

Morphological transparency and the Delay of Principle B Effect[☆]

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Abstract

In L1 acquisition of English, Dutch, Russian, and Icelandic, children do not acquire Principle B until age 7–8, while in L1 acquisition of Italian, French, and German children no such delay is observed. This is the Delay of Principle B Effect (DPBE). Existing accounts of this contrast in terms of the clitic status of the relevant pronouns or their referential properties are unable to account for the dividing line between the languages with and without the DPBE. We relate the DPBE in language acquisition to the Absence of Principle B Effect (APBE) in the adult language. The APBE is the fact that cross-linguistically pronouns express reflexive meanings when dedicated reflexive pronouns are not available. The reason for this is that Principle B effects result from the competition between pronouns and dedicated reflexives. The delay in the acquisition of Principle B is accounted for by a delay in this competition taking effect. This delay is in turn caused by the morphological makeup of dedicated reflexive pronouns. Principle B will be acquired sooner, i.e. there will be no DPBE, when the internal morphological makeup of dedicated reflexives is more transparent. Only if dedicated reflexives are easily recognised as such in the course of acquisition will they compete with pronouns from the start. In such a case, there will be no developmental delay in the acquisition of Principle B. This approach allows us to correctly predict which languages do and which do not show the effect.

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1. Introduction

This paper proposes a novel analysis of the Delay of Principle B Effect in language acquisition, further specifying the proposal made in [Rooryck and Vanden Wyngaerd \(2011\)](#). The new approach is framed in terms of an analysis according to which pronouns and anaphors compete, and pronouns are ‘Elsewhere’ forms, usable for the expression of reflexive relationships when dedicated anaphors are absent. This competition between forms occurs post-syntactically, at the level of lexical insertion. Late insertion is assumed in several current frameworks, such as Distributed Morphology ([Halle and Marantz, 1993](#); [Harley and Noyer, 1999](#)), the Exoskeletal Model ([Borer, 2005a,b](#)), and Nanosyntax ([Starke, 2009](#); [Caha, 2009](#)). We extend this approach to the phenomenon of the Delay of Principle B in language acquisition. We argue that the dividing line between languages that do and that do not show the DPBE is best explained in terms of the rapid or delayed

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availability of competition between anaphoric and pronominal forms for the expression of reflexive relationships. If the competition is delayed, the acquisition of Principle B will likewise be delayed.

The paper is structured as follows. In section 2, we present the facts of the DPBE. In section 3, we present a new generalisation on the occurrence of the DPBE in terms of the internal morphological composition of reflexive pronouns in different languages. In section 4, we propose an approach to the distribution of anaphors and pronouns in terms of a principle of morphological transparency. Section 5 discusses a number of environments where the DPBE has been claimed to manifest itself differently. Section 6 concludes.

2. The Delay of Principle B Effect

The Delay of Principle B Effect refers to the fact that children acquire the target-like use of anaphors long before they do the target-like use of pronouns. In an initial stage of acquisition (around the age of two to three years, when pronouns and anaphors start to appear), children's performance on the pronoun-anaphor distinction is at chance level. Adult-like performance on anaphors follows fairly quickly, around the age of four years. In some languages, however, target-like performance on pronouns (i.e. Principle B) is significantly delayed, with children showing a non-target-like performance of pronouns until the age of eight years. The non-target-like behaviour with respect to pronouns concerns the fact that in children's grammars pronouns are ambiguous between a reflexive and a nonreflexive interpretation, as illustrated in (1), where children may interpret the pronoun *her* as referring either to Sally or to Sue:

- (1) Sue thinks that Sally saw her.

The developmental stages that children acquiring English as their first language go through are summarised in (2):

(2) English	STAGE 1 below 3	STAGE 2 3-8 yrs	STAGE 3 8 and older
reflexive meaning	her/herself	her + herself	herself
nonreflexive meaning	her/herself	her	her

Since adult English (stage 3 and later) does have the Principle B Effect, its delayed emergence in the course of acquisition is surprising.

Examples of languages for which the DPBE has been reported include English (Jakubowicz, 1984; Chien and Wexler, 1990; Wexler and Chien, 1985; Solan, 1987; Grodzinsky and Reinhart, 1993; Thornton and Wexler, 1999; McDaniel et al., 1990; McKee, 1992; McKee et al., 1993), Dutch (Koster, 1993; Sigurjónsdóttir and Coopmans, 1996; Philip and Coopmans, 1996), Icelandic (Sigurjónsdóttir and Hyams, 1992; Sigurjónsdóttir, 1992), and Russian (Avrutin and Wexler, 1992). However, not all languages show the effect. Thus, there is no Delay of Principle B Effect in Italian (McKee, 1992), French (Jakubowicz, 1984; Hamann et al., 1997; Hamann, 2002), Spanish (Padilla, 1990; Baauw et al., 1997), and Catalan (Escobar and Gavarró, 2001).¹ In Italian, for example, the pronoun *lo* 'him/it' cannot refer to the subject *Gianni*, neither for children nor for adults:

- (3) Gianni lo asciuga.
John him dries
'John dries him.'

Early proposals to account for the DPBE have claimed that, while they have target-like knowledge of all the Binding Principles at an early age, children fail to perform accurately on pronouns because pronouns can also acquire reference through other mechanisms, in particular through a pragmatic mechanism of coreference that is distinct from binding (see Reinhart, 1983a,b). A delay in the correct acquisition of this pragmatic mechanism would then be responsible for children's non-adult-like performance on pronouns (see e.g. Wexler and Chien, 1985; Chien and Wexler, 1990; Grodzinsky and Reinhart, 1993; Sigurjónsdóttir and Hyams, 1992). However, proposals framed in these terms typically have not attempted to explain the attested cross-linguistic variation with respect to Principle B, i.e. the split that we find between

¹ For some of these languages, delays in the acquisition of Principle B have been reported in certain constructions, like ECM constructions (see e.g. Baauw et al., 1997, 2011; Hamann et al., 1997). We return to this issue in section 5.2.

languages that show and those that do not show a delay in target-like performance on pronouns.² Such an explanation would need to postulate cross-linguistic variation in the acquisition of pragmatic principles, a far from obvious move.³

The absence of the Delay of Principle B Effect in some languages has been related to the fact that they have clitic pronouns (Cardinaletti and Starke, 1995; Baauw, 1999, 2002). Clitics display different syntactic behaviour from full nominal constituents, for example in having different word order, as opposed to the regular word order found with full noun phrases. For this reason, Baauw (1999) proposes the term Clitic Exemption Effect (CEE), arguing that the absence of the DPBE relates to the clitic status of the pronouns in the languages concerned. Discussion in the literature has centred on the question of what the relevant property is of clitic pronouns that exempts them from the DPBE. Some authors have argued that it is the movement property of clitics that is relevant, i.e. the fact that the clitic is visibly in another position than full noun phrases (e.g. McKee, 1992; Tamburelli, 2005; Di Sciullo and Agüero-Bautista, 2008). Others have maintained that the referential properties of clitics are different from those of full pronouns, and that it is this referential difference that gives rise to the DPBE (e.g. Avrutin and Wexler, 1992; Thornton and Wexler, 1999; Baauw et al., 1997).

A serious problem for the CEE is that a number of Germanic languages lack the DPBE despite not having clitics in the Romance sense. They include German (Ruigendijk, 2007) and Norwegian (Hestvik and Philip, 1996). An interesting minimal contrast is that between Dutch (DPBE) and German (no DPBE), since it is unclear how this contrast could be accommodated under the CEE hypothesis as currently formulated. We take this contrast to imply that the approach to the DPBE in terms of the CEE is flawed, and that a new analysis is called for. Before we present this new analysis, we present a generalisation that we believe correctly accounts for the cross-linguistic distribution of the DPBE.

3. The DPBE: a new generalisation

In this section we provide evidence for a generalisation concerning the cross-linguistic distribution of the DPBE. We believe the internal morphological structure of reflexives is crucial to an understanding of the DPBE. Kayne (2000) has argued that French pronouns of the *me/te/le/se* 'me/you/him/REFL' and *moi/toi/soi* 'me/you/self' paradigms are morphologically complex, with the first part *m-/t-/s-* indicating person, and the second part *-oi* indicating singular number. We shall adopt this idea, and furthermore argue that the DPBE can be linked to the internal structure of pronouns in the following way:

- (4) DPBE occurs iff person and number (and possibly, gender) are fused in the same morphological exponent in the dedicated reflexive form.

