Minimal Pronouns[1]

Fake Indexicals as Windows into the Properties of Bound Variable Pronouns

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Abstract

The paper challenges the widely accepted belief that the relation between a bound variable pronoun and its antecedent is not necessarily submitted to locality constraints. It argues that the locality constraints for bound variable pronouns that are not explicitly marked as such are often hard to detect because of (a) alternative strategies that produce the illusion of true bound variable interpretations and (b) language specific spell-out noise that obscures the presence of agreement chains. To identify and control for those interfering factors, the paper focuses on 'fake indexicals', 1st or 2nd person pronouns with bound variable interpretations. Following up on Kratzer (1998), I argue that (non-logophoric) fake indexicals are born with an incomplete set of features and acquire the remaining features via chains of local agreement relations established in the syntax. If fake indexicals are born with an incomplete set of features, we need a principled account of what those features are. The paper derives such an account from a semantic theory of pronominal features that is in line with contemporary typological work on possible pronominal paradigms.

Keywords: agreement, bound variable pronouns, fake indexicals, meaning of pronominal features, pronominal ambiguity, typologogy of pronouns.

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1.   Minimal Pronouns

Referential and bound variable pronouns tend to look the same. The English pronouns *he*, *she*, and *they* can all be referential or bound, for example. Referential pronouns refer to salient individuals in the utterance situation. Bound variable pronouns are interpreted by assignment functions. This looks like ambiguity. The apparent ambiguity is systematic, though, and this is why most existing accounts propose a unified semantics for both types of pronouns[2]. Following up on Kratzer (1998), I want to suggest a different explanation for the puzzle of pronominal ambiguity: referential and bound variable pronouns look the same because they are made to look the same by the phonological spell-out component. Bound variable pronouns are what I will call "Minimal Pronouns". Minimal Pronouns are born without a complete set of features. They acquire the missing features, and hence the essence of their visible or audible shapes, via chains of local agreement relations established in the syntax.

For reasons that will become clear shortly, I will make my case with 1st and 2nd person pronouns. 1st and 2nd person pronouns do not usually figure in discussions of pronominal ambiguity. Their bound variable readings are easy to overlook. In (1) and (2), for example, the embedded occurrences of *I* and *you* are ambiguous between a referential and a bound variable interpretation:

(1)   I'm the only one around here who can take care of **my** children.
          Modeled after Partee (1989), footnote 3.[3]

(2)   Only you eat what **you** cook.

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[2] .   Kamp (1981), Heim (1982), Heim and Kratzer (1998) and Elbourne (2002, 2005) are some examples.

[3] .   In Partee's original sentence, the 1st person pronoun occurs in an attitude context, hence might be logophoric and thus allow an indexical account. See the discussion at the end of section 2.

On the bound variable interpretation, which is the one we are interested here, (1) implies that nobody else around here can take care of their own children, and (2) conveys that nobody else eats the food they cook. Bound variable readings for 1st and 2nd person pronouns present a major challenge for unified semantic analyses of referential and bound variable pronouns. There seems to be no good way to give 1st and 2nd person features interpretations that could produce both indexical and bound variable readings. Consider the meaning definitions in 3(a) and 3(b):

(3)   For all variable assignments g admissible in a context c:

   a. $[[he_5]]^{g,c}$ = g(5) if g(5) is a single male, undefined otherwise.

   b. $[[I_5]]^{g,c}$ = g(5) if g(5) is the speaker in c, undefined otherwise.

Assuming that admissible variable assignments are constrained by utterance contexts, 3(a) could cover both indexical and bound variable uses of *he*. A particular context might determine that *5* picks out your grandfather, for example. All variable assignments admissible in that context will then assign your grandfather to *5*. Since the reference of he_5 is fixed in such a context, he_5 comes out as a referential pronoun. Other contexts might not determine a reference for *5*. In that case, different assignments admissible in such contexts could assign different individuals to *5*, and he_5 could thus be treated as a non-trivial bound variable pronoun. This type of account cannot be extended to 1st or 2nd person pronouns. The referents of those pronouns are necessarily picked out by the utterance context, and that means that all assignments that are admissible in a context must assign the same individual to them. Consequently, I_5 in 3(b) can never get a non-trivial bound variable reading. 1st and 2nd person pronouns are therefore pronouns whose referential and bound variable interpretations can't seem to be given a unified semantic analysis. But then the prospects of a common semantics for 3rd person pronouns are not good. Whatever non-semantic account has to

be invoked to solve the puzzle of pronominal ambiguity with 1st and 2nd person pronouns is likely to carry over to 3rd person pronouns.

That 1st or 2nd person pronouns can have bound variable interpretations means that it must be possible for pronouns to surface with features that are in principle interpretable with pronouns, but are not in fact interpreted. In Kratzer (1998) I explored the idea that when otherwise indexical pronouns end up with a bound variable interpretation, they start their life in syntax as mere indices that pick up the features that make them visible or audible via syntactically established agreement relations in the PF branch of syntactic derivations. On that account, the embedded occurrences of the 1st and 2nd person pronouns in (1) and (2) are fake indexicals. They are Minimal Pronouns, indices that have acquired the looks of referential expressions. There are variations of the Minimal Pronoun approach in the literature. von Stechow (2003a, b), for example, proposed that fake indexicals enter syntactic derivations with completely specified feature structures, but are nevertheless allowed to get bound like other pronouns. To be interpretable as bound variables, they must get rid of at least some of their feature specifications before semantic interpretation. To this end, they are 'slimmed down' to Minimal Pronouns via checking operations in the LF-branch of syntactic derivations. I will not attempt an in-depth comparison between the feature transmission and checking variants of the Minimal Pronoun approach. Both versions are bound to have crucial properties in common, in particular reliance on local agreement relations. On a checking account, fully specified fake indexicals must enter local agreement relations to check uninterpretable features before semantic interpretation. On the 'constructivist' proposal of Kratzer (1998), underspecified pronouns become fake indexicals by entering local agreement relations that allow them to inherit uninterpretable features at a point in the derivation where the semantic interpretation component can no longer see them.

On the conceptual side, considerations of economy seem to tilt the balance towards constructivist versions of the Minimal Pronouns proposal. Since the shapes of bound variable pronouns depend on the syntactic configuration they end up in, a constructivist approach spells them out as late as possible. When the initial array of lexical items is assembled, then, no decision about which kind of bound variable pronoun to pick has to be made. If a bound variable pronoun entered the derivation with all its features already specified, we would have to decide right from the very start whether the pronoun will surface as 1st or 2nd person, for example, and whether it is going to look like a reflexive, a relative pronoun, or some such. Unless we already foresee where the pronoun will end up, and hence anticipate essential properties of the derivation yet to come, the likelihood for the derivation to crash because of feature incompatibility is high. If considerations of optimal design play a role in natural language, as suggested in Chomsky (2004, 2005), there should be a bias against checking operations whose main use is to filter out wrongly assembled feature structures. "Crash-proof syntax"[4] should try to minimize the need for filtering. Whenever the shape of a bound variable pronoun is predictable from local properties of its final position, spell-out of such a pronoun should be delayed until it has reached that position[5].

The current paper departs from Kratzer (1998) in two important respects. The first departure consists in a separation of logophoric and non-logophoric fake indexicals. To keep this paper within acceptable bounds, I will mainly discuss the properties of non-logophoric fake indexicals here. Logophoric fake indexicals can be given alternative accounts via quantification over contexts along the lines of Schlenker (1999, 2003a, b) and Anand & Nevins (2004), hence are not necessarily

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[4]. Frampton and Gutmann (2002).

[5]. This argument is essentially the one made against the feature checking approach in the postscript of Halle and Marantz (1993).

Minimal Pronouns. The second departure from Kratzer (1998) was prompted by Rullmann (2004). Rullmann shows that fake indexicals cannot always be born as bare indices. It must be possible for them to have certain features even at the earliest stage of their derivation. (4) is an example of the kind Rullmann considered.

 (4)   You must each fill out a questionnaire before **our** first conversation.

Imagine that I use (4) to address a group of job applicants who are assembled in my office. The reading we are after can be paraphrased as 'each of you is an x such that x will fill out a questionnaire before the first conversation of x and me'. On the intended reading, *our* in (4) has a bound variable interpretation, but can't have inherited its 1st person feature via an agreement chain originating with *you*. *Our* in (4) must have had a 1st person feature from the very start, then. If Minimal Pronouns can be born with certain features already in place, we need a principled account of which features such a pronoun can be born with, and which ones it has to acquire via feature transmission. I will develop such an account in sections 3 and 4. Section 3 proposes meanings for pronominal features that predict the range of admissible initial feature combinations for both referential and bound variable pronouns in a way that is compatible with current typological knowledge about the range of possible pronoun paradigms. Section 4 presents case studies that show how to derive correct interpretations and pronunciations for sentences like (4) and other apparently problematic cases discussed by Rullmann, Schlenker (2003b), and Heim (2005). Section 5 argues that we should look at 1st and 2nd person bound variable pronouns when we investigate the properties of bound variable pronouns. Apparent bound variable readings of 3rd person pronouns are often produced by a D-type strategy (Elbourne (2002), (2005)), hence might involve quantification over situations and not tell us what bound variables are truly like. The most surprising conclusion of the paper is that the relationship between a bound variable pronoun and its

antecedent obeys locality constraints like any other known anaphoric relationship. The following section presents the major piece of evidence for this conclusion.

2.   Fake indexicals and agreement

The great theoretical interest of fake indexicals lies in the fact that bound variable interpretations for 1st and 2nd person pronouns are not freely available. If there are constraints for fake indexicals, the core of those constraints must be hard-wired into the very mechanism that is responsible for establishing anaphoric relationships. We would not expect idiosyncratic constraints on binding to come with lexical entries for indexicals like *I* and *you*. Bound variable readings for 1st and 2nd person pronouns are rare to begin with, and constraints for the availability of those readings look hopelessly chaotic. Generalizations only emerge after careful experimentation with hard-to-come-by cases. Language learners could not possibly extract the right generalizations from the data they encounter. There is a good chance, then, that the investigation of fake indexicals might reveal principles that are at the heart of anaphoric relations.

Interestingly, there is also a certain amount of cross-linguistic variation in the availability of bound variable readings for 1st and 2nd person pronouns. The observable constraints seem to be stronger in German than in English, for example. In this section, I will first document that in German variations of sentence (1), bound variable readings for 1st and 2nd person pronouns require unbroken agreement chains connecting the pronouns to suitable antecedents. This is what we expect on a Minimal Pronoun approach. English does not quite fit this neat picture, though. In English, bound variable readings for 1st and 2nd person pronouns do not always seem to require unbroken agreement chains. I will argue that this is just a matter of outward appearance and reflects a language particular reaction to a phonological spell-out dilemma.

The following German variations of sentence (1) are all grammatical. Yet they do not all allow

bound variable readings for the embedded possessive. Checkmarks after a sentence indicate that a

bound variable reading for the possessive pronoun is easily available, and a star after a sentence

means that a bound variable reading is strongly dispreferred or impossible. The judgments are very

clear.

(5)   1ˢᵗ person singular   *

   Ich bin   der   einzige, der   **meine**   Kinder
   1SG be.**1SG** the.MASC.SG only.one who.MASC.SG **1SG**.POSS children

   versorg-**t**.
   take.care.of-**3SG**

    'I am the only one who is taking care of my children.'

