The disunity of Principle B Effects

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Abstract

It is a typologically well-attested generalization that simple personal pronouns are avoided when the purpose is to signal semantic identity between coarguments of a predicate (Faltz, 1985; Comrie, 1999; Levinson, 2000; Haspelmath, 2008, forthcoming; Volkova & Reuland, 2014). Many linguists assume what I call the Unified View, where these pronoun disjointness effects come out as a byproduct of a single syntactic constraint, generally known as Principle B of the Binding Theory (Chomsky, 1981, 1986; Pollard & Sag, 1994; Manning & Sag, 1998; Pollard, 2005; Müller, 2021). This paper argues that the Unified View is mistaken because it is both too weak and too strong. As an alternative, I propose that pronoun disjointness effects stem from a conspiracy of three distinct factors – none of which is a syntactic universal: (i) a preference for expressing identity with coindexation rather than anchoring distinct indices to the same referent (Reinhart, 1983); (ii) a language-specific variant of HPSG's Principle B; and (iii) a constraint on the morphosyntactic encoding of reflexive relations (Faltz, 1985; Reinhart & Reuland, 1993; König & Siemund, 2000).

1   Introduction

It is a typologically well-attested generalization that languages that have dedicated reflexives and personal pronouns (p-pronouns) consistently avoid the latter when the purpose is to signal semantic identity between coarguments of a predicate (Faltz, 1985; Comrie, 1999; Levinson, 2000; Huang, 2000; Haspelmath, 2008, forthcoming; Volkova & Reuland, 2014; Varaschin, 2021). Let us call these patterns Pronoun Disjointness Effects (PDEs). The examples in (1) illustrate the phenomenon in English:

(1)   a.   *Susan$_1$ praised her$_1$.
        b.   *Marta$_1$ voted for her$_1$.
        c.   *Every actor$_1$ talks about him$_1$ all the time.
        d.   *No actress$_1$ seems to defend her$_1$.
        e.   *Joanne$_1$ forgot to include her$_1$ in the guest list.

HPSG follows Mainstream Generative Grammar (MGG) in the assumption that PDEs receive an explanation in terms of Principle B of the Binding Theory. The following is a standard statement of Principle B, where the concept of BINDING is understood as implying coindexation and some notion of syntactic rank (e.g. c-command) (Chomsky, 1981; Pollard & Sag, 1994).

(2)   PRINCIPLE B: A p-pronoun is not bound in a local syntactic domain.

However, in addition, many practitioners of MGG also seem to accept what I call the UNIFIED VIEW: the assumption that something like Principle B is both UNIVERSAL and SUFFICIENT to explain the full range of PDEs found across languages (Chomsky 1981, 1995; Fiengo & May 1994, i.a.).[1]

HPSG, in turn, has been largely silent about the validity of the Unified View. This paper attempts to break the silence by arguing that the Unified View should not be adopted within HPSG, given that it is both TOO WEAK (i.e. it fails to predict real PDEs) and TOO STRONG (i.e. it predicts PDEs where there are none). As an alternative, I propose that PDEs stem from a conspiracy of three distinct factors – none of which is a syntactic universal:

(i) A preference for expressing semantic identity between NPs with coindexation rather than by anchoring distinct indices to the same referent.

(ii) A language-specific variant of HPSG's Principle B.

(iii) A constraint on the morphosyntactic encoding of reflexive relations (Faltz, 1985; Reinhart & Reuland, 1993; Comrie, 1999).

The paper is organized as follows. Section 2 argues that the Unified View is too weak by presenting a class of well-known PDEs that Principle B fails to predict. Section 3 sketches what an HPSG account of such cases might look like in the form of a principle called Coindexing Preference. Section 4 discusses some of the reasons why the Unified View may be considered too strong – in particular, the fact that it fails to account for languages like Brazilian Portuguese, Middle English, Frisian and French, where the binding of p-pronouns seems to depend on semantic properties of predicates, rather than on a purely syntactic notion of locality. Section 5 argues that such languages can be accounted for within HPSG by depriving Principle B of its universal status and positing a separate constraint which is sensitive to the semantics sorts of the relations encoded by particular words.

2   The Unified View is too weak

The Unified View is TOO WEAK because Principle B, however we decide to state it, inevitably fails to predict semantic disjointness in cases where disjointness is clearly enforced. If Principle B is formulated as a restriction against local coreference for p-pronouns – as in some prominent expositions of the Binding Theory (Jackendoff, 1972; Chomsky, 1995) – PDEs like (3), which involve non-referential antecedents will be left unexplained.

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[1]Over the years, there have been several attempts to derive Principle B from more principled assumptions such as constraints on movement, principles of agreement or economy conditions on chains (Burzio 1989; Menuzzi 1999; Hornstein 2001; Kayne 2005; Chomsky 2008; Hicks 2009; Rooryck & Vanden Wyngaerd 2011). These proposals still count as instances of the Unified View insofar as they accept that there is a single unified cause underlying PDEs which is universal and syntactic in nature.

(3) *{No actress$_1$ / Every actress$_1$} hates her$_1$.