The 1P plural English pronoun *we*, for example, is fusional for person and number: no part of the pronoun can be argued to express just 1P, since *w-* and *-e* are absent from 1P singular pronoun *I*, and although *-e* does occur elsewhere in the paradigm (e.g. in *she, me*), it cannot be said to express plural number or 1P. A dedicated reflexive form is one that can only be used to spell out reflexive relationships, such as the 3P reflexive *zich* in Dutch:

- (5) Jan_i heeft zich_{ij*} gewassen.
 Jan has REFL washed
 'Jan washed himself.'

In contrast, non-dedicated reflexive forms can be used to spell out both reflexive and non-reflexive relationships, such as the 1P personal pronoun *me* 'me' in (6).

² An exception is Avrutin and Wexler (1992), who suggest that the findings of McKee (1992) on Italian can be explained by the fact that Italian clitic pronouns cannot be used deictically. They interpret this fact to mean that clitic pronouns in Italian must have a coindexed antecedent. Since coindexed DPs must stand in a binding relationship, a coindexed local antecedent will necessarily violate Principle B. No pragmatic coreference is possible because this is only an option for contra-indexed DPs. But clearly such an account ignores the fact that clitic pronouns can have discourse antecedents, i.e. they do not need a local antecedent in the manner of reflexives. Baauw et al. (1997) develop a similar argument to account for the Clitic Exemption Effect, i.e. they claim that clitics can only be bound and cannot corefer. This account is subject to the same objection that nonreflexive clitics are perfectly able to have discourse antecedents.

³ Acquisition studies that take the binding-coreference split to be basic have typically also found there to be a contrast between quantified and non-quantified antecedents, as the former have been taken to permit only binding, not coreference (the so-called quantificational asymmetry or QA). We discuss this issue in section 5.1.

- (6) a. lk_i heb me_i gewassen.
 'I washed myself.'
 b. Jan_i heeft me_{*ij} gewassen.
 'Jan washed me.'

The single form *me* 'me' can be used both with a reflexive (6a) and a nonreflexive meaning (6b). The example in (6) illustrates the Absence of Principle B Effect (APBE), i.e. the phenomenon (in the adult language) that a pronoun may function as an anaphor, just in case a dedicated reflexive is missing. The connection between APBE and DPBE involves the idea of competition between anaphors and pronouns, in a manner that we shall make precise in section 4. First, however, we will provide empirical evidence from a number of languages in favour of the generalisation in (4).

3.1. German

The German dedicated 3P reflexive *sich* is phonologically very similar to the 1P and 2P forms (*m*)*ich* and *dich*, respectively. This is illustrated in (7).

(7)

	non-reflexive				reflexive		
	NOM	ACC	DAT	GEN	ACC	DAT	GEN
1sg	ich	mich	mir	meiner	mich	mir	meiner
2sg	du	dich	dir	deiner	dich	dir	deiner
3sg.masc	er	ihn	ihm	seiner	sich	sich	seiner
3sg.fem	sie	ihr	ihr	ihrer	sich	sich	ihrer
3sg.neut	es	es	ihm	seiner	sich	sich	seiner
1pl	wir	uns	uns	unser	uns	uns	unser
2pl	ihr	euch	euch	euer	euch	euch	euer
3pl.masc	sie	sie	ihnen	ihrer	sich	sich	ihrer
3pl.fem	sie	sie	ihnen	ihrer	sich	sich	ihrer
3pl.neut	sie	sie	ihnen	ihrer	sich	sich	ihrer

We take this to indicate that the relevant forms are bimorphemic, consisting of an exponent spelling out a person feature (1P *m*–, 2P *d*–, and 3P *s*–) and another exponent *–ich* (following Kayne's similar proposal for French); *–ich* is a fusional exponent that spells out number (N), gender (G), and Case. In addition, *–ich* is neutral with respect to number, gender, and Case, i.e. it cannot be taken to uniquely spell out a specific value of one of these features.⁴ We therefore take *–ich* to be underspecified for number, gender, and Case. We represent this schematically as follows for the third person *sich*:

- (8) s+ich
 3P+0N.0G.0Case

The two morphemes are separated by a morpheme boundary sign (+). A 0 preceding a feature indicates underspecification, and a dot between features indicates fusion.⁵

Underspecification in the above sense is in fact syncretism. When a particular form is said to be underspecified for a certain feature, it is important to realise that this is not syntactic underspecification of features (as the formalism in (8) might lead one to believe). In the syntax features must be valued, or the derivation will crash. When we speak of underspecification of forms, this is the commonly recognised fact that forms may be syncretic, i.e. shared by certain combinations of specifications of ϕ -features. This syncretism is a fact about exponents, however, and not a fact about the syntax. Representations as in (8) are therefore not syntactic representations, but they constitute an informal way of

⁴ For number and gender, this is obvious. For Case, we note the occurrence of *–ich* in the dative column of the reflexive, as well as in the nominative of the first person singular. The dative forms *mir* and *dir* have a morpheme *–ir* that is the exponent of dative Case.

⁵ A reviewer correctly points out a finer prediction of our analysis, namely that there should be a DPBE in German in plural environments, since the plural pronouns do not show morphological transparency (*uns/euch/sich*, see (7)). Similarly, the dative singular is less transparent than the accusative (*mir/dir/sich*), so that a delay could be expected there as well. To the best of our knowledge, these finer predictions have not been investigated in the literature, which seems to have largely focused on singular accusative pronouns.

representing certain facts about the corresponding forms, and the paradigms they occur in, more in particular which parts of the form spell out which features.⁶

3.2. Dutch

In contrast to German *sich*, the Dutch reflexive form *zich* is morphologically unrelated to any other form in the paradigm, as shown in (9).

(9) Dutch pronominal paradigm

	non-reflexive		reflexive
	NOM	OBL	OBL
1sg	ik	me	me
2sg	jij	je	je
3sg.masc	hij	hem	zich
3sg.fem	zij	haar	zich
3sg.neut	het	het	zich
1pl	wij	ons	ons
2pl	jullie	jullie	je
3pl.masc	zij	hun, ze	zich
3pl.fem	zij	hun, ze	zich
3pl.neut	zij	ze	zich

We take this to indicate that *zich* is not bimorphemic, but that the form represents an extreme form of fusion. The single morpheme *zich* fuses person, number, gender, and Case, as represented below:

(10) *zich*
3P.0N.0G.0Case

As was the case with German *-ich*, Dutch *zich* is also underspecified for number, gender, and Case. Comparing (10) to (8), we see that the Dutch dedicated reflexive form *zich* fuses person and number in a single morpheme, whereas the German one does not. In terms of our generalisation in (4), we expect Dutch to display a DPBE, since person and number are fused in the dedicated reflexive form *zich*. In contrast, German is expected not to display any delay in the acquisition of Principle B, since in the German dedicated reflexive *sich* person and number are not fused. These predictions are borne out, as we already observed above (see Ruigendijk, 2007 on German, and Koster, 1993; Sigurjónsdóttir and Coopmans, 1996; Philip and Coopmans, 1996 on Dutch).⁷

3.3. French

The French paradigm is like the German one in that the dedicated 3P reflexive forms *se* and *soi* show a clear formal similarity with the 1P and 2P singular forms *me/te* and *moi/toi*, respectively.⁸

⁶ A reviewer objects that we are unduly complicating the morphological analysis in assuming both underspecification and fusion, whereas a more parsimonious analysis could get by with underspecification alone. What we have in mind, however, is a conception of the relation between morphemes (i.e. combinations of syntactic features) and vocabulary items (i.e. exponents) in terms of the nanosyntactic concept of phrasal spellout (Stärke, 2009). The idea is that features are not unstructured bundles, but that they form a structured tree, and that exponents may spell out variable parts of that tree, subject to cross-linguistic variation. Under this approach, it makes sense to ask which parts of the phonology spell out which part of the structure, i.e. which combinations of features.