(6)   2ⁿᵈ person singular   *

   Du bist   der   einzige, der   **deine**
   2SG be.**2SG** the.MASC.SG only.one who.MASC.SG **2SG**.POSS

   Kinder versorg-**t**.
   children take.care.of-**3SG**

(7)   1ˢᵗ person plural   √

   Wir **sind**   die   einzigen, die   **unsere**   Kinder
   1PL be.**1/3.PL** the.PL only.ones who.PL **1PL**.POSS children

   versorg**en**.
   take.care.of-**1/3.PL**

(8)   2ⁿᵈ person plural   *

   Ihr **seid**   die   einzigen, die   **Eure**   Kinder
   2PL be.**2PL** the.PL only.ones who.PL **2PL**.POSS children

   versorg**en**.
   take.care.of-**1/3.PL**

In (5) to (8), a bound variable interpretation is only possible for the 1st person plural. What makes the 1st person plural special is that there is systematic 1st/3rd plural syncretism throughout the German verbal paradigm. The hypothesis suggested by (5) to (8) is then that a bound variable interpretation for the possessive pronoun in the relative clause is only possible if it can agree with the embedded verb, which would in turn provide a link to an agreement chain leading all the way to the matrix subject via the relative pronoun, the head of the relative clause, and the matrix verb. If it is the availability of such an agreement chain that makes a bound variable interpretation possible for the possessive in (7), bound variable readings should be generally possible in variations of sentence (1) in languages or dialects that allow 1st or 2nd person verbal agreement in the relative clause. Interestingly, German allows this possibility for the 2nd person plural. In addition to (8), there is also the equally grammatical variant (9):

(9)   2nd person plural (agreeing embedded verb)   √

    Ihr **seid**   die   einzigen, die   **Eure**   Kinder
    2PL are.**2PL** the.PL only.ones who.PL **2PL**.POSS children

    versorg-**t**.
    take.care.of-**2PL**

As expected, (9) contrasts with (8) in allowing a bound variable interpretation for the possessive. The agreement chains in (7) and (9) need further scrutiny, though. We need to find out how a person feature could be transmitted via such chains. Neglecting all vertical and horizontal agreement relations within participating CPs and DPs, the agreement chains for our test sentences consist of five major links:
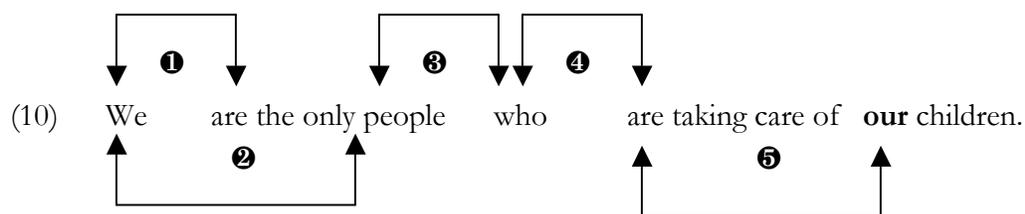
(10)   We   are the only people   who   are taking care of **our** children.

❶   Subject verb agreement

❷   Agreement between a predicative DP and its subject

❸   Agreement between a relative pronoun and its head

❹   Subject verb agreement

❺   Agreement between a verb and a possessive pronoun in the specifier position of the verb's direct object.

Agreement between a subject and its verb is unproblematic: this type of agreement is known to include person agreement and is generally assumed to be established via local agreement relations. Agreement between a verb and a possessive pronoun in the specifier position of its object must be reducible to local relationships as well, since reflexive possessives appear in this configuration in languages that have them. Person agreement between a predicative DP and its subject, and between a relative pronoun and its head is much less obvious.

(11)   We are the only   people   who   are taking care of our children.
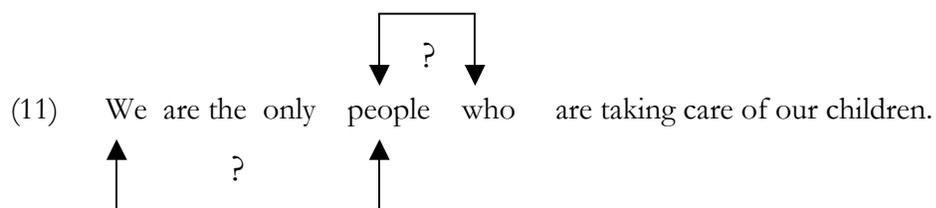
To obtain the two critical links in (10), we have to assume that what looks like a '3rd person' predicative DP can acquire 1st or 2nd person features from its subject and transmit them to a '3rd

person' relative pronoun. Is this plausible? A long line of researchers[6] has emphasized that there really aren't any '3rd person' features. Technically, this might mean that there is no such thing as a 3rd person feature, and so-called '3rd person' inflections would be inflections that are merely unspecified for person. Alternatively, '3rd person' features might in reality be gender, not person features. Languages from the Bantu family support the second option. In Kiswahili, for example, the four 1st and 2nd person subject prefixes *ni* (1.SG), *u* (2.SG), *tu* (1.PL), and *m(u)* (2.PL) contrast with a much larger group of '3rd person' prefixes that differentially mark gender agreement with the full range of 10 or more noun classes. On either proposal, '3rd person' DPs, NPs, and Ns should be able to inherit 1st or 2nd person features without suffering a feature clash. Moreover, assuming a framework like Distributed Morphology, vocabulary insertion should be unaffected by the presence of 1st or 2nd person feature in positions containing NPs built from roots like √PEOPLE, or DPs built from a *wh-*feature. According to the Subset Principle of Halle (1997) and Embick & Noyer (forthcoming), a vocabulary item can be inserted into a position if the item matches at least a subset of the features present in that position and there is no other vocabulary item that is a better match[7]. In the absence of any person marked competitors, *people* in (10) could spell out feature bundles like {√*PERSON*, [*1st*], [*plural*]}, for example, and a relative pronoun might spell out feature bundles like {[*wh*], [*fem*], [*1st*], [*plural*]}. This means that as long as agreement is in principle possible between a predicative DP and its subject or a relative pronoun and its head, person agreement should be a theoretical possibility, too, even though it may not be indicated overtly.

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[6]. See for example Forcheimer (1953), Benveniste (1966), Zwicky (1977), Harley & Ritter (2002), and Wechsler (2004).

[7]. Competition for insertion only affects functional heads, that is, the abstract morphemes of Embick & Noyer (forthcoming), and not roots like √COW, for example. Assuming, as we do, that phonological spell-out cannot affect the semantic interpretation component, roots must be sufficiently specified from the very start. This is consistent with Embick & Noyer (forthcoming), who argue that roots have all of their features throughout the derivation.

That 1st or 2nd person features are obligatorily transmitted to relative pronouns in German can be seen most clearly in non-restrictive relative clauses, as illustrated in (12) and (13), which are based on Ito & Mester (2000). A relative pronoun whose head is a 1st or 2nd person pronoun cannot agree with a '3rd person' verb:

(12) a. * Ich, **der**   schon   sechzig **ist**, …
             I,   who.MASC.SG already sixty   be.**3SG**

      b. * Du, **der**   schon   sechzig **ist**, …
             You who.MASC.SG already sixty   be.**3SG**

      c.   Wir, **die**   schon   sechzig **sind**, …
             We who.PL already sixty   be.**1/3.PL**

      d. * Ihr,   **die**   schon sechzig **sind**, …
             You.PL who.PL already sixty   be. **1/3.PL**

12(a), (b), and (d) are severely ungrammatical. 12(c) is rescued by syncretism. To complicate matters slightly, replacing the '3rd person' verb with the corresponding 1st or 2nd person form turns 12(d) into a grammatical sentence[8], but helps with 12(a) or (b) only if a matching resumptive pronoun is inserted, as shown in 13(a) and (b). The resumptive pronoun is optional for the 1st and 2nd person plural.

(13) a.   Ich, **der**   *(**ich**) schon   sechzig **bin**, …
             I,   who.MASC.SG   I   already sixty   be.**1SG**

      b.   Du, **der**   *(**du**) schon sechzig **bist**, …
             You who.MASC.SG   you already sixty   be.**2SG**

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[8] .   According to Ito & Mester (2000), a resumptive pronoun is also required in 13(d). I do not share this judgment. Data of this kind show a lot of variability across speakers, constructions, and dialects, and more generally within the Germanic language family. See the next footnote for a potential explanation for differing judgments about 13(d).

c. Wir, **die** (**wir**) schon sechzig **sind**, …
    We who.PL we   already sixty   be.**1/3.PL**

d. Ihr, **die** (**ihr**) schon sechzig **seid**, …
   You.PL who.PL you.PL already sixty   be.**2PL**

That '3rd person' agreement is blocked in (12) suggests that 1st or 2nd person DPs obligatorily transmit person features into relative clauses that depend on them. But as shown in (13), singular person features do not seem to be carried by relative pronouns themselves, but have to be spelled out by resumptive pronouns. Why should this be so? Here is a possible explanation. In contrast to plural relative pronouns, German singular relative pronouns are gender marked. More generally, German makes overt gender distinctions with singular, but never with plural DPs. Suppose, then, that singular and only singular DPs have gender features in German. Consequently, singular relative pronouns that inherit a 1st or 2nd person feature end up with both a person and a gender feature. This, I suggest, is not a problem for the relative pronoun, but creates an agreement dilemma for the verb. If '3rd person' singular features are gender features, then '3rd person' singular verbal agreement is gender agreement, even though German verbs happen to have just a single form for all three genders. '3rd person' singular verbal inflection might now require the presence of a gender feature, and would then not merely be a default form that appears in the absence of a person feature, as in the first proposal for '3rd person' sketched above. The vocabulary insertion rules for the present tense forms of the German copula would be as follows:

(14) $[1^{st}]$ $[sing]$ $\rightarrow$ *bin*

$[2^{nd}]$ $[sing]$ $\rightarrow$ *bist*

$\left\{ \begin{array}{l} [masc] \\ [fem] \\ [neut] \end{array} \right\}$ $[sing]$ $\rightarrow$ *ist*

$[plural]$ $\rightarrow$ *sind*

$[2^{nd}]$ $[plural]$ $\rightarrow$ *seid*

(14) looks like an impoverished version of a Bantu paradigm: '3rd person' inflection targets gender features, and there are no gender distinctions for 1st or 2nd person. In (14), the '3rd person' singular verbal inflection is no less specified than 1st or 2nd person singular inflections, and therefore all three forms compete with each other for lexical insertion. If there was no resumptive pronoun in 13(a), for example, the verb would have to agree with a relative pronoun with the features {[*1st*], [*sing*], [*masc*]}, and would thus itself be specified for those features. At vocabulary insertion, there would be two possible candidates to spell it out, *bin* and *ist*. Since neither form is more specified than the other, there is a spell-out conflict, and this, I suggest, forces insertion of a resumptive pronoun. Without a resumptive pronoun, the result is the ungrammatical 12(a). The resumptive pronoun carries a person, but no gender feature, and thus uniquely determines person agreement for the verb. A parallel story can be told about 13(b). If plural forms have no gender features in German, no agreement dilemmas are expected for 13(c) and (d)[9].

Let us return to our main topic, the connection between the availability of bound variable interpretations and agreement. In the test sentences I have been using, the potential fake indexicals all occur in relative clauses. Our investigation of non-restrictive relative clauses showed that person features are obligatorily transmitted from head nouns into relative clauses in German. We can now focus our attention on the second potentially questionable link, link ❷ in the agreement chain (10), repeated below.

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[9].   Because of 1st /3rd person syncretism for plural verbal inflections in German, 13(c) would be expected to be fine, even if plural forms also targeted gender features. On the other hand, 13(d) should be ungrammatical then. Maybe this is the situation for dialects that perceive a grammaticality difference between 13(c) and (d), as do Ito and Mester (2000).