For this reason, it widely recognized the kind of identity which is governed by Principle B should not be at the level of real-world reference, but, rather, at the level of discourse representation or logical syntax (Pollard & Sag, 1994; Reinhart, 2006; Reuland, 2011). HPSG incorporates this insight by stating its own version of Principle B as a constraint against the identity of INDEX values among members of a single ARG-ST list (Pollard & Sag, 1994; Manning & Sag, 1998; Pollard, 2005; Müller, 2021):

(4) PRINCIPLE B:
     A p-pronoun is not coindexed with any of its local o-commanders.[2]

Indices lead a double life within the HPSG formalism. On the one hand, they encode grammatically relevant information that enters into agreement. This is specified as part of the grammar signature, which declares the features PERS, NUM and GEND appropriate to objects of the sort *index* The abbreviated structure in (5) shows that the INDEX value is what express the information that the p-pronoun *her* is 3rd person, singular and feminine:

(5)
$$
\begin{bmatrix}
\text{PHON} & \langle her \rangle \\
\text{SYNSEM|LOC} & \begin{bmatrix}
\text{CAT} & \begin{bmatrix}
\text{HEAD} & \begin{bmatrix} noun \\ \text{CASE} \quad acc \end{bmatrix} \\
\text{SPR} & \langle \rangle \\
\text{COMPS} & \langle \rangle
\end{bmatrix} \\
\text{CONTENT} & \begin{bmatrix}
ppro \\
\text{INDEX} & \begin{bmatrix} index \\ \text{PER} \quad 3rd \\ \text{NUM} \quad sing \\ \text{GEND} \quad fem \end{bmatrix} \\
\text{RELS} & \langle \rangle
\end{bmatrix}
\end{bmatrix}
\end{bmatrix}
$$

On the other hand, HPSG indices also play a semantic role, which is analogous to that of individual variables in first-order logic (Copestake et al., 2005; Koenig & Richter, 2021). In (6), for example, the index 1, which is shared between the reflexive and its antecedent, also fills in the two argument

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[2]Ancillary definitions are given below (Pollard & Sag 1994, 253-4):

(i) Let Y and Z be *synsem* objects with distinct LOCAL values, Y referential.
     a. Y LOCALLY O-COMMANDS Z *iff* Y is less oblique than Z.
     b. Z is LOCALLY BOUND by Y iff Z is locally o-commanded by Y and Z and Y are coindexed.

roles of the elementary predication introduced by the verb *hates*.

(6) Every actress$_1$ hates herself$_1$

$$
\begin{bmatrix}
\textit{headed-phrase} \\
\text{HD-DTR}|\text{ARG-ST} \quad \langle \text{NP}_{\boxed{1}}, \text{NP}[\textit{refl}]_{\boxed{1}}\rangle \\[2pt]
\text{CONTENT}|\text{RELS} \quad
\left\langle
\begin{bmatrix}
\textit{every-rel} \\
\text{LBL} \quad \boxed{2} \\
\text{ARG0} \quad \boxed{1} \\
\text{RSTR} \quad \boxed{3} \\
\text{BODY} \quad \boxed{4}
\end{bmatrix},
\begin{bmatrix}
\textit{actress-rel} \\
\text{LBL} \quad \boxed{3} \\
\text{ARG0} \quad \boxed{1}
\end{bmatrix},
\begin{bmatrix}
\textit{hate-rel} \\
\text{LBL} \quad \boxed{4} \\
\text{ARG1} \quad \boxed{1} \\
\text{ARG2} \quad \boxed{1}
\end{bmatrix}
\right\rangle
\end{bmatrix}
$$

Also like variables in predicate logic, different indices can be assigned or anchored to the same real-world referent. This kind of non-injective mapping from indices to referents can be illustrated with Pollard & Sag's (1994, 72) example in (7) (coreference is signaled by placing NPs in italics):

(7) *The senate*$_1$ just voted *itself*$_1$ another raise. Most of *them*$_2$ were already overpaid to begin with.

In (7) we have a plural index that is part of the CONTENT value of the pronoun *them* picking out the same referent as the singular index that is part of the CONTENT value of *the senate* and *itself*. This mode of achieving coreference is established on purely pragmatic grounds, subject to general anchoring conditions specified by the grammar (Pollard & Sag, 1994).

Given the existence of cases like (7), HPSG's purely index-based Principle B does not rule out the possibility of p-pronouns coreferring with local o-commanding NPs as well as long as token-identity of indices is not involved. This seems to be a particularly useful way to understand why coreference is possible in (8) (Reinhart, 1983; Pollard & Sag, 1994; Heim, 1998):

(8) a. *I*$_2$ dreamt that *I*$_2$ was *Elaine Stritch*$_1$ and *I*$_1$ kissed *me*$_2$.
     b. How can you doubt that *the speaker*$_1$ is *Amy*$_2$? *She*$_1$ praises *her*$_2$ to the sky.
     c. *Sara*$_1$ said that only *she*$_1$ voted for *her*$_2$.

Since p-pronouns in (8) are not coindexed with their local antecedents, coreference is correctly not excluded by Principle B, which merely requires nonidentity of indices. However, for this same reason, we need some other principle to explain why coreference with local o-commanding NPs is not acceptable *in general* – e.g. why we don't get it in neutral contexts like (9):

(9) a. *I_1 kissed *me*$_2$.
     b. *Amy_1 praises *her*$_2$.
     c. *$Sara_1$ voted for *her*$_2$.

3 A solution: Coindexing Preference

The fact that Principle B cannot explain why semantic identity is ruled out in (9), entails that the Unified View is too weak – i.e. it fails to predict cases of disjointness attested in English, as well as in other languages (Noguchi, 1993). To my knowledge, an account of this has not been explicitly proposed in the HPSG literature (but see Pollard & Sag (1994, 74) for some hints).

Some authors within MGG argue that the contrast between (8) and (9) is due to an economy principle that establishes a preference for encoding semantic identity in structural terms (e.g. via syntactic binding) over inferring it on the basis of contextual cues (Reinhart, 1983; Grodzinsky & Reinhart, 1993; Krifka, 2018). I propose something similar for HPSG:

(10)   COINDEXING PREFERENCE:
       Let X and Y be *synsem* objects with distinct INDEX values. X cannot corefer with Y if replacing the INDEX value of Y with the INDEX value of X yields an indistinguishable interpretation.