⁷ A reviewer notes that the Dutch paradigm is that of the simplex reflexives, which are often taken to be a special case limited to grooming verbs (see (5) and (6)), and asks if the argument should not be extended to the case of the complex reflexives. However, the simplex reflexive in Dutch is certainly not limited to verbs of the grooming class, but has a much wider distribution, as shown in Lemmen (2005) (see also Rooryck and Vanden Wyngaerd, 2011). *Zich*-environments certainly cannot be considered to be a special case in this sense. Even so, the argument from the simplex reflexive carries over to the complex one, as it is composed of the simplex one, combined with *zelf*. DPBE effects are therefore expected to occur in both types of environments, as indeed they do (Philip and Coopmans, 1996). Further note that *zich* and *zichzelf* are both dedicated reflexive forms, which are not in competition with each other. This is shown by the fact that many verbs, including grooming verbs, allow both *zich* and *zichzelf*. The distribution of *zich* and *zichzelf* is regulated by other principles, which we do not discuss in the present paper (see Rooryck and Vanden Wyngaerd, 2011, and references cited there).

⁸ The 'imp' column lists the forms that are found with impersonal and quantified antecedents, the column to the right of it the reflexive forms found with other kinds of antecedents. See Rooryck and Vanden Wyngaerd (2011) for examples and discussion.

(11)

	French pronominal paradigm							
	nonreflexive				reflexive			
	NOM	ACC	DAT	PREP	ACC	DAT	PREP	
						imp	other	
1sg	je	me	me	moi	me	me	moi	moi
2sg	tu	te	te	toi	te	te	toi	toi
3sg.masc	il	le	lui	lui	se	se	soi	lui
3sg.fem	elle	la	lui	elle	se	se	soi	elle
1pl	nous	nous	nous	nous	nous	nous	nous	nous
2pl	vous	vous	vous	vous	vous	vous	vous	vous
3pl.masc	ils	les	leur	eux	se	se	soi	eux
3pl.fem	elles	les	leur	eux	se	se	soi	eux

Following Kayne, we take this to mean that *se/soi* are bimorphemic, with *s-* a 3P exponent and *-e* and *-oi* fusional exponents underspecified for number and gender.⁹ The clitic form *-e* is also underspecified for Case, whereas the strong form *-oi* spells out prepositional Case.

The representation of the dedicated reflexive forms *se/soi* is consequently as follows:

- (12) a. *s+e*
 3P+0N.0G.0Case
 b. *s+oi*
 3P+0N.0G.prep

That number and gender sit on the second exponent can clearly be seen in the third person nonreflexive pronoun series *le/la/les*, where the second exponent varies for gender and number.

The internal structure of the dedicated reflexive in French extends to Romance generally. It is also almost identical to the internal structure of the German dedicated reflexive (see (8)). In line with our generalisation in (4), we expect there to be no DPBE in Romance, and this is exactly what has been reported for Italian (McKee, 1992), French (Jakubowicz, 1984; Hamann et al., 1997; Hamann, 2002), Spanish (Padilla, 1990; Baauw et al., 1997), and Catalan (Escobar and Gavarró, 2001).

3.4. English

The case of English is somewhat different from the ones discussed so far in that English lacks a simplex reflexive, and only has a complex reflexive. The internal morphological structure is therefore somewhat different from the reflexive pronouns discussed so far. We suggest that the English dedicated reflexive form is trimorphemic, with the first, pronominal part spelling out person, number, and gender, the second a self-morpheme, which itself shows a number distinction. We represent this structure for a concrete example as in (13)¹⁰:

- (13) *them+[selv+es]*
 3P.pl.masc.acc+[self+pl]

The fact that English shows a DPBE is in line with (4) in so far as person and number are fused in the same morpheme in the English complex reflexive.

3.5. Interim conclusion

The table in (14) summarises our findings so far. Languages that lack the DPBE, such as French and German, display reflexives that are bimorphemic, and that are composed of a first exponent that unambiguously spells out person, and a second exponent that spells out number, gender, and Case.

⁹ We differ here from Kayne (2000), who analyzes the *-e* as an epenthetic vowel. Kayne's argument is based on the contrast apparent in *Invite-le/*me/*te* 'Invite him/me/you'. However, Kayne's analysis would mean that *me/te/se* would be free morphemes in the clitic paradigm, while they would be bound morphemes everywhere else (e.g. in the nonclitic series *moi/toi/soi* and the possessive series *mon/ton/son, ma/ta/sa, mes/tes/ses* 'my/your/his/their').

¹⁰ We ignore here the possessive nature of the pronominal part of the 1P (*myself*) and 2P (*yourself*) reflexives. See Bernstein and Tortora (2005) and Rocquet (2013) for a principled account of this fact.

(14)	DPBE	dedicated reflexive
German	–	3P+0N.0G.0Case
French	–	3P+0N.0G.0Case 3P+0N.0G.Prep
Dutch	+	3P.0N.0G.0Case
English	+	P.N.G+self+N

Languages for which the DPBE has been attested, such as Dutch and English, feature reflexives with exponents that are fusional spellouts of the features for person, number, and gender. We now turn to a discussion of two other languages for which a DPBE has been claimed, Icelandic and Russian. We shall argue that they also bear out our generalisation.

3.6. Icelandic

The Icelandic pronominal paradigm is given in (15) (Einarsson, 1949):

(15)	Icelandic pronominal paradigm						
	non-reflexive				reflexive		
	NOM	ACC	GEN	DAT	ACC	GEN	DAT
1sg	ég	mig	mín	mér	mig	mín	mér
2sg	þú	þig	þín	þér	þig	þín	þér
3sg.masc	hann	hann	hans	honum	sig	sín	sér
3sg.fem	hún	hana	hennar	henni	sig	sín	sér
3sg.neut	það	það	þess	því	sig	sín	sér
1pl	við	okkur	okkar	okkur	okkur	okkar	okkur
2pl	þið	ykkur	ykkar	ykkur	ykkur	ykkar	ykkur
3pl.masc	þeir	þá	þeirra	þeim	sig	sín	sér
3pl.fem	þær	þær	þeirra	þeim	sig	sín	sér
3pl.neut	þau	þau	þeirra	þeim	sig	sín	sér

It is clear that a bimorphemic analysis of the reflexive series is well-motivated: as in the case of French discussed earlier, *mig*=*m+ig*, *mín*=*m+ín*, etc. However, a closer look at the paradigm reveals that the exponents involved are of a different kind than those in German and Romance. The exponents spelling out 1P, 2P, and 3P are *m–*, *þ–*, and *s–*, respectively. The second part of the reflexive pronouns in (15) spells out a Case feature: accusative *–ig*, genitive *–ín*, and dative *–ér*. The question arises which part of the reflexive pronoun spells out number and gender, since number and gender have no clearly identifiable exponents. Two possibilities exist. The first is that the first part of the pronoun (i.e. the *s–* part) is fusional for person, number, and gender. Since it shows no number and gender distinctions, it is underspecified for these features. This compositional analysis is indicated below:

- (16) a. *s+ig*
3P.0N.0G+acc
b. *s+ín*
3P.0N.0G+gen
c. *s+ér*
3P.0N.0G+dat

The other possibility is that *s–* is 3P only, and that the second morpheme is a fusional form fusing Case and underspecified number and gender, as follows:

- (17) a. *s+ig*
3P+0N.0G.acc
b. *s+ín*
3P+0N.0G.gen
c. *s+ér*
3P+0N.0G.dat

If (16) is the correct analysis, the first exponent of the dedicated reflexive pronoun spells out person, number and gender, and the second exponent merely Case. By contrast, if (17) is the correct analysis, the first exponent spells out person, and the second exponent spells out number, gender, and Case.

