

# **RADICAL PRO DROP AND THE MORPHOLOGY OF PRONOUNS\***

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**RADICAL PRO DROP AND THE MORPHOLOGY OF PRONOUNS**  
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**ABSTRACT:** In this paper we propose two new generalizations governing the cross-linguistic distribution of radical pro drop (the type of pro drop found in Chinese). (i) Languages with radical pro drop have pronouns that are agglutinating for case, number or some other nominal feature. (ii) Languages with pronouns that are either invariant in form or fusional for case cannot omit pronouns freely (although they may have agreement-based pro drop). These generalizations can be derived from three assumptions. (i) Spell-out rules for pronouns may target non-terminal categories. (ii) Pro drop is zero spell-out (deletion) of regular pronouns. (iii) competition between spell-out rules is governed by the Elsewhere Principle. Our proposal is tested using data from a sample of twenty languages.

**KEYWORDS:** *Pro drop, Agreement, Pronouns, Spell-out rules*

### 1. THE PROBLEM

The generalization that pro drop is conditioned by rich agreement allows for a very attractive theory that reduces variation in the syntax to variation in the lexicon. The central idea is that languages allow pro drop to the extent that their verbal agreement paradigm expresses the  $\phi$ -features necessary for local recovery of the content of dropped arguments (see Taraldsen 1978, Rizzi 1982, 1986 and Koenenman 2000, among many others). The generalization is mainly based on European languages: richly inflected languages like Italian, Spanish and Greek allow subject drop, but English, Dutch and Swedish, which are poorly inflected, do not.

Further evidence for the link between agreement and pro drop comes from language-internal variation. Pashto data illustrate the point. This language displays split ergativity conditioned by tense. In the present, it has a nominative-accusative pattern of case marking, and, as expected, agreement is with the nominative subject rather than the accusative object. In the past, Pashto is ergative-absolutive, and agreement is with the absolutive object rather than the ergative subject. As the data in (1) show, pro drop is possible exactly when the argument in question agrees with the verb (see Huang 1984: 536; agreeing arguments are underlined). Further language-internal evidence for the relation between agreement and pro drop can be found in Finnish and Hebrew (see Vainikka and Levy 1999).<sup>1</sup>

- |     |    |  |        |
|-----|----|--|--------|
| (1) | a. | <p>(<u>Zə</u>) mana xwr-ə<u>m</u>.<br/> <i>I apple eat-1.M.SG</i><br/>         ‘[I] eat the apple.’</p>          | Pashto |
|     | b. | <p><u>Zə</u> *(mana) xwr-ə<u>m</u>.<br/> <i>I apple eat-1.M.SG</i><br/>         ‘I eat [the apple].’</p>         |        |
|     | c. | <p>*(Ma) <u>mana</u> wə-xwar-<u>a</u>.<br/> <i>I apple PERF-eat-3.F.SG</i><br/>         ‘[I] ate the apple.’</p> |        |

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<sup>1</sup> Abbreviations used in this paper are as follows. 1: 1<sup>st</sup> person; 2: 2<sup>nd</sup> person; 3: 3<sup>rd</sup> person; ACC: accusative; ADD: addressee; ART: article; ATR: advanced tongue root; CL: classifier; DAT: dative; EMPH: emphatic; ERG: ergative; EXCL: exclusive; F: feminine; FUT: future; GEN: genitive; HON: honorific; IMM: immediacy marker; IMPF: imperfect; INCL: inclusive; INSTR: instrumental; INVIS: invisible; KIN: kinship marker; LOC: locative; LMT: limiter; NOM: nominative; M: masculine; NT: neutral; O: object agreement; OBL: oblique; PAR: participant; PERF: perfect; PL: plural; POL: polarity marker; POSS: possessive; PROG: progressive; PRES: present; PRT: particle; Q: question marker; REFL: reflexive; REP: reported speech; RL: realis; S: subject agreement; SG: singular; SPC: specific referent suffix; TOP: topic; TR: transitivity marker; VIS: visible; VOC: vocative.

- d. Ma (mana) wə-xwar-a.  
*I apple PERF-eat-3.F.SG*  
 'I ate [the apple].'

An agreement-based theory of pro drop faces difficulties with languages like Japanese and Chinese, which lack agreement and nevertheless allow pro drop. In fact, pro drop in these languages seems to be more wide-spread than in Italian-type languages: any pronominal argument can be omitted. The literature refers to this phenomenon as 'radical pro drop', 'rampant pro drop', or, perhaps most frequently, 'discourse pro drop'. It is illustrated below (the Chinese data are from Huang 1984: 533, 563):

- |     |  |          |
|-----|--|----------|
| (2) | <p>a. Ø siken-ni otita.<br/> <i>exam-DAT failed</i><br/>         'pro failed the exam.'</p> <p>b. Bill-ga Ø setokusuru<br/> <i>Bill-NOM persuade</i><br/>         'Bill persuaded pro.'</p> <p>c. [Ø mimi-ga] nagai<br/> <i>ear-NOM long</i><br/>         'pro's ears are long.'</p>         | Japanese |
| (3) | <p>a. Ø kanjian ta le.<br/> <i>see he LE</i><br/>         'pro saw him.'</p> <p>b. Ta kanjian Ø le.<br/> <i>he see LE</i><br/>         'He saw pro.'</p> <p>c. Zhangsan, [Ø baba] hen youqian.<br/> <i>zhangsan father very rich</i><br/>         'Zhangsan, pro's father is very rich.'</p> | Chinese  |

One possible reaction to these data is to give up on the connection between pro drop and agreement. But such a move would amount to abandoning what insight we have in favour of descriptivism. It is more desirable to develop a theory that maintains the agreement-based account where it seems relevant, but allows pro drop in the absence of agreement under certain well-defined circumstances. There are at least three proposals in the literature that attempt to do so. We discuss these immediately below in section 2, arguing that all three have serious shortcomings. We propose a new theory of radical pro drop and its cross-linguistic distribution in sections 3 and 4.

What sets apart our proposal from competing theories is that it focuses on the pronominal paradigm. While many researchers have looked at the relevance of agreement for pro drop, none have considered whether the nature of pronouns has a role to play in allowing omission of arguments in languages like Japanese in Chinese. Our main claim is that a language will only allow radical pro drop if its personal pronouns are agglutinating for case or some other nominal feature. So, the morphological characteristics of the pronominal paradigm determine whether radical pro drop is allowed. In languages that do not have an agglutinating pronominal paradigm, omission of pronouns is possible, but only in the presence of rich verbal agreement. This proposal thus extends the original idea that variation in the lexicon may determine variation in the syntax.

We should point out that our proposal does not address the pragmatic conditions under which pro drop can take place in discourse. Rather we intend to find out what grammatical characteristics give rise to radical pro drop, and what typological predictions can be derived from these. A full theory of pro drop requires an additional pragmatic component that governs the use of null pronouns in languages whose grammar allows them. There are many proposals in the literature that deal with this aspect of radical pro drop, but evaluating these is beyond the scope of this paper.

## 2. THREE EARLIER PROPOSALS

### 2.1 Radical pro drop involves topic drop

A first attempt at explaining why pro drop can take place in the absence of agreement can be based on the phenomenon of topic drop. In many Germanic languages, elements that have moved to sentence-initial position can be deleted (if mentioned in the previous discourse). Some Dutch examples are given in (4).

- (4) a.  $\emptyset_1$  ken ik  $t_1$  niet. Dutch  
*know I not*  
 'I don't know *pro*.'
- b.  $\emptyset_1$  ken  $t_1$  hem niet.  
*know him not*  
 '*pro* don't know him.'
- c.  $\emptyset_1$  had ik gedacht dat ik morgen  $t_1$  zou zien.  
*had I thought that I tomorrow would see*  
 'I thought that I would see *pro* tomorrow.'

In non-sentence-initial position, deletion is ruled out, even if the appropriate discourse conditions are met. Thus, examples like (5) are ungrammatical.

- (5) a. \*Ik ken  $\emptyset$  niet. Dutch  
*I know not*  
 'I don't know *pro*.'
- b. \*Hem ken  $\emptyset$  niet.  
*him know not*  
 '*pro* don't know him.'
- c. \*Ik had gedacht dat ik morgen  $\emptyset$  zou zien.  
*I had thought that I tomorrow would see*  
 'I had thought that I would see *pro* tomorrow.'

Topic drop is clearly different from, and independent of, the type of pro drop found in languages like Italian (the latter does not rely on movement). This provides an opportunity of explaining away radical pro drop in languages like Japanese and Chinese as a case of topic drop. If this can be done successfully, the link between genuine pro drop and rich agreement need not be severed. The traditional analysis of Italian-style pro drop can be maintained as part of a more elaborate theory of argument omission. This brings us very close to the proposal in Huang 1984.

Huang proposes a theory of empty arguments based on two parameters: one allowing zero topics, the other allowing silent pronominal arguments. The former are subject to conditions on movement. The latter are subject to a fairly standard theory of recoverability: they must be locally bound by either a DP argument or rich agreement. In pro-drop languages with rich agreement, such as Italian, *pro* can appear in the specifier position of any finite IP,

as desired. In pro-drop languages with poor or no agreement, such as Chinese, *pro* can only appear as the subject of an embedded clause, bound by an argument of the matrix clause. All other null arguments in languages like Chinese must be accommodated by the setting of the second parameter: they must be zero topics.<sup>2</sup>

Although we agree with the claim that radical pro drop is due to a second parametric factor, there are contrasts between topic drop and radical pro drop that in our view prevent a unification of the two. In particular, topic drop and movement display the same properties in Germanic: just like no constituent can be moved out of a subject or adjunct, no topic contained in a subject or adjunct can be deleted. We illustrate this for Dutch in (6).

- (6) a.  $\emptyset_1$  ken ik [alleen dat boek van  $t_1$ ]. Dutch  
*know I only that book of*  
 ‘I only know that book of *pro*.’  
 b. \* $\emptyset_1$  heeft [alleen die vriend van  $t_1$ ] een bijdrage geleverd.  
*has only that friend of a contribution made*  
 ‘Only that friend of *pro* has made a contribution.’  
 c. \* $\emptyset_1$  heb ik Jan [alleen tijdens een lezing van  $t_1$ ] gezien.  
*have I John only during a lecture of seen*  
 ‘I have seen John only during a lecture of *pro*.’

As it turns out, there is no such parallel behaviour when it comes to radical pro drop. In Japanese, for example, possessive pronouns can be omitted freely, as the data in (7) show. In contrast, extraction of possessors is systematically ruled out, as shown in (8).

- (7) a. John-wa [(kanozyo-no) syasin]-o totta. Japanese  
*John-TOP she-GEN picture-ACC took*  
 ‘John took a picture of (her).’  
 b. [(Kare-no) imooto]-ga Bill-ni atta.  
*he-GEN younger.sister-NOM Bill-DAT met*  
 ‘(His) younger sister met Bill.’  
 c. John-ga [(kanozyo-no) zigyoo-tyuuni] inemuri-o sita.  
*John-NOM she-GEN lecture-during dozing.off-ACC did*  
 ‘John dozed off during (her) lecture.’