(10) We are the only people who are taking care of **our** children.
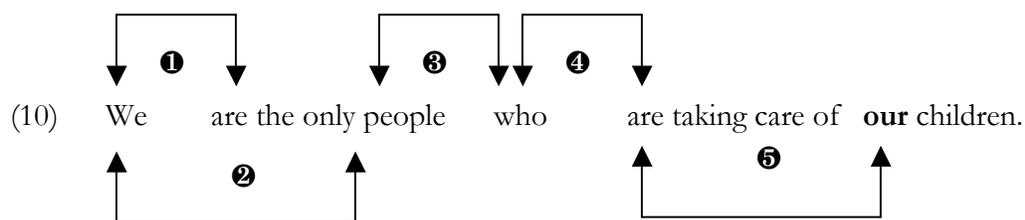
Earlier I argued that given the Subset Principle of Distributed Morphology and the assumption that '3rd person' features are not really person features, person agreement between *we* and the predicative DP (*the only*) *people* in (10) should at least be a possibility. Overt person agreement on nouns has been reported for Chukchee, a Paleo-Siberian language. According to Muravyova (1998), Chukchee nouns are marked for person and number in copular constructions ("I am a reindeer breeder"), but also in appositives and vocatives, as in "we reindeer breeders" and "Hey you, reindeer-breeders!"[10]. (15) illustrates person marking on nouns within an appositive DP in Chukchee:

(15) gyt, mewet-ine-jgyt ekke-jgyt, qyntoge
you, Mewet-POSS-2SG son-2SG, leave
'You, Mewet's son, leave'
Spencer, chapter 3, (24).

While agreement between a predicative DP and its subject is an option for natural languages, it can't be obligatory, as illustrated in (16):

(16) a. If I were you, I wouldn't go. Person mismatch

b. If I were two people, we would fight. Number mismatch

c. Dieser Mann ist eine Katastrophe. Gender mismatch
This.MASC.SG man is a.FEM.SG disaster
This man is a disaster

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[10]. Muravyova (1998), 524.

If link ❷ is optional in configurations like (10), the head of the relative clause does not *have* to have a

matching person feature, and if it doesn't, no person feature is passed on to the relative pronoun.

The verb will then show '3rd person' inflection, and if the possessive is born as a Minimal Pronoun,

it will surface as a '3rd person' pronoun, because it can only inherit '3rd person' features. It should

then be possible to produce the complete set of bound variable readings we are interested in with

'3rd person' possessives. This is the case, as shown in (17) to (20).

(17)   1st person singular   √

        Ich bin   **der**   einzige, **der**   **seine**
        I   be.1SG the.**MASC**.SG only.one who.**MASC**.SG **MASC.SG**.POSS

        Kinder versorg-**t**.
        children take.care.of-**3SG**

        'I am the only one who is taking care of his children.'

(18)   2nd person singular   √

        Du   bist   **der**   einzige, **der**   **seine**
        You.SG be.2SG the.**MASC**.SG only.one who.**MASC**.SG **MASC.SG**.POSS

        Kinder versorg-**t**.
        children take.care.of-**3SG**

(19)   1st person plural   √

        Wir sind   **die**   einzigen, **die**   **ihre**   Kinder
        We be.1/3.PL the.**PL** only.ones who.**PL PL**.POSS children

        versorg**en**.
        take.care.of-**1/3.PL**

(20)   2nd person plural   √

> Ihr   seid   **die**   einzigen, **die   ihre**   Kinder
> You.PL are.2PL the.**PL** only.ones who.**PL PL**.POSS children
>
> versorg-**en**.
> take.care.of-**3PL**

If person marked, rather than '3rd person', possessives had surfaced in (17) to (20), they could not have inherited their features via agreement, hence could not have been Minimal Pronouns, except for the 1st person plural, where there is syncretism. Those pronouns would then have to have been referential. This is exactly the configuration in sentences (5) to (8) above, which we started out with.

On the other hand, if we opt for passing on a person feature through link ❷ in our test sentences, the feature will trickle down to the head of the relative clause, and will then be obligatorily passed on to the relative pronoun. The relative pronoun has now both a gender and a person feature, and the simultaneous presence of those features should create a spell-out dilemma for the verb in the 1st and 2nd person singular, just as in non-restrictive relative clauses, assuming that the vocabulary insertion rules for German present tense verbal inflections look as follows:

(21) $[1^{st}]$ $[sing]$ →   - e   *versorge*

        $[2^{nd}]$ $[sing]$ →   - st   *versorgst*

        $\left\{ \begin{array}{c} [masc] \\ [fem] \\ [neut] \end{array} \right\}$ $[sing]$ →   - t   *versorgt*

        $[plural]$ →   - en   *versorgen*

        $[2^{nd}]$ $[plural]$ →   - t   *versorgt*

For reasons that do not have to concern us here, resumptive pronouns are unavailable in restrictive relative clauses. As a consequence, the agreement chains that would be required to obtain bound

variable readings for singular 1st or 2nd person possessives in our test sentences can't be spelled out in German. (22) and (23) have the intended bound variable readings (as far as I can tell), but are plain ungrammatical.

(22)   1st person singular   √

    ∗ Ich **bin**   der   einzige, der   **meine**   Kinder
        I   be.**1SG** the.MASC.SG only.one who.MASC.SG **1SG**.POSS children

        versorg-**e**.
        take.care.of-**1SG**

        'I am the only one who is taking care of my children.'

(23)   2nd person singular   √

    ∗ Du   **bist**   der   einzige, der   **deine**
        You.SG be.**2SG** the.MASC.SG only.one who.MASC.SG **2SG**.POSS

        Kinder versorg-**st**.
        children take.care.of-**2SG**

The agreement dilemma cannot be resolved for the 1st or 2nd person singular in our test sentences. The situation changes for the 1st or 2nd person plural. Person agreement with plural relative pronouns is possible, as illustrated in (7) and (9) below, repeated from above. The likely explanation is again syncretism and the lack of gender features for plural forms, as in 13(c) and (d).

(7)   1st person plural   √

        Wir **sind**   die   einzigen, die   **unsere**   Kinder
        1PL be.**1/3.PL** the.PL only.ones who.PL **1PL**.POSS children

        versorg**en**.
        take.care.of-**1/3.PL**

(9)   2nd person plural (agreeing embedded verb)   √

    Ihr **seid**   die   einzigen, die   **Eure**   Kinder
    2PL are.**2PL** the.PL only.ones who.PL **2PL**.POSS children

    versorg-**t**.
    take.care.of-**2PL**

I have relied on German, a language with relatively rich verbal inflections, to argue that the availability of bound variable readings for 1st and 2nd person pronouns requires unbroken agreement chains leading to a suitable antecedent. This requirement is expected if fake indexicals are Minimal Pronouns whose visible or audible shape depends on feature transmission. If the account is on the right track, it should carry over to other languages. Interestingly, the situation in English is not as clear as we might expect it to be. Consider the data in (24).

(24)   a.   I am the only one who **has** brushed **my** teeth.   ?

      b.   You are the only one who **has** brushed **your** teeth.   ?

      c.   We are the only ones who **have** brushed **our** teeth.   √

      d.   You are the only ones who **have** brushed **your** teeth.   √

According to the native speakers I consulted[11], bound variable readings are possible in all four cases. However, all speakers perceived a slight difference between 24(a) and (b) on the one hand, and 24(c) and (d) on the other. In 24(c) and (d), bound variable readings are more readily available than in 24(a) and (b). From the current perspective, the availability of a bound variable reading in 24(a) and (b) is surprising. '3rd person' inflection on the embedded verb seems to break the agreement chain linking the possessive to its matrix antecedent. Bound variable readings for 24(a) or (b) should therefore be impossible or hard to get, which is not the case.

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[11] .   Gregory Carlson, Barbara Partee, Chris Potts, and Lisa Selkirk, all speakers of Standard American English.

Suppose English is like German, in that '3rd person' singular agreement is gender agreement. The main difference between German and English could then be that in English, most common nouns are neuter. The vocabulary insertion rules for the present tense forms of the auxiliaries *have* and *be* should look as follows:

(25) [*1st*] [*sing*] → *am* *have*

$$\left\{\begin{array}{c} [masc] \\ [fem] \\ [neut] \end{array}\right\} \; [sing] \quad → \quad is \quad\quad has$$

$$\left\{\begin{array}{c} [2^{nd}] \\ [plural] \end{array}\right\} \quad\quad → \quad are \quad\quad have$$

Assuming vocabulary insertion rules like (25), the presence of both a gender and a person feature with a subject relative pronoun should create the very same spell-out dilemma for English verbs that we found in German. The fact the '3rd person' form *has* appears in 24(a) and (b) would then not necessarily mean that speakers opted against transmitting a 1st or 2nd person feature to the relative pronoun. It could also mean that a 1st or 2nd person feature was in fact transmitted, but the resulting spell-out dilemma was resolved - in this case in favor of gender agreement. This hypothesis would explain why speakers still report a slight difference between 24(a)/(b) and 24(c)/(d). Assuming (25), no spell-out dilemma would have to be resolved in 24(c)/(d), hence the presence of an unbroken agreement chain could be more readily acknowledged. The hypothesis also explains why verbal agreement in relative clauses with 1st or 2nd person heads shows a wide range of variation among different English speakers and dialects, and even among different verbal paradigms within a single dialect. A Google search turned up the following non-restrictive relative clauses, for example:

(26)   Gender agreement

    a.   **I**, who **has** never smoked a cigarette in **my** life, …

    b.   How do **I**, who **has** never been able to manage **my** funds, …

    c.   **I**, who **has** never played a serious game of anything in **my** life, …

    d.   How is it that **I**, who **has** always promoted **myself** to be a self enduring lone wolf …

(27)   Person agreement

    a.   Why should **I**, who **have** never been a gutter drunk, …

    b.   **I**, who **have** never had anything worse than a case of ferocious flu, …

    c.   **I**, who **have** never been to Japan, …

    d.   **I**, who **have** always believed I can merge into any crowd, …

While the speakers of Standard American English I consulted clearly preferred (27) to (26), the person agreement strategy was unanimously rejected for parallel cases with *be*. Example (28), which I owe to Barbara Partee, is considered obsolete.

(28)   **I**, who **am** about to die, salute you.

For the 1st person singular, speakers of contemporary Standard American English seem to have no resolution for the spell-out dilemma with *be* in non-restrictive relative clauses. (29) is equally obsolete:

(29)   **I**, who **is** old and respected, …

In restrictive relative clauses of the kind illustrated in (24), gender agreement seems to be the only acceptable option for speakers of Standard American English. But for this construction, too, a Google search turned up many examples with person agreement:

(30)   a.   I guess **I** am the only one who **have** negative feelings about the album.

    b.   **I** am the only one who **have** been using it for years.

c.   **I** am the only one who **have** gotten the game to run.

d.   **I** am the only one who **have** actually bothered to get an account.

The pattern of agreement variations in English relative clauses with 1st or 2nd person singular heads suggests that the choice of '3rd person' agreement in 24(a) and (b) might very well be a spell-out phenomenon, and does not necessarily indicate a broken agreement chain. The fact that there are differences between *have* and *be*, for example, even within a single dialect, makes the spell-out hypothesis plausible. The spell-out hypothesis is also supported by the fact that in English, person marked reflexives can appear in configurations like (24), as illustrated in (31), from Adger (2005):

(31)   **I** am the one who hate**s myself**.
        Adger (2005), example 61.

I conclude that in English, too, bound variable readings for 1st or 2nd person pronouns are likely to require unbroken agreement chains leading to an antecedent.

Fake indexicals illustrate in a close to perfect way how universal principles can interact with language particular facts to create data that look hopelessly chaotic. The agreement chains that bound variable readings depend on may not always be easy to recognize. Whether those chains can be spelled out at all, and if so, how they surface, depends on idiosyncrasies of paradigms, language particular strategies guiding phonological spell-out, the rulings of normative grammar, and speakers' strategies for responding to them. This makes the data situation complex and requires careful experimentation to bring out generalizations.

