that don’t project to alternatives by saying that it is the *pure*-presupposition triggers, i.e. those items whose sole semantic contribution is a presupposition. This definition, however, is too broad: *again* and *too*, for example, also seem to be pure-presupposition triggers but their presupposition cannot be eliminated in the alternatives.

- (45) For the departmental Christmas party, every faculty member was encouraged to bring their/his or her spouse. But #*only MICHAEL brought me* (based on Jacobson, 2012:338)

The italicized sentence in (45) cannot mean that Michael brought me, his spouse, and no one other than Michael brought his or her spouse. But since the “spouse” relation was made salient by surrounding context, our Cooper-style theory overgenerates this reading with the following LF, where  $g(R_6)$  is the “spouse” relation:

- (46) # Only Michael [ $\lambda_7$  brought [1ST [the  $R_6$   $x_7$ ]]]

The upshot is that E-type pronouns in focus environments (at least 1ST-person ones)<sup>12</sup> cannot after all retrieve their content merely from contextual information; rather, they must be anteceded overtly by a matching focused phrase in the sentence, as in all the examples we had until (45). A more restrictive, ‘syntacticized’ theory which requires some formal link (contra the Cooper-style theory) between the focused antecedent and the dependent pronoun is therefore necessary in order not to overgenerate in (45). Two relevant proposals are found in Elbourne (2005) (formal link in terms of NP-ellipsis) and Sauerland (2007) (multi-dominant structures), but for space reasons we cannot elaborate on them here. We leave to future work how to refine the argument from donkey pronouns so that it may be stated in terms of a more adequate E-type theory (note that the argument from split binding, which is independent of E-type anaphora, is unaffected by this issue).

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<sup>12</sup>Jacobson (2012) claims that the picture changes when it comes to gender features: *only Michael brought her* does allow for the relevant reading missing in (45), and the spouses in question can be either female or male. Jacobson’s judgments, however, are controversial; the sentence is judged very degraded by our informants, as well as by some of her own informants – see fn. 18 in Jacobson (2012). More work is necessary to clarify the empirical picture.

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