- (8) a. \*[John-no(-wa)]<sub>1</sub> kinoo Mary-ga [ $t_1$  imooto]-o mita. Japanese  
*John-GEN-TOP yesterday Mary-NOM sister-ACC saw*  
 ‘Mary saw John’s sister yesterday.’  
 b. \*[John-no(-wa)]<sub>1</sub> kinoo [ $t_1$  imooto]-ga Mary-o mita.  
*John-GEN-TOP yesterday sister-NOM Mary-ACC saw*  
 ‘John’s sister saw Mary yesterday.’

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<sup>2</sup> The main observation that underpins Huang’s theory is that, in Chinese, a dropped object in an embedded clause resists binding by the matrix subject. Such an interpretation is allowed for overt pronouns, suggesting that a dropped object is not a pronoun. However, as Huang points out, the relevant construal is not always ungrammatical. Huang concludes from this that certain discourse factors may override grammatical principles in Chinese, but not in English. We would like to propose a different interpretation of the restriction under discussion, namely as a pragmatic principle, thus maintaining the autonomy of syntax. Suggestive evidence comes from English, where the interpretation of reduced pronouns shows a similar tendency, although judgments are subtle (cf. [*Every boy*]<sub>i</sub> *thinks that Mary likes him<sub>i</sub>/?’*m*<sub>i</sub>*).

- c. \* $[\text{John-no(-wa)}]_1$  kinoo Mary-ga gakkoo-e  $[\text{t}_1$  imooto]-to itta.  
*John-GEN-TOP yesterday Mary-NOM school-to sister-with went*  
 ‘Mary went to school with John’s sister yesterday.’

It is crucial that the fronted constituent in the examples in (8) carries the genitive marker *-no*. This is because genitive case will only be licensed if the fronted constituent binds a trace in a position to which genitive is assigned (as movement chains allow transfer of case). Hence, the fact that the examples in (8) are acceptable when *John* does not carry the genitive marker but only the topic marker *-wa* does not invalidate our argument:

- (9) a.  $[\text{John-wa}]_1$  kinoo Mary-ga  $[\text{pro}_1$  imooto]-o mita. Japanese  
*John-TOP yesterday Mary-NOM sister-ACC saw*  
 ‘As for John, Mary saw his sister yesterday.’  
 b.  $[\text{John-wa}]_1$  kinoo  $[\text{pro}_1$  imooto]-ga Mary-o mita.  
*John-GEN-TOP yesterday sister-NOM Mary-ACC saw*  
 ‘As for John, his sister saw Mary yesterday.’  
 c.  $[\text{John-wa}]_1$  kinoo Mary-ga gakkoo-e  $[\text{pro}_1$  imooto]-to itta.  
*John-GEN-TOP yesterday Mary-NOM school-to sister-with went*  
 ‘As for John, Mary went to school with his sister yesterday.’

In fact, we would suggest that the acceptability of the examples in (9) follows from the fact that Japanese is a radical pro drop language. The fronted constituents in (9) bind a silent pronoun rather than a trace (which explains why there is no transfer of case). Notice, however, that this analysis implies that radical pro drop does *not* involve movement, suggesting that it should not be treated on a par with Germanic topic drop.

Contrasts of the type discussed above have been observed before. In fact, Huang notices that radical pro drop does not always have movement properties and proposes that in such cases pro drop involves a base-generated empty category bound by a null operator. This might be true, but it amounts to giving up the original analysis, as the base-generated empty category in question cannot empirically be distinguished from a silent pronoun.

## 2.2 Poor agreement must be licensed

A second theory that reconciles radical pro drop with an agreement-based account of pro drop in languages like Italian has been developed by Speas (1994, 2004). The basic idea is that poor agreement, rather than *pro*, must be licensed. When  $I^0$  contains  $\phi$ -features that lack a specification, values must be provided through the specifier-head relation. Since *pro* lacks  $\phi$ -features, it cannot act as licenser, and hence languages with poor agreement do not allow insertion of this element. Rich agreement is fully specified, and consequently does not need a licenser. Therefore, null subjects are allowed in languages like Italian. Finally, if there is no agreement, there is nothing to be licensed, which means that *pro* can appear in subject position in languages like Japanese. Thus, Speas derives the generalization that null subjects occur in the context of either very rich agreement or no agreement at all.

Although Speas’ proposal is attractive, it faces various problems. To begin with, it is not general enough. As we have seen above, radical pro drop can apply to any argument, not just the subject. This might follow, given that Japanese lacks object agreement as well as agreement between nouns and possessors. However, the same is true for most European languages, which typically do not permit object drop or possessor drop. Of course, technical solutions are not inconceivable, and have in fact been developed in Speas (1994, 2004).

However, to the extent that they are successful, they inevitably weaken Speas' account of subject pro drop, because they undermine the basic claim on which it rests.<sup>3</sup>

The problem repeats itself for subjects in languages like Swedish, Norwegian and Afrikaans. These languages lack verbal agreement but disallow null subjects. We illustrate this for Swedish below:

- (10) köpa 'buy' Swedish  
 Present: köper  
 Past: köpte
- (11) a. Vad beträffar fisk, John tycker om \*(den) rå. Swedish  
*what concern fish, John likes PRT raw*  
 'As for fish, John likes it raw.'  
 b. Vad beträffar Bill, \*(han) tycker om Mary.  
*what concern Bill, he likes PRT Mary*  
 'As for Bill, he likes Mary.'  
 c. Vad beträffar Bill, \*(hans) mor tycker om honom.  
*what concern Bill, his mother likes PRT him*  
 'As for Bill, his mother likes him.'

Speas accounts for the lack of pro drop in Swedish by arguing that the language does not entirely lack agreement. It is of course true that Swedish has some adjectival agreement, but evidence for a link between pro drop and adjectival agreement is currently lacking. More importantly, however, Afrikaans lacks agreement altogether and still does not allow pro drop.

In fact, the claim that poor agreement blocks pro drop is incorrect as well. As pointed out by Butt (2001) there are languages that allow radical pro drop in the presence of agreement affixes that are not fully specified for  $\phi$ -features. For example, in Kokota (an Oceanic language described in detail by Palmer (1999)), richness of agreement differs across arguments: object agreement is specified for person and number, subject agreement is merely specified for person, and there is no agreement with oblique arguments. Nevertheless, as Palmer shows, all arguments can be dropped if the right discourse conditions are met.

Crucial to our present purposes is subject drop, which takes place in the presence of poor agreement. The partial discourse in (12) makes clear that the subject dropped in the final example is interpreted as third person singular. Note that the agreement marker, *-e*, is unspecified for number.

- (12) a. ... n-e hage g'obilologu Kokota  
 RL-3.S ascend Gobilologu  
 '... Gobilologu went up,'  
 b. kai gilai n-e la toke-i bla mane n-e-ke seha-n-lau.  
 LOC until RL-3.S go arrive-3.SG.O LMT man RL-3.S-PERF climb-that.N-SPC  
 'until *pro* reached that man who was climbing.'  
 [...]

---

<sup>3</sup> The generalization that Speas derives goes back to Jaeggli and Safir (1989), who claim that pro drop is possible in languages with a uniform agreement paradigm. These authors acknowledge that the empirical content of their generalization must be reduced, given that the Mainland Scandinavian languages do not have pro drop. Thus they state that the form of the verbal paradigm is a necessary, but not a sufficient condition for pro drop.

- c. n-e la piri-ni-u Ø Ø ka-ia kolu e-u ...  
 RL-3.S go tie-3.SG.O-PROG LOC-the.SG snake 3.S-be.thus  
 ‘pro went and was tying pro up with the snake, like that ...’

The partial discourse in (13) features a null subject in the third person plural, apparently associated with the same underspecified agreement marker *-e*.<sup>4</sup>

- (13) a. Tetu-<sub>J</sub>a ira naitu toke nogoi. Kokota  
 stand-IMM the.PL devil arrive VOC  
 ‘The arriving devils stood up, man!’  
 b. G’-e tog’ la-ni Ø Ø n-e-ke-u.  
 NT-3.S chase-3.SG.O RL-3.S-PERF-be.thus  
 ‘pro chased pro.’

### 2.3 Radical pro drop is blocked by determiners

In a recent paper mainly concerned with the semantics of null arguments across languages, Tomioka (2003) suggests a new perspective on radical pro drop.<sup>5</sup> Simplifying things considerably, we can summarize the proposal as follows. What underlies radical pro drop according to Tomioka is the fact that languages universally allow deletion of NP. In a language that lacks determiners, this operation will give rise to phonologically unrealized arguments (and hence radical pro drop). In a language that has determiners, these will be stranded by NP deletion. This might not be possible in some languages, for example because the determiner is a phonological clitic. But irrespective of this, NP deletion cannot create null arguments in a language with determiners. The following empirical generalization thus emerges from Tomioka’s work:

- (14) *Tomioka’s generalization*  
 All languages which allow radical pro drop allow (robust) bare NP arguments.

Assuming that DP deletion is conditioned by rich agreement, along the lines of the classical pro drop parameter, a full typology of null arguments can be drawn up:

- (15) a. Italian-style pro drop ⇒ Rich agreement, obligatory determiners  
 b. No pro drop ⇒ Poor/no agreement, obligatory determiners  
 c. Radical pro drop ⇒ (i) Rich agreement, optional/no determiners, or  
 (ii) Poor/no agreement, optional/no determiners

Although elegant, Tomioka’s proposal must be rejected on various grounds. To start with, it is unclear to us why, of all the material that can adorn NP, only D would block radical pro drop. Various radical pro drop languages require certain functional heads to be present in the extended nominal projection. In Japanese and Korean, for example, NPs must be

<sup>4</sup> A possible way of dealing with Kokota within Speas’ framework would be to deny that the subject agreement morpheme has an unspecified number feature. This would imply that the subject agreement endings carry a single person feature, which is fully specified. But this would predict that languages with fully specified number, but no person agreement, should also allow subject drop. This is shown to be untrue by the Hallingdalen variety of Norwegian (see Trosterud 1989).

<sup>5</sup> The main point of Tomioka’s paper concerns the interpretation of null arguments in radical pro drop languages. He claims that the semantic characteristics of null arguments in these languages suggest an analysis involving NP deletion. Some relevant discussion on this issue can be found in section 3.2.

accompanied by a case particle. In the same vein, count nouns in Chinese are obligatorily merged with a classifier (see Yang 2001 and references mentioned there):

- (16) [Nei [yi [\* (ben) [shu]]]] hen gui. Chinese  
*that one CL book very expensive*  
 ‘That book is expensive.’

NP deletion would strand these functional heads, much like it strands determiners in languages like English and Dutch. But this would rule out radical pro drop in Japanese, Korean and Chinese – obviously an undesirable result. In order to avoid this conclusion, one would have to say that the universally available deletion operation that underlies radical pro drop in Tomioka’s theory can target bare NPs and functional projections headed by classifiers or case particles, but not determiner phrases. But this would be a rather arbitrary statement.

The problem is aggravated by the following. Recall that in Chinese, pro drop must be analyzed as the deletion of a classifier phrase. As shown by the contrast in (17c,d), there is independent evidence for the possibility of NP-deletion, but not for the deletion of classifier phrases (the data in (17) are from Yang 2001).

