

# Indexical binding, presuppositions and agreement<sup>1</sup>

Isabelle CHARNAVEL — *University of Geneva*

Dominique SPORTICHE — *University of California, Los Angeles*

**Abstract.** This paper focuses on bound readings of first and second person pronouns, which challenge Kaplan’s (1977/1989) fixity theory of indexicals. It first reviews the virtues and problems of the two main previous analyses: morphosyntactic approaches exploiting binding and agreement, and semantic approaches exploiting focus and presupposition. Next, it proposes a novel account combining all these ingredients based in part on new French data.

**Keywords:** indexical, binding, presupposition, agreement, focus, ellipsis.

## 1. Introduction

The goal of this paper is to provide a novel account of indexical binding illustrated in (1)-(2).

- (1) a. Only I did **my** homework. (Heim 1991)  
*Intended:* the others didn’t do **their** homework.
- b. I did **my** homework, but my classmates didn’t. (Heim 1991)  
*Intended:* ... but my classmates didn’t do **their** homework.
- (2) a. Only you eat what **you** cook. (Kratzer 2009: 188)  
*Intended:* the others do not eat what **they** cook.
- b. ?You are the only one who has brushed **your** teeth. (Kratzer 2009: 202)  
*Intended:* the others haven’t brushed **their** teeth.

In all these examples, the first or second person pronoun in boldface can induce a bound (or “sloppy”) reading, whether it appears in a focal construction (involving e.g. *only*) as in (1a) or (2a), in an elliptical construction as in (1b), or in a relative clause as in (2b). Such cases famously challenge Kaplan’s (1977/1989) fixity theory that treats indexicals as expressions whose interpretation directly depends on the context of utterance: under this approach, *I* and *you* rigidly refer to the speaker and addressee of the current context, and are thus expected to trigger only referential (or “strict”) readings (see details in section 2.1).

As we will review in section 2, two main solutions have been proposed to this problem. Morphosyntactic approaches (Heim 2008, Kratzer 2009, Wurmbrand 2017a, i.a.) analyze bound indexicals as fake indexicals, i.e., as pronouns that exhibit the form of indexicals (at PF), but are not interpreted as such (at LF), due to a mechanism of feature transmission (or feature deletion, depending on implementations) under binding. Semantic approaches (Jacobson 2012, Sauerland 2013, i.a.) treat bound indexicals as real indexicals whose indexicality can be ignored in focus alternatives because it is coded as a presupposition that can disappear in such alternatives.

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Both approaches face outstanding empirical and theoretical problems. Morphosyntactic analyses, which focus on relative clause cases (see (2b)), overlook the role of focus. Conversely, semantic approaches, which concentrate on focal constructions (see (1a) or (2a)), overlook the role of verbal agreement. Instead, we propose a novel, semantic solution incorporating the role of both focus and agreement (see section 3). The key innovations consist in treating verbal agreement as presuppositional (at least in some cases) and binding and predication as inducing presupposition unification. These hypotheses have general consequences for both the theory of indexicals, on which we focus here, and the theory of agreement, which is not discussed in this paper.

## 2. Previous approaches to indexical binding and their problems

### 2.1. Kaplan's fixity theory

Under Kaplan's (1977/1989) theory, first and second person pronouns are treated as indexicals, that is, as directly referential expressions whose meaning rigidly depends on the context of utterance: *me* refers to the speaker *s*, and *you* to the addressee *a*, of the actual speech act *c*.

- (3) a.  $\llbracket me \rrbracket^{g, w, t, c} = s_c$   
 b.  $\llbracket you \rrbracket^{g, w, t, c} = a_c$

Under this analysis, the interpretation of first and second person pronouns is only relativized to a context parameter *c* (which cannot be manipulated by any operator<sup>2</sup>): unlike definite descriptions, *I* and *you* do not depend on the world and time parameters *w* and *t*; unlike third person pronouns, *I* and *you* do not depend on the assignment function *g* which provides values to individual variables. The former point is mainly motivated by the insensitivity of indexicals to world and time operators illustrated in (4): unlike the description *the speaker*, *I* cannot be interpreted in the scope of the time quantifier *always* or the world quantifier *necessarily* (and thus induce reference to multiple individuals varying depending on times or worlds), but must rigidly refer to the actual speaker.

- (4) a. **I** am {**always/necessarily**} boring.  
 b. **The speaker** is {**always/necessarily**} boring. (Schlenker 2018: 299)

The latter point (independence of the assignment function) is partly motivated by the referential constraints of indexicals: while the reference of *I* in, e.g., (5a) has to depend on who utters the sentence and thus vary across contexts, the reference of *she* in, e.g., (5b) can be the same in different contexts of utterance involving different speakers.

- (5) a. **I** am a linguist.  
 b. **She** is a linguist.

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<sup>2</sup> According to Kaplan, the fixed reference of indexicals also derives from the hypothesis that operators manipulating the context parameter are claimed not to exist in natural languages (prohibition against monsters). This claim has been famously challenged by the observation that indexicals can shift in some attitude contexts in some languages (see, e.g., Deal 2020 for a review). Although this problem of the Kaplanian theory is independent of the problem of indexical binding (and will thus not be treated in this paper), any solution to one of these problems must of course be compatible with potential solutions to the other problem.

Crucially for our purposes, the hypothesis that indexicals do not depend on the assignment function (i.e., they are not treated as variables) predicts that they cannot be bound. Given that sloppy readings (require binding, Kaplan's analysis implies that (1)-(2) exhibit only strict readings, contrary to facts. For instance, (1a) (repeated in (6)) is predicted to contrast with (7) involving a third person pronoun, because the property  $\alpha$  predicated of the subject (and quantified over by *only*<sup>3</sup>) can be reflexive only in (7): only *her* (vs. *my*) can be construed as a bound variable.

- (6) a. Only I [ $\alpha$  did **my** homework].  
 b.  $\llbracket \alpha \rrbracket^{g,w,t,c} = \llbracket I t_1 \text{ did } \mathbf{my} \text{ homework} \rrbracket^{g,w,t,c} = \lambda x_e. x \text{ did } \mathbf{s}_e \text{'s homework}$
- (7) a. Only Anna [ $\alpha$  did **her** homework].  
 b.  $\llbracket \alpha \rrbracket^{g,w,t,c} = \llbracket I t_1 \text{ did } \mathbf{her}_1 \text{ homework} \rrbracket^{g,w,t,c} = \lambda x_e. x \text{ did } \mathbf{x} \text{'s homework}$

Bound readings of 1<sup>st</sup> and 2<sup>nd</sup> person pronouns in (1)-(2) thus seem to challenge a fundamental aspect of the Kaplanian approach: indexical binding is an oxymoron under this theory, since indexicals cannot be construed as variables in a given context of utterance. In the next two sections, we review the two main approaches that have been adopted in order to reconcile the bindability of indexicals revealed by (1)-(2) and their context dependency supported by the Kaplanian arguments.

## 2.2. Morphosyntactic approach

The core idea of the morphosyntactic approach to indexical binding is to distinguish between indexical form and indexical interpretation: bound indexicals only exhibit the former. In other words, bound indexicals are fake indexicals whose indexical features are only present at the morphosyntactic level of the derivation, due to binding, but absent at the semantic level.