Unbroken agreement chains have been identified as necessary prerequisites for other types of anaphoric relations, e.g. for switch reference in Finer (1984, 1985) and Hale (1992), for control in Borer (1989), Hale (1992), and Landau (2000, 2004), and for SE-anaphors in Reinhart & Reuland

(1991). What all of those proposals have in common with the present approach to fake indexicals is that an apparent long-distance dependency between a pronoun and its antecedent is established via chains of local agreement relations, crucially involving verbal inflectional heads. The pivotal role of verbal agreement morphology in establishing long distance dependencies is also shown by agreeing complementizers marking *wh*-dependencies with or without movement in Celtic[12] and by Austronesian *wh*-agreement[13], which is sometimes visible in the inflection of all verbs crossed by an extracted *wh*-phrase.

There is a class of examples where bound variable readings for 1st and 2nd pronouns are possible in positions that cannot seem to be linked to suitable antecedents via agreement chains – even granting that those chains may not always look perfect. For example, there is a rather unexpected and very solid contrast between 32(a) and (b):

(32) a. Du   bist   der   einzige, der   **deinen** Vortrag versteht.   *
          You.SG be.2SG the.M.SG only.one who.M.SG your   talk   grasps.
           'You are the only one who understands your talk.'

      b. Du   bist   der   einzige, der   glaubt,   √
          You.SG be.2SG the.M.SG only.one who.M.SG believes

          dass jemand   **Deinen** Vortrag versteht.
          that somebody your   talk   grasps

          'You are the only one who thinks that somebody understands your talk.'

For 32(a), a bound variable interpretation for the 2nd person possessive *deine* is impossible or hard to get, and this is expected. The verbal agreement morphology in the relative clause does not match

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[12] .   McCloskey (1979, 1990, 2001, 2002), Rouveret (2002), Adger & Ramchand (2005).

[13] .   Chung (1994), (1998), Rackowski & Richards (forthcoming).

that in the matrix clause. But why is a bound variable reading for *deine* available in 32(b), then? Wouldn't we expect a substantial intervention effect?

Intuitively, the bound variable reading in 32(b) has a point of view flavor that seems related to a switch of perspective triggered by the attitude verb. That perspective or point of view is a factor facilitating the availability of bound variable readings for 1st or 2nd person pronouns is also shown by the contrast between the minimal pairs 33(a) and (b):

(33)   a.   I am the only one who wants DSS to take care of **my** children.   √

    b.   I am the only one who DSS wants to take care of **my** children.   *

Neither 33(a) nor (b) has a chain of local agreement relations leading from *my* all the way up to the matrix subject. But 33(a) talks about my wishes, and this seems to make it easier for *my* to have a bound variable reading. 33(b), on the other hand, reports what DSS wants, and that seems to be why a bound variable reading for *my* is blocked or hard to get. Cross-linguistically, sensitivity to point of view is the signature property of so-called "long-distance anaphora" [14]. Long-distance anaphora are a major challenge for the Minimal Pronoun approach. It seems that there is no chance for the embedded possessives in sentences like 32(b) or 33(a) to inherit their Φ-features via suitable agreement chains.

Logophors and other pronouns that are sensitive to perspective in one way or other are a big topic that I cannot possibly do justice to in this paper. The issue is discussed in more detail in Kratzer (in preparation). All I can do here is sketch the main ideas pursued there up to a point where it looks

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[14]. Cantrall (1969), Kuno (1972), Kuroda (1973), Maling (1984), Sells (1987), Zribi-Hertz (1989), the papers in Koster & Reuland (1991) including Reinhart & Reuland (1991), Pollard & Sag (1992), the papers in Cole et al. (2000), among many others.

plausible that logophoric fake indexicals are not necessarily Minimal Pronouns. Logophors like

those seen in 32(b) and 33(a) can in principle be produced by context shifting operations of the kind

proposed in Schlenker (1999), (2003)) for Amharic and in Anand and Nevins (2004) for the Kurdish

language Zazaki. Simplifying slightly, suppose sentences are evaluated with respect to an 'origo'

(Latin for 'source') index o (Büring (2005)) which is shifted by attitude verbs, as illustrated in (34):

(34) $[[\textit{believe } \alpha]]^{g,c,o} = \lambda x\lambda w.\ \forall x'\forall w'\ [\ DOX(w, x)(w', x') \rightarrow [[\ \alpha\ ]]^{g,c,x'}(w')]$

(34) takes doxastic alternatives to be centered worlds, that is, pairs consisting of a world and an

individual who, as far as the content of the belief is concerned, might be the believer in that world.

Via the origo parameter, a believer's individual alternatives can be 'plugged in' directly as values for

de se (that is, logophoric) pronouns. Following Anand and Nevins, we could then have context

shifters of the kind shown in (35):

(35)   a.   First person perspective

$[[Comp_{[1st]}\ \alpha]]^{g,c,o} = [[\alpha]]^{g,c',o}$, where c' is just like c, except that author(c') = o.

b.   Second person perspective

$[[Comp_{[2nd]}\ \alpha]]^{g,c,o} = [[\alpha]]^{g,c',o}$, where c' is just like c, except that addressee(c') = o.

The shifters in (35) shift contexts to ones whose author or addressee is identified with the origo.

The proposal in Kratzer (in preparation) is that in all languages, the operator in 35(a) appears in

complements embedded by a 1st person attitude verb, and the operator in 35(b) appears in

complements embedded under a 2nd person attitude verb. Amharic and Zazaki are special in that

such operators can also appear in complements embedded under a 3rd person attitude verb. The

context shifting account produces apparent bound variable readings for 1st or 2nd person *de se*

pronouns in languages like German or English, even though those pronouns are given their usual

indexical interpretation. In interaction with a context shifter, quantification over doxastic alternatives creates the illusion of quantification over individuals. Logophoric fake indexicals do not have to be Minimal Pronouns, then. They can be born as full-fledged indexical pronouns with all their features in place, hence do not have to depend on an agreement chain leading to an antecedent. There does not have to be any syntactically represented operator-variable relation at all.

In this section, we have seen substantial constraints for bound variable readings of 1st and 2nd person pronouns. The constraints themselves are not in any way new, but are the kind of constraints that are known to guide anaphoric relationships more generally: The one fact that scholars of anaphora seem to agree on, for example, is that there are two kinds of them. One kind of anaphoric pronoun depends on chains of local agreement relations. The other kind depends on point of view in a way that might seem hard to reconcile with a structural account. Reinhart & Reuland (1991) refer to the "discovery that a distinction is needed between logophoric processes and structural binding relations" as a "major breakthrough".[15] One of the results of this section is that the very same bipartition also affects fake indexicals.

At the beginning of this section I noted that it is highly unlikely that 1st or 2nd pronouns have special binding conditions attached to them. We therefore expect constraints on fake indexicals to be universal hard-wired constraints that any kind of anaphoric relationship is submitted to. It is reassuring to see that the constraints for bound variable readings of 1st and 2nd person pronouns we were able to isolate here are part of the general family of constraints that have been identified for more clearly recognizable species of anaphora.

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[15]. Reinhart & Reuland (1991), 283.

In the following two sections, I will work towards a principled account of which features bound variable pronouns can or cannot be born with. I will suggest that which features a bound variable pronoun can have at the beginning of its life in syntax is determined by the meanings of those features in interaction with an economy principle along the lines of Reinhart (1983).

3.   The meaning of pronominal features and the typology of pronouns

Why should bound variable pronouns be born without a full set of agreement features? What is it that forces them to enter derivations underspecified? Where in the grammar is the police that tells a bound variable pronoun which features it can or can't have? In the formal semantics tradition, meaningful features are commonly taken to introduce presuppositions[16]. Those features would then denote partial identity functions[17], as illustrated in (36).

(36)   a. $[[[fem]]]^{g,c} = \lambda x: x$ is female. x

b. $[[[1st]]]^{g,c} = \lambda x: x$ includes the speaker in c. x

36(a) says that the feature [fem] denotes a partial identity function from the set of individuals that is only defined for individuals that are females.   According to 36(b), [1st] stands for a partial identity function that is only defined for singularities or pluralities that include the speaker in the context c. If pronominal features denoted partial identity functions, we would expect them to combine with bound variable pronouns. There would be no veto from the semantics; features could restrict

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[16] .   Cooper (1983), Dowty & Jacobson (1989), Heim & Kratzer (1998), Schlenker (2003b), Sauerland (2005), Büring (2005), Heim (2005).

[17] .   Heim and Kratzer (1998) have denotations of this kind (p. 244), for example. Büring (2005, 189) presents a related proposal, but posits predicative denotations for indexical, descriptive, and number features and then introduces a special pronoun interpretation rule that uses features to restrict admissible assignments to pronouns.

admissible variable assignments. There are, however, reasons for being skeptical about presuppositional denotations for all pronominal features. If all pronominal features denoted partial identity functions, features could never directly interact with each other, and we would not expect the semantics of features to impose any significant constraints on feature combinations apart from ruling out cases involving incompatibility, redundancy, and some such. The feature combinations that yield pronouns that are possible in natural languages are more constrained than that, however. There seems to be a highly restrictive 'combinatorics' for feature interactions that determines the set of possible pronouns in natural languages (Adger (in press), Harbour (2005, 2006)). Moreover, Harley and Ritter (2002) have argued that the features that pronouns are built from are hierarchically organized. Below I will suggest that pronominal features have denotations that can be assumed to come from a general pool of lexical denotations. According to the proposal, 1st and 2nd person features are referential, for example. They denote participants in the utterance situation. '3rd person' pronouns are constructed from a definiteness feature and descriptive features, two components that are also found elsewhere. The definiteness feature may show up as a definite article, for example. Descriptive features may surface as nouns. Plural features denote pluralization operations that are the very same as those that are carried by the connective *and* and associative plural morphemes. The semantic type structure of pronominal features determines a combinatorics and a hierarchical organization for pronominal features without any stipulations. The main result of the section is that the semantically induced combinatorics predicts precisely the possible person marking paradigms that Cysouw (2003) documents. The proposed feature system, then, does not only tell us which features a Minimal Pronoun can be born with, it also determines a range of possible pronouns that is consistent with current typological research. In what follows, I will first introduce the relevant pronominal features one by one, motivate the suggested denotations, and follow up on immediate predictions. In a second step, I will present the space of possible pronominal paradigms generated

by the system and discuss some typological predictions. Section 4 will then investigate the specific

consequences of the feature system for the construction of fake indexicals.

What does it take to be a personal pronoun? There are some properties that all personal pronouns

have in common. They have denotations of type e and are composed of meaningful features. On the

current approach, the minimally possible types of pronouns are bound variable pronouns. They can

be identified with indices. If all pronouns are syntactically represented as feature bundles, indices

must be features, too[18]. Being features, they can be part of the initial pool of lexical items that

provides the raw materials for syntactic derivations. Indices are no longer the result of late

annotations of structures that have already been built. We have then:

(37)   Index features: [*1*], [*2*], [*3*] …

   $[[[n]]]^{g,c} = g(n)$

As mentioned earlier, many scholars have argued against a '3rd person' feature, and I have been

assuming that the alleged '3rd person' features are in fact gender features, a variety of descriptive

features. If feature meanings are recruited from a general pool of atomic concepts, descriptive

features should express properties, as illustrated in (38):

(36)   A selection of descriptive features

a. $[[[masc]]]^{g,c} = \lambda x.$ x is one or more males

b. $[[[fem]]]^{g,c} = \lambda x.$ x is one or more females

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[18] .   If indices are features, they should behave like features in all important respects. See Kratzer (2004) and Adger & Ramchand (2005) for more discussion. Chomsky (2000) raises the question whether syntactic representations contain indices. Indices seem to violate his Inclusiveness Condition, which bars the introduction of any new features into a syntactic representation that has been built at an earlier stage. Inclusiveness is not violated, of course, if indices are features that are present in the initial pool of items accessed by the syntactic computation.

c. $[[[thing]]]^{g,c} = \lambda x.$ x is one or more things

(38) assumes that descriptive features are number neutral and therefore denote properties that can be true of singularities or pluralities[19]. Krifka (1992) conjectured that basic predicates in natural languages are always cumulative. That is, whenever such a predicate is true of individuals a and b, it is also true of a+b, the sum of a and b. Predicative features are prime examples of basic predicates, of course, so we expect them to satisfy Krifka's cumulativity universal.