The basic idea is that speakers should not opt for anchoring distinct indices to the same referent unless there is a clear interpretive motivation for not using a plain coindexed structure – i.e. if there is some specific interpretive effect attainable solely by a non-coindexed variant. This is arguably a consequence of Levinson's (2000) MANNER PRINCIPLE:

(11)   MANNER PRINCIPLE:
       Avoid prolix, obscure or marked expressions without reason.

Coindexed structures are *less ambiguous* (and, thus, *less obscure*) than non-coindexed ones because they can only be interpreted as expressing semantic identity. Non-coindexed structures, in turn, have a broader range of possible interpretations: they can convey semantic identity as well as disjoint reference. The only reason for expressing coreference *without* coindexing (given that expressing coreference *with* coindexing is generally clearer) is if there is some interpretive justification for using an extra index.

In Pollard & Sag's example in (7), each index signals a different mode of individuation in virtue of the distinct anchoring conditions the grammar of English associates with the features *sing* and *plur*. These anchoring conditions may be stated in the form of implicational constraints (Meurers, 2000):

(12) $\left[\text{CONTENT}|\text{INDEX} \quad \boxed{1}\left[\text{NUM} \quad sing\right]\right] \Rightarrow \left[\text{CONTEXT}|\text{BACKGR} \quad \left\{\left[\begin{array}{l}non\text{-}aggregate\text{-}rel \\ \text{ARG0} \quad \boxed{1}\end{array}\right]\right\}\right]$

(13) $\left[\text{CONTENT}|\text{INDEX} \quad \boxed{2}\left[\text{NUM} \quad plur\right]\right] \Rightarrow \left[\text{CONTEXT}|\text{BACKGR} \quad \left\{\left[\begin{array}{l}aggregate\text{-}rel \\ \text{ARG0} \quad \boxed{2}\end{array}\right]\right\}\right]$

The distinct modes of individuation conveyed as background assumptions

by each type of index may justify using singular and plural to pick out the same referent, as long as the referent in question is one that can be conceptualized simultaneously as an aggregate and as a non-aggregate entity. This is the case for *the senate* and other collective-denoting NPs.

In contexts where using a new index for an old referent can be justified on interpretive grounds, there is nothing stopping p-pronouns from coreferring with locally o-commanding NPs. This is precisely what happens in (8).

In (8-a) and (8-b), each index is associated with a different *descriptive relation* or *guise* via the BACKGR(OUND) attribute. In (8-a), index 1 represents its referent under the Elaine Stritch guise and 2 as the dream counterpart of the speaker (Lakoff, 1972; Safir, 2004). In (8-b), index 1 represents the referent as *the speaker* and 2 represents it as the bearer of the name *Amy* (Heim, 1998). The following is an abbreviated structure for the latter example:

$$(14) \quad \begin{bmatrix} \textit{headed-phrase} \\ \text{HD-DTR}|\text{ARG-ST} \quad \langle \text{NP}_{\boxed{1}}, \text{NP}[\textit{ppro}]_{\boxed{2}} \rangle \\[2em] \text{CONTENT}|\text{RELS} \quad \left\langle \begin{bmatrix} \textit{praise-rel} \\ \text{LBL} \quad \boxed{3} \\ \text{ARG1} \quad \boxed{1} \\ \text{ARG2} \quad \boxed{2} \end{bmatrix} \right\rangle \\[4em] \text{CONTEXT}|\text{BACKGR} \quad \left\{ \begin{bmatrix} \textit{speaker-rel} \\ \text{LBL} \quad \boxed{4} \\ \text{ARG0} \quad \boxed{1} \end{bmatrix}, \begin{bmatrix} \textit{name-rel} \\ \text{LBL} \quad \boxed{5} \\ \text{ARG0} \quad \boxed{2} \\ \text{NAME} \quad \textit{Amy} \end{bmatrix} \right\} \end{bmatrix}$$

The non-coindexed structure in (8-c) is also not interpretively equivalent to a coindexed one, since different properties are ascribed to Sara in each of these cases. The non-coindexed structure ascribes the property in (15-a), while a coindexed one would ascribe (15-b):

(15) a. $\lambda x.\ x$ voted for y (where y is contextually anchored to Sara)
      b. $\lambda x.\ x$ voted for x

These two properties yield distinct truth-conditional effects in the presence of the focus-sensitive operator *only* (Rooth, 1992). Saying that Sara is the sole possessor of the property in (15-a), which is conveyed by a non-coindexed ARG-ST, entails that Sara received a total of one vote. This is compatible with a scenario with other people voted for themselves. If a coindexed structure were used, (15-b) would ascribed to Sara, given that the two argument roles of the predicate would be filled by the same index. The resulting structure would entail that Sara is the only self-voter. This is compatible with a situation where other people also voted for Sara. Since the non-coindexed structure is not interpretively equivalent to the coindexed one in this case, (10) does not rule out coreference in the former (Heim, 1998).

None of these differences in interpretation between coindexed and non-coindexed structures exist in neutral contexts like (9). Therefore, Coindexing Preference correctly predicts PDEs to emerge in these cases. If we assume r-expressions introduce fresh indices by default, Coindexing Preference also goes a long way in deriving Principle C effects along with many exceptions to Principle C (Grodzinsky & Reinhart, 1993; Varaschin et al., in press).

