

SOME CONSEQUENCES OF AN IMPOVERISHMENT-BASED APPROACH TO  
MORPHOLOGICAL RICHNESS AND PRO-DROP

Gereon Müller\*

## 1. Introduction

Standardly, the often-noted correlation between morphological richness and the availability of pro-drop in a language is captured by invoking traditional notions of morphological paradigms (as they are known from reference grammars), and determining morphological richness as required for pro-drop on this basis, either in a somewhat impressionistic way, or by counting distinct forms and setting up a minimal threshold of relevant distinctions (see, e.g., Jaeggli & Safir (1989), Rohrbacher (1999), and Rizzi (2002)). In Müller (2006b), I argue that these approaches are both empirically and conceptually problematic. They are empirically problematic because the systems of verb inflection in non-pro-drop languages like, e.g., German or Icelandic would typically qualify as rich, and the systems of verb inflection in pro-drop languages like Modern Irish or, particularly, Korean would qualify as poor. Furthermore, they are conceptually problematic because most current theories of inflectional morphology hold that paradigms either do not exist at all (e.g., this is assumed in Distributed Morphology; see Halle & Marantz (1993, 1994), Bobaljik (2002)), or are highly abstract grammatical objects that bear little resemblance to the traditional reference grammar notion (see e.g., the notions of paradigm in approaches as diverse as Williams (1994), Wunderlich (1996), Johnston (1996), Wiese (1999), Stump (2001)).

In view of this, I develop an approach to (referential subject argument) pro-drop in Müller (2006b) that strives to come up with a concept of morphological richness which is based on impoverishment operations as they have been proposed in Distributed Morphology. More specifically, the reasoning proceeds as follows. First, a careful morphological analysis of systems of verb inflection reveals a difference between system-defining instances of syncretism and other instances of syncretism. Second, Distributed Morphology treats system-defining instances of syncretism by *impoverishment*, and

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other instances of syncretism by simple *underspecification* of inflection markers. Third, and crucially, the hypothesis is put forward that only the former kinds of syncretism are relevant for determining morphological richness in syntax; i.e., a syncretism can classify a given system of verb inflection as “poor” (in the sense relevant for subject pro-drop) only if it is part of a system-wide pattern, and not if it is merely due to the accidental fact that some inflection marker happens to be underspecified. For concreteness, I propose the generalization in (1) in Müller (2006b). This generalization presupposes that (referential subject argument) pro-drop is to be analyzed in terms of a pronominal element *pro* that is not phonologically realized; *pro* is base-generated as an external argument in a specifier of vP and undergoes Agree with T, thereby triggering subject/verb agreement and receiving nominative case (in nominative/accusative systems of argument encoding); in languages where T has an EPP property, *pro* also moves to SpecT.<sup>1,2</sup>

(1) *Pro Generalization:*

An argumental *pro* DP cannot undergo Agree with T in the syntax if T has been subjected (perhaps vacuously) to person feature neutralizing impoverishment in morphology.

Thus, if person feature-neutralizing impoverishment applies to T, T cannot agree with a *pro* argument, and any derivation that contains a subject argument *pro* crashes (see Chomsky (2001)).

Given (1), a non-trivial theoretical problem arises: In Distributed Morphology, inflection is conceived of as the insertion of – often underspecified – inflection markers (‘vocabulary items’) into functional heads. A functional head provides a fully specified set of morpho-syntactic features. Insertion takes place in accordance with the Subset Principle (see Halle (1997), among many others). The Subset Principle chooses the most specific inflection marker among those that are characterized by a subset of the fully specified set of morpho-syntactic features in the functional head. Impoverishment operations delete morpho-syntactic features before vocabulary insertion takes place; this effects a “retreat to the general case” (see Halle

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<sup>1</sup>See Chomsky (1982). Also see Roberts (2006) for arguments that *pro* is a *weak* pronoun in the sense of Cardinaletti & Starke (1999).

<sup>2</sup>Arguably, (1) should ultimately have the status of a theorem, not of an axiom. However, I do not attempt to derive (1) from more basic assumptions in Müller (2006b), and I will not try to do this here either. Also note that (1) originally mentions  $\Phi$ -features rather than person features, but the only kinds of  $\Phi$ -features which are actually considered from this perspective in Müller (2006b) are person features (not, say, number or gender features); in the present paper I explicitly assume that it is person feature neutralizations that are responsible for blocking pro-drop.

& Marantz (1993, 1994) and Bobaljik (2002), among others). Crucially, if impoverishment deletes morpho-syntactic features, it cannot apply before or in the syntax (where fully specified feature bundles are needed). Consequently, impoverishment as deletion must apply post-syntactically, and since vocabulary insertion must follow impoverishment (otherwise the operation would be pointless), vocabulary insertion must be post-syntactic as well. In fact, late insertion is usually taken to be one of the core properties of Distributed Morphology (and the existence of impoverishment-as-deletion operations is one of the few strong arguments in support of this concept).