Two main types of mechanisms have been proposed to derive this mismatch between form and interpretation. First, von Stechow (2003) hypothesizes that it is the result of obligatory feature deletion under semantic binding. According to this analysis, semantic binding, which requires agreement of  $\varphi$ -features between binder and bindee, induces deletion of the bindee's features at LF. In (1a) repeated in (8), the 1<sup>st</sup> person feature of the possessive is thus deleted because *my* is semantically bound by *only I* (which is assumed to inherit its 1<sup>st</sup> person feature from *I*). Under the assumption that  $\varphi$ -features restrict the denotation of variables (cf. semantic approach in section 2.3), such feature deletion gives rise to the sloppy reading.

- (8) a. Surface Structure:  $[_{DP} \text{ only } I_5]_8 \text{ did } \mathbf{my}_8 \text{ homework.}$   
 b. Logical Form:  $[_{DP} \text{ only } I_5]^{1st} \lambda_8 t_8 \text{ did } \mathbf{8^{1st}} \text{'s homework.}$

Von Stechow's system is intended to derive indexical binding, indexical shift and sequence of tenses in a uniform way: indexical shift (e.g., in Amharic) results from person feature deletion, and sequence of tense (e.g., in Russian) from tense feature deletion, under binding by some attitude verbs. Thus, the traditional Kaplanian theory can be largely preserved: the reason why indexicals can be bound (or shifted) despite their (rigid) context dependency is that their indexical features can be ignored in the interpretation because they match those of their binder. Note though that von

<sup>3</sup> This holds whether *only* is treated as a generalized quantifier or a propositional focus sensitive operator.

Stechow implicitly abandons the Kaplanian indexical independence of the assignment function, since *I* and *you* can be bound once their features are deleted.

As noted by von Stechow, the hypothesis that features of semantically bound variables are not interpreted is due to Heim who proposes a different mechanism to account for it, i.e., feature transmission. In Heim 2008, she hypothesizes that at PF, all features of a DP must be copied onto all variables it binds. Under the assumption that pronouns may be base-generated featureless and remain so at LF, the bound reading of (1a) derives from transmission of the 1<sup>st</sup> person feature from *only I* (inherited from *I* by feature percolation at PF) to the featureless possessive it binds (see (9)).

- (9) a. Base generation: [only 1<sup>st</sup>-sg<sub>5</sub>] did  $\emptyset_4$ 's homework.  
 b. Phonetic Form: 1<sup>st</sup>-sg [only 1<sup>st</sup>-sg<sub>5</sub>]  $\lambda_4$  [1<sup>st</sup>-sg<sub>4</sub> did 1<sup>st</sup>-sg<sub>4</sub>'s homework.

Kratzer (2009) also adopts the mechanism of feature transmission under binding, but modifies it in two crucial ways. First, binders are not DP antecedents, but “functional heads” such as verbs. Second, features are not just transmitted to bindees, but are shared between binders and bindees (unification). Under the bound interpretation of (1a) repeated in (10), it is thus the 1<sup>st</sup> person feature of the verb (inherited from the subject *I* by predication, i.e., specifier-head agreement under binding) that is transmitted to the possessive pronoun born as a minimal pronoun.

- (10) a. Base generation: only I[1<sup>st</sup>-sg<sub>5</sub>] did  $\emptyset_4$ 's homework.  
 b. Phonetic Form: only I[1<sup>st</sup>-sg<sub>5</sub>] T[past] v[1<sup>st</sup>-sg<sub>4</sub>]  $\lambda_4$  do [1<sup>st</sup>-sg<sub>4</sub>]'s homework.

Kratzer's main motivation for these new hypotheses is the observation that verbal agreement seems to play a role in indexical binding, at least in some relative clause constructions in some languages. For instance, the sloppy reading is available in German only in the plural in (11b), not in the singular in (11a). This correlates with the fact that unlike the singular form, the plural form is syncretic, thus allowing matching features between the verb and the bound pronoun.

- (11) a. # Ich bin die einzige, die **meinen** Sohn versorg-t.  
 1SG be.1SG the.FEM.SG only.one who.FEM.SG 1SG.POSS.ACC son take.care-3SG  
 ‘I am the only one who takes care of **my** son.’  
 b. Wir sind die einzigen, die **unseren** Sohn versorg-en.  
 1PL be.1/3PL the.PL only.ones who.PL 1PL.POSS.ACC son take.care.of-1/3PL  
 ‘We are the only ones who **take** care of **our** son.’

Specifically, Kratzer assumes that in relative clauses, the verb can start the derivation with 1<sup>st</sup> person features given that both its subject (the relative pronoun) and its bindee (the possessive) are minimal pronouns without features. Due to feature transmission, the possessive ends up acquiring these features at PF and thus taking the form of an indexical. But crucially, the relative pronoun also inherits gender features (which are assimilated to 3<sup>rd</sup> person features by Kratzer) from the head of the relative clause (i.e. *the only one*), which are transmitted to the verb and the possessive pronoun. All members of the agreement chain thus end up with the set of features {[female], [1<sup>st</sup>], [singular]} in the singular, and {[female], [1<sup>st</sup>], [plural]} in the plural. The association of gender (3<sup>rd</sup> person) and 1<sup>st</sup> person features gives rise to a spellout dilemma for the verb in the singular (where verbal forms are all specified differently), but not in the plural (due to 1<sup>st</sup> person/3<sup>rd</sup> person

syncretism).<sup>4</sup> This is why binding is licensed in the plural, but not in the singular. In other words, Kratzer derives the correlation between syncretism and bound readings from the hypothesis that features are shared between bound pronouns and verbs, which are thus treated as binders.

In English, however, verbal agreement does not seem to play any role in indexical binding: even when the verb has a non-syncretic, 3<sup>rd</sup> person marking (as in (2b)), indexical binding remains available (although Kratzer reports a slight degradation in judgments in such cases). Kratzer derives this fact from a crosslinguistic difference in the treatment of spellout dilemmas: unlike German, English can resolve some spellout dilemmas due to the markedness of certain features. For instance, Kratzer assumes that person features are marked in the verbal domain in English, because except for the verb *be*, 1<sup>st</sup> and 2<sup>nd</sup> persons are not distinguished morphologically; in the feature set {[female], [1<sup>st</sup>], [singular]}, [female] thus wins over [1<sup>st</sup>] without giving rise to ungrammaticality.<sup>5</sup>

Like von Stechow's feature deletion rule, feature transmission is thus intended to reconcile the (anti-Kaplanian) bindability of indexicals with their (Kaplanian) context dependency: given that bound indexicals are fake indexicals (minimal pronouns not interpreted as indexicals, but only acquiring their person features at PF), they do not challenge Kaplan's fixity theory. Kratzer (2009) nevertheless proposes an additional mechanism challenging the Kaplanian theory, in order to treat long distance bound indexicals illustrated in (12b).

- (12) Du bist der einzige, der ...  
 2SG be.2SG the.MASC.SG only.one who.MASC.SG  
 a. # **deinen** Aufsatz versteht.  
 2SG.POSS.ACC paper understand.3SG  
 'You are the only one who understands **your** paper.'  
 b. glaubt, dass jemand **deinen** Aufsatz versteht.  
 believes that someone 2SG.POSS.ACC paper understand.3SG  
 'You are the only one who thinks that someone understands **your** paper.'