4 The Unified View is too strong

The idea that a syntactic Principle B exhausts the range of disjointness effects involving p-pronouns is also TOO STRONG: i.e. it predicts semantic disjointness for p-pronouns where we see none. The excessive restrictiveness of the Unified View can be illustrated with data from the dialect of Brazilian Portuguese (BP) spoken in the states of São Paulo and Minas Gerais. I will specifically look at the behavior of the 3SG p-pronouns *ele* ('him') and *ela* ('her') as it is reported in previous theoretical and experimental literature (Moreira da Silva, 1983; Galves, 1986; Menuzzi, 1999; Grolla, 2011; Grolla & Bertolino, 2011; Lacerda et al., 2014; Varaschin, 2021).

First, note that *ele/ela* have all of the characteristics independently ascribed to p-pronouns (Zribi-Hertz, 1995; Safir, 2004; Reuland, 2011). They can be used as demonstratives (16) and with non-local antecedents (17):

(16) Dê o livro pra ele_1, pra ela_2 e pra ele_3. [pointing gestures]
give the book to him to her and to him
'Give the book to him_1, to her_2 and to him_3.'

(17) Nenhuma $atriz_1$ disse [que o Pedro odeia ela_1].
no actress said that the Pedro hates her
'No $actress_1$ said that Pedro hates her_1.'

Furthermore, in (18), p-pronouns in BP exhibit PDEs just like their English counterparts would in similar environments:

(18) a. *O $Paulo_1$ viu ele_1.
the Paulo saw him
'$Paulo_1$ saw him(self)$_1$.'
b. *A $Sara_1$ esqueceu de elogiar ela_1 na festa.
the Sara forgot to praise her in-the party
'$Sara_1$ forgot to praise her(self)$_1$ at the party.'
c. *A Amy_1 bateu primeiro $nela_1$, depois nos outros.
the Amy hit first on-her, then on-the others
'Amy_1 hit her(self)$_1$ first, then other people.'
d. *O $Pedro_1$ não depreciou ele_1 na festa.
the Pedro not disparaged him in-the party
'$Pedro_1$ didn't disparage him(self)$_1$ at the party.'

e. *Todo político$_1$ fica reclamando dele$_1$ o tempo todo.
   every politician stayed complaining of-him the time all
   'Every politician$_1$ complains about him(self)$_1$ all the time.'

The problem, however, is that slight modifications of (18) make binding by a local coargument fully acceptable, in violation of Principle B:

(19) a. O Paulo$_1$ viu ele$_1$ no espelho.
         the Paulo saw him in-the mirror
         'Paulo$_1$ saw him(self)$_1$ in the mirror.'
      b. A Sara$_1$ esqueceu de incluir ela$_1$ na lista de convidados.
         the Sara forgot to include her in-the list of guests
         'Sara$_1$ forgot to include her(self)$_1$ in the guest list.'
      c. A Amy$_1$ pensa primeiro nela$_1$, depois nos outros.
         the Amy thinks first on-her, then on-the others
         'Amy$_1$ thinks of her(self)$_1$ first, then of others.'
      d. O Pedro$_1$ não reconheceu ele$_1$ na foto.
         the Pedro not recognized him in-the photo
         'Pedro$_1$ didn't recognize him(self)$_1$ in the photo'.
      e. Todo político$_1$ fica falando dele$_1$ o tempo todo.
         every politician stays talking of-him the time all
         'Every politician$_1$ talks about him(self)$_1$ all the time.'

The first set of data in (18) suggests that BP p-pronouns are subject to a disjointness constraint of some sort. However, the subsequent examples in (19) show that this constraint cannot be Principle B as it applies to English, since the latter incorrectly rules out instances of local binding that are acceptable in BP. This presents a major puzzle for the Unified View, which attempts to reduce all PDEs to a single syntactic constraint, which is supposed to be universal and apply in the same way in different languages.[3]

We see similar patterns in several other languages. The examples below provide illustrations of similar contrasts in French (Pica, 1984; Zribi-Hertz, 1995), Middle English (Faltz, 1985; Peitsara, 1997; van Gelderen, 2000) and Frisian (Reinhart & Reuland, 1993; Rooryck & Vanden Wyngaerd, 2011):[4]

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[3] The explanation for why semantic identity is possible in (19) cannot be coreference-without-coindexing (as suggested for (8) above) for two main reasons: (i) it can involve non-referential antecedents (cf. (19-e)), and (ii) unlike what we saw in (8), the examples in (19) do not require any special motivating context. See Varaschin (2021) for more.

[4] The fact that we find counterexamples to Principle B in these particular languages also undermines competition-based theories of anaphora (Burzio, 1989; Menuzzi, 1999; Safir, 2004; Hicks, 2009). These approaches are more flexible than the standard Binding Theory because they allow locally bound p-pronouns whenever anaphors are not available as alternative ways to express semantic identity. The problem for them is that BP, French, Middle English and Frisian all have dedicated anaphors which could be used in contexts like (19)/(21)/(23)/(25) with no relevant difference in meaning: *ele mesmo* in BP, *lui-même* in French, *hymself* in Middle English and *himsels* in Frisian (Varaschin, 2021).

(20) a. *Pierre$_1$ bavarde   avec lui$_1$.
          Pierre is.chatting with him
          'Pierre$_1$ is talking to him(self)$_1$.'
      b. *Pierre$_1$ est jaloux de lui$_1$.
          Pierre is jealous of him
          'Pierre$_1$ is jealous of him$_1$.'

(21) a. Jean$_1$ parle souvent de   lui$_1$.
          Jean often talks   about him
          'Jean$_1$ often talks about him(self)$_1$.'
      b. Pierre$_1$ est fier   de lui$_1$.
          Pierre is proud of him
          'Pierre$_1$ is proud of him(self)$_1$.'