Descriptive features all by themselves cannot be pronouns. They do not have denotations of type e. They therefore have to combine with a definiteness feature that should have the semantics of a number neutral definite article. The σ-operator of Link (1983) gives us just that:

(39)   Definiteness

        $[[[def]]]^{g,c} = \lambda P_{<et>}. \sigma x\ P(x)$

The operation denoted by [def] maps cumulative properties of individuals to the sum of all individuals that have the property. If no individual has the property, the operation is undefined. If just one individual has the property, the operation returns that individual. The σ-operator thus captures the properties of the English definite article *the*, which is also number neutral.

The feature [def] has a determiner denotation. In contrast, index features and descriptive features have nominal denotations, assuming that possible nominal semantic types are e or <et>. Seen from the point of view of Distributed Morphology, types e and <et> are possible types for root

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[19].   I am assuming an extensional semantics here for convenience. Eventually, we would have to recognize intensional denotations, of course, in particular when we consider the use of descriptive pronouns as D-type pronouns, which require a situation semantics (Berman (1987), Heim (1990), Elbourne (2002, 2005)).

denotations. In contrast, the denotation of [*def*] is a candidate for the denotation of a functional

head. The feature [*def*] should then head a determiner projection, and, consequently, [*def*] and

descriptive features do not start out in the same nominal feature structure. The two types of

features can come together via head movement or merger operations during spell-out. Pronouns end

up being Ds, then, confirming the close relationship between determiners and pronouns observed in

Grimm (1857) and Postal (1966), among others. We could have the following structural

configuration, for example:

Structure 1

```
        /\
       /  \
      /    \
     D      N
   [def]  [fem]
```
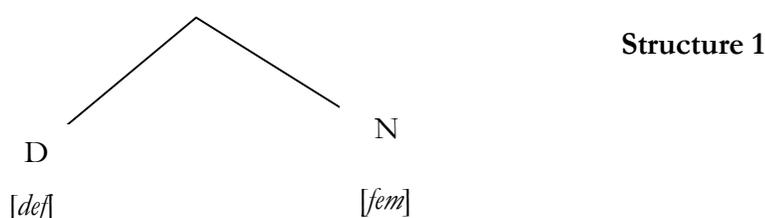
On the proposed analysis, initial '3rd person' pronouns are definite descriptions. They are composed

of the very same kind of semantic ingredients as phrasal definite descriptions. It is not at all

surprising, then, that they can be used as descriptive or 'D-type' pronouns[20], and might literally look

like definite descriptions in some languages[21].

 '3rd person' pronouns contrast with 1st and 2nd person pronouns, which play a special role in many

pronominal systems. As noted in Siewierska (2004, 5), one indication of the special status of 1st and

2nd person is that speakers and listeners are normally only referred to by person markers, whereas

reference to any other things or individuals can, and in some languages must, be achieved via

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[20] .   Neale (1990). See Elbourne (2002, 2005) for a recent account of D-type pronouns. Elbourne argues that D-type pronouns also contain elided NPs. Elbourne's proposal is not incompatible with the present account of 3rd person pronouns. I will briefly come back to this issue in section 3.

[21] .   See Wiltschko (2002) and Déchaine & Wiltschko (2002) for Halkomelem Salish.

demonstratives or (phrasal) descriptions. Semantically, it seems, the special status of 1st and 2nd person is likely to mean that 1st and 2nd person features are irreducibly referential. They refer to speakers and hearers[22]. We have, then:

(40)   Participant features

a. $[[[1^{st}]]]^{g,c}$ = the speaker(s) in c

b. $[[[2^{nd}]]]^{g,c}$ = the hearer(s) in c

c. $[[[1^{st}+2^{nd}]]]^{g,c}$ = the sum of speaker(s) and hearer(s) in c

(40) includes a separate person feature $[1^{st}+2^{nd}]$. The need for a $[1^{st}+2^{nd}]$ pronoun was first recognized by Thomas (1955) for Ilocano, an Austronesian language of the Philippines. According to Cysouw (2003), monomorphemic pronouns exclusively referring to the sum of speaker and hearer are common and occur in a wide range of unrelated languages.

Instead of a basic feature $[1^{st}+2^{nd}]$ there might be a sum feature that can freely combine individual features with denotations of type e without projecting structure. If it combines just two referential features, its meaning would be as in   (41):

(41)   Sum feature[23]

 $[[[sum]]]^{g,c} = \lambda x \lambda y.\ x+y$

Since person and index features are the only features with denotations of type e, they should be the

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[22] .   That features can be referential is proposed in Zwicky (1977). Zwicky characterizes the content of pronominal categories in terms of "reference sets" that can be covered by instantiations of those categories. This comes very close to a compositional semantics, where the denotation of a pronoun is a function of the denotations of the features it contains.

[23] .   Eventually we want a more general sum feature that can map any number of individuals to their sum.

only features that can combine with [*sum*] within the same feature structure. In particular, [*sum*]

should not be able to combine with descriptive features, unless it projects structure. The

denotations of descriptive features are of type <et>. They cannot provide arguments for [*sum*],

then. If [*sum*] projects in the syntax, the feature carrying the sum operation will head its own

projection and is then spelled out as *and* in English. The immediate prediction of this proposal is

that there should be no non-compound pronouns[24] that can only refer to the sum of a single male

and a single female, for example. Setting aside combinations with index features, which will become

very important in section 4, [$1^{st}+2^{nd}$] should be the only non-compound sum pronoun in natural

languages. This prediction seems correct, according to Cysouw (2003).

Participant features are referential, hence need not, and in fact cannot, combine with [*def*], given our

current assumptions[25]. They could therefore be assembled in the following configuration:
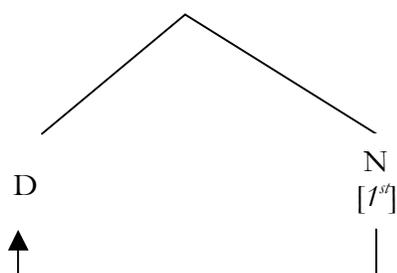
Structure 2

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[24] . See Hyman (1979), Noyer (1992), and Cysouw (2003) for extensive discussion of compound pronouns.

[25] . The Halkomelem independent pronouns discussed in Wiltschko (2002) and Déchaine & Wiltschko (2002) might be a problem for this prediction, since even 1st and 2nd person pronouns appear with what is clearly identifiable as a meaningful determiner in Halkomelem. However, the Halkomelem determiners convey gender and remoteness (as well as number) information, which might mean that 1st and 2nd person independent pronouns as a whole might involve nonrestrictive modification, as in *the local plumber Andy French*. See the discussion of non-restrictive gender features below. Interestingly, Halkomelem independent pronouns do not have bound variable readings.

As in the case of descriptive features, the actual pronoun is constructed via head movement or merger operations during spell-out. It also ends up as a D.

The major prediction made by our system of pronominal features so far seems to be that descriptive features should not be able to semantically combine with participant or index features. The result would be an expression with a denotation of type t, which is a truth value, hence not a possible pronoun denotation. Since referential 1st or 2nd person pronouns are born with all their features in place, they should never be able to surface with gender features. There are typological data about the appearance of 1st or 2nd person pronouns with gender features that make clear that our prediction is only borne out as a tendency. Siewierska observes that "Gender oppositions are characteristic of third rather than first or second person. Of the 133 languages in the sample (33%) which have gender in their independent forms, 129 (97%) have gender in the third person as opposed to 24 (18%) in the second and three in the first (3%)" (Siewierska (2004), 104).

The rationale behind my positing the feature denotations I did was the assumption that meaningful features for pronouns are recruited from a general pool of lexical meanings and compose in the way familiar from phrasal syntax. If a feature denotes a property, then, its compositional behavior should match that of other property denoting expressions. Interestingly, sometimes, predicates can combine with DPs of type e without affecting the type of the DP. This happens in non-restrictive modification, as in (40):

(42)   Ich **armes Kind** hab' kein eigenes Bett.
        I   poor kid   have no own   bed
         'Me poor kid, I don't have my own bed.'

Potts (2004, 2005) has argued that non-restrictive modifiers like the one illustrated in (42) are interpreted as conventional implicatures. The truth-conditional content of an utterance of (42)

could then be paraphrased as saying that the speaker doesn't have his or her own bed. The conventional implicature conveys that the speaker considers herself a poor child. According to Potts, the computation of conventional implicatures uses the same kind of composition mechanisms as the computation of truth-conditional meanings, except that the implicatures themselves are assigned types that prevent them from being the input to any further semantic computation. If Potts is right about non-restrictive modification, we expect descriptive features to contribute conventional implicatures when they occur with 1st or 2nd person pronouns. Their function would be quite similar to that of honorific markers, then, which Potts and Kawahara (2004) also analyze as contributing conventional implicatures. Corbett (1991) reports that in Diuxi Mixtec, an Oto-Manguean language of Mexico[26], the form of the 2nd person pronouns depends on the sex of the speaker, the age of the addressee, and the relationship between them. In the North-East Caucasian language Andi[27] the forms of both 1st and 2nd person singular pronouns depend on the speaker's sex. Corbett notes that with 1st or 2nd person pronouns, apparent gender markers are sometimes closely related to markers that indicate social status or distinguish men's and women's language.

We can now state more accurately what our system predicts for descriptive and participant features: descriptive features should primarily be found with '3rd person' pronouns, but we do not exclude uses with 1st and 2nd person pronouns, in which case the features are expected to merely contribute conventional implicatures. Crucially, descriptive features should not be able to semantically combine with index features at all. Bound variable pronouns do not generally tolerate non-restrictive modification, as shown in (43), and Pott's type logic accounts for this intolerance in a principled way.

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[26] .   Kuiper & Pickett (1974), 54-55.

[27] .   Cercvadze (1967), 285.

(43) * No boy was admitted to the Mystery Spot, before he, who had to wait in line for at least two hours, signed a waiver of liability form.

If '3rd person' bound variable pronouns surface with descriptive features, then, those features must have been inherited via agreement. It follows that there should be no '3rd person' bound variable pronouns that surface with descriptive features that are not agreement features (Φ-features). I will come back to this issue in section 5. If participant and descriptive features denoted partial identity functions, the two types of features should semantically combine with each other, and there would be no reason to expect that descriptive features should mostly show up with '3rd person' pronouns. On the current approach, descriptive features are essential building blocks for '3rd person' pronouns that are not bound variables, but are carriers of additional social meanings in connection with 1st or 2nd person pronouns. They make no contribution to truth-conditional meaning. This difference is most likely responsible for the fact that participant and descriptive features rarely combine.

In the family of semantico-syntactic features, those that are intuitively related to 'number' in one way or other are the most elusive. That number is not a unified concept is one of the main lessons from Corbett (2000). In the formal semantics literature, plural operators are most commonly identified with $*$-operators (Link (1983)), which pluralize predicates. But $*$-operators cannot be responsible for the plurality of 1st or 2nd person pronouns. Plural pronouns typically refer not to pluralities of speakers or hearers, but to groups including speakers or hearers[28]. This property of plural 1st and 2nd person pronouns suggests that there is a feature available for pronouns that shares properties with associative or group plurals[29], as proposed in Moravcsik (2003) and Cysouw (2003). Cysouw (2003)

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[28] .   Benveniste (1966), Zwicky (1977), Noyer (1992), Moravcsik (2003), Corbett (2000), Cysouw (2003), Siewierska (2004), and many others.