Given the contrast in bound reading acceptability between (12a) and (12b), indexical binding in (12b) cannot result from feature transmission, but is hypothesized by Kratzer to derive from indexical abstraction (cf. Cable 2005). She assumes that an operator is inserted on the embedding verb (*glaubt* in (12b)), which manipulates the values of 1<sup>st</sup> and 2<sup>nd</sup> person pronouns in its scope by shifting the context parameter. Thus, verbal agreement does not play a role in such cases.<sup>6</sup>

<sup>4</sup> Kratzer also supposes that the same contrast between singular and plural holds for possessive pronouns: assuming that possessive pronouns are marked for both person and number in all singular cases, but only for person in the first two plural cases, she concludes that {[female], [1<sup>st</sup>], [singular]} gives rise to a spellout dilemma that cannot be resolved, while {[female], [1<sup>st</sup>], [plural]} does not, but induces the form *unser*. As for the relative pronoun, it is not subject to any spellout dilemma as it is never marked for person. Note that Kratzer implements these hypotheses in a framework using vocabulary insertion rules and the elsewhere/subset principle.

<sup>5</sup> Conversely, Kratzer assumes that gender features are marked in the nominal domain on the basis of agreement conflict resolutions with conjoined DPs (e.g. *the teacher and I* is resolved as *we*) and gender-neuter 3<sup>rd</sup> person plural form (as in, e.g., *nobody has lost **their** job yet*) in English (vs. German). In the feature set {[female], [1<sup>st</sup>], [singular]}, [1<sup>st</sup>] thus wins over [female] without creating any ungrammaticality in English.

<sup>6</sup> More precisely, indexical abstraction operators are defined as follows by Kratzer:

- (i) a.  $[[\lambda[1^{st}] \alpha]]^{c, g} = \lambda x [[\alpha]]^{g, c'}$ , where  $c'$  is like  $c$ , except possibly that  $speaker(c')=x$   
 b.  $[[\lambda[2^{nd}] \alpha]]^{c, g} = \lambda x [[\alpha]]^{g, c'}$ , where  $c'$  is like  $c$ , except possibly that  $addressee(c')=x$

Furthermore, Kratzer stipulates that the person features they induce on the verb on which they are introduced are so marked that they do not give rise to spellout dilemmas. They thus do not affect verbal agreement.

The addition of this mechanism undermines Kratzer’s approach. From the point of view of theoretical economy, the new feature transmission rule and distinction between fake and true indexicals is justifiable by the intention to preserve Kaplan’s theory. The indexical abstraction hypothesis not only defeats this purpose, but also adds a new duplication in the system (not only between fake and true indexicals, but also between locally and long distance bound indexicals).

Beyond this problem of analytical parsimony, Kratzer’s approach faces various challenges, some of which are explicitly mentioned in Wurmbrand 2017a. For example, Wurmbrand observes that 1/3 syncretism in the singular in other verbal paradigms (e.g., modal verbs such as *können*) or in other tenses (e.g., past tense) does not correlate with the availability of indexical binding. Furthermore, Wurmbrand reports some further crosslinguistic differences that cannot be captured by Kratzer’s system without stipulations. For instance, Dutch behaves like English with respect to indexical binding (esp. concerning the lack of effect of verbal agreement), but does not exhibit the properties motivating the resolution of spellout dilemmas through markedness (e.g., poor verbal paradigm). All this reveals that the various types of spellout dilemma (non-)resolutions posited by Kratzer are hard to independently motivate.<sup>7</sup>

More generally, all implementations of the morphosyntactic approach are challenged by cases of partial binding of indexicals as pointed out in Rullmann 2004 and Heim 2008.<sup>8</sup>

- (13) a. Only **you** remember **our** first appointment. [uttered by the adviser to an advisee]  
*Intended:* my other students do not remember their first appointment with me.  
 b. Only **I** remember **our** first appointment. [uttered by an advisee to the adviser]  
*Intended:* my peer students do not remember their first appointment with you.

For example, the contrast between Kratzer’s (2009: 231) (13a) and (13b) (uttered in a scenario where an adviser meets with their former students) suggests that additional assumptions must be made to capture partial indexical binding. In (13a), the 1<sup>st</sup> person feature on *our* cannot be assumed to be inherited from its 2<sup>nd</sup> person binder (whether it is assumed to be the verb or its subject). Conversely, in (13b), the 1<sup>st</sup> person feature must be assumed to have been acquired through feature transmission (vs. to be interpreted) given that not all pairs of advisee-adviser contain the speaker. To solve the dilemma, Heim (2008) shows that it must be assumed that feature transmission can target only one part of the pronoun and features for a complex pronoun are computed on the basis of the features of its parts by a specific PF operation. For example, *our* in (13b) starts with a 2<sup>nd</sup> person specification for the second half of the bound pronoun; then, the first half of the pronoun acquires a 1<sup>st</sup> person feature by feature transmission; finally, the PF operation about complex

<sup>7</sup> Wurmbrand (2017a) further argues against Kratzer’s hypothesis that binding is done by a functional head on the basis of word order restrictions in the cases of scrambling and specificational sentences. This part of Wurmbrand’s argumentation is nevertheless more complex to evaluate as it ignores the potential role of Weak Crossover effects, and the conditions (to be further investigated according to Kratzer) under which person features can be inserted on verbs when the subject (e.g., relative pronoun) is underspecified. Wurmbrand instead argues for binding by a DP antecedent (cf. Heim 2008) and derives the effect of syncretism in German from a morphological analogue of Rule H. This analysis is not without its specific problems either. For example, it implies – controversially – that Agree must operate beyond phase boundaries. Moreover, the crucial role it attributes to gender marking on the relative DP (unmarked in English/Dutch vs. marked in German/Icelandic) seems challenged by other languages (such as French, as already noticed by Bassi 2018) that exhibit both gender marking on the relative DP and possible mismatch between verbal agreement and bound indexicals (see fn. 34).

<sup>8</sup> Besides indexicals, they are also challenged by crosslinguistic cases with gender and number features involving a difference between grammatical and semantic features (see e.g. Spathas 2007, Ke 2019).

pronouns states that if one of the parts is specified as 1<sup>st</sup> person, then the whole pronoun must be specified as 1<sup>st</sup> person. But as acknowledged in Heim 2008, it is unsatisfactory to posit a PF operation on complex pronouns that largely duplicates semantic theorems about sum formation and inclusion.<sup>9</sup> For example, we independently know that if at least one of two atoms is the speaker, then their sum includes the speaker. This type of theorem coupled with a semantics for person features suffices to deduce the person specification of standardly interpreted complex pronouns; only bound indexicals require the addition of a specific PF operation.

In sum, all versions of the morphological approach to bound indexicals require several stipulations that clearly go against analytical parsimony, in order to have a good empirical coverage.<sup>10</sup> Furthermore, they uniformly ignore the role of focus, even if indexical binding seems to be observed only in constructions involving focus: all examples discussed include a focus particle such as *only* (even in relative clauses, see, e.g., (2b)) or ellipsis (which is standardly analyzed as involving focus, see Rooth 1992, Merchant 2001, i.a.).<sup>11</sup> On the contrary, this observation lies at the heart of semantic approaches to indexical binding, which we review in the next section.

### 2.3. Semantic approaches

Unlike morphosyntactic approaches, semantic approaches treat bound indexicals as real indexicals, whose person features are interpreted (see Jacobson 2012, Sauerland 2013, i.a.). As reviewed below, their bindability derives from two hypotheses: the presuppositionality of person features and the blindness of focus values to some presuppositions.

<sup>9</sup> Instead of assuming partial feature transmission, Kratzer posits the feature [sum] and modifies vocabulary insertion rules so that the combination of [1<sup>st</sup>] and [2<sup>nd</sup>] features yields a 1<sup>st</sup> person plural pronoun. These hypotheses are similarly unparsimonious.