- (17) a. Ø hen gui. Chinese  
*very expensive*  
 ‘*pro* is expensive.’  
 b. [Nei [yi [ben [shu]]]] hen gui.  
*that one CL book very expensive*  
 ‘That book is expensive.’  
 c. [Nei [yi [ben e]]] hen gui.  
*that one CL very expensive*  
 ‘That one is expensive.’  
 d. \*[Nei [yi e]] hen gui.  
*that one very expensive*  
 ‘That one is expensive.’

In addition, the generalization in (14) is not without exceptions. There are languages that allow pro drop in the absence of agreement and that require referential NPs to be accompanied by determiners. Oceanic again provides the crucial example. Palmer (2004) describes the syntax of Cheke Holo in considerable detail. He shows that the language allows every argument to be omitted, even if the predicate does not agree with it. For instance, the subject is dropped in (18a), although no corresponding agreement marker appears on the verb. At the same time, Cheke Holo has determiners, even on proper names, as (18b) shows. To the best of our knowledge, these obligatorily accompany definite count nouns.

- (18) a. Wasi gu Ø pohe are. Cheke Holo  
*wash EMPH clothes those*  
 ‘[She] washes the clothes.’  
 b. Richard \*(na) e tusu mei radio \*(na) ka iara.  
*Richard ART PM hand:over come radio ART to me*  
 ‘Richard handed the radio to me.’

### 3. OUR ALTERNATIVE: PRO DROP AS A SPELL-OUT PHENOMENON

The discussion in the previous section shows that the cross-linguistic distribution of radical pro-drop is still ill understood. We will now explore a different approach, based on the idea

that the possibility of radical pro drop in a given language is dependent on the nature of its pronominal paradigm. We believe that the following generalization provides a good approximation of the typological situation. A language may drop pronouns if one of two conditions is met: either its pronouns do not vary for case, or if they do vary, case morphology is agglutinating. The two types of languages are exemplified by Chinese and Japanese, respectively. Chinese is a language with invariant pronouns. For example, as (19) illustrates, the nominative and the accusative forms of the third person, singular, masculine pronoun are identical (see Huang 1984: 533).

- (19) Ta kanjian ta le. Chinese  
*he see he LE*  
 ‘He saw him.’

Japanese pronouns do inflect for case, but the inflection is clearly separate from the pronominal stem. In other words, the case morphology on pronouns is agglutinating rather than fusional. This is illustrated in (20).

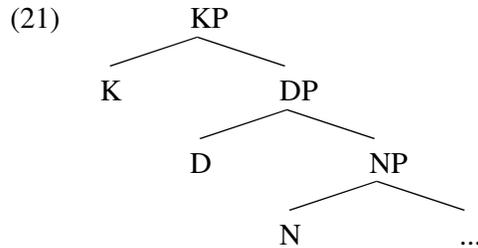
- (20) Kare-ga kare-o setokusuru. Japanese  
*he-NOM he-ACC persuade*  
 ‘He persuades him.’

In contrast, languages in which case on pronouns is fusional do not permit radical pro drop. English, for example, has fusional case morphology (as *he saw him* shows). Hence English pronouns cannot be omitted. The same is true of Italian. The fact that Italian pronouns have fusional case morphology blocks radical pro drop, with the consequence that omission of arguments is conditioned by agreement.

The correlation between the morphology of pronouns and the availability of radical pro drop can be derived from three independently motivated assumptions. First, as originally argued by Perlmutter (1971) and more recently by Holmberg (2004), null arguments are regular pronouns that fail to be spelled out at PF, rather than special silent lexical items, *pro*. Second, as argued by Weerman and Evers-Vermeul (2002), spell-out rules for pronouns may target non-terminal nodes, as well as terminals. Finally, potential competition between different spell-out rules is regulated by the elsewhere principle (see Kiparsky 1973 and subsequent work). We devote one subsection to each of these assumptions.

### 3.1 Pronominal spell-out

Let us start by discussing the nature of spell-out rules for pronouns. For concreteness’ sake, we assume that the extended nominal projection consists of an NP, dominated by a DP, which is in turn dominated by a KP (or Case Phrase). The hypothesis that there is a DP goes back to Abney 1987, and has been widely adopted. Motivation for KP can be found in Bittner and Hale 1996 and Neeleman and Weerman 1999, amongst others. It is conceivable that there is some cross-linguistic variation in the make-up of the extended nominal projection, but we take KP and NP to be universal.



There is general agreement that in an ordinary referential noun phrase like *the old man* the phonological units *the*, *old* and *man* correspond to terminal nodes. In theories that have *en bloc* lexical insertion of semantic, syntactic and phonological material, this is the only possibility. Phonological units cannot be associated with non-terminal nodes. This is different in theories based on ‘late spell-out’ (see Sproat 1985, Halle and Marantz 1993, Jackendoff 1997, and many others). In such theories, syntactic terminals do not contain phonological information; rather, syntactic representations are associated with phonological material in a mapping procedure at the PF interface. They therefore do not only allow spell-out of terminal nodes, but also of larger chunks of structure.

Of course, the idea of spell-out of non-terminal nodes has been around for a long time. For example, the contrast between *the student from Amsterdam* and *the one from Rotterdam* and the ill-formed *\*the student of physics and the one of chemistry* can be explained by assuming that *one* realizes N’, rather than N (see Radford 1988). More recent proposals relying on the phonological realization of non-terminal categories have been developed by Weerman and Evers-Vermeul (2002), and by Michal Starke in unpublished work.

Weerman and Evers-Vermeul (2002) argue that pronouns very often correspond to larger chunks of structure than D or N. The evidence they provide is partly based on Dutch possessive pronouns. Regular possessive pronouns seem to realize D. This is shown in the examples below. The possessive pronoun *mijn* ‘my’ is in complementary distribution with the determiner *de* ‘the’, but not with any other material that can normally appear in the extended nominal projection. Hence the pronoun cannot be said to spell out a projection of D, as that would block realization of the NP *mooie boek* ‘beautiful book’.

- (22)
- |    |  |       |
|----|--|-------|
| a. | Mijn mooie boek is gestolen.<br><i>my beautiful book is stolen</i><br>‘My beautiful book has been stolen.’ | Dutch |
| b. | *De mijn mooie boek is gestolen.<br><i>the my beautiful book is stolen</i>                                 |       |
| c. | *Mijn de mooie boeken is gestolen.<br><i>my the beautiful books is stolen</i>                              |       |

Dutch has a second type of possessive pronoun whose distribution suggests that it spells out NP. As (23a,b) show, *mijne* must co-occur with a determiner; as (23c) shows, its presence blocks realization of material that can normally be part of NP.<sup>6</sup>

<sup>6</sup> Note that spell-out of non-terminal nodes does *not* imply that these nodes have no internal structure. The suggestion is rather that syntactically complex categories may be realized as simplex phonological units. Hence, syntactic evidence for the internal structure of *mijne*, etc., is fully compatible with the claim that *mijne* realizes NP. The same is true of other pronouns that realize non-terminal nodes in the extended nominal projection.

- (23) a. De mijne is gestolen. Dutch  
*the mine is stolen*  
 ‘Mine has been stolen.’  
 b. \*Mijne is gestolen.  
*mine is stolen*  
 c. \*De mijne mooie boek is gestolen.  
*the mine beautiful book is stolen*

In non-standard varieties of Dutch, there is an additional possessive pronoun that corresponds to DP. It is in complementary distribution not only with the determiner, but in fact with all DP-internal material:

- (24) a. Mijnes is gestolen. Dutch  
*mine is stolen*  
 ‘Mine has been stolen.’  
 b. \*De mijnes is gestolen.  
*the mine is stolen*  
 c. \*Mijnes mooie boek is gestolen.  
*mine beautiful book is stolen*

On the basis of these data, we cannot ascertain whether *mijnes* spells out DP or KP. The fact that it does not have separate forms for nominative and accusative might suggest that it does not realize case, and therefore spells out DP (compare (24a) and (25)). However, since syncretism of nominative and accusative forms is very common, it might also be that *mijnes* spells out KP.

- (25) Ik ben mijnes kwijt. Dutch  
*I have mine lost*  
 ‘I have lost mine.’

Weerman and Evers-Vermeul suggest that personal pronouns like *hem* ‘him’ correspond to KPs. They cannot be combined with any other material normally hosted by DP, as (26a-c) illustrate, and they vary in form depending on their case, as shown by (26d).

- (26) a. Ik heb hem gisteren nog gezien. Dutch  
*I have him yesterday still seen*  
 ‘I saw him only yesterday.’  
 b. \*Ik heb de hem gisteren nog gezien.  
*I have the him yesterday still seen*  
 c. \*Ik had hem aardige jongen gisteren nog gezien.  
*I have him nice guy yesterday still seen*  
 d. Hij is vertrokken.  
*he is left*  
 ‘He has left.’

If we accept Weerman and Evers-Vermeul’s proposal, the Dutch pronominal paradigm consists of a set of spell-out rules that distinguish between KPs on the basis of their phi-feature composition. For example, *hem* is introduced by the spell-out rule in (27).<sup>7</sup>

(27)  $[\text{KP} +\text{p}, -\text{a}, 3, \text{SG}, \text{MASC}, \text{ACC}] \Leftrightarrow /hem/$  Dutch

Of course, the idea that pronouns stand for complete nominal phrases is quite intuitive, and was part of traditional as well as early generative grammar. However, it is not uncontroversial. Since Postal 1969, personal pronouns have been analysed as occupying the D-position. The main evidence for this is based on expressions like *us guys*, in which a pronoun seems to take an NP complement. However, various linguists have argued that this conclusion is incorrect, and that the relation between *us* and *guys* is more like apposition than like complementation. Bhat (2004:50-52) gives a good overview of some of the arguments that support this claim. To give one example, in Hausa the apparent complement of the pronoun includes a determiner:

(28)  $s\bar{u} \text{ mut}\bar{a}n\bar{e}-n$  Hausa  
*they men-the*

### 3.2 *Pro drop as zero spell out of regular pronouns*

Given what we have said so far, a natural way of analyzing pro drop is to assume that null arguments are regular pronouns in syntax that fail to be realized at the PF interface. Thus, radical pro drop languages would have the spell-out rule in (29).

(29)  $[\text{KP} +\text{p}, -\text{a}] \Leftrightarrow \emptyset$

The way the rule in (29) is formulated is meant to capture the fact that pro drop cannot affect non-nominal arguments, adjuncts, or reflexives. The evidence showing that reflexives cannot be dropped is very simple; *zibun* ‘self’ cannot be omitted in (30) without a loss of the example’s reflexive interpretation. It requires more space to show that non-nominal arguments and adjuncts do not permit pro drop, and we will therefore have to refrain from doing so here.