(22) a. *Hie$_1$ forseoth hie$_1$.
          he   despises him
          'He$_1$ despises him(self)$_1$.'
      b. *He$_1$ hynge   hym$_1$.
          he   hanged him
          'He$_1$ hanged him(self)$_1$.'[5]

(23) a. He$_1$ cladde   hym$_1$ as a poure laborer.
          he   dressed him   as a poor laborer
          'He$_1$ dressed him(self)$_1$ as a poor laborer.'
      b. He$_1$ repentyd hym$_1$.
          he   repented him
          'He$_1$ repented (himself$_1$).'

(24) a. *Max$_1$ hatet him$_1$.
          Max   hates him
          'Max$_1$ hates him(self)$_1$.'
      b. *Willem$_1$ bewûnderet him$_1$.
          Willem admires   him
          'Willem$_1$ admires him(self)$_1$.'

(25) a. Max$_1$ wasket him$_1$.
          Max   washes him
          'Max$_1$ washes him(self)$_1$.'
      b. Jack$_1$ fielde him$_1$ fuortglieden.
          Jack felt   him slip-away
          'Jack$_1$ felt him(self)$_1$ slip away.'

There is no syntactic generalization that distinguishes the good and bad cases of local binding in these languages in a general way. Rather, the difference seems to be related to a semantic property of the predicates that

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[5]The judgments in (22) are hypotheses motivated by the unexpected absence of locally bound *hym* with these kinds of predicates in corpora (Faltz, 1985; Peitsara, 1997).

p-pronouns contribute their INDEX values to – e.g. the difference between *reclamar* ('complain') and *falar* ('talk') in the BP contrast below:

(26)   a. *Todo político₁ fica **reclamando** dele₁ o tempo todo.
       every politician stayed complaining of-him the time all
       'Every politician₁ complains about him(self)₁ all the time.'
       b. Todo político₁ fica **falando** dele₁ o tempo todo.
       every politician stays talking of-him the time all
       'Every politician₁ talks about him(self)₁ all the time.'

This suggests that PDEs in these languages are not the product of Principle B, but of some principle which is sensitive to non-syntactic properties of predicates (Zribi-Hertz, 1995; Menuzzi, 1999; König & Siemund, 2000).

5   A solution: Constraint on Reflexive Relations

The simplest solution involves to the problem mentioned in the previous section involves (i) abandoning the idea that p-pronouns in BP, French, Middle English and Frisian abide by Principle B; and (ii) explaining PDEs in these languages with a constraint over non-syntactic aspects of *word* objects.

The first step in this solution implies rejecting the assumption that Principle B is a syntactic universal, which lies at the heart of the Unified View. In this spirit, we can regard Principle B as a language-specific implicational constraint on the ARG-ST values of predicative words, as in (27):

(27) $\begin{bmatrix} word \\ \text{ARG-ST} \quad list \oplus \langle \text{NP}[ppro] \rangle \end{bmatrix} \Rightarrow \begin{bmatrix} word \\ \text{ARG-ST} \quad \langle \text{NP}_{\boxed{1}}(, \text{NP}_{\boxed{2}}) \rangle \oplus \langle \text{NP}[ppro]_{\neg\boxed{1} \wedge \neg\boxed{2}} \rangle \end{bmatrix}$

The effect of (27) is to prohibit sharing the INDEX values of p-pronoun complements with any o-commanding coarguments. This syntactic constraint is operative in English. Languages like BP, Middle English, Frisian and French, however, simply they lack (27) as a constraint on their *word* objects. The cases where locally bound p-pronouns are *not* acceptable in these languages are handled by a constraint which is sensitive to the CONTENT values of *word* objects – i.e. a semantically-based constraint:

(28)   CONSTRAINT ON REFLEXIVE RELATIONS (CRR):
       If the CONTENT|RELS value of a *word* object W contains a reflexive relation R and R is stereotypically non-reflexive, then W must be reflexive-marked, where
       (i) R is reflexive iff the values for two ARG attributes of R are structure-shared;
       (ii) W is reflexive-marked iff a member of W's ARG-ST is NP[*refl*].

The notion of stereotypical non-reflexivity invoked by (28) comes from

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functionalist work on anaphora (Faltz, 1985; Comrie, 1999; Levinson, 2000; König & Siemund, 2000; Ariel, 2008; Haspelmath, 2008). It is based on the intuition that reflexive interpretations are less expected for some predicative words (e.g. *hit*, *jealous*, *hate*) than for others (e.g. *dress*, *proud*, *shave*). Like other kinds of stereotypes, stereotypes about non-reflexivity are arguably product of inductive regularities in speakers' experience of the world: e.g. people experience less often self-directed instances of actions like *hitting* than of actions like *dressing* (Levinson, 2000).

These stereotypes are also plausibly reflected in frequency of reflexive use: words that introduce stereotypically non-reflexive relations like *jealous* and *hang* occur less frequently with reflexive arguments (signaling reflexive readings) than other words like *proud* or *dress* (Haspelmath, 2008; Ariel, 2008; Bouma & Spenader, 2008). This is confirmed by the following data:

	Non-reflexive Pronoun	Reflexive Pronoun
jealous	41 (100%)	0 (0%)
proud	212 (84%)	39 (16%)

Table 1: Reflexive *vs.* non-reflexive readings in the British National Corpus (adapted from Haspelmath 2008, 47)

	Non-reflexive Pronoun	Reflexive Pronoun
hit	109 (99.1%)	1 (0.09%)
dress	4 (6.2%)	60 (93.7%)

Table 2: Reflexive *vs.* non-reflexive readings in the Longman Spoken American Corpus (adapted from Ariel 2008, 231-232)