At first sight, Icelandic provides overt evidence for number and gender fusing with Case, and not person, favouring the analysis proposed in (17) over that in (16). This evidence is found in the possessive (and demonstrative) pronouns. Icelandic Case suffixes in possessives and demonstratives are different from those in dedicated reflexive pronouns. In possessives and demonstratives, the correct segmentation at first sight appears to be as in (17), since the case endings vary for number and gender (as in French, illustrated above). This is shown in (18) (Einarsson, 1949):

(18) Icelandic possessive pronoun paradigm

		1P			2P			3P		
		masc	fem	neut	masc	fem	neut	masc	fem	neut
sg	NOM	minn	mín	mitt	þinn	þín	þitt	sinn	sín	sitt
	ACC	minn	mína	mitt	þinn	þína	þitt	sinn	sína	sitt
	DAT	mínum	mínni	mínu	þínum	þínni	þínu	sínum	sínni	sínu
	GEN	míns	mínnar	míns	þíns	þínnar	þíns	síns	sínnar	síns
pl	NOM	mínir	mínar	mín	þínir	þínar	þín	sínir	sínar	sín
	ACC	mína	mínar	mín	þína	þínar	þín	sína	sínar	sín
	DAT		mínum			þínum			sínum	
	GEN		mínna			þinna			sinna	

On closer inspection, however, the facts turn out to be more complex. The internal structure of the Icelandic possessive pronoun is clearly tripartite. The first exponent (*m-*, *b-*, and *s-*) is identical to the one we find in the personal pronouns.¹¹ This first exponent spells out the ϕ -features of the possessor. The third person possessor exponent *s-* is a dedicated reflexive, which is underspecified for gender and number: e.g. *s-inn* means ‘his/her/its/their own’. In this respect, it is fully identical to the initial *s-* of the third person reflexive pronoun. The middle part of the possessive (*-in-*) seems to be related to definiteness, at least formally.¹² The third part is a fused exponent that spells out number, gender, and Case of the Possessum. This is represented schematically in (19) for *mína*:

(19) m+in+a
1P.sg+def+sg.fem.acc

The evidence from possessives in favour of (17) therefore is only apparent: the number, gender, and Case features on the third exponent in (19) represent those of the Possessum, not those of the Possessor, whose features are expressed in the first exponent. Put differently, possessive pronouns express two sets of ϕ -features: the first set is found in the first exponent and are those of the Possessor; the second set is found in the third exponent, and expresses gender, number, and Case of the Possessum.

The morphological structure of personal and reflexive pronouns can now be insightfully compared with that of possessive pronouns. In Icelandic, the first exponent in possessive pronouns is identical to the first exponent in the personal pronouns. This can be seen by comparing the relevant forms in the table in (15) with those in the table in (18). In both possessive and personal pronouns, the first and second person exponents *m-* and *b-* are underspecified for gender, while the third person *s-* is underspecified for both gender and number. Furthermore, the third person *s-* is a dedicated reflexive in both personal and possessive pronouns (Thráinsson, 2007:461). The complete identity between the first exponent of the possessive pronouns and the first exponent of the personal pronouns provides a straightforward argument in favour of the analysis in (16).

A second argument in support of the analysis in (16) is the fact that the Case endings in the personal and reflexive pronouns are different from those in the possessive pronouns. This is because they spell out different features: the second exponent of the personal pronouns just expresses Case, while the third exponent of possessive pronouns fuses gender, number, and Case of the Possessum. If (17) was the correct analysis, this difference would be unexpected.

Assuming that the correct analysis for the personal and reflexive pronouns is (16), we expect there to be a DPBE in Icelandic following our generalisation in (4), since person and number are fused in (16) but not in (17). This prediction is

¹¹ There is also a possessive form for the 1P.pl possessor *vor* ‘our’ (not represented in the table), an archaic form which is not used anymore in the spoken language, and hardly ever in the written language. Any missing forms are filled in by the genitive forms of the personal pronouns (e.g. *ykkar* ‘yours’, *hans* ‘his’).

¹² Icelandic suffixal definite article is *-(i)nn*, *-(i)n*, and *-ið*, for masculine, feminine, and neuter, respectively. Note, however, that the feminine possessive pronoun *mín* [min] has another vowel than the definite suffix *-in* [ɪn]. The German possessive pronoun seems to have a similar structure, i.e. trimorphemic with an indefinite article in the middle, e.g. *m/d/s+ein+0/en/em/er* ‘my/your/his/her’. We refrain from a detailed investigation of the middle part of the possessive pronoun in Icelandic and German, since this issue is orthogonal to our concerns.

confirmed. Sigurjónsdóttir and Hyams (1992) and Sigurjónsdóttir (1992) have found that in a judgment tasks children did not perform target-like, allowing local antecedents for pronouns.¹³

3.7. Russian

The Russian pronouns present a picture that is very similar to the Icelandic one. Like Icelandic, Russian is also a language that displays the DPBE (Avrutin and Wexler, 1992). The pronominal system of Russian is given in (20)¹⁴:

(20)

	non-reflexive				reflexive		
	NOM	ACC/GEN	DAT	INSTR	ACC/GEN	DAT	INSTR
1sg	ja	menja	mne	mnoj	sebja	sebe	soboj
2sg	ty	tebja	tebe	toboj	sebja	sebe	soboj
3sg.masc	on	ego	emu	im	sebja	sebe	soboj
3sg.fem	ona	ejo	ej	ej	sebja	sebe	soboj
3sg.neut	ono	ego	emu	im	sebja	sebe	soboj
1pl	my	nas	nam	nami	sebja	sebe	soboj
2pl	vy	vas	vam	vami	sebja	sebe	soboj
3pl.masc	oni	ix	im	imi	sebja	sebe	soboj
3pl.fem	oni	ix	im	imi	sebja	sebe	soboj
3pl.neut	oni	ix	im	imi	sebja	sebe	soboj

In the reflexive series we clearly have a bimorphemic form, with the first morpheme *s-* syncretic for all persons, numbers, and genders, and three distinct case morphemes for four different cases (we ignore prepositional case here and below because it adds nothing new to the pattern in the table). The most plausible analysis of the dedicated reflexive form is therefore the one in (21):

- (21)
- s+ebja*
0P.0N.0G+Acc
 - s+ebe*
0P.0N.0G+Dat
 - s+oboj*
0P.0N.0G+Instr

The alternative analysis would have to assume that the different Case morphemes spell out Case and are each of them syncretic (i.e. underspecified) for person, or number, or gender, or any combination of those, as shown in (22).

- (22)
- s+ebja*
0P+0N.0G.Acc
 - s+ebe*
0P+0N.0G.Dat
 - s+oboj*
0P+0N.0G.Instr

The argument against this alternative goes exactly like the one for Icelandic discussed earlier. If we look at the possessive pronouns in Russian, given in (23), we find the same tripartite internal structure as we observed with the Icelandic possessives.¹⁵

¹³ In contrast, in an act-out task, children did perform in a target-like manner on Principle B in choosing a nonlocal antecedent. Sigurjónsdóttir and Hyams (1992:381–384) argue that the DPBE is nevertheless undisputed, because the judgment task accesses multiple interpretations of a sentence, whereas the act-out task only allows the child to act out one interpretation of a sentence. Thus, the judgment task gives a much better view of a child's grammatical knowledge than the act-out task, especially in sentences which have more than one grammatical interpretation. The fact that Hyams and Sigurjónsdóttir (1990:59) report that 'our data fail to support the notion that the binding condition associated with pronouns develops later than those associated with anaphors in Icelandic children' can likewise be linked to the fact that this study only used the act-out task method.

¹⁴ We thank Jos Schaecken and Lena Karvovskaya for their help with the transliteration.

¹⁵ For simplicity, and because they don't add anything new, we have left out the forms for plural possessors (*naš* 'our', *vaš* 'your.pl'). The third person possessive is a dedicated reflexive; nonreflexive possessives are identical to the genitive forms of the personal pronouns (i.e. *ego* 'his', *ejo* 'her', *ix* 'their'), and do not show any possessum marking.

(23) Russian possessive pronoun paradigm

		1P			2P			3P		
		masc	fem	neut	masc	fem	neut	masc	fem	neut
sg	NOM	moj	moja	mojo	tvoj	tvoja	tvojo	svoj	svoja	svojo
	ACC	moj	moju	mojo	tvoj	tvoju	tvojo	svoj	svoju	svojo
	DAT	mojemu	mojej	mojemu	tvojemu	tvojeju	tvojemu	svojemu	svojej	svojemu
	GEN	mojego	mojej	mojego	tvojego	tvojej	tvojego	svojego	svojej	svojego
	INSTR	moim	mojej	moim	tvoim	tvojej	tvoim	svoim	svojej	svoim
pl	NOM		moi			tvoi			svoi	
	ACC		moix			tvoix			svoix	
	DAT		moim			tvoim			svoim	
	GEN		moix			tvoix			svoix	
	INSTR		moimi			tvoimi			svoimi	

The first exponents (*m-*, *t-*, and *s-*) fuse the person and number features of the Possessor; they appear identically in the personal pronouns. The middle part of the possessive is *-o-* in the 1P and *-vo-* in the 2/3P. The etymology of *-(v)o-* is unclear; we speculate that it might spell out (in)definiteness, by analogy with the structure of possessive pronouns in Icelandic and German. The third part is, like in Icelandic, a fused exponent that is also found in the adjectival declension, and which spells out number, gender, and Case of the Possessum. This is represented schematically in (24) for *moja*:

(24) m+o+ja
1P.sg+(in)def+sg.fem.acc

As in Icelandic, the third person *s-* is a dedicated reflexive in both the personal and the possessive pronouns (Timberlake, 1979). The two arguments we advanced in the case of Icelandic in support of the analysis in (16) apply here as well: the first exponent of the possessive pronouns is identical to the first exponent of the personal pronouns, and can therefore be taken to spell out a full set of ϕ -features in both cases. The Case endings (i.e. the second exponent of the personal pronouns and the third exponent of the possessives) are different, which is unexplained by the analysis in (17). We conclude that person and number are fused in a single morphological exponent in Russian personal and reflexive pronouns, and by our generalisation in (4) we expect there to be a DPBE. This prediction is borne out.