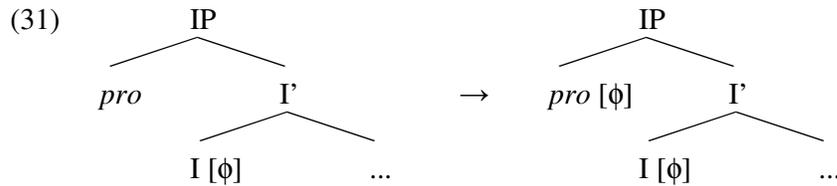
(30) Taroo-ga \*(zibun-o) semeta. Japanese  
*Taro-NOM self-ACC blamed*  
 ‘Taro blamed himself.’

An analysis of pro drop in terms of spell-out ties in with recent work by Holmberg (2004). Holmberg argues that omitted pronouns must carry a full set of phi-features. This is compatible with an analysis based on a rule like (29), but incompatible with the claim that pro drop results from the insertion of a special silent pronoun, *pro*. He presents the argument in terms of minimalist checking theory, but we believe it holds more generally.

If there was a special silent pronoun, it could not have valued phi-features, as its interpretation would vary depending on the context. At the same time, it seems reasonable to assume that *pro* would have to receive a phi-feature specification in the course of the derivation, as it is interpreted as a referential argument. It is often assumed that in languages

<sup>7</sup> We use the familiar features [+p(ronominal), -a(naphoric)] to indicate that KP is a pronoun. We are not committed to these particular features. What is important for us is that pronouns can be distinguished from other nominal categories, such as R-expressions and anaphors.

like Italian the features of *pro* are provided by the agreement on the verb. An analysis along these lines implies that phi-features are copied to *pro* (or that *pro* has an underspecified set of phi-features, whose values are copied):



The copying operation in (31) is incompatible with principles that regulate the way structures are built in minimalism. In particular, the inclusiveness condition requires that the properties of a terminal node are recoverable from the lexicon and that the properties of a non-terminal are recoverable from the structure it dominates (see Chomsky 1995 and Neeleman and Van de Koot 2002). Copying information from  $I^0$  to *pro* violates inclusiveness, as *pro* acquires features from a node that it does not dominate.<sup>8</sup>

Holmberg points out that there are two analyses of *pro* drop that adhere to minimalist assumptions. First, one could assume that *pro* does not exist, and that the information in  $I^0$  is interpreted as the subject (see Weerman 1989, Alexiadou and Anagnostopoulou 1998, Ackema 1999 and Platzack 2004). However, this approach cannot work for languages like Japanese or Chinese, which lack agreement altogether. Thus, dramatically different accounts of radical and agreement-related *pro* drop are necessary. The alternative is to assume that omitted pronouns carry a full set of phi-features. But this strongly suggests an analysis of *pro* drop as zero spell-out of regular pronouns, as otherwise one would have to postulate a different covert pronoun for each overt one, thus unnecessarily multiplying the number of lexical entries.<sup>9</sup>

It has been observed that omitted arguments sometimes behave like regular NPs, rather than pronouns. In Japanese, structures like (32b) are ambiguous. The strict reading is unproblematic, but the sloppy reading seems to require an empty category with more internal structure than a deleted pronoun would have. In particular, it requires that the elided category contains a covert possessor. But pronouns, whether overt or covert, do not have possessors.

- (32) a. Mary-wa zibun-no kuruma-o aratta. Japanese  
*Mary-TOP self-GEN car-ACC washed*  
 'Mary washed her car.'
- b. John mo  $\emptyset$  aratta.  
*John also washed*  
 (i) 'John washed Mary's car too.' (strict)  
 (ii) 'John washed John's car too.' (sloppy)

If examples like (32b) involve *pro* drop, the availability of the sloppy reading would falsify an account of *pro* drop as zero spell out of regular pronouns. However, it can be argued that such examples are *not* derived by *pro* drop, but rather by ellipsis. Otani and Whitman (1991) suggested that ellipsis of a remnant VP was involved, an analysis that had to be abandoned in

<sup>8</sup> Chomsky (1999) has weakened inclusiveness in order to develop an analysis of feature checking as feature valuation. This does not help here. Crucially, the uninterpretable phi-features of the verb are taken to be unvalued; hence these would have to be valued by *pro*, which does not have a phi-feature specification.

<sup>9</sup> Holmberg provides some further empirical evidence that agreement-based *pro* drop must involve a zero element. In Finnish, it occupies the specifier of IP and therefore blocks expletive insertion (see Hakulinen 1975 and Holmberg and Nikanne 2002).

the light of evidence in Kim 1999. Whitman and Moriyama (2004) argue convincingly that the sloppy reading of (32b) must be derived by ellipsis of a nominal category. Crucially, null arguments can only get a sloppy interpretation if some kind of parallelism constraint is met. For instance, if the example in (32a) is followed by a non-parallel structure, as in (33), only the strict reading is available. Sensitivity to parallelism is of course typical of ellipsis, not pro drop.

- (33) Atode John-wa  $\emptyset$  notta. Japanese  
*Afterwards John-TOP rode*  
 (i) ‘Afterwards, John rode in Mary’s car.’ (strict)  
 (ii) \*‘Afterwards, John rode in John’s car.’ (sloppy)

The fact that a sloppy reading is excluded where ellipsis is not possible suggests that pro drop should be analyzed as zero spell out of regular pronouns. After all, overt pronouns do not allow sloppy readings either in the relevant contexts.<sup>10</sup>

Note that the claim that pro drop is deletion of regular pronouns does not imply that overt and covert pronouns are identical in all respects. There is an obvious phonological difference. Therefore, where a pronoun cannot be destressed, it can also not be dropped. Focussed pronouns thus resist omission, as do pronouns in coordinate structures. What circumstances require phonological realisation of a pronominal is a matter of debate, but it is clear that under the present proposal contrasts between overt and covert pronouns must be attributed to pragmatic considerations.

### 3.3 *The Elsewhere Principle*

The third and final assumption that underlies our account of radical pro drop is the elsewhere principle. This principle was introduced into generative grammar by Kiparsky (1973), although it has a rich history predating the Chomskyan turn. It can be formulated as follows:

- (34) Let  $R_1$  and  $R_2$  be competing rules that have  $SD_1$  and  $SD_2$  as their respective structural descriptions. If  $SD_2$  properly includes  $SD_1$ , then  $R_1$  blocks the application of  $R_2$ .

The notion of ‘rule’ that the elsewhere principle relies on includes single operations as well as sets of operations. Suppose, for example, that some structure  $S$  is to acquire some property  $P$ . Then, any two sets of operations that add  $P$  to  $S$  will be in competition (all else being equal).

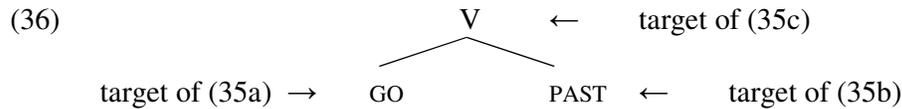
The elsewhere principle has two well-known implications with respect to the phonological realization of syntactic structures. The first is that, all else being equal, it favours spell-out of a category  $C$  over spell-out of the categories contained in  $C$ . This can be demonstrated using the irregular past tense of verbs like *go*. The following relevant spell-out rules are part of the English lexicon:

- (35) a. GO  $\Leftrightarrow$  /go/  
 b. PAST  $\Leftrightarrow$  /-ed/  
 c. GO+PAST  $\Leftrightarrow$  /went/

---

<sup>10</sup> An account distinguishing ellipsis from pro drop has a further advantage. It explains why reflexives can be omitted in parallel structures, but not elsewhere. The rule in (29) does not permit pro drop of anaphors, but like other nominal categories anaphors can undergo ellipsis.

Given these rules, the structure in (36) can be assigned two different phonological realizations. If we apply the rule in (35c), the resulting form will be /went/; if we apply the rules in (35a) and (35b), we arrive at the ungrammatical \*/go-ed/.



The elsewhere principle rules out the regular past tense of *go*. This is because any verb allows a past tense in *-ed*, but only *go* allows a past tense *went*. Put differently, the structural description of the rule for the past tense of *go* is properly included in the structural description of the rule for the regular past tense. It therefore takes priority. This result holds generally: all else being equal, spell-out of a higher-level category will involve a more specific rule than spell-out of the categories contained in it. It will therefore be favoured over spell-out of lower-level categories.

A second implication of the elsewhere principle is that it gives preference to a phonological realization of a category C that spells out more of C's features over a phonological realization that spells out fewer features. As an example, consider the spell-out rules for person agreement in German:

- (37) a. [PERSON PAR] ⇔ /e/ German  
 b. [PERSON PAR, ADD] ⇔ /st/  
 c. PERSON ⇔ /t/

Arguably, person distinctions are syntactically encoded through two features: PAR (for participant in the speech act) and ADD (for addressee). The second person is specified as [PAR, ADD], as it involves an addressee, and by implication, a participant in the speech act. The first person involves a participant, but not an addressee, and is therefore specified as [PAR] only. Finally, the third person involves neither a participant, nor an addressee, and will consequently not carry any person features (see Kerstens 1993, Harley and Ritter 2002, and Ackema and Neeleman 2004 for further discussion of person features).

Now consider the structures in (38). In the case of a third person subject, only the spell-out rule in (37c) can apply, as (37a) and (37b) are overspecified. Hence, (38c) will be realized as *er spielt*. In the case of a first person subject, however, not only (37a), but also (37c) can apply, as the latter has a very general structural description. When we are dealing with a second person subject, the situation is even worse: all three spell-out-rules in (37) can in principle apply.

- (38) a. Ich spiel-[PERSON PAR]. German  
*I play*  
 b. Du spiel-[PERSON PAR, ADD].  
*you play*  
 c. Er spiel-[PERSON ∅].  
*he play*

But of course the structural description of the rule in (37a) properly includes the structural description of (37b), as the latter mentions an additional feature (namely [ADD]). For the same reason the structural description of (37c) properly includes that of (37a). This means that the elsewhere principle blocks (37a) where (37b) can apply, and (37c) where (37a) can apply.

The structures in (38a) and (38b) are consequently realized as *ich spiele* and *du spielst*, respectively.

We should stress that the two implications of the elsewhere principle discussed above hold *all else being equal*. This is particularly important when we consider situations in which a spell-out rule for a category C realizes fewer features than the spell-out rules for the categories contained in C (say A and B). In situations of this type, the elsewhere principle does not favour one realization of [C A B] over the other. A realization of C as /c/ is more specific in that it targets a higher category, while a realization of C as /a/-b/ is more specific in that it spells out more features. The consequence of this stalemate is that neither form will block the other, and hence that both realizations of C are allowed. We may therefore sum up the effects of the elsewhere principle in the following three rules of thumb:

- (39) a. All else being equal, a phonological realization of a category C takes priority over a phonological realization of the categories contained in C.  
 b. All else being equal, a phonological realization of a category C that spells out more of C's features takes priority over phonological realization that spells out fewer features.  
 c. Optionality results if the phonological realization a category C spells out fewer of C's features than the phonological realization of the categories contained in C.

### 3.4 Why Radical Pro Drop is Sensitive to the Morphology of Pronouns

Let us now return to the question at the heart of this paper: what determines the cross-linguistic distribution of radical pro-drop. As a result of the elsewhere principle, the general zero spell-out rule in (29) would be blocked by more specific spell-out rules that realize a KP with particular case and phi-features, such as (27). (We repeat these rules below.)