I assume that stereotypically non-reflexive relations (*st-nref-rel*) and their complement (*nst-nref-rel*) form a sortal hierarchy, similar to the one used in the linking theory of Davis & Koenig (2000). The following is partial representation of this hierarchy, based on what we have seen so far:[6]

(29)

---
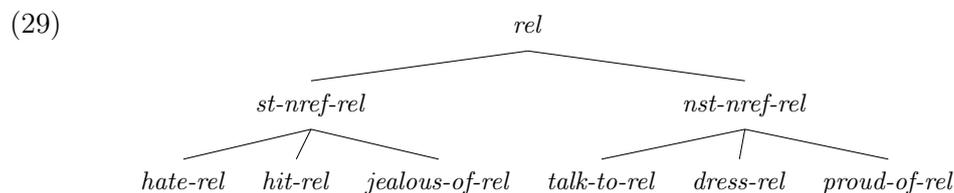
[6]Though the CRR is plausibly universal, I leave open the possibility that some aspects of this hierarchy (e.g. what relations wind up being subsorts of *st-nref-rel* or *nst-nref-rel*) may be language-specific. There is some reason to believe that grooming relations like *dress-rel* and *shave-rel* are not subsorts of *nst-nref-rel* in BP (Varaschin, 2021, 349).

Given this, we can state the CRR more formally as the following implicational constraint (where $\bigcirc$ is the shuffle relation).[7]

(30)
$$\begin{bmatrix} word \\ \\ \text{CONTENT|RELS} \quad \left\langle \begin{bmatrix} st\text{-}nrefl\text{-}rel \\ \text{ARG1} \quad \boxed{1} \\ \text{ARG2} \quad \boxed{1} \end{bmatrix} \right\rangle \end{bmatrix} \Rightarrow \begin{bmatrix} word \\ \text{ARG-ST} \quad list \; \bigcirc \; \langle \text{NP}[refl]_{\boxed{1}} \rangle \end{bmatrix}$$

The CRR is similar to the Reflexivity Condition B of Reinhart and Reuland's (1993) Reflexivity Theory. Unlike Reinhart & Reuland's principle, however, the CRR should not be seen as a primitive feature of UG, but as a consequence of a universal pragmatic principle that associates unmarked forms with stereotypical interpretations (Levinson, 2000, 37):

(31)   INFORMATIVENESS PRINCIPLE:
        What is expressed simply is stereotypically exemplified.

The idea is that, since p-pronouns are simple unmarked forms (in contrast to reflexives), (31) motivates an inference to a stereotypical interpretation for each word in whose ARG-ST p-pronouns occur. This means that if a non-reflexive interpretation is stereotypical for a *word* object W, p-pronouns, *qua* unmarked forms, will trigger an inference to a non-reflexive interpretation for W. The only way to signal that W is to be interpreted reflexively in such cases is by resorting to specialized reflexive-marking. A reflexive NP acts as a marked form which blocks the inference to the non-reflexive stereotype.

The BP, French, Middle English and Frisian structures in (32), repeated from earlier examples, are ruled out by the CRR because the words in boldface all introduce stereotypically non-reflexive relations (*complain-rel*, *jealous-of-rel*, etc.) without being appropriately reflexive-marked:

(32)   a. *Todo político$_1$ fica **reclamando** dele$_1$ o tempo todo.
            every politician stays complain of-him the time all
        b. *Pierre$_1$ est **jaloux** de lui$_1$.
            Pierre is jealous of him
        c. *He$_1$ **hynge** hym$_1$.
            he hanged him
        d. *Max$_1$ **hatet** him$_1$.
            Max hates him

For such cases, the effects of the CRR are indistinguishable from those of Principle B. Differences between the two constraints emerge in contexts where CRR predicts exemption from the disjointness requirement. The CRR

---

[7]Note that since (30) employs the shuffle relation, NP[*refl*] can occupy any position in the ARG-ST list. What prevents a reflexive like *himself* from occupying the position that gets mapped to SUBJ is its specification for accusative case (Pollard & Sag, 1994, 262).

gives us basically two logically possible scenarios where a locally bound p-pronoun may be acceptable in languages lacking Principle B:

(33)   a.   When the *rel* introduced by the word in whose ARG-ST the p-pronoun appears is not stereotypically non-reflexive.

           b.   When the *rel* introduced by the word in whose ARG-ST the p-pronoun appears is not reflexive.

The scenario in (33-a) covers the following kinds of cases:

(34)   a.   Todo político$_1$ fica **falando** dele$_1$ o tempo todo.
               every politician stays talking of-him the time all

           b.   Pierre$_1$ est **fier** de lui$_1$.
               Pierre is proud of him

           c.   He$_1$ **cladde** hym$_1$ as a poure laborer.
               he dressed him as a poor laborer

           d.   Max$_1$ **wasket** him$_1$.
               Max washes him

The relations introduced by the predicates in boldface (*talk-to-rel*, *proud-of-rel*, *dress-rel* and *wash-rel*) are not stereotypically non-reflexive. Therefore, they do not satisfy the antecedent of the constraint (30) and are exempt from the reflexive-marking requirement expressed in the consequent.

The CRR also allows local binding of p-pronouns whenever the relation encoded by word where the p-pronoun appears as an argument is not reflexive to begin with (cf. (33-b)). This happens in raising to object structures, which imply a mismatch between the syntactic locality of ARG-ST lists and the semantic locality of the relations expressed as the CONTENT|RELS values of words (Reinhart & Reuland, 1993). This allows us to predict the following BP and Frisian examples:

(35)   a.   O Roberto$_1$ imaginou ele$_1$ casado.
               the Roberto imagined him married
               'Roberto$_1$ imagined him(self)$_1$ married.'

           b.   Jack$_1$ fielde him$_1$ fuortglieden.
               Jack felt him slip-away
               'Jack$_1$ felt him(self)$_1$ slip away.'