3.8. Conclusion

To summarise, in both Icelandic and Russian the personal and possessive pronouns contain a first exponent that fuses the person and number features of the Possessor, and that in the third person (*s-*) is also a dedicated reflexive. In both languages, the third exponent of the possessive pronouns fuses number, gender and Case features of the Possessum. This feature distribution accounts for the presence of the DPBE in Icelandic and Russian.

It is important to note at this point that the analysis of the German personal and possessive pronouns is different. Recall we have argued that *m-*, *d-* and *s-* in German only spell out a person feature, and that the number feature is expressed in the second exponent *-ich*. This analysis is matched by the properties of German possessive pronouns. More in particular, there is no strict identity in German between the *s-* of the third person possessive pronoun and the *s-* of the third person reflexive pronoun. For one thing, the possessive *s-* is not a dedicated reflexive in German. For another, it expresses masculine gender and singular number of the Possessor. By contrast, reflexive *sich* is underspecified for gender and number. This means that German reflexive *s-* should be distinguished from possessive *s-* as a function of their different feature composition. So while in Icelandic and Russian the first exponent *s-* of third person personal and possessive pronouns carries person and number features and functions as a dedicated reflexive, the German third person *s-* does not display consistent morphosyntactic features across personal and possessive pronouns. We take this as an indication that our analysis of *m-*, *d-*, and *s-* in German as being restricted to the expression of person is on the right track.

4. Analysis

The general theoretical perspective that we wish to adopt here is the one assumed in a number of recent approaches to the relationship between syntax and morphology, such as the Distributed Morphology framework (Halle and Marantz, 1993; Harley and Noyer, 1999), the Exoskeletal Model (Borer, 2005a,b), and Nanosyntax (Starke, 2009; Caha, 2009). These approaches assume that the syntax works with a universal set of features without forms. Morphological forms (exponents) are added to these features in a postsyntactic module (see also Rooryck and Vanden Wyngaerd, 2011)

4.1. Morphological transparency and learnability

One of the motivations behind postsyntactic lexical insertion approaches is that features and forms rarely match on a 1:1 basis. Typically, forms are underspecified for certain features. In the domain of pronouns, the relevant features are, minimally, person, number, gender, and case. But languages rarely have as many forms as there are logical combinations of these features. For example, in the English pronominal system, plural pronouns are underspecified for gender (*they*), whereas they are not in French (*ils/elles*). Forms also compete with each other, and this competition is subject to the Elsewhere Principle. In the German paradigm in (7) for example, the line of 1PL shows one nominative form (*wir*), and an Elsewhere form (*uns*) that is used in all the other Cases.

The problem facing the child learning a language is to find out how the pronominal forms that are available in its input language map onto a universal set of features and their combinations. We propose that the learnability of this mapping is affected by morphological transparency:

(25) *The Morphological Transparency Hypothesis (MTH)*

The transparency of the mapping between syntactic features and their morphological exponents promotes the learnability of a morphological system. Conversely, a lack of transparency in the mapping between syntactic features and their morphological exponents may lead to a delay in acquisition.

Morphological transparency (and hence learnability) is optimal when the mapping between features and morphological exponents approaches a 1:1 relation. As we noted, however, such 1:1 relation is rarely present in languages, and both underspecification and fusion are the norm. Underspecification and fusion decrease morphological transparency (and hence learnability) since they obscure the relationship between feature combinations and morphological exponents.

With this in mind, let us return to our generalisation in (4), repeated here:

- (26) DPBE occurs iff person and number (and possibly, gender) are fused in the same morphological exponent in the dedicated reflexive form.

It follows from this generalisation that the acquisition of binding Principle B proceeds without delay if the person and the number features are spelled out by different morphological exponents. The reason for this, we argue, is that in such a case there is greater morphological transparency in the way the reflexive pronoun spells out syntactic features: the person feature is spelled out by a single morphological exponent, the number (and possibly, gender) feature by another.

For Principle B effects to arise, a child must recognise a dedicated reflexive pronoun as such, i.e. as part of a system that also contains nonreflexive pronouns with comparable feature content. Recall from (6) that pronouns in certain cases fail to give rise to a Principle B effect in the adult language as well. This APBE occurs when dedicated reflexive pronouns are missing. We suggest that the task of recognising dedicated reflexive pronouns is simplified if the internal structure of the reflexive pronoun allows the child to unambiguously identify the person features of that reflexive pronoun on a par with those of nonreflexive pronouns. The prominent status of the person feature can be related to the fact that the person feature is the most identifying feature of the pronominal system. If the person feature of reflexive pronouns is not unambiguously identifiable, the reflexive pronoun will not be easily recognised as part of the pronominal system, giving rise to the DPBE.

We now have to explain why there is a correlation between the easy recognition of dedicated reflexive pronouns as part of a pronominal system on the one hand, and the rapid acquisition of Principle B on the other. In order to do so, we have to make a short digression introducing the account of Binding phenomena in terms of the Elsewhere Principle presented in [Rooryck and Vanden Wyngaerd \(2011\)](#).

4.2. Competition between reflexive and nonreflexive forms

Classical Binding theory ([Chomsky, 1981](#)) states that anaphors need to be bound in their binding domain, and pronouns free. But the theory takes it for granted that we can tell anaphors apart from pronouns, so that we can apply the correct binding principle to any given form. However, there are forms that cannot be characterised as either anaphors or pronouns, but that are best described as forms with a double function. As we saw earlier (see (5) and (6)), this is the case for 1P and 2P pronouns in Dutch, where a single form can be used both with a reflexive and a nonreflexive meaning:

- (27) a. Ik_i heb me_{ii*j} gewassen. [Standard Dutch]
 'I washed myself.'
 b. Jan_i heeft me_{*ijj} gewassen.
 'Jan washed me.'

- (28) a. Jij_i hebt $je_{i/*j}$ gewassen. [Standard Dutch]
 'You washed yourself.'
 b. Jan_i heeft je_{*ijj} gewassen.
 'Jan washed you.'

Under classical Binding theory, Dutch 1P and 2P pronouns must be listed twice in the lexicon, once as an anaphor and once as a pronoun. Only in the third person are anaphors and pronouns disambiguated:

- (29) a. Jan_i heeft $zich_{ij/*j}$ gewassen. [Standard Dutch]
 Jan has REFL washed
 'Jan washed himself.'
 b. Jan_i heeft hem_{*ijj} gewassen.
 'Jan washed him.'

Frisian and Flemish Brabant Dutch lack the simplex reflexive anaphor *zich*. In these dialects, the contexts requiring *zich* in Standard Dutch (e.g. with inherently reflexive verbs) employ an equivalent of the 3P pronoun *him* (Frisian examples from [Reuland and Everaert, 2001:660](#)):

- (30) Max gedraagt $zich$. [Standard Dutch]
 Max behaves REFL
 'Max behaves himself.'
- (31) Max_i hâld him_i . [Frisian]
 Max behaves him
 'Max behaves himself.'
- (32) Max_i gedraagt 'em_i. [Flemish Brabant Dutch]
 Max behaves him
 'Max behaves himself.'

Similar cases can be found in the domain of possessive pronouns, where languages such as English and Dutch have a single form for the reflexive and nonreflexive possessive pronoun (e.g. *his*, *her*, *their*), while other languages have distinct forms for the reflexive (Latin *suus* 'his.REFL'; Swedish *sin* 'his.REFL'), and the nonreflexive possessive forms (Latin *eius* 'his.NONREFL'; Swedish *hans/hennes* 'his/her.NONREFL').