(27)  $[\text{KP} +\text{p}, -\text{a}, 3, \text{SG}, \text{M}, \text{ACC}] \Leftrightarrow / \text{hem} /$  Dutch

(29)  $[\text{KP} +\text{p}, -\text{a}] \Leftrightarrow \emptyset$

This means that in languages whose pronominal paradigm consists of spell-out rules for KP, a general pro drop rule would not have any effect. Its application would be systematically suppressed by the more specific spell-out rules that introduce overt pronouns.

This does not mean that such languages necessarily lack pro drop altogether. A context-sensitive spell-out rule could legitimately give rise to zero arguments. Consider a rule that mentions agreement (indicated by co-indexation with an element in the structural description of the rule):<sup>11,12</sup>

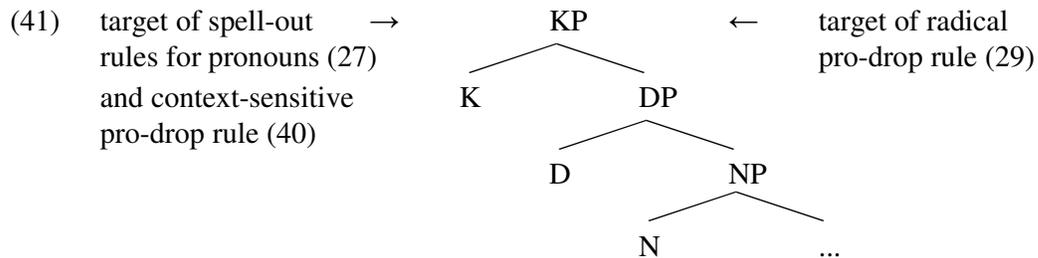
(40)  $[\text{KP} +\text{p}, -\text{a}, \phi_i] \Leftrightarrow \emptyset / \text{---} [\phi_i]$

<sup>11</sup> It has been established in the literature that the richer the agreement, the greater the likelihood of context-sensitive pro drop (see Ackema et al. 2005 for an overview). On the theory developed here, this correlation is not derived from a syntactic principle, but must either be explained on functional grounds, or in terms of the theory of context-sensitive spell-out rules, or a combination of the two. We cannot go into this issue here, and will simply take for granted the relevance of rich agreement for context-sensitive pro drop.

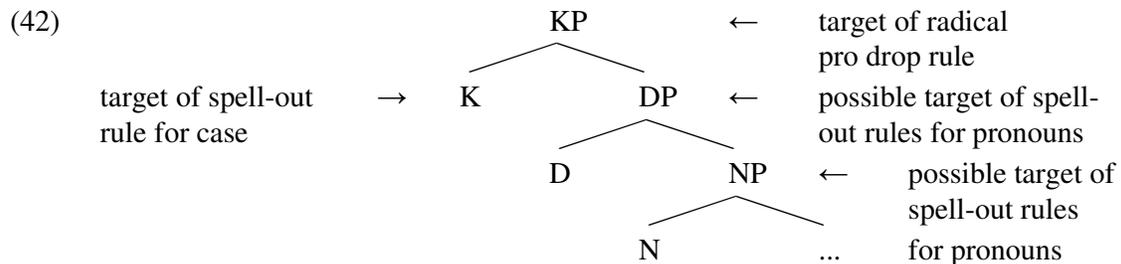
<sup>12</sup> Various authors have argued that certain agreeing arguments lack a specification for case. Nominative and absolutive in particular can be analyzed as bare forms of nominals in a variety of languages (see Nichols 1986, Bittner and Hale 1996 and Neeleman and Weerman 1999, among others). If this is on the right track, agreeing arguments may be DPs rather than KPs. This would imply that the input of the rule in (40) should be adjusted: the label KP should be replaced by DP. It would also imply that there is never a context in which (29) and (40) compete.

The rule in (40) is not in an elsewhere relation with the rules that make up the (overt) pronominal paradigm. In order to see this, compare it with (27). The structural description of the context-sensitive rule is more specific in one sense: it mentions agreement, while the context-free rule does not. On the other hand, the structural description of a context-free rule like (27) is more specific in that it mentions particular phi-features, which (40) does not. This means that a spell-out rule for an overt pronoun and the context-sensitive pro-drop rule are not in an elsewhere relation. Consequently, neither rule blocks the other: languages with fusional pronominal paradigms cannot have radical pro drop, but they can have pro drop in the context of rich agreement.

The reason why radical pro drop is blocked in languages with fusional pronominal paradigms is that the relevant spell-out rules all apply to the same category, KP:



So, in order for a general zero spell-out rule like (29) to have an effect, the language in question cannot have other spell-out rules for pronominal KPs. Consider what happens if the rules that express the pronominal paradigm target lower-level categories, such as K and DP or NP:



An example of a language with this set-up for overt pronouns is Japanese. Recall that this language has independent pronominal stems and case markers. These are inserted by the rules below:

- (43)
- |   |                            |              |
|---|----------------------------|--------------|
| [ <sub>NP</sub> +p, -a, 1, SG] ⇔ /watasi/       | [ <sub>K</sub> NOM] ⇔ /ga/ | Japanese     |
| [ <sub>NP</sub> +p, -a, 2, SG] ⇔ /anata/        | [ <sub>K</sub> ACC] ⇔ /o/  | (simplified) |
| [ <sub>NP</sub> +p, -a, 3, SG, MASC] ⇔ /kare/   | [ <sub>K</sub> DAT] ⇔ /ni/ |              |
| [ <sub>NP</sub> +p, -a, 3, SG, FEM] ⇔ /kanozyo/ | [ <sub>K</sub> GEN] ⇔ /no/ |              |
| [PL] ⇔ /tati/; /ra/                             |                            |              |

Application of these rules generates forms like (44).

- (44) kare-ra-ga Japanese  
 he-PL-NOM  
 'they'

Similarly, the nominative form of ‘I’ is *watasi-ga*, the accusative form is *watasi-o*, etc. Clearly, the general zero spell-out rule in (29) does not stand in an elsewhere relation to any of the rules in (43), which generate overt pronouns. The structural description of (29) is more specific in one sense, namely in that it spells out a larger chunk of structure than any of the rules in (43). On the other hand, the structural descriptions of the rules in (43) mention features that the zero spell-out rule is insensitive to, which makes *them* more specific. Hence, the structural description of the zero spell-out rule does not properly include those of the rules for overt pronouns; similarly, none of the structural descriptions of the rules for overt pronouns properly includes that of the zero spell-out rule. As a consequence, there will be no blocking effects between (29) and (43), and pro drop should be possible for all pronominal arguments. This is indeed a fair characterisation of the situation in Japanese, as was demonstrated in (2) above.

Another type of pronominal system that allows radical pro drop is found in Chinese. In this language, pronouns have invariant forms in subject and object positions, while possessors are derived by the particle *de*. A possible analysis of this situation would be to assume that case is not overtly realised, and that the spell-out rules for pronominal stems target a category lower than KP (for simplicity’s sake, let us say NP):

- |      |                                       |                          |         |
|------|---------------------------------------|--------------------------|---------|
| (45) | [ <sub>NP</sub> +p, -a, 1, SG] ⇔ /wǒ/ | [ <sub>K</sub> ... ] ⇔ ∅ | Chinese |
|      | [ <sub>NP</sub> +p, -a, 2, SG] ⇔ /nǐ/ | [POSS] ⇔ /de/            |         |
|      | [ <sub>NP</sub> +p, -a, 3, SG] ⇔ /tā/ | [PL] ⇔ /men/             |         |

These rules generate pronouns like (46).

- |      |    |                                  |         |
|------|----|----------------------------------|---------|
| (46) | a. | wǒ-men-∅<br>I-PL-CASE<br>‘we/us’ | Chinese |
|      | b. | wǒ-de<br>I-POSS<br>‘my/mine’     |         |

If analyzed along these lines, the situation in Chinese, is formally indistinct from that in Japanese. Chinese should therefore allow radical pro drop. This is, of course, correct (see (3)).

### 3.5 More on Pronouns without Case

The main typological prediction we derived so far is that languages with radical pro drop must have a pronominal paradigm that is either invariant (as in Chinese) or agglutinating for case (as in Japanese). In other words, there should be no radical pro drop languages with a pronominal paradigm that is fusional for case.

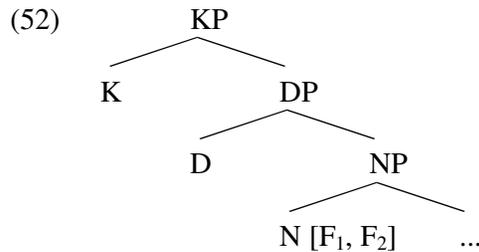
For languages with an invariant pronominal paradigm, more precise predictions can be made. Recall that in our analysis of Chinese in (45) above, we have assumed that the spell-out rules that generate overt pronouns target a category lower than KP, and that there is a silent vocabulary item for K. However, one could in principle devise a set of spell-out rules for Chinese that target KP, as in (47). Such an analysis would of course imply that Chinese would not allow radical pro drop, because the rules in (47) block application of the radical pro drop rule.



a result of the lack of access to negative evidence in language acquisition. Suppose a child has acquired a pronominal form /xxx/ that realizes a set of features {F<sub>1</sub>, F<sub>2</sub>}, but he or she has not figured out yet what category the pronoun realizes:

(51) [? F<sub>1</sub>, F<sub>2</sub>] ⇔ /xxx/

Suppose, furthermore, that the lowest category that can host these features is N, and that /xxx/ could hence realize N, NP, DP or KP:



An insurmountable problem arises if the child hypothesizes that /xxx/ spells out N, while in the adult grammar it stands for a larger category, say KP. Under such circumstances, adult speakers will never produce data that can persuade the child to abandon his or her initial (incorrect) hypothesis. On the other hand, it is harmless for the child to hypothesize that /xxx/ realizes the highest category KP, even if in the adult grammar it stands for a lower category, say N. Adult speakers will produce data in which /xxx/ is combined with other KP-internal material, and this input will force the child to reassociate the rule in (51) with a lower-level category. Learnability thus dictates that spell-out rules are hypothesized to target the highest possible category compatible with their feature specification and distributional data.<sup>13</sup> The implication for Jamaican Creole is that its invariant pronouns must be associated with KP. Languages like Jamaican Creole will therefore not allow radical pro drop.

We summarize our predictions about the cross-linguistic distribution of radical pro drop in the table below. In the remainder of this paper we consider to what extent these predictions are borne out.