<sup>10</sup> Furthermore, the empirical coverage remains imperfect. First, the reported relation between verbal agreement and indexical binding is only addressed in Kratzer 2009 and Wurmbrand 2017a (vs. von Stechow 2003 and Heim 2008). Second, the availability of agreeing verbs (in some conditions) in relative clauses in some languages (see, e.g., French facts in section 3.2) raises problems even for Kratzer and Wurmbrand. In fact, this point is already problematic for them in German (their main language of investigation), where it is partially attested: they observe that in the 2<sup>nd</sup> person plural, bound indexicals seem unavailable with the standard, 1<sup>st</sup>/3<sup>rd</sup> person syncretic verbal agreement, but available with the dialectal, 2<sup>nd</sup> person verbal agreement:

(i) Ihr seid die einzigen, die **euren** Sohn {# versorg-**en** / %versorg-**t** }  
 2PL be.2PL the.PL only\_ones who.PL **2PL.POSS.ACC** son take.care.of-**1/3PL** take.care.of-**2PL**  
 ‘You are the only ones who **are** taking care of **your** son.’

Under Kratzer’s system, the bound reading under dialectal agreement is straightforwardly derived (since all members of the agreement chain are endowed with the set of features {[female], [2<sup>nd</sup>], [plural]}, and [2<sup>nd</sup>][plural] is spelled out as *-t*), but it remains unclear why speakers of the standard dialect cannot use the agreeing form. Conversely, Wurmbrand seems to overgenerate the bound reading with standard agreement (which is not discussed), and can derive the dialectal agreement only by supposing the presence of a silent subject clitic (Wurmbrand 2017a: fn. 7). Finally, some specific predictions by Kratzer (vs. other morphosyntactic implementations) remain to be empirically checked (e.g. variable acceptability of indexical binding with ditransitive verbs depending on the type of verb; possibility of mixed readings only with two local – vs. two long distance – indexicals; impossibility of combining a locally and a long distance bound indexical).

<sup>11</sup> A potential exception is dependent plurals discussed by Heim (2008), which occur in non-focal constructions:

(i) They each believe that **they** are the only person in the room. (Heim 2008: 46)

Although (i) (cf. (18b)) does not involve indexicals, it seems to present the same type of morphology-semantics mismatch as bound indexicals, given that the embedded *they* seems to be interpreted as a singular here. Heim thus proposes that feature transmission (under binding) also applies to such examples. An alternative approach is adopted by, e.g., Sudo (2014) that does not treat dependent plurals like bound indexicals partly because they do not in fact require binding. On that basis, we will tentatively ignore such examples in the remainder of this paper.

The first ingredient of semantic approaches consists in extending the presuppositional account of gender features (pioneered by Cooper 1983) to person (and number) features (see Heim & Kratzer 1998, Heim 2008, i.a.) as illustrated in (14) for *I* under Heim’s 2008 implementation.

- (14) a. LF: [ 1<sup>st</sup> [ singular [ I<sub>7</sub> ] ] ]  
 b.  $\llbracket I_7 \rrbracket^{g, w, t, c} = g(7)$   
 c.  $\llbracket 1^{st} \rrbracket^{g, w, t, c} = \lambda_{x_e}. x$  includes  $s_c. x$   
 d.  $\llbracket \text{singular} \rrbracket^{g, w, t, c} = \lambda_{x_e}. x$  is an atom.  $x$

Under this approach, all pronouns, including indexicals, are treated as variables dependent on the assignment function (see (14b)), and the  $\varphi$ -features adjoined to them denote partial identity functions of type  $\langle e, e \rangle$  (see (14c-d)). In general, the semantic role of  $\varphi$ -features consists in constraining the range of possible referents (or antecedents). In the case of indexical pronouns, this restriction is done with reference to the utterance context, potentially resulting in a restriction to a single possible referent (e.g., in (14), an atom including the speaker can only be the speaker herself). Note that the Kaplanian context dependency of indexical pronouns is thereby moved from the pronoun itself to its person features, i.e., to its presuppositional content.

The second ingredient relies on distinguishing between the meaning contribution of assertion and presupposition and assuming that the latter can be ignored under some conditions such as focus. Specifically,  $\varphi$ -features of bound pronouns are assumed – due to their presuppositional status<sup>12</sup> – to contribute to the regular meaning, but not to the focus meaning (see Spathas 2007, Jacobson 2012, i.a.). This hypothesis is applied to indexical binding in (15) (conflating person and number presuppositions) under Rooth’s 1992 alternative semantics, where the ordinary semantic value is noted  $\llbracket . \rrbracket^\circ$  and the focus semantic value  $\llbracket . \rrbracket^f$ .

- (15) a. Only  $I_F$  [ $\alpha$  did **my** homework].  
 b.  $\llbracket \alpha \rrbracket^\circ = \lambda_{x_e}. x$  is  $s_c. x$  did  $x$ ’s homework  
 c.  $\llbracket \alpha \rrbracket^f = \{ \lambda_{x_e}. x$  did  $x$ ’s homework }

In example (1a) repeated in (15a), the predicate containing the bound pronoun is restricted to combining with a speaker-denoting subject in the ordinary semantic value represented in (15b). This results from the interpretation of the presuppositions contributed by the person and number features on *my*.<sup>13</sup> However, the focus value represented in (15c) is a set of predicates with domains not restricted so. This derives from the hypothesis that the presuppositional contribution of  $\varphi$ -features on bound pronouns is ignored in focus values. These hypotheses correctly derive the sloppy reading of (15a) assuming that *only* quantifies over focus alternatives as is standard.<sup>14</sup>

<sup>12</sup> This can be taken as an argument for the presuppositional account of  $\varphi$ -features. Other, independent arguments involve projection behavior and judgments (of presupposition failure vs. falsity) when their information is not verified by the referent (see Sudo 2012, Charneval 2019, i.a.).

<sup>13</sup> Adopting Heim & Kratzer’s (1998) and Heim’s (2008) implementations, the presupposition of the bound pronoun is coded on the predicate due to the following formulation of the rule of Predicate Abstraction:

(i)  $\llbracket i \alpha \rrbracket^g = \lambda_{x_e}. \alpha \in \text{dom} (\llbracket \cdot \rrbracket^{g x/i}). (\llbracket \alpha \rrbracket^{g x/i})$

<sup>14</sup> This holds whatever exact lexical entry is chosen for *only* (see fn. 3). Specifically, the combination of (15b) with the subject *I* yields the proposition that the speaker did the speaker’s homework as ordinary value (ultimately an



This semantic approach to indexical binding has been implemented in various ways on the basis of various data and motivations. Adopting a variable-free framework, Jacobson (2012) concentrates on person and gender features (vs. number features) of bound pronouns in the scope of focus-sensitive particles as in (1a)<sup>15</sup>, and stipulates (as acknowledged in Jacobson 2012: fn. 12) that they are ignored in the computation of focus values. Her main argument against morphosyntactic approaches relies on the interpretation of paycheck pronouns such as *her* in (16) (roughly interpreted as *his spouse*): the gender restriction on *her* is ignored in focus computation even if it is not standardly bound by, and thus cannot acquire its features from the antecedent *Bill*<sup>16</sup> (see a similar argument in Bassi & Longenbaugh 2018<sup>17</sup>).

- (16) For the departmental Christmas party, every faculty member was encouraged to bring their/his or her spouse. But only BILL brought **her**. (Jacobson 2012: 31)

Sauerland (2013) similarly proposes to derive bound readings of indexicals from a multi-tiered interpretation of focus, but extends the hypothesis to other presuppositions beyond gender and person features as shown in (17), and other constructions beyond focal ones as shown in (18).