Such cases seem to suggest that pronouns fail to display a Principle B effect (and therefore function like anaphors) when a dedicated reflexive form is absent. We formulate this generalisation in (33):

- (33) *Absence of Principle B Effect (APBE)*
 Pronouns behave like anaphors when a dedicated class of reflexive pronouns is lacking.

The APBE indicates that there exists a competition between forms: where dedicated reflexives are available, they compete with pronouns for the expression of reflexive meanings, 'pushing out' the pronouns as it were. The pronouns can therefore only be used for nonreflexive meanings, and the Principle B effect arises. By contrast, in the absence of a dedicated reflexive form, there is no competition with anaphors, and pronouns can do all the work, and there is no Principle B effect.¹⁶

Classical Binding theory has no means of accounting for the APBE. At best, it can stipulate that the lexicon contains an anaphoric form (e.g. *her* for the English possessive pronoun), which happens to be homophonic with the pronominal form *her*, but it has no means of expressing the generalisation in (33).¹⁷ In [Rooryck and Vanden Wyngaerd \(2011\)](#), we propose a new way of looking at the APBE in terms of competition between forms. As stated earlier, this competition takes place post-syntactically, at the level of lexical insertion. The syntax works exclusively with features. For pronouns and anaphors, we take

¹⁶ The APBE holds at the level of the individual forms, not at the level of the language as a whole. In the Dutch simplex reflexive paradigm, for example, there is an APBE in 1P and 2P since there is no dedicated 1/2P reflexive, but there is one in the 3P (*zich*), causing a Principle B effect for pronouns in the 3P only.

¹⁷ Proposals exist in the literature that try to account for competition, usually by invoking some principle outside of Binding Theory that has the desired effect (e.g. [Burzio, 1989, 1991, 1992, 1996](#); [Kiparsky, 2002](#); [Safir, 2004](#); [Richards, 1997](#)). A detailed discussion of these proposals would lead us too far afield, however.

these features to be the classical ϕ -features. The syntax makes a clear featural distinction between anaphors and pronouns: pronouns enter the derivation with valued features, reflexives with unvalued features. The need for a local antecedent follows from the need to value these features, which happens through an application of Agree. Agree results in feature sharing (Frampton and Gutmann, 2000, 2006; Pesetsky and Torrego, 2007). For concreteness, consider the following representations:

- | | | |
|------|------------------------|---|
| (34) | a. {P:3, N:sg, G:m} | lexically valued features (pronoun) |
| | b. {P:_, N:_, G:_} | unvalued features (reflexive) |
| | c. {P:3*, N:sg*, G:m*} | features valued after Agree (reflexive) |

Following Frampton and Gutmann (2000, 2006), we indicate shared feature values, i.e. originally unvalued features which have come to share feature values via Agree, by an asterisk following the feature value. Features valued by Agree (i.e. reflexives) are distinguishable from features natively valued in the lexicon (i.e. pronouns) at the interface levels.

Languages do not differ in the syntax of reflexive relationships as just outlined, but they do differ in the inventory of lexical items they have at their disposal to express these relationships. Typically, dedicated reflexive forms may be missing to varying degrees, as discussed earlier. Importantly, the assumption of late insertion allows us to provide a principled account of the DPBE. Let us look at a concrete case, i.e. the distribution of forms in (27), (28), and (29). We assume the following insertion rules:

- (35) *A subset of insertion rules for Dutch:*
- | | | | |
|----|-----------------|---|--------------------------------|
| a. | P:1(*), N:sg(*) | ↔ | <i>me</i> / ___ oblique Case |
| b. | P:2(*) | ↔ | <i>je</i> / ___ oblique Case |
| c. | P:3* | ↔ | <i>zich</i> / ___ oblique Case |
| d. | P:3, N:sg, G:m | ↔ | <i>hem</i> / ___ oblique Case |
| e. | P:3, N:sg, G:f | ↔ | <i>haar</i> / ___ oblique Case |

Modulo the subset principle (Halle, 1997:428), rule (35a) will insert the pronoun *me* ‘me’ whenever the syntax contains a 1P non-nominative feature bundle. The brackets around the asterisks imply that it does not matter whether the syntax has a reflexive or nonreflexive feature makeup: the same form will be inserted in either case. The reason is that there is no dedicated reflexive in the 1P. The same is true for the 2P (rule (35b)). In the third person, matters are different: rule (35c) will insert the dedicated reflexive *zich* in reflexive 3P environments only. In nonreflexive 3P masculine singular non-nominative environments, *hem* ‘him’ will be inserted; similarly, rule (35e) will insert *haar* ‘her’ in 3P feminine singular non-nominative environments, etc. In this way, forms that appear as competitors for the same feature value 3P each find their proper distribution. Lexical insertion is subject to the Elsewhere Principle (Kiparsky, 1973). If the lexicon of a language does not provide dedicated forms for the expression of reflexive relationships (i.e. anaphors), pronouns are inserted as ‘Elsewhere’ forms both in reflexive and nonreflexive environments, as in Frisian and Flemish Brabant Dutch. We refer the reader to Rooryck and Vanden Wyngaerd (2011) for further details about the way in which feature values are obtained via the Agree mechanism operative in syntax.¹⁸

What is important for our approach to the DPBE is the notion of competition between forms. For a reflexive to be able to compete with a nonreflexive pronoun, it must first be recognised as part of the pronominal system. Various factors can promote or impede the integration of a form into the pronominal system. For instance, in Middle English, pronouns and anaphoric forms were in free variation for about 500 years without noticeable Principle B effects (e.g. Sinar, 2006). Rooryck and Vanden Wyngaerd (2011) show that the emergence of Principle B effects coincides with the loss of case endings in the DP, and the concurrent fusion of the syntactic phrase *hyne selfne* into the single compound *himself*. Only when reflexive *himself* was recognisable as a single morphological form could it start to compete with nonreflexive *him*, thus triggering Principle B effects.

4.3. Finalising the account of DPBE

We propose that a lack of morphological transparency is another factor that may stall the integration of a form into the pronominal system where it can compete with other forms. We argue that the unambiguous relation between the person

¹⁸ A reviewer asks why the DPBE is much stronger in grooming verb type environments. We are only aware of the findings of Van den Akker et al. (2012) in this respect. They have indeed reported this effect, but they also note that “very little attention has been paid to semantic properties of the verbs used that might influence results”. We believe that our account is perfectly compatible with the fact that other factors, including verb type, may influence the appearance of the DPBE. We must leave this issue for further research, however.

feature and its morphological exponents *m-/d-/s-* in German and *m-/t-/s-* in Romance enable the child to easily and quickly analyse the dedicated reflexive forms as part of the same pronominal system. As part of the pronominal system, the dedicated reflexive forms *sich* and *se/si* will immediately take part in the competition between anaphors and pronouns. Since the dedicated reflexive *s-* forms compete with the pronominal forms *ihn/ihr* 'him/her' and *le/la* 'him/her/it' right from the start, Principle B effects will quickly arise, and there is no DPBE.

This morphological similarity to 1P and 2P pronouns is completely absent in the case of Dutch *zich*, which fuses person, number, and gender into a single exponent. As a result, the Dutch form is less easily recognised by the child as a competitor for the other pronouns, and since there is no competition, DPBE effects will arise.

In Icelandic and Russian, by contrast, the 3P form is at first sight morphologically similar to the 1P and 2P forms, opposing 1P *m-* and 2P *t-/b-* to 3P *s-*. However, these initial exponents do not unambiguously represent the person feature, and in fact also spell out features for number and gender, as we have argued in section 3. We propose that this lack of morphological transparency delays integration into the pronominal system, and concomitantly delays the acquisition of Principle B.