(53)

<i>PROPERTIES OF THE PRONOMINAL PARADIGM</i>				
	<i>AGGLUTINATING CASE</i>	<i>INVARIANT FOR CASE</i>		<i>FUSIONAL CASE</i>
		<i>agglutinating for number, etc.</i>	<i>invariant or fusional for number, etc.</i>	
<i>RADICAL PRO DROP</i>	YES	YES	NO	NO

#### 4. THE CROSS-LINGUISTIC DISTRIBUTION OF RADICAL PRO DROP

The primary aim of this section is to demonstrate the correlation between the existence of radical pro drop in a language and the morphology of its pronouns. We will first look at languages that do not allow radical pro drop, and subsequently discuss languages that do. The

<sup>13</sup> This is in line with Panneman and Weerman’s (2005) proposal about the acquisition of determiners. The basis for their argument is the assumption that proper names spell out DPs in the adult language. They notice that around 2 years, children use bare nouns and D+N combinations in free variation. This can be understood if children start out with associating the spell-out rules for bare nouns with DP, as if they were proper names.

section has a secondary aim, which is to illustrate some of the complications that arise in classifying pronominal systems.

#### 4.1 Languages that do not allow radical pro drop

Since pro drop is quite common cross-linguistically, it is important that theories of pro drop predict under which circumstances arguments cannot be omitted. On our account, radical pro drop is blocked in case a language has a non-agglutinating pronominal paradigm. There are two types of paradigm that fall under this heading, namely paradigms containing fusional forms and paradigms with truly invariant forms. This is not to say that languages of this type cannot have pro drop, but to the extent that they do, deletion should only affect agreeing arguments.

We begin this section by demonstrating that this theory correctly characterizes the Germanic languages. In all Germanic languages, the pronominal paradigm is fusional, and as expected, none of these languages allows omission of arguments. We will not give pronominal paradigms for the entire class of Germanic languages, but restrict ourselves to Swedish, Dutch, and Afrikaans (an honorary Germanic language).

The Swedish pronominal paradigm is given in (54). It is clearly fusional: no separate pronominal stems or case suffixes can be identified.

#### (54) Swedish pronouns

	NOMINATIVE	ACCUSATIVE	POSSESSIVE
1 SG	jag	mig	min
2 SG	du	dig	din
3 SG M	han	honom	hans
3 SG F	hon	henne	hennes
1 PL	vi	oss	vår
2 PL	ni	er	
3 PL	de	dem	deras

As expected, Swedish does not allow zero spell out of pronominal arguments, as shown in (55a) for subjects, (55b) for objects and (55c) for possessors. (It is likely that Germanic possessors are D-heads, as demonstrated above for Dutch, in which case they cannot be input to the zero spell-out rule in (29) for independent reasons.)

- (55) a. I går tok \*(han) sin hatt. Swedish  
yesterday took he 3.REFL hat  
‘Yesterday, he took his (own) hat.’
- b. Jag har \*(henne) inte gett lov att komma.  
I have her not give permission to come  
‘I didn’t give her permission to come.’
- c. Han tok \*(hans) hatt.  
he took his hat  
‘He took his hat.’

Even though it is fusional, some patterns can be observed in the Swedish paradigm. For example, third person singular forms share the string *hVn*, while first and second person singular forms display the same *-ig/-in* alternation in the accusative and possessive. This, however, is not sufficient to establish an agglutinating paradigm. It seems pointless to identify *hVn* as a third person singular morpheme, as that would require listing of several otherwise unmotivated case suffixes. It seems equally pointless to analyze *-ig* and *-in* as case

endings, simply because they do not generalize across the pronominal paradigm or indeed to any other nominals.

Such patterns are reminiscent of the ‘family resemblances’ discussed by Bybee and Slobin (1982) and Pinker and Prince (1988, 1994, 1996) in connection with English irregular verbs. These authors argue that subregularities among irregular verb forms are real, but should not be handled by symbol manipulation (that is, grammatical rules), but in terms of associative memory. Similarly, family resemblances among fusional pronouns should not be analyzed as part of the grammar, and hence do not affect the theory of pro drop.

Note that there is no theory-independent cut-off point between family resemblances and grammatical rules. A rule-based analysis can be devised for any paradigm, as long as one allows oneself an unlimited number of allomorphy rules for both stems and affixes. But if the complexity of the rule system is comparable to (or exceeds) the complexity of the actual paradigm, it seems likely that native speakers simply list unanalyzed forms. For the Swedish paradigm, this is clearly the case; the same is true of the other paradigms in this section.

The Dutch pronominal paradigm is given in (56). As in the case of Swedish, it is uncontroversially fusional, although it also contains a few invariant forms.

(56) *Dutch strong pronouns*

	NOMINATIVE	ACCUSATIVE	POSSESSIVE
1 SG	ik	mij	mijn
2 SG	jj	jou	jouw
3 SG M	hij	hem	zijn
3 SG F	zij	haar	
3 SG N	het		zijn
1 PL	wij	ons	
2 PL	jullie		
3 PL	zij	hun	

Dutch also has weak pronouns, which differ in form from their strong counterparts given above. (Indeed, the weak paradigm might seem more relevant, given Cardinaletti and Starke’s (1999) claim that null subjects fall in the category of weak pronouns.) The reason we give the strong paradigm for Dutch, as well as for the languages discussed below, is that tonic pronouns are less susceptible to phonological change, and therefore more likely to preserve regularity. This might just be a tendency, but for the languages we consider in this paper, it seems true that the paradigms for weak pronouns and clitics never show more regularities than the strong paradigm.

Like Swedish, Dutch lacks radical pro drop. Arguments can only be dropped if they are topics. We have already demonstrated that subjects and objects cannot be omitted in (5). The same is true of possessors, as (57) illustrates.

- (57) Jan wil \*(zijn) fiets verkopen. Dutch  
*Jan wants his bike sell*  
 ‘John wants to sell his bike.’

The pattern found in Swedish and Dutch extends to other Germanic languages. This is of some theoretical importance, because these languages vary considerably with respect to verbal agreement. The mainland Scandinavian languages and English have no or very poor agreement; Dutch, Frisian and Flemish have what one might call a ‘middle-class’ paradigm; German and Icelandic, finally, have rich morphology. Despite this variation, none of these

languages allows radical pro drop. It seems to us that theories of radical pro drop that rely on the nature of verbal agreement face considerable difficulties in this domain.

While Afrikaans singular pronouns must be classified as fusional, the plural ones have systematically invariant forms; they are not inflected for case, number or gender:

(58) *Afrikaans pronouns*

	NOMINATIVE	ACCUSATIVE	POSSESSIVE
1 SG	ek		my
2 SG	jy		jou
3 SG M	hy	hom	sy
3 SG F	sy		haar
3 SG N		dit	sy
1 PL		ons	
2 PL		julle	
3 PL		hulle	

Since neither fusional nor invariant paradigms allow zero spell out of pronominal arguments, Afrikaans cannot have radical pro drop, which is indeed the case:

- (59) a. Ons is egter vol vertroue dat \*(ons) sal slaag. Afrikaans  
*we are however full confidence that we will succeed*  
 ‘We are full of confidence, however, that we will succeed.’
- b. Ons sal hulle nie toelaat om oor \*(ons) te loop nie.  
*we will them not allow for over us to walk not*  
 ‘We will not allow them to walk over us.’
- c. Sowat 28% van \*(sy) projekte is nie op koers nie.  
*about 28% of his projects is not on course not*  
 ‘About 28% of his projects is not on course.’

We now turn to languages that have classical pro drop. Italian, for example, allows context-sensitive pro drop in the subject position of finite clauses. However, it does not allow possessors or referential objects to be omitted. This is illustrated in (60).<sup>14</sup>

- (60) a. (Loro) amano Gianni. Italian  
*they love-3.PL John*
- b. Per quanto riguarda Gianni, penso che Maria \*(lo) ami.  
*For how.much regards John, think-1.SG that Mary 3.SG.M love-3.SG*
- c. Per quanto riguarda Gianni, penso che Maria ami \*(lui).  
*For how.much regards John, think-1.SG that Mary love-3.SG him*  
 ‘As for John, I think Mary loves him.’
- d. Per quanto riguarda Gianni, penso che \*(sua) madre lo ami.  
*For how.much regards John, think-1.SG that his mother 3.SG.M love-3.SG*  
 ‘As for John, I think his mother loves him.’

<sup>14</sup> Rizzi (1986) observes that Italian allows non-referential human objects to be dropped in object position. One of his examples is *La buona musica riconcilia Ø con se stessi* ‘Good music reconciles one with oneself.’ Although this example shows that Italian has a silent arbitrary pronoun, it does not establish that the language has object pro drop, as there is no corresponding overt pronoun that could be substituted for the empty category (without changing the reflexive).

Italian can only drop pronouns that agree with a verb or auxiliary because its pronominal paradigm does not consist of agglutinating forms. Nominative and accusative forms are either fusional forms or invariant. Hence, these forms cannot undergo radical pro drop. Possessives are more complex: they have two sets of phi-features. The first – expressed by the stems in (61) – determines their reference; the second, which indicates properties of the possessum, is represented by the agreement suffixes in (62). So, possessive pronouns have predictable morphological structures.

(61) *Italian strong pronouns*

	NOMINATIVE	ACCUSATIVE	POSSESSIVE
1 SG	io	me	mi-
2 SG	tu	te	tu-
3 SG M	lui		su-
3 SG F	lei		
1 PL	noi		nostr-
2 PL	voi		vostr-
3 PL	loro		

(62) *Italian possessive endings*

SG M	-o
SG F	-a
PL M	-i/-ei/-oi
PL F	-e

However, the traditional analysis has it that Italian possessive pronouns are adjectival rather than nominal. This claim is supported by the fact that the agreement endings they carry are identical to the adjectival agreement endings (modulo some allomorphy in the masculine plural). Moreover, the distribution of possessive pronouns contrasts sharply with that of other possessors (compare *la casa di Gianni* ‘the house of John’ with *la mia casa* ‘the my house’), while it resembles the distribution of certain adjectives (compare *la piccola casa* ‘the small house’). If possessive pronouns are adjectival, they cannot be input to the zero spell out in (29), as this rule targets a nominal category, KP.

Let us turn to a different language, Pashto. As mentioned at the outset, this language allows omission of agreeing pronouns, but not of non-agreeing ones, much like Italian. The fact that non-agreeing pronouns cannot be dropped in subject or object position is not surprising, given that Pashto personal pronouns are fusional. (The paradigms below are taken from Roberts 2000; see pages 19-21 for discussion).

(63) *Pashto strong pronouns*

	DIRECT	OBLIQUE
1 SG	ze	Maa
2 SG	te	Taa
3 SG VIS M	day	de
3 SG INVIS M	daa	dee
3 SG VIS F	agha	aghe
3 SG INVIS F	agha	aghee
1 PL	mung	
2 PL	taasee	
3 PL VIS	duy	
3 PL INVIS	aghuy	

This leaves possessive pronouns. The possessive relation can be expressed in two ways in Pashto. There is a general strategy involving the preposition *di/dee*, which applies to strong pronouns as well as to R-expressions. For pronouns, an alternative strategy is available, namely the use of a second position clitic. As (64) shows, these clitics do not relate to the strong pronouns in any transparent way (see Roberts 2000: 68).