- (17) a. Sam only talked to **the** German<sub>F</sub> professor.  
 b. Only Mary is still a waitress.  
 c. Only Romney expected **himself** to win.
- (18) a. Lakoff dreamt that **he** was Brigitte Bardot.  
 b. The boys all were riding the bike **they** had recently bought.

Based on examples such as (17)a-c and (1a), Sauerland argues that presuppositions that can<sup>18</sup> be ignored in the interpretation of focus alternatives (i.e., that exhibit *weakened projection*, in Sauerland's terms) form a natural class: they are purely presuppositional triggers, that is, they contribute nothing but a presupposition.<sup>19</sup> According to Sauerland, this is mainly the case of  $\varphi$ -

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assertion or a presupposition depending on the semantics adopted for *only*). Furthermore, following Rooth's hypothesis that the focus value of F-marked elements is a set of elements of the same semantic type (which can be pragmatically restricted), the combination of  $I_F$  with (15c) yields the set of propositions  $\{x \text{ did } x\text{'s homework, for } x \in D_e\}$  as focus value, which is ultimately quantified over by *only*.

<sup>15</sup> This encompasses constructions with bare contrastive stress, with focus particles like *only*, *too* or *also*, and – to some extent (due to speaker variation) – with ellipsis. However, Jacobson (2012) excludes from her investigation cases involving relative clauses because they contain no focal stress and because gender and person do not exhibit the same pattern depending on the order of the specificational sentence (see fn. 36).

- (i) {a. **I** am / b. **Sue** is} the only one who handed in {a. **my** / b. **her**} homework on time.  
 (ii) The only one who handed in {a. # **my** / b. **her**} homework on time was {a. **me** / b. **Sue**}.

<sup>16</sup> Nevertheless, Jacobson (2012: 34) cannot explain why person features do not behave the same in this respect:

- (i) # This year, everyone was supposed to bring their spouse, but only MICHAEL brought **me**.

<sup>17</sup> Bassi & Longenbaugh (2018) argue against morphosyntactic approaches on the basis of uninterpreted  $\varphi$ -features on donkey anaphora as in (i) where *I* can alternate with non-speakers (see discussion in section 3.1).

- (i) Only the woman who is dating ME<sub>F</sub> says **I** make her happy.

<sup>18</sup> Unlike Jacobson, Sauerland considers focus values to be only optionally blind to the presuppositions contributed by  $\varphi$ -features. For instance,  $\varphi$ -features are interpreted in focus alternatives in *only Mary criticized HERself*.

<sup>19</sup> More precisely, Sauerland (2013: 162) first defines purely presuppositional triggers as identity functions on some domain that are a subset of the full set of entities of that type. As restricted identity functions of type  $\langle e, e \rangle$ ,  $\varphi$ -features fit this description. Sauerland (2013: 167) then adds a more general definition of pure presuppositionality that can apply to *self*, which is not a restricted identity function.

features (e.g., in (1a) and (17)a-b<sup>20</sup>) and *self* (e.g., in (17c)). For example, (17)a-b can involve alternatives including pluralities of professors or male waiters, respectively, because singular and feminine features need not be computed in focus values; as for (17)c, it exhibits a strict reading because the presuppositional contribution of *self* can be ignored in focus alternatives.<sup>21</sup>

Furthermore, Sauerland extends his approach to cases involving *de se* binding (e.g., (18a) where the referent of the *de se* pronoun *he* is female) and distributive binding (e.g., (18b) where all considered referents of *they* must be singular since each boy bought a different bike). His uniform account relies on the notion of pairs: just like focus alternatives can be conceived as a pair of the actual value and the focus alternative value, *de se* binding and distributive binding can be assumed to involve quantification over pairs: pairs of the real-world counterpart and the *de se* center on the one hand, and of the plurality and atomic parts thereof on the other hand. All interpretations in (17)-(18) derive from the hypothesis that presuppositions in some cases need only be verified for the first member of the paired evaluation. Thus, *he* and *they* are licensed in (18a-b) under a front-tier interpretation of the masculine and plural presupposition.

In sum, semantic approaches improve on morphosyntactic approaches by overcoming their main problems of parsimony. Instead of assuming both fake and real indexicals, they derive the uninterpretability of person features in bound indexicals from the constructions they appear in, which usually involve focus. Thereby, they can furthermore account for partial indexical binding without stipulation (see Bassi & Longenbaugh 2018). Nevertheless, semantic accounts also present some stipulative aspects. In particular, it remains unclear how to derive the blindness of focus values to the  $\phi$ -features of bound pronouns. As we saw, while Jacobson (2012) stipulates it, Sauerland (2013) proposes to derive it from a general property of purely presuppositional triggers, which he claims need not be interpreted in all levels of multi-tiered interpretation.<sup>22</sup> But as discussed by McKillen (2016), several challenges are faced by Sauerland's hypothesis, which predicts that all and only purely presuppositional triggers can exhibit weakened projection in focus alternatives (and in the case of distributive and *de se* quantification<sup>23</sup>). First, examples like (17)a suggest that presuppositions of non purely presuppositional triggers such as the definite article (i.e.,

<sup>20</sup> In (17)a (from von Heusinger 2007; see also Walker 2012), Sauerland assumes that it is not the (uniqueness presupposition of the) definite article (which is not purely presuppositional), but a singular feature that exhibits weakened projection, based on the hypothesis that full DPs are always the complement of a  $\phi$ -head. For cases where the plurality is not treated uniformly (e.g. Sam talked to some of the Japanese professors), Sauerland must further stipulate the existence of a fourth truth value to which *only* is sensitive.

<sup>21</sup> Sauerland (2013: 165) assumes that  $\llbracket \text{self} \rrbracket (P)(x)(y)$  presupposes that  $x = y$  and denotes P. In the ECM case in (17)c, Sauerland further assumes that the predicate for reflexive marking is created in the syntax by movement and  $\lambda$ -abstraction. Note that Sauerland claims that only ECM constructions trigger strict readings, which leads him to stipulate that the relevant level for projection weakening is the maximal syntactic head (since in Sauerland's account, *self* adjoins to different levels in ECM and simple transitive cases). But McKillen's (2016) experimental evidence shows that strict readings are in fact also available with simple transitive verbs.

<sup>22</sup> Several aspects of this hypothesis furthermore remain to be worked out. First, the formal definition of pure presuppositionality is not straightforward (see fn. 19; see also McKillen 2016: 114-115). Second, the notions of pair and front-tier interpretation on which Sauerland's analysis relies remain underspecified. In what exact sense do focus alternatives, distributive quantification and *de se* quantification involve the same notion of pair? From what general principle does the availability of a front-tier (vs. multi-tiered or rear-tiered) interpretation derive?

<sup>23</sup> The behavior of other presuppositional triggers in distributive and *de se* quantification is not examined by McKillen, nor by Sauerland, except for *self*. But note that Sauerland's general argumentation based on *self* is undermined by the problems raised by the underlying hypothesis that *self* involves predicate reflexivization: as shown by Sportiche (2023), this hypothesis is challenged by the fact that unlike predicates involving *herself*, overt *self*-predicates exhibit neither strict readings (see Charneval & Sportiche 2021), nor *de se/de re* ambiguities.

its uniqueness presupposition) can be ignored in focus alternatives (see von Heusinger 2007). For that reason, Sauerland reanalyzes this example as involving weakened projection of a singular feature on the DP head (see fn. 20).<sup>24</sup> Even more problematically, some purely presuppositional triggers like *again*, *too*, *already* or *also*, can conversely be shown not to exhibit weakened projection (see Walker 2012, Bassi 2021: 51-53). For example, McKillen (2016: 117) argues that if the scope of *again* with respect to *only* is controlled for, the meaning of *again* (i.e., that an event satisfying the properties of its complement occurred previously) must be taken into account in focus alternatives: (19) is not felicitous if no one but John forgot their homework previously.