Finally, the case of the English reflexive pronoun *himself* must be explained differently. This reflexive is clearly internally morphologically complex as well, consisting of a form of the pronoun (*me/you/him*) and *self*. As a result, the reflexives show a large amount of morphological similarity with the pronominal system. It might therefore be expected that, as in German and Romance, these forms are recognised early on as being part of the pronominal system. However, contrary to expectation, English does feature a DPBE. This suggests that the formal similarity of pronouns and anaphors has different guises: schematically, the case of French and German involves the relatedness of two forms [A+B] and [C+B], whereas that of English involves the relatedness of [A] and [A+SELF]. Moreover, as we have argued, within the A part of the complex form, morphological transparency is weak, there being no uniquely identifiable person exponent. The case of English shows, then, that morphological transparency cannot simply be understood as morphological relatedness in an intuitive, pretheoretical sense, but instead has to be understood quite specifically in terms of the identifiability of a person exponent, as in (4).¹⁹

5. Special cases

5.1. Quantificational asymmetry

A number of studies have reported an exemption from the DPBE involving quantified antecedents (Avrutin and Thornton, 1994; Avrutin and Wexler, 1992; Chien and Wexler, 1990; Boster, 1991; Thornton and Wexler, 1999). In languages displaying the DPBE, children nevertheless perform in an adult-like manner on Principle B provided the antecedent is a quantified DP like *every bear*, i.e. they perform in an adult-like manner on (36b) but not on (36a). This is the quantificational asymmetry or QA.

- (36) a. Mama Bear is touching her.
b. Every bear is touching her.

Such facts are unexpected for the approach to the DPBE advocated here, since we attribute the DPBE to properties of the reflexive pronoun, and therefore do not expect that the nature of the antecedent should cause the DPBE to be suspended. However, Elbourne (2005) has argued that the experimental design of the studies in the literature is flawed and does not really warrant the conclusion that the QA exists. Instead, he advances two other hypotheses to account for improved performance on (36b) as opposed to (36a). One of these hypotheses (the Reference Hypothesis) is that children in general prefer a referential interpretation for pronouns to a bound variable interpretation (Crain and Thornton, 1998:111; Thornton and Wexler, 1999:156). That this preference exists independently of Principle B can be shown by examples with VP-ellipsis, where children have been shown to display a preference for a strict identity (i.e. referential) reading even where this is pragmatically implausible, as in the following example (Thornton and Wexler, 1999:156):

- (37) Mr. Dog brushed his teeth and every dinosaur did too.

¹⁹ A reviewer asks why it should be the (non-)transparent mapping of features contained in reflexives that matters for the acquisition of Principle B, rather than the similarity of the reflexives with the pronouns. This raises the question why English children do not have difficulties acquiring reflexives as well. However, we believe the DPBE is due to the late onset of competition, and that competition rests on the correct mapping of forms to grammatical features. Forms only compete for insertion if they express the same features. What the asymmetry between Principle A (no delay) and Principle B (possible delay) suggests is that means of expressing reflexivity can arise before the grammatical competition between anaphors and pronouns takes effect. This is independently suggested by the fact that many languages diachronically develop a pronominal reflexive from a syntactically complex possessive structure (e.g. *his body/head/own*). See Rooryck and Vanden Wyngaerd (2011) for discussion and references.

This preference might lead them to find (36a) better on average than they do (36b), even though both sentences violate Principle B (with the pronoun referring to the subject). Another hypothesis is the Saliency Hypothesis, which states that the QA arises because children interpret pronouns in the way made most plausible by the context, and the scenarios used in the relevant experiments make it likely that the pronouns in question will be interpreted as referring to certain prominent characters. The experiments used involve a Truth Value Judgment Task (TVJT), where children are given a scenario and have to indicate whether a sentence like (36a) or (36b) is true or not. Concretely, in the experiment of [Chien and Wexler \(1990\)](#), which used the sentences in (36), children had to answer ‘yes’ or ‘no’ to the interrogative variant of (36) (i.e. *Is Goldilocks touching her? Is every bear touching her?*), after having been shown a picture. For (36a) they were shown a picture that contained only Goldilocks and Mama Bear; Mama Bear was not touching Goldilocks but was touching herself. For (36b) the picture showed Goldilocks and three bears; the bears were not touching Goldilocks but were touching themselves. In the first case, the two characters in the picture were equally prominent in visual terms. Children therefore selected one of the two characters more or less at random as a referent for *her*. In the second case, however, Goldilocks is much more visually prominent than any of the bears, and there is no clue as to the sex of the bears. This strongly leads them to interpret *her* as referring to Goldilocks (and therefore to answer the question in the negative much more frequently than for *Is Mama bear touching her?*). Therefore, children’s significantly larger rejection of (36b) is not due to Principle B, but to independent factors.

Following up on [Elbourne \(2005\)](#), [Conroy et al. \(2009\)](#) have carried out experiments that control for the effects of the Reference Hypothesis and the Saliency Hypothesis. The results indicate that the QA is an artefact of the particular experimental design adopted, and that when the relevant factors are controlled for, the QA disappears. Surprisingly, these researchers have failed to detect the DPBE, contradicting the results of numerous previous studies. However, we do not believe that the DPBE can simply be dismissed as an artefact of the experimental setup. Such an approach leaves the question unanswered why children learning different languages react differently to Principle B violations, even if similar tasks are used. This strongly suggests that the DPBE relates to grammatical properties of the language system. We leave this as an issue for further research.

5.2. ECM constructions

Another type of exception related to the DPBE concerns ECM constructions. For some of the languages reported as having no developmental delay in the acquisition of Principle B, such delays have nevertheless been noted in ECM constructions. For example, [Baauw et al. \(1997\)](#) observe that Spanish children perform adult-like on a simple transitive sentence like (38a) (90% correct responses), but achieve only 64% correct responses on an ECM-sentence like (38b):

- (38) a. La niña la seca.
 the girl her dries.off
 ‘The girl dries her off.’
 b. La niña la ve bailar.
 the girl her sees dance
 ‘The girl sees her dance.’

This exception is unexpected under the clitic hypothesis discussed earlier. [Baauw et al. \(1997\)](#) suggest that the DPBE may have several causes. In the languages that have a full-fledged DPBE, this is due to the late acquisition of the pragmatic mechanism of coreference ([Reinhart, 1983a,b](#)). Languages with clitics are exempt from the delay because of a special property of clitics (see the discussion in section 2). If the delay does arise in such languages, as they do in Spanish ECM constructions, this delay has another cause. In particular, [Baauw et al. \(1997\)](#) argue that Spanish children overgeneralise a property of the 1/2P clitic pronouns to the 3P clitic pronoun. This property is what we have called the ABPE: there is no dedicated reflexive in Spanish 1/2P clitic pronouns, which can therefore function for the expression of both reflexive and nonreflexive meanings. This is illustrated for 1P *me* in (39):

- (39) a. Juan me ha visto.
 Juan me has seen
 ‘Juan has seen me.’
 b. Me he secado.
 me I.have dried.off
 ‘I dried myself off.’

Spanish children overgeneralise this property of the 1/2P clitics and think it also applies to the 3P clitic *lo/la*, which is why they show a DPBE. The account predicts that the DPBE will only occur in those languages with clitics that have an ABPE in the

1/2P, a prediction which is confirmed, according to Sigurjónsdóttir (1992). The restriction of this exception to ECM contexts is taken to follow from the different theories that are responsible for Principle B effects in ordinary transitive sentences and in ECM contexts (Reinhart and Reuland, 1993). In the former case, they follow from Principle B, whereas in the latter case they follow from Reinhart and Reuland's Condition on A-chains, which states that an A-chain contains exactly one link that is both structurally Case-marked and [+R], i.e. referential. In (37b) under the reflexive reading there would be an A-chain (*la niña, la*), which would have two such links. Reflexive clitics being [-R], they do not violate the Condition on A-chains.