[29] .   See Nakanishi & Tomioka (2004) for a discussion of associative plurals in Japanese.

remarks that "a much better approach for the analysis of pronominal paradigms is to talk about group marking instead of plural marking"[30]. There could be a pronominal feature [*group*], then, whose semantics might look as follows:

(44)   Group feature

$$[[[group]]]^{g,c} = \lambda x. \text{ the group of x for c}$$

The feature [*group*] maps individuals to their groups, that is, to contextually determined pluralities containing those individuals[31]. The pronoun *we* could then denote the group of the speaker(s), and the plural form of *you* could refer to the group of the hearer(s) in a given context. As is, the semantics of [*group*] does not guarantee that plural *you* excludes speakers. Nor does it guarantee that the pronoun {[*group*], [1st]}, which should correspond to exclusive *we*, excludes hearers. Exclusion conditions of this kind are likely to be pragmatic effects, as argued in Krifka (2005). In languages that have exclusive *we*, for example, {[*group*], [1st]} is likely to exclude hearers because it contrasts with {[*group*], [$1^{st}+2^{nd}$]}, which includes them.

Syntactically, [*group*] could appear in two places within a DP while preserving interpretability. It might project in the syntax and attach above D. In that case, we get a fully productive associative plural, as in Japanese or Hungarian. But [*group*] could also not project in the syntax and directly combine with [1st], [2nd], [$1^{st}+2^{nd}$], or an index feature within a single feature structure. Having

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[30] .   Cysouw (2003), 72.

[31] .   The groups are determined by the utterance context c, but that doesn't imply that all the group members must be present in c. To highlight that difference, I wrote "groups for c" in (44). The definition could be stated better in a situation semantics, where it becomes clear that the groups are usually present in the evaluation situation, rather than in the utterance situation. I opted for the simpler framework to make the proposal more widely accessible.

denotations of type <et>, descriptive features cannot combine with [*group*]. The assumption that [*group*] might not project in the syntax, but might directly combine with other features in the same feature structure explains the otherwise puzzling fact that there are many languages that have associative plurals for 1st and 2nd pronouns without using associative plurals otherwise[32].

If [*group*] combines with [$1^{st}+2^{nd}$], we get an inclusive 1st person pronoun whose feature structure corresponds to the unordered set of features {[*group*], [*sum*], [1st], [2nd]}. The features in this set can semantically compose in exactly three ways:

(45)   a.   The common group for you and me: [*group*] ([*sum*] ([1st], [2nd]))

      b.   The sum of you and my group: [*sum*] (([*group*] ([1st])), [2nd])

      c.   The sum of me and your group: [*sum*] (([*group*] ([2nd])), [1st])

In the absence of any hierarchical structure dictating a particular order for semantic composition, 1st person inclusive pronouns spelling out the feature combination {[*group*], [*sum*], [1st], [2nd]} should generally be able to refer to all three kinds of groups without feeling ambiguous. This seems to be the case, as far as I know. No language should have pronouns that distinguish meanings (a), (b), and (c), then.

We still seem to need number features like [*singular*], [*dual*], and some such. Those features might very well have the traditional presuppositional denotations, as illustrated in (46).

(46)   Number features

a.   [[[*singular*]]]^{g,c} = λx: x is an atom. x

[32] .   See Moravcsik (2003) for discussion of this issue.

b.   [[[*dual*]]] ^{g,c} = λx: x consists of two atoms. x

That associative or group plurals are different from 'ordinary' plurals is argued in Corbett & Mithun

(1996) and Corbett (2000) with evidence from Central Pomo and Central Alaskan Yup'ik, a language

spoken in south-western Alaska. In Yup'ik, for example, the associative morpheme -*nku*- and the

number morphemes -*k* (dual) and -*t* (plural) are realized separately.

(47)   a.   cuna-nku-k
                   Chuna-associate-dual
                   Chuna plus one associate

        b.   cuna-nku-t
                   Chuna-associate-plural
                   Chuna plus two or more associates

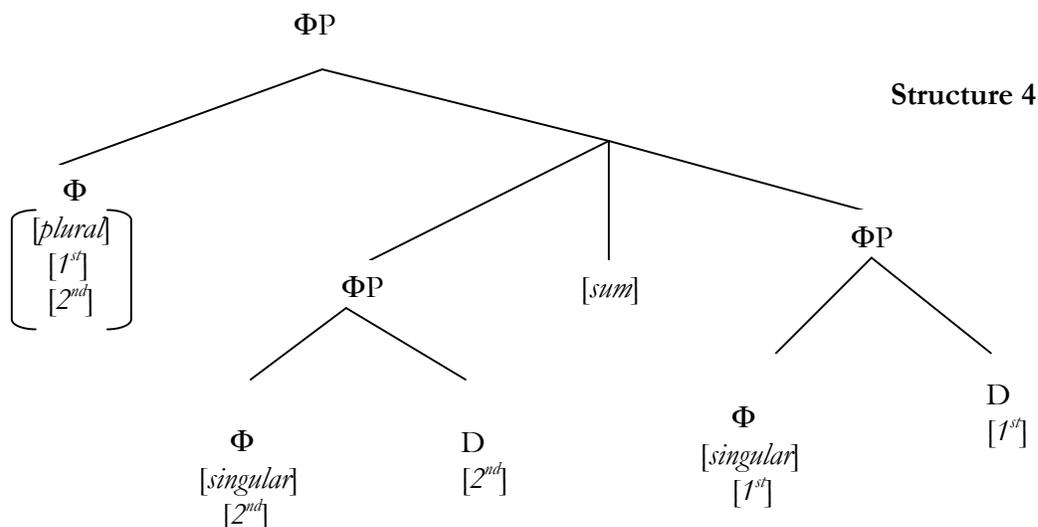   Corbett (2000), 109.[33]

The Yup'ik data also show that number features attach outside of group features. They are already

part of phrasal syntax, then. They might in fact belong to special Φ-feature projections that appear

above all DPs and negotiate agreement relations, as proposed in Sauerland (2003, 2005). We could

have structures of the following kind:
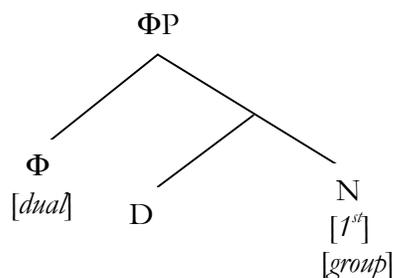
Structure 3

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[33] .   I added the glosses and the translations according to the descriptions given by Corbett.

Sauerland notes that **Φ**-heads seem to be needed to regulate agreement for conjoined DPs. From the current perspective, the **Φ**- projections for the phrase *you and I* might look as in Structure 4:

Structure 4

```
                        ΦP
         _____/    _____
        Φ                               \
    ⎡[plural]⎤                           ΦP
    ⎢ [1st] ⎥                  ___/  |  \___
    ⎣ [2nd] ⎦                 /      |      \
                            ΦP     [sum]     ΦP
                          _/  \_          _/    \_
                         /      \        /        \
                        Φ        D      Φ          D
                   [singular]  [2nd]  [singular]  [1st]
                     [2nd]                [1st]
```

Given its particular **Φ**-projection, the DP *you and I* should behave like *we* with respect to verbal agreement, and this is the right result: in languages with more elaborate verbal paradigms, subjects corresponding to *you and I* tend to trigger 1st person plural verbal agreement.

The person and gender features of **Φ**-projections cannot be interpreted on our account, and they would therefore have to be copied from their original positions after semantic interpretation has taken place, possibly after the syntax proper[34]. On the other hand, cardinal number features like [*singular*] or [*dual*] are in principle interpretable, and may therefore head **Φ**-projections from the very start. Sauerland assumes that the feature [*plural*] denotes the unrestricted identity function of type <ee>, hence has a completely trivial denotation. Alternatively, [*plural*] might be merely

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[34] . Bobaljik (forthcoming), Embick & Noyer (forthcoming).

"ornamental", to use a term from Embick & Noyer (forthcoming))[35]. We could then say that [*singular*] must appear with all 1st or 2nd person pronouns, provided they lack [*group*] or [*sum*], and may optionally appear with '3rd person' pronouns. Assuming that number features are obligatory and there is no dual, [*plural*] would be inserted in the absence of [*singular*], possibly postsyntactically[36]. If [*plural*] does not affect semantic interpretation, the semantic plurality of a '3rd person' pronoun derives from the initial cumulativity of descriptive features, and is not the result of a pluralization operation.

To summarize the discussion of plural features, I have proposed two features that participate in the construction of plural pronouns *per se*: The sum operation, which maps sets of individuals to their sum, and the group operation, which maps individuals to a contextually determined group containing them. The features I called "number" features have a different syntactic status: they are part of **Φ**- projections that appear with all DPs. Their role is to negotiate agreement relations with **Φ**- projections of other constituents, and we therefore expect them to play a pivotal role for feature transmission. While the features that make up an initial pronoun are all meaningful, the features in its **Φ**- projection needn't be. Those features could have been copied from other positions, or they might have been inserted as ornamental features during spell-out.

The most distinctive property of the proposed feature system is that different kinds of features can have denotations of different semantic types, which allows for a non-trivial combinatorics of

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[35] .   However, Ussery (2006) uses facts about partial control to argue that [*plural*] is not merely ornamental, but has the function to map groups that are construed as atoms to the sum of all individuals realizing the group.

[36] .   This proposal is not necessarily incompatible with Kratzer (forthcoming). Ornamental [*plural*] in the **Φ**- projection of a DP might agree with another instance of ornamental [*plural*] in the **Φ**- projection of its sister predicate. That [*plural*] might appear in the **Φ**- projection of the predicate because the predicate was pluralized via Link's *-operator.

features. The definiteness feature can only combine with descriptive features, for example. Group

and sum features only combine with features of type e. In the end, all pronouns must be Ds with

denotations of type e, and features can combine in whatever way to reach that goal. Here is an

overview of the different kinds of features that participate in making a pronoun on the current

account.

Table 1

Feature	Semantic type
Index features	e
Descriptive features	<et>
Definiteness feature	<<et>e>
Participant features	e
Group feature	<ee>
Sum feature	<e<ee>>

Our feature system determines a non-trivial range of possible pronoun paradigms. If any feature

combination that produces a D with a denotation of type e defines a possible pronoun, the set of all

possible pronouns gives us the most differentiated possible pronoun paradigm. This is a paradigm

without syncretism. Table 2 displays such a paradigm. I should add a few qualifications. Table 2

neglects irrelevant distinctions that our system makes in principle available: combinations with index

features and distinctions triggered by different descriptive features. I picked feminine representatives

for '3rd person' pronouns. I also factored in the possible semantic contributions of [*singular*]. The

resulting eight distinctions correspond piece by piece to the eight distinctions argued for in Cysouw

(2003) on the basis of a very detailed investigation of person marking paradigms.