(19) Only JOHN<sub>F</sub> has **again** forgotten his homework.

Another generalization about weakened projection has been provided by Walker (2012) that attributes this property to soft presuppositional triggers, i.e., to triggers that can suspend their presupposition in some environments (such as disjunctions in which the presuppositions of the second disjunct are entailed by the negation of the first disjunct or contexts where the speaker is ignorant about the presupposition). For example, *again*, which behaves like a hard trigger in both contexts, does not weaken in focus alternatives; conversely, *stop* behaves like a soft trigger and does weaken. But as shown by McKillen (2016) (cf. Sudo 2012), this generalization cannot extend to  $\varphi$ -features, which do not pattern like soft triggers as shown by the contrast between *she* and *continue* in relevant disjunctions like (20).

(20) a. # Either this is a man or **she** has a really deep voice.  
 b. Either John went to the previous meetings or he will **continue** to miss meetings.

On the analytical side, the advantage of semantic approaches over morphosyntactic ones in terms of parsimony is thus reduced by the difficulty with defining the relevant class of presuppositional triggers subject to weakened projection. On the empirical side, the main advantage of semantic approaches consists in deriving cases of weakened projection in the absence of syntactic binding (see e.g. (16)). But the exact extent of relevant data remains controversial and poorly understood (see Jacobson 2012, Bassi & Longenbaugh 2018; see also section 3.1). Furthermore, semantic approaches do not seem to extend to relative clause constructions like (2b) (where focus prosody is absent, according to Jacobson) and cannot predict the role of agreement on indexical binding revealed by morphosyntactic analyses. Our goal in the next section is instead to propose an analysis that incorporates the insights of both approaches, i.e., that can derive the bindability of indexicals from the specificity of focus constructions while explaining agreement effects.

### 3. Proposal

On the one hand, our proposal adopts from semantic approaches the presuppositional account of person features and the hypothesis that focus plays a crucial role in indexical binding. But unlike semantic approaches, we propose to combine the two hypotheses not by assuming presupposition ignorance under some conditions, but by applying a general economy principle of presupposition

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<sup>24</sup> McKillen (2016: 121) argues that the case of the definite article in (17)a does not in fact provide an argument about weakened projection because the interpretation of (17)a can be derived without supposing any kind of weakened projection: it can simply be assumed that the whole DP (instead of just the adjective) is F-marked despite the prosody (which seems reasonable since *professor* is given in the context).

unification as detailed in section 3.1. On the other hand, our proposal adopts from morphosyntactic approaches the hypothesis that relative clauses and focus constructions involving bound indexicals should be analyzed uniformly and verbal agreement plays a crucial role in indexical binding. But unlike morphosyntactic approaches, we propose to derive the relation between verbal agreement and indexical binding not from the uninterpretability of some person features, but conversely, by the interpretability of some verbal agreement as detailed in section 3.2.

### 3.1. Indexical binding in focus constructions: presupposition unification

As reviewed in section 2, all cases of indexical binding involve focus as long as we assume that ellipsis (see Rooth 1992, Merchant 2001, i.a.) and adjectival *only* (see Bhatt 2002, Bumford 2017, Bassi 2019 vs. Jacobson 2012, Coppock & Beaver 2013) also involve focus. Like semantic accounts, we thus hypothesize that focus plays a crucial role in licensing indexical binding. To specify it, we first capitalize on the uncontroversial assumption that the  $\varphi$ -features of F-marked elements are ignored in focus alternatives as shown in (21).<sup>25</sup>

- (21) a. Only  $I_F$  left.  
 b.  $\llbracket I_F \rrbracket^f = \{x \mid x \in D_e\}$

Example (21a) means that the other contextually relevant people did not leave. This interpretation implies that *only* quantifies over semantically unrestricted alternatives, i.e., that the person feature is not interpreted in the focus meaning of *I* (otherwise, it would be incorrectly predicted that it is a singleton set containing the speaker<sup>26</sup>) as shown in (21b) under a Roothian implementation. Coupled with the presuppositional account of  $\varphi$ -features, this observation suggests that the presuppositions of F-marked elements are ignored in focus alternatives.<sup>27</sup>

Second, we posit an economy principle enforcing presupposition unification in case of redundancy:

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<sup>25</sup> This observation lies at the core of focus binding analyses of bound indexicals (see Bassi 2019, cf. Ke 2019). Like semantic accounts, this type of analysis assumes that person features are not fake; but instead of relying on weakened projection, it exploits the mechanism of focus co-indexation proposed by Kratzer (1991) to capture so-called Tanglewood sentences illustrated in (i).

(i) I only went to Tanglewood<sub>F</sub> because you did [~~go to Tanglewood~~<sub>F</sub>]. (I didn't go to Block Island or Elk Lake Lodge because you did).

Thus, it is because bound indexicals are F-marked that their  $\varphi$ -features are not interpreted in focus alternatives. Although our proposal also exploits this idea, we do not review the focus binding account in detail here, because they face a fundamental challenge: focus co-indexation is conditioned by ellipsis in Tanglewood sentences, while bound indexicals in focal constructions are not elided. To reconcile the ellipsis condition with focus binding of indexicals, Bassi (2019) therefore has to stipulate that parts of bound indexicals are not pronounced.

<sup>26</sup> Unless we hypothesize that *only* quantifies over contexts, which is highly controversial (see Cable 2005, Charneval 2023a for discussion). In any case, this hypothesis could not account for the general uninterpretability of  $\varphi$ -features of F-marked elements. For example, *only she<sub>F</sub> left* implies that all other contextually relevant individuals left (crucially, whether they are female or male).

<sup>27</sup> To our knowledge, this hypothesis has not been explored in depth: it is usually implicitly assumed without explanation that the focus meaning of F-marked elements is not constrained by  $\varphi$ -features. This is often implemented by the absence of  $\varphi$ -features on the trace left by movement of the focused element (e.g., *only I*).

- (22) **Economy of Representation Principle (ERP)**: presuppositions must unify whenever possible, i.e., under binding or predication.<sup>28</sup>

This principle ensures that presuppositions are not coded more than necessary. Thus, when an indexical is bound by another indexical as in (23a), the indexical presupposition is represented only once.<sup>29</sup> The same holds of gender presuppositions under binding as in (23b) or in (23d) (thus, even in the absence of semantic effects) or under predication as in (23c).<sup>30</sup>

- (23) a. Only **I** did **my** homework. [presupposition: the referent is the speaker]  
 b. Only **she** did **her** homework. [presupposition: the referent is female]  
 c. Only **Sue** is still a waitress. [presupposition: Sue is female]  
 d. No waitress did **her** job. [presupposition: all relevant waiters are female]

Under these hypotheses, bound readings of indexicals are directly derived: given that the indexical presupposition of the bindee (*my*) unifies with that of the binder (*I*) as schematized in (24), and that the binder is F-marked, the person feature is absent in focus alternatives.