Even though the p-pronouns and their antecedents in (35) are in a local relationship with respect to the ARG-ST of the matrix verb, they carry indices that contribute to separate semantic relations: *marry-rel* in (35-a) and *slip-away-rel* in (35-b). This is made clear in the simplified structure in (36), which depicts the CONTENT value for (35-a). Since BP and Frisian lack the purely ARG-ST-based Principle B we see in English, these examples are predicted to be fine: there is no reflexive relation in need of reflexive-marking.

(36)
$$
\begin{bmatrix}
\text{INDEX} & \boxed{3} \\[2ex]
\text{RELS} & \left\langle
\begin{bmatrix}
\textit{name-rel} \\
\text{LBL} & \boxed{2} \\
\text{ARG0} & \boxed{1} \\
\text{NAME} & \textit{Roberto}
\end{bmatrix},
\begin{bmatrix}
\textit{imagine-rel} \\
\text{LBL} & \boxed{4} \\
\text{ARG1} & \boxed{1} \\
\text{ARG2} & \boxed{5}
\end{bmatrix},
\begin{bmatrix}
\textit{married-rel} \\
\text{LBL} & \boxed{5} \\
\text{ARG0} & \boxed{1}
\end{bmatrix}
\right\rangle
\end{bmatrix}
$$

Something similar goes on in cases where the meaning of the p-pronoun is not identical to that of its antecedent, but is shifted to denote a representational proxy of the latter (Jackendoff, 1992; Safir, 2004; Varaschin, 2020).[8] This is what happens in the BP example (37), where *ele* ('him') is interpreted as a visual image of Pedro, as the structure in (38) makes clear:

(37) O Pedro$_1$ não reconheceu ele$_1$ na foto.
the Pedro not recognized him in-the photo
'Pedro$_1$ didn't recognize him(self)$_1$ in the photo'.

(38)
$$
\begin{bmatrix}
\text{ARG-ST} & \langle \text{NP}_{\boxed{1}}, \text{NP}_{\boxed{1}} \rangle \\[2ex]
\text{CONTENT}|\text{RELS} & \left\langle
\begin{bmatrix}
\textit{recognize-rel} \\
\text{LBL} & \boxed{3} \\
\text{ARG1} & \boxed{1} \\
\text{ARG2} & \boxed{2}
\end{bmatrix},
\begin{bmatrix}
\textit{proxy-rel} \\
\text{LBL} & \boxed{4} \\
\text{IMAGE PROXY} & \boxed{2} \\
\text{REPRESENTED} & \boxed{1}
\end{bmatrix}
\right\rangle
\end{bmatrix}
$$

Since the object NP in (37) receives a proxy reading, it no longer contributes its literal meaning to the relation that corresponds to the verb. Rather, the verb comes to express a relation between Pedro and his image proxy.

This is also what happens in the infinitival VP in (39):

(39) A Joana$_1$ esqueceu de incluir ela$_1$ na lista de convidados.
the Joana forgot to include her in-the list of guests
'Joana$_1$ forgot to include her(self)$_1$ in the guest list.'

---

[8]Proxy readings are semantically distinct from the guise reading of the first person pronoun in (8-a) (Safir, 2004, 114-118), repeated below with the guise NP in boldface:

(i)   I dreamt that I was Elaine Stritch and **I** kissed me.

Guise readings occur when an NP is interpreted as a person assuming the perspective of another while retaining some aspects of their own original identity: e.g. when speakers say (8-a)/(i), they are talking about *themselves-as-Elaine-Stritch*, rather than *Elaine Stritch* per se. Proxy readings, by contrast, do not preserve any kind of semantic identity relation between the normal meaning and the proxy meaning: i.e. the pronoun in (35) does not refer to *Pedro-as-an-image*, but to an *image of Pedro*. In other words, while a referent and its guise are still, in some sense, the same entity (one is a counterpart of the other), a proxy and the entity it represents are not. I express this difference by having the proxy and the entity it represents correspond to different indices in the CONTENT value. I assume that guises and their perspective-holders are identical in terms of CONTENT. I do not attempt to state the constructions responsible for proxy and guise readings in this paper.

(40)
$$\begin{bmatrix} \text{ARG-ST} & \langle \text{NP}_{\boxed{1}},\ \text{NP}_{\boxed{1}} \rangle \\ \\ \text{CONTENT}|\text{RELS} & \left\langle \begin{bmatrix} \textit{include-rel} \\ \text{LBL} & \boxed{3} \\ \text{ARG1} & \boxed{1} \\ \text{ARG2} & \boxed{2} \end{bmatrix},\ \begin{bmatrix} \textit{proxy-rel} \\ \text{LBL} & \boxed{4} \\ \text{NAME PROXY} & \boxed{2} \\ \text{REPRESENTED} & \boxed{1} \end{bmatrix} \right\rangle \end{bmatrix}$$

As the abbreviated structure for the infinitival VP in (40) makes clear, CONTENT|RELS value of *incluir* ('include') in (39) expresses a relation between Joana and a proxy of Joana (namely, *her name*). Given that there is no reflexive relation in semantics, no reflexive-marking is necessary either.

Since the CRR is grounded in the pragmatic INFORMATIVENESS PRINCIPLE, it should be universal (*pace* possible cross-linguistic variation regarding the hierarchy of semantic sorts in (29)). Something like the CRR does indeed seem to be a genuine source of invariance across the anaphoric systems of different languages (Levinson, 2000; König & Siemund, 2000; Haspelmath, 2008; Ariel, 2008; Volkova & Reuland, 2014). We even see some of its effects in English words that are exempt from syntactic Principle B.