[*singular*] [*1st*]	Refers to the speaker.	1
[*singular*] [*2nd*]	Refers to the hearer.	2
[*singular*] [*def*] [*fem*]	Refers to a single female.	3
[*sum*] [*1st*] [*2nd*]	Refers to the sum of speaker(s) and hearer(s): minimal inclusive.	1+2
[*group*] [*sum*] [*1st*] [*2nd*]	Refers to a group including speaker(s) and hearer(s) and possibly non-participants: augmented inclusive	1+2(+3)
[*group*] [*1st*]	Refers to a group including speaker(s) and possibly non-participants: augmented exclusive	1(+3)
[*group*] [*2nd*]	Refers to a group including hearer(s) and possibly non-participants.	2(+3)
[*def*] [*fem*]	Refers to one or more females.	3(+3)

Table 2. Most differentiated paradigm

According to Cysouw, languages that instantiate all eight distinctions are relatively frequent among the world's languages[37]. The range of possible person marking paradigms are obtained from the most differentiated one by syncretism. The German system of personal pronouns emerges through neutralization of all distinctions between non-singular pronouns containing [*1st*], for example. In Standard English, the distinction between singular and non-singular 2nd person pronouns is neutralized as well. Cysouw (2003) shows that many of the possible paradigms that can be generated from the one in table 2 by neutralization are actually attested. Ultimately, we want to explain why certain types of syncretism are rare or might be altogether unviable, but this is another project[38].

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[37] .   Cysouw (2003), section 4.5.2

[38] .   There is a question, for example, whether there are any languages that neutralize the distinction between 2+3 and 1+2+3. Harley & Ritter (2002) argue against Zwicky (1977) and Noyer (1992) that there are such languages. It seems that English generic *you* also neutralizes that

Knowledge about the space of possible paradigms should be an invaluable tool for the acquisition of actual pronoun paradigms. If a set of features determines a single most differentiated paradigm, which in turn generates a space of possible paradigms via neutralization of distinctions, all a language learner might have to do, is wipe out distinctions that conflict with the evidence she encounters and evaluate the viability of the resulting paradigm. The equipment she would have to bring to the task would be a small set of designated interpretable features, a handful of syntactic and semantic criteria telling her what legitimate feature combinations are, and some general guidelines evaluating the viability of whole paradigms.

The system of pronominal features in table 2 allows languages to have up to six different non-compound pronouns that include [*1st*] or [*2nd*] person features, but interestingly, it doesn't provide 1st person pronouns that must refer to pluralities of speakers, or 2nd person pronouns that must refer to pluralities of hearers. It's not that you cannot refer to such pluralities with one of the available pronouns. The combinations ([*group*] [*1st*]) and ([*group*] [*2nd*]) could pick them out, assuming that in the limiting case, the group of a plurality of speakers or hearers might coincide with those speakers or hearers themselves. Neither one of those pronouns has to refer to pluralities of speakers or hearers, however. They both allow 3rd parties as members of the groups they refer to. In languages without [*singular*], even [*1st*] or [*2nd*] alone might refer to pluralities of speakers or hearers. But both of those pronouns can also be used to refer to just one speaker or hearer. There should be no

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distinction, but from the current perspective, no conclusions can be drawn as long as we do not know how person features are used in the compositional derivation of the meanings of generic pronouns.

language, then, that has pronouns that exclusively refer to pluralities of speakers or to pluralities of hearers. The prediction is correct, as observed in Moravcsik (1978) and much subsequent work[39].

To sum up this section, I have suggested that we should abandon the widely accepted idea that all pronominal features denote partial identity functions. I pointed out that on that analysis, it would be hard to see how the semantics of pronominal features could play a significant role in determining the range of possible pronoun paradigms in natural languages. The more restrictive and more interestingly interactive semantics of features proposed here leads to a plausible typology of possible pronouns and pronoun paradigms, and it also makes non-trivial predictions about which features a Minimal Pronoun can or cannot be born with. Those predictions are vital for the current project and are the centerpiece of the following section.

4.   Deriving fake indexicals

The investigation of pronominal features in the previous section has provided a possible answer to one of the most pressing questions raised by the Minimal Pronoun approach: Why is it that a Minimal Pronoun must be born with an incomplete set of features? The answer I proposed is that pronouns are D's that need to have denotations of type e, and not all pronominal features produce such denotations when combined with an index feature, the essential core of any Minimal Pronoun. When an index feature combines with a descriptive feature, for example, it produces a truth-value (or proposition), hence not a possible pronoun meaning, or else it is understood as a non-restrictive modifier, which yields an illicit combination with a variable. Minimal Pronouns must be born without descriptive features, then. On the other hand, semantically combining an index feature with

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[39] .   See also Zwicky (1977), Greenberg (1988), Noyer (1992), Cysouw (2003), Siewierska (2004), Wechsler (2004).

[*group*] or [*sum*] creates denotations of type e, hence it should be possible for Minimal Pronouns to start out with [*group*] or [*sum*]. This is the case. In fact all the apparently problematic examples discussed in Rullmann (2004) and Heim (2005) seem to involve [*group*] or [*sum*] in one way or other. Rullmann's and Heim's original examples mostly have 1st or 2nd person pronouns in attitude context, however. Since those pronouns might be logophoric, and are then not necessarily Minimal Pronouns requiring a local antecedent, I will try to produce the relevant pronoun constellations with possessive pronouns that are known to be able to connect to subject or object DPs via chains of local agreement relations.

That bound variable pronouns can have interpretable [*group*] features is shown in (48):

(48)   Only I mentioned **our** audiovisual capabilities.

Suppose (48) is part of my report on a SALT business meeting where offers for hosting next year's SALT conference were solicited and discussed. SALT is not hosted by individuals, but by whole departments, so what I said with my utterance on the intended reading can be paraphrased roughly as 'I was the only person x such that x mentioned the audiovisual capabilities of x and her group'. If Minimal Pronouns couldn't be born with [*group*], (48) and its kin would be serious problems, as observed in Rullmann (2004)[40]. It would be hard to see how to derive the correct interpretation or pronunciation for such sentences.

If Minimal Pronouns can be born with certain features already in place, we expect there to be explicit guidelines regulating which features they have to have from the start, and which ones they can acquire via feature transmission. A bigger sample of cases has to be investigated to reach firm

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[40] .   See also the related discussion in Schlenker (2003b).

conclusions on this matter, but interface constraints like those in (49) seem initially plausible, and might serve as working hypotheses.

(49)   Interface constraints for pronouns
    a.   A pronoun is born with the minimal number of features that produces the intended interpretation.

    b.   A pronoun acquires the maximal number of features that leads to a unique pronunciation.

(49) requires a maximum of initial underspecification and a maximum of feature transmission for pronouns. 49(a) is a version of Reinhart's Rule I (Reinhart (1983)), which gives bound variable pronouns a privileged role. On the Minimal Pronoun approach, the privileged role derives from maximal initial underspecification. Maximizing initial underspecification is a desirable design feature since it cuts down on feature clashes and unsuccessful unifications. 49(b) maximizes feature transmission. Maximizing feature transmission helps with optimizing the representation of agreement relationships. The more features are shared between a pronoun and its antecedent, the easier it is to detect anaphoric relations in the output.

(49) determines that the Minimal Pronoun in (48) must start out as [$_D$ [*group*] [*n*]], neglecting the possessive feature. The [*group*] feature is needed to obtain the intended interpretation. The structure [$_D$ [*group*] [*n*]] is not yet pronounceable, though, assuming vocabulary insertion rules for English personal pronouns like those in (50):

(50)   Vocabulary insertion rules for English possessive pronouns[41]:

$[poss]$ $[1^{st}]$ $[singular]$	$\rightarrow$	*my*
$[poss]$ $[1^{st}]$ $([2^{nd}])$	$\rightarrow$	*our*
$[poss]$ $[2^{nd}]$	$\rightarrow$	*your*
$[poss]$ $[female]$ $[singular]$	$\rightarrow$	*her*
$[poss]$ $[male]$ $[singular]$	$\rightarrow$	*his*
$[poss]$ $[thing]$ $[singular]$	$\rightarrow$	*its*
$[poss]$ $[plural]$	$\rightarrow$	*their*

Assuming that English DPs require number marking and that a possibly ornamental [*plural*] feature has to appear with **Φ**- heads whose sister node contains [*group*], [$_D$ [*group*] [*n*]] grows into

[$_\Phi$ [*plural*] [$_D$ [*group*] [*n*]]] during spell-out. In this form, the pronoun is still not pronounceable, hence has to acquire additional features via an agreement chain leading to a suitable antecedent.

How does a Minimal Pronoun find its antecedent? Suppose that all index features that are D's, hence pronominal, must be bound by matching index features that function as binders, along the lines of Heim & Kratzer (1998)[42]. Following Kratzer (2004), let us assume furthermore that binder indices come bundled with verbal functional heads, **ν** or C, for example. Finally, suppose that all indexed verbal inflectional heads enter the derivation with all their **Φ**-features in place[43]. Those features must then be checked in a local configuration since they are uninterpretable. This could

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[41] .   The vocabulary insertion rules in (50) are simplifications. We also have to make sure that if a gender feature appears with 1st or 2nd person possessive pronouns, there is no spell-out conflict, and the result is still pronounced as *my, our, your* respectively. To guarantee this, the optional presence of gender features must be mentioned in the insertion rules for 1st and 2nd person pronouns.

[42] .   That binders are features has been proposed in Adger & Ramchand (2005).

[43] .   Verbal functional heads that are not indexed can acquire their **Φ**-features via Agree, as proposed in Chomsky (2000, 2001).
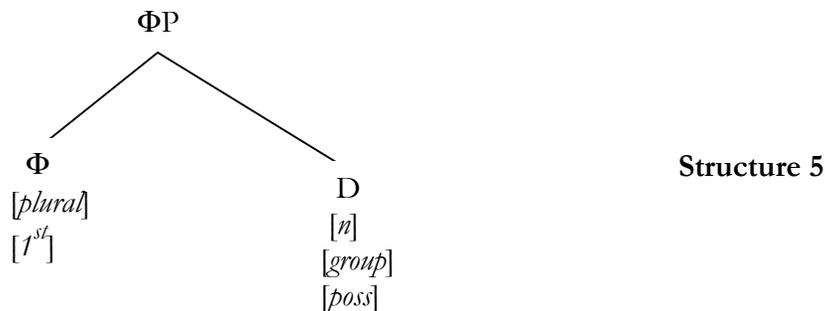
force the presence of an agreeing DP in the head's specifier position[44]. If that DP is referential, it is the 'ultimate' source of a Minimal Pronoun's Φ-features. We call it the pronoun's "antecedent". Agreement chains get longer when the agreeing DP is itself a Minimal Pronoun that must be bound by a binder index introduced by a coindexed higher verbal inflectional head[45]. In the many variations of Partee's sentence that I used as experimental items, the closest possible binder for the possessive in the relative clause was the embedded v. Assuming locality for binding relations, the possessive must be bound by that v if indeed it is a Minimal Pronoun. If v binds, it has to be indexed. It must then enter the derivation fully inflected and can therefore transmit Φ-features to a Minimal Pronoun in its domain. To check its uninterpretable features, v must agree with the subject argument it introduces. In our examples, that subject argument was a relative pronoun, hence itself a Minimal Pronoun that needed to be bound. The rest of the story depends on the analysis of relativization that I cannot pursue here. Be this as it may, we now understand why the availability of bound variable readings for the embedded possessives in our test sentences depended on agreement with the embedded verb.

Returning to (48), the pronoun we are building can, and in fact must, inherit a 1st person feature from its antecedent. It cannot acquire its antecedent's number feature, since this would make it unpronounceable. Assuming that features are always transmitted to Φ- projections, the result is structure 5. Given (50), the pronoun surfaces as *our*.

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[44] . Thanks to David Adger and Peter Svenonius for suggesting this scenario.

[45] . This process of forming agreement chains is discussed more fully in Kratzer (in preparation).

```
                    ΦP
                   ╱  ╲
                  ╱    ╲
                 ╱      ╲
                Φ        D
            [plural]    [n]                    **Structure 5**
             [1ˢᵗ]     [group]
                       [poss]
```

The interface principle 49(a) has interesting consequences for cases like (51)[46]:

(51)   We each love **our** children.