- (24) a. Only **1<sup>st</sup>-pro<sub>1-F</sub>** did **1<sup>st</sup>-pro<sub>1</sub>**'s homework.  
 b. only  $[[\lambda_{x_e}: \mathbf{x} \text{ is } \mathbf{s}_c. \mathbf{x}](g(1))]_F$  did  $[[\lambda_{x_e}: \mathbf{x} \text{ is } \mathbf{s}_c. \mathbf{x}](g(1))]$ 's homework  
 c. only  $[[\lambda_{x_e}: \mathbf{x} \text{ is } \mathbf{s}_c. \mathbf{x}](g(1))]_F$  [ $\lambda_{x_e}: \mathbf{x} \text{ is } \mathbf{s}_c. \mathbf{x}$  did  $\mathbf{x}$ 's homework] *predicate abstraction*  
 d. only  $[[\lambda_{x_e}: \mathbf{x} \text{ is } \mathbf{s}_c. \mathbf{x}](g(1))]_F$  [ $\lambda_{x_e}. \mathbf{x}$  did  $\mathbf{x}$ 's homework] *ERP*

This analysis presents the same advantages as semantic accounts over morphosyntactic accounts. First, it does not unparsimoniously distinguish between true and fake indexicals (as well as between locally and long distance bound indexicals<sup>31</sup>). Second, it derives partial indexical binding without stipulation. Third, it explains why indexical binding requires relevant placement of focus as observed by Bassi (2019, 2021) in (25) (see further discussion in section 3.2).

- (25) a. *Why are they complaining?* **I** am the one who did not get {my / his} paycheck yet.  
 b. *I stop by at the HR lady's office. She doesn't recognize me and asks who I am.*  
 I am [the one who did not get {#my / his} paycheck yet]<sub>F</sub>.

Furthermore, it does not present the stipulative aspect of semantic accounts: weakened projection of  $\phi$ -features of bound pronouns (which we saw is hard to derived from a general, independently motivated principle of weakened projection) is here reduced to a principle of economy.

<sup>28</sup> Binding may be subsumed under predication under Heim & Kratzer's implementation of binding where the binder (e.g., *only I*) ultimately combines by functional application with the predicate created by its movement.

<sup>29</sup> This principle may be assimilated to a type of presupposition projection. Under Heim & Kratzer's implementation, it implies that the presupposition of a bindee not only projects under lambda abstraction (see fn. 13), but also under predication (see fn. 28) where it thus unifies with the presupposition of the binder.

<sup>30</sup> For simplicity, we here use the term *female* conventionally, but we do not mean to conflate sex and gender. Further note that we assume that not just pronouns, but also other DPs like some nouns (see e.g. Sudo & Spathas 2020) or proper names can carry gender presuppositions.

<sup>31</sup> It therefore predicts (contrary to Kratzer 2009, see fn. 10) that mixed readings are also available with long distance indexicals, and that locally and long distance bound indexicals can be combined. This seems promising:

- (i) a. Only you know somebody who recommends **your** books to **your** librarian. (Kratzer 2009: (67))  
 b. You are the only one who bought **yourself** a suit that **you** don't like. (cf. Kratzer 2009: (63))

Finally, our account (like morphosyntactic accounts) does not make the same prediction as semantic accounts in the absence of binding: it only explains why person features are ignored when they can be unified, i.e. under binding or predication; on the contrary, semantic accounts predict the availability of weakened projection in the absence of binding or predication. As briefly mentioned, the data pertaining to this point remain empirically debated. As acknowledged by Bassi & Longenbaugh (2018), weakened projection overgenerates: the judgments of Jacobson’s example in (26a) are controversial, and (26b) is clearly infelicitous.

- (26) a. ? Only Bill brought her (i.e., his spouse). cf. (16)  
 b. # Only Michael brought me (i.e., his spouse). cf. fn. 16

But two further types of examples that are correctly predicted by semantic accounts seem to be undergenerated by ours (see Bassi & Longenbaugh 2018, Bassi 2021):

- (27) a. Only the woman who is dating **ME<sub>F</sub>** says **I** make her happy. cf. fn. 17  
 b. *Everyone was encouraged to bring their spouse. But only Michael brought his **wife**.*

As argued by Bassi & Longenbaugh (2018) and Bassi (2021), both types of examples are available even in the absence of focus on the bolded element (*pace* Jacobson 2012 for (27b)). This excludes an analysis in terms of complex focus. Additional principles (to be further investigated) are thus required under our approach: (27a) can be explained if we assume movement of *me* to a position c-commanding *I* capitalizing on island-violating movements being licensed under some conditions (cf. Sportiche 2020); (27b) may motivate projection weakening targeting not-at-issue content (here, the wife’s gender), consistent with appositives as in (28) not being computed in focus alternatives.<sup>32</sup>

- (28) But only Michael brought his spouse, **who by the way is a woman**.

### 3.2. Indexical binding in relative clause constructions: presuppositional agreement

Another crucial difference between morphosyntactic and semantic approaches in favor of the former pertains to the role of verbal agreement: as we reviewed in section 2, only (some) morphosyntactic accounts derive the observed partial correlation between indexical binding and verbal agreement. On the basis of novel French data, we here propose to derive it under a semantic approach by attributing semantic effects to some verbal agreement.

First, as discussed in Sportiche 2016, we observe that verbal agreement can have semantic effects independently of indexical binding as in (29) involving a quantitative subject triggering various agreement possibilities: syntactic agreement with the singular head DP (*une majorité* ‘a majority’) and semantic agreements with the plural embedded DP (*nous* ‘us’).

- (29) Une majorité d’ entre nous { est / sont / sommes } à Bochum.

<sup>32</sup> This principle does not equate with that of semantic accounts. First,  $\phi$ -features of bound pronouns do not have the same not-at-issue status as gender inferences triggered by *wife* or *woman* in (27b) or (28), as suggested by the difference between (28) and (i). Second, not-at-issue content to be ignored in focus alternatives can be different from  $\phi$ -features or independently known presuppositions (see (ii)).

- (i) Only I did someone’s homework, which by the way was mine.  
 (ii) Everyone was supposed to bring their pets. But only John brought his **dog**.

## Indexical binding, presuppositions and agreement

A majority of among us is are-3P are-1P in Bochum  
 ‘Most of us are in Bochum.’

Crucially, 1<sup>st</sup> person agreement in (29) induces an interpretation under which the speaker has to be included in the group in Bochum, while the speaker herself need not be in Bochum (but only her group, e.g., her colleagues) if 3<sup>rd</sup> person agreement is used. We therefore hypothesize that (at least in cases where there are several agreement possibilities) 1<sup>st</sup> person verbal agreement induces the presupposition that the referent of the subject includes the speaker. Furthermore, 3<sup>rd</sup> person plural agreement is dispreferred if the speaker is included in the group in Bochum. For that reason, we assume that 3<sup>rd</sup> person agreement triggers the anti-presupposition that the speaker is not included in the group in Bochum (see Sauerland 2008 on implicated presuppositions). As for 3<sup>rd</sup> person singular agreement, it is compatible with either interpretation and can thus be assumed to be the default, grammatical agreement.

Second, we observe that verbal agreement affects indexical binding in French, more clearly so than in German because French licenses two types of agreement in relevant relative clauses:

- (30) a. Je suis le seul qui {i. **suis** /ii. #**est**} fier de **mes** enfants.  
 I am the only\_one who am is proud of my kids  
 b. Je suis le seul qui {i. # **suis** /ii. **est**} fier de **ses** enfants.  
 I am the only\_one who am is proud of his kids  
 ‘I am the only one who is proud of {my/his} children.’