However, this proposal faces two important problems. For one thing, the approach to binding in terms of reflexivity (Reinhart and Reuland, 1993) has to assume that there is an important theoretical difference between transitive and ECM environments, as the antecedent of a reflexive with a transitive verb is its co-argument, whereas it is not with ECM-verbs. However, as argued at length in Rooryck and Vanden Wyngaerd (2011), there is no empirical evidence to support such a difference. Reflexives behave exactly the same in both environments, and the distribution of reflexives and pronouns is identical. Other environments, like PP-complements, do reveal a distinction with respect to the properties and distribution of reflexives, but not the ECM-environment. For another, the proposal does not really address the exact nature of the mechanism of overgeneralisation which is assumed to play in (38b) but not (38a): the fact that the explanation for the Principle B effect is different in both cases in no way predicts that the overgeneralisation from the behaviour of the 1/2P pronouns should be restricted to the ECM-case, in particular because the relevant behaviour of the 1/2P pronouns is also observed in non-ECM-environments (as testified by (39b)). As a result, there is no explanation for why the overgeneralisation should be restricted to ECM contexts.²⁰

The poorer performance of children with respect to Principle B on ECM constructions is not expected under the account we have proposed either. The morphological transparency of (reflexive) pronouns does not change with their syntactic position. Nor is there any evidence that the distribution of anaphors and pronouns is different in ECM environments as compared with simple transitive sentences. At this point, we can only speculate that the poorer performance of children in ECM environments relates to their biclausal nature. This makes them harder to process than monoclausal sentences, resulting in poorer performance on Principle B. This speculation is given some plausibility by the fact that children's performance on pronouns in ECM constructions is also poorer in a language like Dutch, which has the full-fledged DPBE. Philip and Coopmans (1996) report significantly lower percentages of adult-like responses on ECM sentences than on simple transitive sentences with pronouns.²¹ In this context, it is also worth mentioning that the difference between the ECM and the transitive construction is at least to some extent a method effect. In Truth Value Judgement (TVJ) tasks children have to say 'yes' or 'no' to a particular pairing of a picture shown to them and an interrogative sentence. In a Picture Selection (PS) task, however, they are given a sentence and have to select the picture that correctly describes the sentence. Baauw et al. (2011) have found that the performance of Spanish children on ECM constructions significantly improves in a PS task over a TVJ task, reaching adult-like responses of up to 75% (though there remains a gap with transitive sentences).

5.3. Production–comprehension asymmetries

Some recent evidence suggests that there might be an asymmetry with respect to the DPBE between comprehension and production. Experiments that have found the DPBE have typically involved comprehension tasks, but some experiments have also looked at production data, and found the DPBE to be lacking in production in languages where it does show up in comprehension.²² This has motivated the introduction of the term Pronoun Interpretation Problem (PIP) to replace the earlier DPBE, suggesting that the acquisitional delay might be restricted to interpretation.

To our knowledge, the first study to report such a result is that of Bloom et al. (1994), who have found there to be no DPBE with first person pronouns in spontaneous English production data. Bloom et al.'s study is restricted to first person pronouns and reflexives, because if a child produces an example like *I hit me* instead of *I hit myself*, one can be sure it is violating Principle B. This is not the case if a child produces *John hit him*, where establishing a Principle B violation requires access to the intended interpretation. However, the fact that Bloom et al. (1994) have only looked at first person pronouns means that we cannot be certain that the absence of a delay is due to the asymmetry between comprehension and production, or to the difference between first and third person. For production and comprehension to be compared insightfully, the full range of pronouns should be investigated in both comprehension and production, and such attempts have not been undertaken until only more recently.

²⁰ Baauw et al. (2011) develop a slightly different account, that is not susceptible to the second criticism, but it remains vulnerable to the first.

²¹ In the group of 4–6 year olds, the figures are 36% adult-like response for simple transitives, vs 5% (*hem* 'him') to 10% (*haar* 'her') for the ECM sentences. In the 7 year olds, the difference is between 55% and 35% (*hem* 'him') and 15% (*haar* 'her'), whereas in the 8 year olds it is between 50% and 35–37%. For reasons that we fail to understand for the time being, there is a sometimes sizable performance difference between the masculine pronoun *hem* 'him' and the feminine one *haar* 'her'.

²² On the general issue of comprehension–production asymmetries, see Grimm et al. (2011).

De Villiers et al. (2006) tested English children for both their comprehension and production in a truth-value judgment task. They tested sentences like (40a) (the ‘classic condition’, taken from Chien and Wexler’s (1990) study), as well as sentences with an embedded clause like (40b).

- (40) a. Here is Big Bird and Grover. Big Bird is touching him/himself.
b. Papa Bear says Baby Bear is touching him/himself.

Production was tested by asking children to describe the pictures in the same way as presented in the comprehension task. They found that children never used a reflexive when a pronoun was required in the classic condition (40a), and did so only 2.8% of the time in embedded sentences.²³ From the children’s nearly flawless production of pronouns they conclude that they do have knowledge of Principle B, and can use it. However, it seems to us that this conclusion is not warranted. The fact that children use pronouns where pronouns are required (i.e. in nonreflexive contexts) shows that they master Principle A, since using a reflexive in such a context would amount to a violation of Principle A. The context that would demonstrate knowledge of Principle B would be one where a reflexive is required by the picture and the story, i.e. a reflexive context. If in such a context children consistently refrained from using a pronoun, that would demonstrate knowledge of Principle B; if in such contexts they frequently used pronouns, it would indicate a delay in the acquisition of Principle B.

Spencer et al. (2009) carried out a study with Dutch children, using a methodology largely similar to that of De Villiers et al. (2006). They also tested both comprehension and production in the classic condition (39a) and the embedded condition (39b), but also in a third condition, which they call the single topic condition. The idea is that pronoun interpretation is sensitive to discourse factors, and more in particular, that salient discourse items (‘topics’) are the most natural antecedents for pronouns (cf. the Saliency Hypothesis of Elbourne, 2005). In a sequence like (41a), Goldilocks is the topic by the time we get to the third sentence, so that the pronoun refers naturally to Goldilocks, in a Principle B compliant manner. On the other hand, in (41b) the topic is Mamma Bear, so that the final sentence is geared towards a Principle B violating interpretation of the pronoun as referring to Mamma Bear.

- (41) a. This is Mamma Bear. This is Goldilocks. Is Mamma Bear washing her?
b. This is Goldilocks. This is Mamma Bear. Is Mamma Bear washing her?

Such discourse factors were not controlled for in the earlier experiments on the DPBE.²⁴

In the experiment they conducted, Spencer et al. used a variant of (41a), but with only one sentence preceding the test sentence:

- (42) This is Goldilocks. Is Mamma Bear washing her?

They call this the single topic condition; like (41a), it is a condition that favours a Principle B compliant interpretation for the pronoun, i.e. one where the pronoun refers to the discourse-salient topic Goldilocks.

The results from their experiment indicate that in the single topic condition pronouns and reflexives are produced and comprehended equally well. In other words, the DPBE is lifted if a coherent discourse is provided, but it is lifted equally well in comprehension and in production. There are two asymmetries that survive, however: in the classic condition, there is a clear difference between comprehension (with performance on reflexives better than on pronouns) and production (with no such difference). Importantly, in the embedded condition, a clear asymmetry persists between reflexives and pronouns, both in comprehension and production.

We have no explanation for the fact that in some circumstances the DPBE seems to be lifted in production (e.g. as with first person pronouns and reflexives in Bloom et al., 1994, or as in the classic condition in Spencer et al., 2009). However, we do not believe that these findings invalidate the claim that there is a DPBE in languages like Dutch and English. What they do show is that discourse factors such as saliency of a participant may favour a particular interpretation for a pronoun, such that it appears as if DPBE is lifted. But in the absence of such discourse factors, a strong asymmetry in children’s performance on Principle A as opposed to Principle B persists.²⁵

²³ The children also frequently used a proper name in the classic condition, but these clearly do not bear on their knowledge of Principle B.

²⁴ We do not believe that this fact invalidates the earlier results, since the discourse factors work exactly the same for reflexives. That is, the discourse factors that make (41b) unnatural with the pronoun make (41a) unnatural with the reflexive. The fact that there is an asymmetry between children’s performance on reflexives and their performance on pronouns is therefore not explained by discourse factors.

²⁵ Other factors than the ones discussed in this section may affect the appearance of the DPBE, such as verb type (see note 18), or the finer predictions that our own analysis makes (see note 5).

6. Conclusion

We have proposed an analysis of the Delay of Principle B Effect in language acquisition, building on Rooryck and Vanden Wyngaerd (2011), who argue that pronouns and anaphors are in competition. Pronouns are ‘Elsewhere’ forms that can express reflexive relationships when dedicated anaphors are absent. We have extended this approach to the phenomenon of the Delay of Principle B in language acquisition. We argue that the relevant distinction between languages that do and that do not show the DPBE is one between the quick or delayed availability of competition between anaphoric and pronominal forms for the expression of reflexive relationships. If the competition is delayed, Principle B effects will likewise be delayed. The availability of competition is determined by morphological transparency, along the lines of the Morphological Transparency Hypothesis (MTH) formulated in (25): the more transparent the mapping between syntactic features and their morphological exponents in a dedicated reflexive form, the more easily this dedicated reflexive form will be recognised by the child as part of the pronominal system. Once the dedicated reflexive is so recognised, it will compete with nonreflexive forms in the pronominal system, and as a result Principle B effects will arise.

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