(64) *Pashto second-position clitics*

1 SG	mee
2 SG	dee
3 SG/PL	yee
1 SG/1 PL	am/mo

Neither strategy allows omission of the possessor. The zero spell out rule in (29) does not target PPs. It cannot apply to the pronominal complement of the preposition either, as its application is blocked by any of the more specific rules that insert overt forms:

- (65) a. \*(Di taa) plaar mee dee wé-leg-i. Pashto  
*of 2.SG.OBL father 1.SG must PERF-send-PRES.3.SG*  
b. Di \*(taa) plaar mee dee wé-leg-i.  
*of 2.SG.OBL father 1.SG must PERF-send-PRES.3.SG*  
'Your father must send me.'

Possessive clitics cannot be left out either because they are fusional in form:

- (66) Plaar mee \*(dee) léeg-i Pashto  
*father 1.SG 2.SG send-PRES.3.SG*  
'Your father is sending me.'

Greek is our final example of a classical pro-drop language. This language allows omission of subjects of finite clauses, which agree with the verb, but omission of objects or possessors is impossible (compare Papangeli 2000).

- (67) a. (Aftes) agapane to Vasili. Greek  
*they.fem love the Vasilis*  
'They love Vasilis.'

- b. O Janis idhe \*(afton/ton) na perni tis karameles.  
*the Janis saw him NA take the sweets*  
 ‘Janis saw him taking the sweets.’
- c. I mitera \*(afton/ton) simbathi to Vasili.  
*the mother their.masc like the Vasilis*  
 ‘Their mother like Vasilis.’

The lack of radical pro drop in Greek arguably follows from the organization of its pronominal paradigm, which is given in (68). No case or number affixes can be identified, and in this respect the paradigm can be characterized as fusional. However, a complication arises because there are regularities that go beyond the notion of ‘family resemblance’: third person forms share *af-*, while first and second person forms share *e-*. This cannot be coincidental given that pronominal clitics can by and large be derived from their strong counterparts by omission of *af-* and *e-* (see Drachman 1997 for discussion). In (69), we give the clitic forms for comparison.

(68) *Greek strong pronouns*

	NOMINATIVE	ACCUSATIVE	DATIVE/GENITIVE
1 SG	ego	emena(ne)	
2 SG	esi	esena(ne)	
3 SG M	aftos	afton(e)	aftu
3 SG F	afti	aftin(e)	aftis
3 SG N	afto		aftu
1 PL	emis	emas	
2 PL	esis	esas	
3 PL M	afti	aftus	afton
3 PL F	aftes		
3 PL N	afta		

(69) *Greek clitics*

	ACCUSATIVE	DATIVE/GENITIVE
1 SG	<u>me</u>	mu
2 SG	<u>se</u>	su
3 SG M	<u>ton(e)</u>	<u>tu</u>
3 SG F	<u>ti(n)(e)</u>	<u>tis</u>
3 SG N	<u>to</u>	<u>tu</u>
1 PL	<u>mas</u>	
2 PL	<u>sas</u>	
3 PL M	<u>tus</u>	tus
3 PL F	tis/ <u>tes</u>	
3 PL N	<u>ta</u>	

The prefixes *af-* and *e-* are what Cardinaletti and Starke (1999) call support morphemes, that is, elements that allow deficient pronominal forms to function as strong pronouns. There are various ways of analyzing such elements. The most likely one in our view takes them to be inserted at PF by rule of extended exponence (see Matthews 1972 and subsequent literature). Simplifying things considerably, *e-* would be a second realization of [PERSON PAR] (a feature specification that generalizes over first and second person), while *af-* would be a second realization of [PERSON] (the feature expressing third person). On this analysis, the spell-out

rules for both strong pronouns and clitics in fact realize KP and they thus block application of (29).

The languages discussed so far all have paradigms that encode at least some case distinctions. Our theory also predicts, however, that languages whose pronouns do not vary for case will lack radical pro drop, unless other nominal features are expressed through separate markers. This prediction is borne out by Creole languages. As Holm (2000) points out, these languages do not mark case, even if the superstrate or substrate languages do. Moreover, when creoles distinguish number in pronouns, the expression of plurality is typically fusional. We have already demonstrated this for Jamaican Creole. The same observation can be made for Papiamentu:

(70) *Papiamentu pronouns*

	DIRECT	POSSESSIVE
1 SG	(a)mi	
2 SG	(a)bo	
3 SG	e	su
1 PL	nos	
2 PL	boso(nan)	
3 PL	nan	

Given that invariant and fusional pronominal paradigms block the application of the zero spell-out rule in (29), Creole languages should not allow radical pro drop. The following examples demonstrate the ungrammaticality of argument omission in Papiamentu (see Kouwenberg and Muysken 1995 for general discussion of this language):

- (71) a. Ta kiko \*(bo) ta hasi? Papiamentu  
 PRT *what you* PROG *do*  
 ‘What are you doing?’
- b. mi a mir’ \*(e) o  
 I PAST *see he* PRT  
 ‘I did see him.’
- c. Bo ke bende \*(bo) auto Hapones?  
 you PRT *sell you car Japanese*  
 ‘Do you want to sell your Japanese car?’

There are a few Creole languages for which it has been suggested that pronouns may carry an independent plural marker. Perhaps the best-known example is Tok Pisin, whose paradigm is given below. Various descriptions of this language treat *-pela* as a plural marker that can be attached to the singular pronouns *mi* and *yu* (see, for example, Foley 1986).

(72) *Tok Pisin pronouns*

1 SG	mi
2 SG	yu
3 SG	em
1 PL INCL	yumi
1 PL EXCL	mipela
2 PL	yupela
3 PL	ol

If *-pela* were a plural marker, we might expect radical pro drop, at least for first and second person pronouns. But Tok Pisin is a typical Creole language in that it does *not* allow arguments to be omitted (data from Mühlhäusler 1985):

- (73) a. \*(Mi) laik go long Mosbi. Tok Pisin  
*I want go to Moresby*  
 ‘I want to go to Moresby.’
- b. Wanpela man i bin skulim \*(mi) long Tok Pisin.  
*one man PM PAST teach-TR I to Tok Pisin*  
 ‘A man was teaching me Tok Pisin.’
- c. Em ya i bagarapim meri bilong \*(mi)  
*he EMPH PM assaulted-TR woman of I*  
 ‘It’s he who assaulted my wife.’

As a matter of fact, *-pela* does not seem to be a plural marker. It is never used as one anywhere else in the language. Rather, it appears on short adjectives and numerals. In this context, it is uncontroversially analysed as an adjectival marker, amongst other things because it occurs in expressions like *wanpela man* ‘one man’ (see (73b)). So, at best *-pela* is ambiguous between an adjectival marker and a plural marker that exclusively attaches to *mi* and *yu*. We agree with Mühlhäusler (1985) that an analysis along these lines is rather unattractive, given that positing a rule of pluralisation for two lexical items is more complex than simply listing *mipela* and *yupela* as underived forms. Moreover, Moravcsik (1978b: 354) observes that if a language uses an inflectional ending to indicate number in the first and/or second person pronoun, then it does so in the third person as well. An analysis of *-pela* as a number marker would make Tok Pisin an exception to an almost exceptionless generalization.

We conclude on the basis of the discussion so far that the proposed correlation between fusional or invariant pronominal morphology on the hand and the impossibility of radical pro drop on the other is real. This does not mean that testing the validity of the correlation in any given language is unproblematic. The reason is that in addition to radical pro drop, there are various other mechanisms that result in omission of arguments. We have already mentioned context-sensitive pro drop, topic drop (see section 2.1), ellipsis in parallel structures (see section 3.2), and the use of silent arbitrary pronouns (see note 14). A language may combine a number of these strategies, giving rise to wide-spread argument omission, even if radical pro drop is not available. The implication is that our hypothesis cannot be tested without a certain degree of syntactic analysis.

For example, the Slavic languages allow argument omission in a number of contexts, despite the fact that they have fusional pronominal paradigms. A case can be made that the phenomenon should not be analyzed as radical pro drop. From the very careful work by McShane (1999, 2000, 2005), it can be concluded that several operations are at work, including ellipsis in parallel structures and Germanic-style topic drop. Crucially, McShane shows that argument omission in the Slavic languages is subject to a number of conditions that are certainly stricter than those typical of radical pro drop.

Similarly, both Brazilian and European Portuguese allow argument omission in the absence of agreement (see Raposo 1986). According to our theory, this cannot be radical pro drop, as Portuguese has fusional pronominal morphology. But as in Slavic, argument omission in Portuguese seems to be subject to restrictions absent in Japanese and Chinese. For example, as pointed out by Ferreira (2004), omitted embedded subjects in Brazilian Portuguese must be related to a local, c-commanding DP. Moreover, they do not permit split

antecedents. So, although Portuguese might seem a counterexample on the surface, it may in fact support our proposal.

#### 4.2 Languages that allow radical *pro* drop

We have argued that the existence of radical *pro* drop in a language is linked to the categories for which that language has overt spell-out rules. Only if those spell-out rules target categories lower than KP is it possible for the zero spell-out rule in (29) to apply. In the previous section, we have examined a number of languages that have overt spell-out rules for KP, and that consequently disallow the omission of pronominal arguments. In this section, we turn to languages in which overt pronouns realize categories lower than KP, and that permit radical *pro* drop as a result.

Overt pronouns must spell out categories lower than KP if accompanied by separate morphemes that realize case or other nominal features. So, we can test our hypothesis by checking whether languages with radical *pro* drop have pronominal paradigms that are agglutinating. We begin by considering two straightforward cases: Korean and Burmese.

It is well known that both languages allow omission of subjects, objects and possessors (the Korean data are from Sohn 1994; the Burmese data are from Okell 1969):

- (74) a.  $\emptyset$  etten swul-ul cohaha-sey-yo? Korean  
*what.kind.of liqueur-ACC like-HON-POL*  
 ‘What kind of liqueur do *pro* like?’  
 b. Yongho-ka  $\emptyset$  kumwul-lo cap-ass-eyo  
*Yongho-NOM net-with catch-PAST-POL*  
 ‘Yongho caught *pro* with a net.’  
 c. Nami-nun [ $\emptyset$  kwi-ka] yeypu-ta  
*Nami-TOP ear-NOM pretty-PRT*  
 ‘As for Nami, *pro*’s ears are pretty.’
- (75) a.  $\emptyset$  cou mã-hpyei-naiñ-loú ... Burmese  
*rope not-undo-be.able-because ...*  
 ‘Because *pro* couldn’t undo the rope, ...’  
 b. Bethu  $\emptyset$  pyò-thă-lè?  
*who tell-PRT-Q*  
 ‘Who told *pro*?’  
 c. Éda [ $\emptyset$  âmá-kou] ãcauñ cà.  
*that sister-ACC matter communicate*  
 ‘Of that, inform *pro*’s sister.’

As predicted, both languages have agglutinating pronominal paradigms. Korean is like Japanese in that pronouns carry the same case particles that regular nouns do. The pronominal stems are introduced by the spell-out rules in (76); the case endings by the rules in (77). (There are many more pronominal stems, but since these all inflect regularly for case, we only give some representative examples here.)