This is the case of locative Ps (Reinhart & Reuland, 1993; Menuzzi, 1999). These words are exempt from Principle B because they have single-membered ARG-ST lists. However, in spite of this, they encode binary relations as their CONTENT|RELS value. A preposition like *over*, for example, expresses a relation *over-rel* that holds between a surface and an entity that is located above the surface. In typical cases, these relations are not interpreted reflexively:

(41)   Bobby$_1$ rolled the carpet over him$_1$.

(42)
$$\begin{bmatrix} \textit{headed-phrase} \\ \\ \text{HD-DTR}|\text{DTRS} & \left\langle \dots \begin{bmatrix} \text{SYNSEM}|\text{CAT} & \begin{bmatrix} \text{HEAD} & \textit{prep} \\ \text{ARG-ST} & \langle \text{NP}[\textit{ppro}]_{\boxed{1}} \rangle \end{bmatrix} \end{bmatrix} \dots \right\rangle \\ \\ \text{CONTENT}|\text{RELS} & \left\langle \begin{bmatrix} \textit{name-rel} \\ \text{LBL} & \boxed{4} \\ \text{ARG0} & \boxed{1} \\ \text{NAME} & \textit{bobby} \end{bmatrix}, \begin{bmatrix} \textit{carpet-rel} \\ \text{LBL} & \boxed{5} \\ \text{ARG0} & \boxed{2} \end{bmatrix}, \begin{bmatrix} \textit{roll-rel} \\ \text{LBL} & \boxed{6} \\ \text{ARG1} & \boxed{1} \\ \text{ARG2} & \boxed{2} \\ \text{ARG3} & \boxed{3} \end{bmatrix}, \begin{bmatrix} \textit{over-rel} \\ \text{LBL} & \boxed{3} \\ \text{ARG1} & \boxed{2} \\ \text{ARG2} & \boxed{1} \end{bmatrix} \right\rangle \end{bmatrix}$$

It is, however, possible for (at least some of) these locative relations to be interpreted reflexively. When the *word* object that corresponds to preposition does contain a reflexive relation among the values of CONTENT|RELS in a particular sentence, CRR predicts reflexive marking to be necessary. This prediction is in fact correct (Reinhart & Reuland, 1993, 687-8):

(43)   *Bobby rolled the carpet$_2$ over it$_2$.

(44)

$$
\begin{bmatrix}
\textit{headed-phrase} \\
\text{HD-DTR}|\text{DTRS} \quad \left\langle \ldots \begin{bmatrix} \text{SYNSEM}|\text{CAT} & \begin{bmatrix} \text{HEAD} & \textit{prep} \\ \text{ARG-ST} & \langle \text{NP}[\textit{ppro}]_{\boxed{2}}\rangle \end{bmatrix} \end{bmatrix} \ldots \right\rangle \\
\text{CONTENT}|\text{RELS} \quad \left\langle \begin{bmatrix} \textit{name-rel} \\ \text{LBL} & \boxed{4} \\ \text{ARG0} & \boxed{1} \\ \text{NAME} & \textit{bobby} \end{bmatrix}, \begin{bmatrix} \textit{carpet-rel} \\ \text{LBL} & \boxed{5} \\ \text{ARG0} & \boxed{2} \end{bmatrix}, \begin{bmatrix} \textit{roll-rel} \\ \text{LBL} & \boxed{6} \\ \text{ARG1} & \boxed{1} \\ \text{ARG2} & \boxed{2} \\ \text{ARG3} & \boxed{3} \end{bmatrix}, \begin{bmatrix} \textit{over-rel} \\ \text{LBL} & \boxed{3} \\ \text{ARG1} & \boxed{2} \\ \text{ARG2} & \boxed{2} \end{bmatrix} \right\rangle
\end{bmatrix}
$$

Note that (43) is not ruled out by Principle B (cf. (27)) because *over* has a single-membered ARG-ST where the NP[*ppro*] is not locally o-commanded by anything. The only principle that rules out (43) is the CRR.

6 Concluding Remarks

The phenomena examined throughout this paper strongly suggest that the disjointness effects typically attributed to Principle B do not stem from a single cause, thereby contradicting the Unified View. I proposed that the responsibility for accounting for PDEs across different languages should distributed into at least three independent factors:

(i) a preference for expressing semantic identity with coindexation;

(ii) a language-specific variant of Principle B (interpreted as an implicational constraint on *word* objects), and

(iii) a constraint on the morphosyntactic encoding of reflexive relations.

Unlike the traditional Principle B, none of these factors is a syntactic universal. (ii) is syntactic, but not universal. In fact, (ii) is probably learned on the basis of indirect negative evidence, such as statistical preemption – i.e. learners posit something like Principle B if they are consistently faced with positive evidence for other forms (e.g. reflexives) that occur in local binding contexts (Elbourne, 2005; Varaschin, 2021).[9] (i) and (iii) are plausibly universal, but they are not crucially syntactic. I suggested that (i) might be subsumed under Levinson's (2000) Manner Principle, which associates marked forms with marked meanings, and (iii) might be motivated by Levinson's (2000) Informativeness Principle, which associates unmarked forms with unmarked (i.e. stereotypical) meanings.

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[9]This provides a novel way to interpret the well-attested fact that children do not display robust adult-level knowledge of Principle B until the age of seven (Elbourne 2005; Hamann 2011; Baauw 2018). If the purely syntactic Principle B pattern we see in English has to be learned, it is not surprising that children might not know it at some point. Furthermore, if Principle B is posited on the basis of statistical preemption, we explain the absence of syntactic PDEs in languages that lack grammaticalized reflexives.

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