Unlike German or English (but like Hebrew or Farsi, see Bassi 2019, Ivan & Mirrazi 2019), French allows for optional 1<sup>st</sup> (or 2<sup>nd</sup>)-person agreement in subject relative clauses such as (30). And crucially, the type of agreement correlates with the type of reading: bound readings are only available if the person agreement on the verb matches the person of the bindee.<sup>33</sup> These facts follow from our hypotheses: given that verbal agreement triggers presuppositions on the subject, binding (which requires match in presuppositions) by the subject (the trace of the relative pronoun) is only licensed if the bindee carries the same presupposition; and crucially note that under the relevant interpretation, direct binding by the matrix subject is banned by Rule H.

Now, what regulates the variation between 1<sup>st</sup> and 3<sup>rd</sup> person agreements here? We hypothesize that it results from a complex interaction between copular sentences, relativization and focus. 1<sup>st</sup> person agreement implies that the head of the relative clause (*le seul* ‘the only one’)<sup>34</sup> can carry a 1<sup>st</sup> person feature under some conditions (because of underspecification). This is possible only when it has no overt head noun (vs. (31a), cf. Bassi 2018) and (possibly due to binding conditions B or C) when it is predicated of a 1<sup>st</sup> person subject (vs. (31b), cf. Ivan & Mirrazi 2019).

- (31) a. Je suis le seul **étudiant** qui {i. \* **suis** / ii. est} content.  
 I am the only\_one student who am is happy  
 b. Je **vois** le seul qui {i. \* **suis** /ii. est} content.  
 I see the only\_one who am is happy

<sup>33</sup> We here report our own judgments, but note that there seems to be some cross-speaker variation (possibly due to the prescriptive norm enforcing 1<sup>st</sup> person agreement) to be further investigated as planned in our SNSF project.

<sup>34</sup> Regarding gender agreement, note that the article (*le* vs. *la*) is marked for gender (the adjective *seul(e)* is not), but indexical binding is nevertheless licensed (cf. Bassi 2018) *pace* Wurmbrand’s generalization (see fn. 7).

‘I {a. am / b. see} the only {a. student / b. one} who is happy.’

Moreover, 1<sup>st</sup> person agreement obtains only in some copular sentences (cf. Bassi 2019 for Hebrew): unlike binding, predication does not require match in person features (cf. *Je suis Isabelle* ‘I am Isabelle’), but the choice of person feature depends on the type of predication and information structure: 1<sup>st</sup> person features are only acceptable in cases of specificational (vs. predicational) structures (as for reasons that remain unclear, predicates cannot carry 1<sup>st</sup> feature as independently observed for adjectives) and when the subject is focused (for reasons to be elucidated).<sup>35</sup>

- (32) a. *Who are you?* Je suis [ celle qui {i. \* **suis** / ii. **est**} française ]<sub>F</sub>  
 I am the\_one who am is French  
 b. *Who is the one who is French?* Je<sub>F</sub> suis celle qui {i. **suis** / ii. ? **est**} française.  
 I am the\_one who am is French

Crucially, it is this focus on the subject that licenses indexical binding in (30a) (cf. (25)) under binding of the embedded subject (the trace) by the matrix subject, due to our ERP principle.<sup>36</sup> Thus, focus also plays a crucial role in relative clause constructions just as in focal constructions. But the relation between focus, indexical binding and *only*, we assume, is here indirect. Adjectival *only* is focus sensitive in the same way as superlatives (see Bhatt 2002, Bumford 2017, i.a.). But following Charnavel (2023b), we assume that the domain of comparison in our relative clause constructions is not determined by focus, but by the subordinate clause (the DP in (30) roughly corresponding to *the only one among those that are proud of their children*; incidentally, this explains why 3<sup>rd</sup> person agreement is available despite its implicated presupposition, as alternatives do not involve the speaker<sup>37</sup>). Focus is induced by the specificational construction, which is favored by the presence of *only* (because it can provide the variable that needs to be specified).<sup>38</sup>

<sup>35</sup> This last point is supported by the unavailability of 1<sup>st</sup> person agreement when the subject is unfocusable:

- (i) Il **me** considère (comme) celle qui {\* **suis** / est} française.  
 he me considers as the\_one who am is French

Both points may be tied together as specificational sentences involve focus on the value element (Heycock 2012).

<sup>36</sup> The possibility of binding is supported by (ia), and the binding requirement by (ib) (cf. Jacobson 2012). Note that in (ib) (an inverted specificational construction), it may anyway be the case that *le seul* cannot carry 1<sup>st</sup> person features because the pre-copular constituent is not an individual (but a predicate or an intensional object, see Heycock 2012, i.a.). This hypothesis and the difference between person and gender features in this respect may explain the contrast with (ii), which does exhibit a sloppy reading (cf. Jacobson 2012, see fn. 15).

- (i) a. Chaque mère est la seule qui est fière de **ses** enfants.  
 Each mother is the only\_one who is proud of his kids  
 b. Le seul qui {i. \* **suis** / ii. # **est**} fier de **mes** enfants, c’ est moi.  
 the only\_one who am is proud of my kids it is me  
 (ii) La seule qui est fière d’ **elle**, c’ est Marie.  
 the only\_one who is proud of her it is Mary

<sup>37</sup> In this respect, note that several constructions exhibiting variable 1<sup>st</sup> or 3<sup>rd</sup> person agreement involve focus:

- (i) a. Seul moi { suis / % est } fier. b. C’ est moi qui { suis / % est } fier.  
 only me am is proud it is me who am is proud

Under our approach, this follows from the fact that focus alternatives do not involve the speaker, which satisfies the anti-presupposition of 3<sup>rd</sup> person. Also note that tonic (non-nominative) forms of the pronouns usually trigger 3<sup>rd</sup> (vs. 1<sup>st</sup>/2<sup>nd</sup>) person agreement (see Heycock 2012). This also holds for English (*me* vs. *I*).

<sup>38</sup> Alternatively, we could suppose that *only* induces focus within the relative head or on its trace of (as sometimes proposed for absolute superlatives – when analyzed like relative superlatives – see Bhatt 2002, Romero 2011; cf. Bassi 2019). But this analysis poses independent problems (see, e.g., Charnavel 2023b) and cannot derive (25).



In sum, French reveals that one condition for triggering indexical binding in relative clauses is the availability of indexical feature on the relative head, which depends on the type of head noun and copular construction.<sup>39</sup> But what regulates crosslinguistic variation in verbal agreement? It seems to rely on an independent difference (to be further understood) in the availability of person agreement in relative clauses in general: French *moi qui {suis/?est}* contrasts with English *I who {?am/is}* and German *ich die {\*(ich) bin/\*ist}* (see Ito & Mester 2000, Bassi 2021). Configurations under which indexical binding is possible, which require indexical agreement in French, thus involve 3<sup>rd</sup> person agreement in English. In German, they are precluded (which explains the unavailability of indexical binding) unless the pronoun is repeated in the relative (see Wurmbrand 2017b) or in the 1<sup>st</sup> person plural, which is remarkably the only pronominal form to license relatives without pronoun repetition (*wir, die sind*, Ito & Mester 2000).

#### 4. Conclusion

Under our approach, indexical binding results from two independent principles: a principle of economy enforcing presupposition unification, and a principle of focus interpretation ignoring presuppositions of F-marked elements. Furthermore, correlations between indexical binding and verbal agreement follow from possible semantic (presuppositional) effects of agreement. We can thus maintain a uniform, semantic (presuppositional) analysis of 1<sup>st</sup>/2<sup>nd</sup> person pronouns mainly in line with Kaplan's theory of indexicals.

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<sup>39</sup> Under our approach, this should also hold for long distance bound indexicals (cf. fn. 31), which seems correct;

(i) Je suis le seul qui { suis/? est} content que ma mère vienne.  
I am the only\_one who am is happy that my mother come

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