- (76) [NP +p, -a, 1, SG]  $\Leftrightarrow$  /na/, ...      [NP +p, -a, 1, PL]  $\Leftrightarrow$  /wuli/, ...      Korean  
 [NP +p, -a, 2, SG]  $\Leftrightarrow$  /ne/, ...      [NP +p, -a, 2, PL]  $\Leftrightarrow$  /ne-huy/, ...      (simplified)  
 [NP +p, -a, 3, SG]  $\Leftrightarrow$  /ku/      [NP +p, -a, 3, PL]  $\Leftrightarrow$  /ku tul/







Notwithstanding the complexities of Hindi/Urdu allomorphy rules, we can distinguish separate stems and case endings in (89). Thus, the language is agglutinating in the required sense.

Our theory does not predict that languages that allow radical pro drop should be agglutinating for case. They may also have separate endings for other nominal features. We have already seen one example of this. In Chinese, radical pro drop is made possible by the existence of number marking. Similar patterns can be found in the Oceanic languages Kokota and Cheke Holo. We have already shown, in sections 2.2 and 2.3, that these are radical pro drop languages. However, they lack morphological case, and hence our theory predicts that they should be agglutinating for some other nominal feature. As in Chinese, the feature in question is number in Kokota. In Cheke Holo, pronouns can co-occur with both number morphemes and determiners.

Let us first consider the structure of pronouns in Kokota in some more detail. Palmer (1999) argues that pronouns in this language project a phrase that can host a single post-head modifier. This position can host locational expressions, certain numerals, and so on. If the post-head modifier is not in apposition with the pronoun, that would be enough to license radical pro drop, simply because the modifier would reveal that pronominal spell-out rules must target categories internal to KP. There is some evidence for an analysis of Kokota post-head modification as KP-internal. First, apposition is usually not restricted to a single constituent. Second, the uninflected form of one pronoun, *rei* ‘they/them’, can only surface if accompanied by the kind of numeral that appears in the post-head position. Appositions are, of course, never obligatory.

Irrespective of the analysis of post-head modifiers, Kokota can be argued to be agglutinating for number. Plural pronouns can be followed by *-palu*, which indicates dual, and *-tilo*, which indicates trial. At first sight, one might think that these elements occupy the post-head numeral modifiers, given that *palu* means ‘two’, and *tilo* means ‘three’. Palmer argues that such an analysis must be rejected. To begin with, numeral modifiers must carry an inflectional marker *-(g)u*. This is not true of the dual and trial markers *-palu* and *-tilo*. Moreover, while there can be only one post-head modifier, *-palu* and *-tilo* may co-occur with other post-head material. An example is given in (90).

- (90) gita-tilo hugo Kokota  
*we.INCL-TRIAL Hugo*  
 ‘the three of us, you and I and Hugo’

On the basis of these considerations, we may formulate the spell-out rules in (91), which derive the pronouns in (92) (the table is adapted from Palmer 1999:65).

- (91) [NP +p, -a, 1, SG] ⇔ /ara/                      [NP +p, -a, 1, PL, INCL] ⇔ /gita/                      Kokota  
 [NP +p, -a, 2, SG] ⇔ /ago/                      [NP +p, -a, 1, PL, EXCL] ⇔ /gai/  
 [NP +p, -a, 3, SG] ⇔ /manei/                      [NP +p, -a, 2, PL] ⇔ /gau/  
 [NP +p, -a, 3, SG F] ⇔ /nai/                      [NP +p, -a, 3, PL] ⇔ /rei;/maneri/  
 [DUAL] ⇔ /palu/                      [TRIAL] ⇔ /tilo/

(92) *Kokota pronouns*

	1 INCL	1 EXCL	2	3
SINGULAR	-	ara	ago	manei/nai (F)
DUAL	gita-palu	gai-palu	gau-palu	rei-palu
TRIAL	gita-tilo	gai-tilo	gau-tilo	rei-tilo
PLURAL	gita	gai	gau	maneri
Other pronominal expressions are derived through post-head modification.				

It should be clear that this paradigm is of the type that allows radical pro-drop.

The situation in Cheke Holo is very similar to that in Kokota. The language has a dual and a trial marker (which resemble the Kokota ones in form). In addition, there is a plural marker *-hati*, which combines with all pronominal stems except the second person plural, where *-tilo* is used. Number morphology is obligatory for plural pronouns, except for *mare*, the third person masculine plural. The relevant spell-out rules are given below:

(93)	[NP +p, -a, 1, SG] ⇔ /i)ara/	[NP +p, -a, 1, PL, INCL] ⇔ /ta-/	Cheke Holo
	[NP +p, -a, 2, SG] ⇔ /i)ago/	[NP +p, -a, 1, PL, EXCL] ⇔ /ge-/	(simplified)
	[NP +p, -a, 3, SG] ⇔ /na'a/	[NP +p, -a, 2, PL] ⇔ /go-/	
	[NP +p, -a, 3, SG M] ⇔ /mana/	[NP +p, -a, 3, PL] ⇔ /re-/	
	[DUAL] ⇔ /pa/	[NP +p, -a, 3, PL, M] ⇔ /mare/	
	[PL] ⇔ /hati/-/tilo/	[TRIAL] ⇔ /tilo/	
		D ⇔ /ia/-/na/-/re/	

We have included a spell-out rule for the determiner position, because Cheke Holo allows pronouns to co-occur with articles. Thus, we find the forms in (94). (Most of these are taken from Palmer 2003, except for the dual forms, which are taken from the Austronesian Basic Vocabulary Database of the University of Auckland.) As in the case of Kokota, this paradigm allows radical pro drop.

(94) *Cheke Holo pronouns*

	1 INCL	1 EXCL	2	3
SINGULAR	-	(i)ara (ia)	(i)ago (ia)	na'a (ia) /mana (na) (M)
DUAL	ta-pa (ia)	ge-pa (ia)	go-pa (ia)	re-pa (ia)
TRIAL	ta-tilo (ia)	ge-tilo (ia)	go-tilo (ia)	re-tilo (ia)
PLURAL	ta-hati (a)	ge-hati (a)		re-hati (a) /mare (re) (M)

The final language we consider in this section is Turkish, which is unrelated to the languages discussed above. This language can be argued to allow radical pro drop, as both agreeing and non-agreeing arguments can be omitted. As (95) shows, the language allows omission of subjects, objects and possessors. Crucially, there is no object agreement in Turkish (see Turan 1996:26 and references mentioned there on Turkish null objects; the data are taken from Turan 1995 and Kornfilt 1990).<sup>16</sup>

<sup>16</sup> Turkish object drop does not seem to be simple argument ellipsis, as it occurs in the kinds of contexts that block object omission in, say, Russian. For example, in the Turkish translation of *If you put it there, the cat will eat the rat*, the pronoun *it* can be dropped without losing any of the reading available in English. In the Russian translation, omission of *it* is very marginal. If acceptable at all, it requires a preceding context that licenses topic drop (compare the discussion of Slavic in section 4.1).

- (95) a. Ø okul-a gid-eceğ-im. Turkish  
*school-DAT go-FUT-1.SG*  
 ‘[I] shall go to school.’
- b. Ahmet Ø çiğ sev-iyor.  
*Ahmet raw like-PRES-3.SG*  
 ‘Ahmet likes (it) raw.’
- c. Ahmet [Ø kitab-ım-ı] kayb-et-miş.  
*Ahmet book-1.SG-ACC loss-do-REP.PAST*  
 ‘It is said that Ahmet lost [my] book.’

As expected, the Turkish pronominal paradigm is agglutinating. It is obvious that pronouns carry case markers, and, although we will not demonstrate this here, it could be argued that number also receives a separate realization. The spell-out rules are given below (the instrumental attaches to genitive forms only).

- |      |                               |                              |              |
|------|-------------------------------|------------------------------|--------------|
| (96) | [NP +p, -a, 1, SG] ⇔ /ben/    | [NP +p, -a, 1, PL] ⇔ /biz/   | Turkish      |
|      | [NP +p, -a, 2, SG] ⇔ /sen/    | [NP +p, -a, 2, PL] ⇔ /siz/   | (simplified) |
|      | [NP +p, -a, 3, SG] ⇔ /o/-/on/ | [NP +p, -a, 3, PL] ⇔ /onlar/ |              |
|      | [K NOM] ⇔ Ø                   | [K ACC] ⇔ /i/                |              |
|      | [K GEN] ⇔ /in/                | [K DAT] ⇔ /a/                |              |
|      | [K LOC] ⇔ /de/                | [K ABL] ⇔ /den/              |              |
|      | [K INST] ⇔ /le/               |                              |              |

These rules generate the kind of pronominal forms that allow radical pro drop. Some representative examples are given below.

- (97) a. san-a Turkish  
 2.SG-DAT  
 ‘to you’
- b. biz-im-le  
 1.PL-GEN-INSTR  
 ‘with us’

## 5. CONCLUDING REMARKS

The empirical findings of this paper are summarized in the table below. It illustrates the two typological generalizations at the heart of this paper. First, there are no languages that combine radical pro drop with a fusional or invariant pronominal paradigm. Second, languages that have radical pro drop must have an agglutinating pronominal paradigm for at least one nominal feature.

(98)

<i>PROPERTIES OF THE PRONOMINAL PARADIGM</i>				
	<i>AGGLUTINATING CASE</i>	<i>INVARIANT FOR CASE</i>		<i>FUSIONAL CASE</i>
		<i>agglutinating for number, etc.</i>	<i>invariant or fusional for number, etc.</i>	
<i>RADICAL PRO DROP</i>	Japanese Korean Burmese Assamese Hindi/Urdu Turkish	Chinese Kokota Cheke Holo		
<i>NO RADICAL PRO DROP</i>				Italian Pashto Greek
			Papiamentu Tok Pisin Jamaican Creole	English Afrikaans Swedish Dutch
Languages with mixed fusional and invariant case paradigms are listed as fusional.				

*CONTEXT-SENSITIVE PRO DROP**NO PRO DROP*

Of course, a sample of nineteen languages is not enough to firmly establish typological universals, but it is suggestive that we have been unable to find radical pro drop languages with the ‘wrong’ kind of paradigm. It is also suggestive that the table in (98) does not contain any languages that have an agglutinating paradigm and lack radical pro drop. This potentially allows a stronger conclusion than follows from the theory developed so far: it might not only be the case that radical pro drop languages have agglutinating paradigms, but also that languages with agglutinating paradigms have radical pro drop.

If the generalization were indeed bi-directional, this could be explained in two ways. A functional explanation could emphasize the computational benefits to the speaker of not pronouncing superfluous information. This would exert some pressure on grammars to introduce rules of pronoun deletion where possible. A grammatical explanation would simply have it that the zero spell-out rule in (29) is part of Universal Grammar, and therefore present in every language. The empirical difference between the two approaches is that the grammatical one does permit exceptions, while the functional one only expresses a tendency.

We do not know whether exceptions exist. One language that seems relevant is Finnish, which is not a radical pro drop language. It only allows subject drop in the first and second person (see Vainikka and Levy 1999). The written language is clearly agglutinating for case. The general spoken language has some irregularities, while the pronominal paradigms of certain dialects seem to contain unpredictable forms. We cannot ascertain on the basis of the data available to us to what extent Finnish qualifies as a counterexample to claim that the zero spell-out rule in (29) is universal. We must leave this issue for future research.

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