On the reading we are interested in, (51) conveys that each of us loves his or her own children. Observing (49), the Minimal Pronoun in (51) would have to start as a mere index, because that would be the minimal representation that guarantees the intended interpretation. The same interpretation could also be achieved if the pronoun was born as [$_\Phi$ [*singular*] [$_D$[*n*]]], hence with a number feature that restricts the individuals quantified over to singularities. But this restriction is unnecessary for obtaining the intended interpretation, since *each* already restricts quantification to singularities. The pronoun now has to acquire both a person and a number feature via an agreement chain leading to *we*. The result is again *our*. If the pronoun had been allowed to start out with a [*singular*] feature and had had the option to just acquire a person feature, the resulting pronunciation would have been *my*, the wrong result.

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[46] .   To complete the picture, we would also have to look at cases like (i) (thanks to Hotze Rullmann (p.c.) for raising this issue):

(i)   Each of us love**s our** children.

The possessive *our* in (i) can have a bound variable interpretation even though the closest verb is *loves*, rather than the expected *love*. However, this is again an area where we see a lot of variation across different dialects of English: instead of *loves*, *love* can be used in (i) in certain dialects. This suggests that we are dealing with a 'late' spell-out phenomenon, here, too.

Schlenker (2003b), Rullmann (2004) and Heim (2005b) discuss a class of examples that, from the current perspective, show that Minimal Pronouns can be born with a [*sum*] feature. Here is a variation of one of Rullmann's examples. Imagine my using (52) to address a group of former students at a reunion.

(52)   You each remember **our** first appointment.

On the intended reading, (52) can be paraphrased as 'each of you is an x such that x remembers the first appointment of x and me.' In this case, there is no antecedent that could provide even a 1st person feature. Following Higginbotham (1983) and Sportiche (1985), Rullmann uses set indices to represent the intended interpretation in such cases. (52) could be formalized as (52'), then:

(52')   You each λx. x remembers the first appointment of {x, I}.

Set indices have a wider application and are commonly used for bound variable pronouns with split antecedents, as in (53).

(53)   Each of the cats chased each of the dogs before **they** curled up with each other.

We can replicate the effect of set indices with the help of [*sum*]. To represent the reading of (52) we are interested in, the Minimal Pronoun would have to start out as $[_{D}$ [*sum*] [1st] [*n*]]. The presence of [*sum*] triggers the insertion of ornamental [*plural*] during spell-out. After acquiring [2nd] from its antecedent, the Minimal Pronoun is spelled out as *our*.

Continuing with the student reunion scenario, imagine now that one of the assembled former students talks to me, uttering (54)[47]:

(54)   We each remember **our** first appointment.

In those examples, the Minimal Pronoun has to start out as [$_D$ [*sum*] [2nd] [*n*]] on the intended interpretation, which can be paraphrased as 'each of us is an x such that x remembers the first appointment of x and you.' As before, the presence of [*sum*] triggers insertion of ornamental [*plural*] during spell-out. If we left it at that, the result would be pronounced *your*. But 49(b) guarantees that the pronoun must acquire a 1st person feature from its 1st person plural antecedent. The result is again *our*, which is right.

While index features can in principle combine with participant features on the current account, those combinations could never be the source of run-of-the mill fake indexicals like that in (55):

(55)   Only I understand **my** talk.

The source for the fake indexical in (55) has to be a pronoun with the structure in 56(a), and could never be one with the structure in 56(b).

(56)   a.   [$_D$ [*n*]]
         b.   [$_D$ [*sum*] [1st] [*n*]]

56(b) does not give us the intended interpretation and would furthermore have to be spelled out as *we*. Singular fake indexicals cannot be born with person features, then. If they end up looking like ordinary 1st or 2nd person pronouns, they must have acquired their person feature via feature

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[47] .   This is an example of the kind discussed in Heim (2005).

transmission at a stage where the presence of that feature can no longer have an impact on semantic interpretation.

To sum up this section, I have explored the consequences of the feature system proposed in section 3 for fake indexicals. The system predicts a number of rather 'baroque' types of fake indexicals to be possible, in particular those that Rullmann (2004) and Heim (2005) thought to be major problems for the Minimal Pronoun approach. When the [*group*] feature combines with an index feature or the [*sum*] feature joins an index feature and a participant feature, we create configurations of partial binding[48] that allow feature transmission from an antecedent. Initial and transmitted features combine to determine the pronoun's pronunciation using the same vocabulary insertion rules that are also used to spell-out referential pronouns. We saw that there are a number of different pronoun building strategies that all converge on a single output, the possessive *our*, for example.

5.   Fake indexicals as windows into the properties of bound variable pronouns

Let us return to the question posed at the beginning of this paper: How come referential and bound variable pronouns often look the same? The answer I suggest is that the architecture of the phonological spell-out component implies that feature combinations that include an index feature are typically spelled out in exactly the same way as the same feature combination without index feature.

(57)   Index features appearing with other features are typically ignored in the phonological spell-out of pronouns.

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[48] .   Ussery (2006) argues that the phenomenon of partial control results from such a configuration.

In Distributed Morphology, (57) follows from the Subset Principle under the assumption that natural languages typically lack vocabulary items that target the presence of index features. With the possible exception of reflexives, there don't seem to be such vocabulary items in English or German, for example. Consequently, a person who knows when to use, say, referential *we* or *our* does not have to be taught how to spell out the complex bound variable pronouns in the examples I have been discussing in this section, even if she encounters such pronouns for the first time in her life. From the current perspective, the phenomenon of pronominal ambiguity is largely a product of phonological spell-out.

Languages are known to have pronouns that cannot have bound variable interpretations. Typically, demonstrative pronouns fall in this category, like Japanese *kare* (Noguchi (1997), Elbourne (2005)).

(58) a. * Daremo$_i$-ga **kare**$_i$-no hahaoya-o aisite-iru.
Everyone-NOM he-GEN mother-ACC love-PRES
'Everyone$_i$ loves his$_i$ mother.'

b. John$_i$-ga **kare**$_i$-no hahaoya-o aisite-iru.
John-NOM he-GEN mother-ACC love-PRES
'John$_i$ loves his$_i$ mother.'

Noguchi (1997), 770.

If demonstrative meaning components correspond to descriptive features, hence denote properties, our semantics for pronominal features dictates that a bound variable pronoun cannot be born as a demonstrative. Whether or not a bound variable pronoun can surface with a descriptive feature depends on the universal or language particular inventories of Φ-features. Crucially, if a particular descriptive feature is not a possible Φ-feature, it can never be transmitted to a Minimal Pronoun under our current assumptions, and we should therefore never encounter a bound variable pronoun with such a feature. In contrast to the gender feature of *he*, the demonstrative feature of *kare* might

not be a possible **Φ**-feature, hence cannot be passed on via agreement relations. Elbourne (2005)

observes that *kare* can be used as a D-type pronoun, as shown in (59), and proposes to analyze *kare*-

DPs as "bland" definite descriptions[49]. This is the expected analysis, given the account of

pronominal features in section 2.

(59)   Musuko-ga iru   dono hito-mo   kare-no   atarasii syasin-o
        Son-NOM exists which person-even he-GEN new   photo-ACC

        motteiru.
        has-PRES

        'Every person who has a son$_i$ has a new photo of him$_i$.'

        Elbourne (2005), 164.

In contrast to demonstrative features, honorific features are possible **Φ**-features and can trigger

agreement. If they can, we expect the pronouns that surface as honorific pronouns to be capable of

taking on bound variable interpretations. This is so for the German sentence (60), for example[50].

(60)   Nur **Sie**   versorg**en**   **Ihre** Kinder.   √
        Only you.**HON** take care of.1PL/3PL/**2HON** your.**HON** childtren
        'Only you (polite) are taken care of your (polite) children.'

With '3rd person' pronouns, we have to be careful to separate true instances of bound variable

pronouns from instances of descriptive (or "D-type" pronouns[51]) that may look like bound variable

pronouns, but involve quantification over situations. Quantification over situations often mimics

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[49] .   Elbourne (2005), 163.

[50] .   I am indebted to Chris Potts p.c. for bringing up the topic of honorifics with bound variable
interpretations.

[51] .   The term is due to Neale (1990) and is used in Elbourne (2002, 2005). To implement the D-
type strategy, we would have to switch to a situation-based semantics (Kratzer 1989), and adjust the
semantics of features accordingly.

quantification over individuals[52], and this creates the illusion that the constraints for Minimal Pronouns do not apply to 3rd person pronouns.

(61)   None of those men was on vacation when the boss asked you where **he** was.

In (61), *he* is far away from any potential antecedent and does not occur in a logophoric context. Yet a bound variable reading is readily available. On, the current account, we have to invoke the D-type strategy in this case. There are a couple of problems to overcome with such an assessment, however. The D-type strategy is usually taken to be unavailable for pronouns that are c-commanded by their antecedents. But in (61), *he* IS c-commanded by its antecedent. While tacitly assumed[53], the 'no c-command' requirement for D-type pronouns has never been argued for on empirical grounds. The ban on c-command seems hard to maintain, given that a full-fledged definite description can replace the pronoun *he* in (62) without taking away the apparent bound variable reading.

(62)   None of those men was on vacation when the boss asked you where **the man** was.

If a definite description can produce an apparent bound variable interpretation in (62), there is no reason why D-type pronouns couldn't. On the other hand, given the interface constraint 49(a), D-type pronouns are expected to be excluded from any position where a Minimal Pronoun might occur without change in interpretation. Descriptive pronouns are born with a full set of features, hence are not an option when a pronoun that is to receive a bound variable interpretation is close enough to an antecedent to inherit features from it. We therefore do not expect *his* in 63(a) to be a D-type pronoun. Not surprisingly, the position of *his* in 63(a) is also not a position where a full-

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52 .   Berman (1987), Heim (1990), Elbourne (2002, 2005), and many others.

53 .   The 'no c-command' requirement is explicitly stated in Neale (1990).

fledged definite description could mimic a bound variable reading. In 63(b), *the man* can only refer to a contextually salient man.

(63)   a.   None of those men visited **his** daughter.

       b.   None of those men visited **the man's** daughter.

Another potential obstacle for my invoking the D-type strategy in cases where apparent '3rd person' bound variable pronouns violate the constraints for Minimal Pronouns comes from the work of Paul Elbourne. Elbourne (2001, 2002, 2005) has argued that D-type pronouns have more structure than my analysis of descriptive pronouns seems to provide. More specifically, he argued that D-type pronouns contain elided NPs that contribute descriptive contents that are richer than those that could be produced by a limited inventory of descriptive features[54]. However, on the current approach, nothing speaks in principle against descriptive pronouns that contain elided NPs. There might very well be pronouns that are born as (64), for example:

(64) $[_D \ [\mathit{def}] \ [_{NP} \ [\mathit{fem}] \ \Delta \ ] \ ]$

Since the elided NP is a predicate, hence denotes a property, it can combine with a descriptive feature via Predicate Conjunction. If the elided NP is complex and contains a relational predicate, it may even contain an index feature that is bound from outside and triggers feature transmission. Spell-out should be unaffected by all of this, since elided material does not make any claims on pronunciation.

I conclude that '3rd person' pronouns make bad test items when we want to find out about the properties of bound variable pronouns. We have to make sure that the apparent bound variable

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[54] .   Wiltschko (2002) shows that Halkomelem independent pronouns can contain elided NPs.

readings we are after aren't being produced by the D-type strategy. I suspect that it is largely due to the binding illusions created by the D-type strategy that the locality constraints for bound variable pronouns have gone unrecognized to the present day. Bound variable pronouns always seemed anomalous in allowing unconnected distant antecedents. This anomaly has now gone away. A bound variable pronoun is as good an anaphor as any. It needs to be connected to its antecedent by an unbroken agreement chain. True long distance relations between operators and variables might not exist. Spell-out noise and strategies creating the illusion of variable binding fooled us into thinking that they do.

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