This dilemma can be solved by assuming that both impoverishment and morphological inflection are in fact pre-syntactic operations.<sup>3</sup> A pre-syntactic approach to inflectional morphology that otherwise incorporates the main properties of Distributed Morphology (but not yet impoverishment) is justified in Alexiadou & Müller (2005) on independent grounds (both conceptual and empirical). A basic assumption is that inflection takes place in the *numeration* (see Chomsky (1995, 2001)), where lexical items (including functional categories like T) are assembled from the lexicon before the syntactic derivation starts. A stem merges with an (often underspecified) inflection marker in the numeration in accordance with the Subset Principle, with the fully specified bundle of morpho-syntactic features (against which the inflection marker's features are matched) provided by an associated functional head that is also present in the numeration.<sup>4</sup> (For instance, a verb stem *like* is combined with the inflection marker *-s* in English by a pre-syntactic Merge operation in the numeration if there is an associated T item in the numeration that bears a 3.SG.PRESENT specification.) Furthermore, I argue in Müller (2006b) that impoverishment (like other operations that are usually assumed to apply post-syntactically in Distributed Morphology, e.g., fission) can straightforwardly be reinterpreted as a pre-syntactic operation, provided that the morpho-syntactic features which are affected are invisible for morphology, but not for subsequent syntactic operations: Impoverishment *marks* features as morphologically inaccessible, but it does not actually *delete* them (see Chomsky (1995) on this difference, with a different terminology).

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<sup>3</sup>See, e.g., the Minimalist Morphology approach developed by Wunderlich (1996, 1997); note also that Wunderlich (2004) derives effects that can be attributed to impoverishment in Distributed Morphology by a system of ranked constraints, with feature deletion effects brought about by optimal candidates that involve MAX violations (see Prince & Smolensky (2004)).

<sup>4</sup>It is argued in Alexiadou & Müller (2005) that (concatenative) inflection is a pre-syntactic Merge operation that is always brought about by syntactically uninterpretable (and sometimes trivial) inflection class features, but the exact mechanics of the operation are of no importance in the present context.

## 2. Correlating Morphological Richness and Pro-Drop

Given these assumptions, the prediction is that a language can have (referential subject argument) pro-drop only if its system of verb inflection does not involve an impoverishment operation applying to an associated T item in the numeration; and recall that impoverishment is postulated on morphological grounds for those instances of syncretism that instantiate a system-wide pattern. Therefore, we expect that languages with subject pro-drop either do not involve any syncretism in their system of verb inflection at all, or involve only instances of syncretism which are not system-defining.<sup>5</sup> Of course, the latter cases are the more interesting ones from the present perspective. In Müller (2006b), I address the verb inflection systems of German, Icelandic, Modern Irish, and Russian. As far as German and Icelandic are concerned, there is good reason to postulate impoverishment operations for T that lead to a neutralization of person feature distinctions. For instance, Icelandic exhibits a systematic syncretism in 2.SG.PRESENT and 3.SG.PRESENT contexts. Moreover, the forms for 1.SG.PAST and 3.SG.PAST contexts are necessarily syncretic, in all inflection classes. All this is shown for three different conjugations in (2) (see Kress (1982)).

### (2) *Present and past tense conjugations in Icelandic*

<i>Weak conjugation, class 1</i> <i>krefja</i> ('demand')			<i>Weak conjugation, class 4</i> <i>dansa</i> ('dance')			<i>Strong conjugation, class 3</i> <i>sleppa</i> ('slip')		
	present	past		present	past		present	past
1.SG	kref	krafði	1.SG	dansa	dansaði	1.SG	slepp	slapp
2.SG	krefur	krafðir	2.SG	dansar	dansaðir	2.SG	sleppur	slappst
3.SG	krefur	krafði	3.SG	dansar	dansaði	3.SG	sleppur	slapp
1.PL	krefjum	kröfðum	1.PL	dönsum	dönsuðum	1.PL	sleppum	slappum
2.PL	krefjið	kröfðuð	2.PL	dansið	dönsuðuð	2.PL	sleppið	sluppuð
3.PL	krefja	kröfðu	3.PL	dansa	dönsuðu	3.PL	sleppa	sluppu

Given that these two instances of syncretism are system-defining, in the sense that they do not just emerge accidentally because of various unrelated underspecifications of individual inflection markers, there is every reason to conclude that impoverishment is involved: The distinction between 2. and 3. person, and between 1. and 3. person, can be systematically neutralized for morphology in certain contexts in Icelandic.

<sup>5</sup>Furthermore, there may be accidental homonymy, i.e., two forms may be identical, but this identity cannot be traced back to a common source, neither by underspecification of inflection markers nor by impoverishment. If we reserve the notion of syncretism for instances of form identity which are derivable in some way, inflectional systems with accidental homonymy count as systems without syncretism.

At this point, it becomes necessary to say something about the actual derivation of instances of person syncretism, by underspecification or impoverishment. As observed by Cysouw (2001) and Baerman et al. (2005), syncretism can in principle affect 1. and 2. person, 2. and 3. person, and 1. and 3. person in the world's languages (also see section 4 below). This suggests that every person can form a natural class with every other person. Assuming that natural classes can be defined in terms of shared features, the simplest strategy is to adopt a system of three primitive binary person features as the maximum  $[\pm 1]$ ,  $[\pm 2]$ ,  $[\pm 3]$  (see Trommer (2006)). Languages typically do not employ all three features; Icelandic, e.g., can be assumed to make do with  $[\pm 1]$ ,  $[\pm 2]$ . Cross-classification of these features yields the standard persons ( $[+1, -2]$  = 1. person,  $[-1, +2]$  = 2. person,  $[-1, -2]$  = 3. person, and  $[+1, +2]$  = 1. person inclusive, not active in Icelandic); and underspecification with respect to these features captures natural classes of persons. For Icelandic, we can now postulate two impoverishment operations: The first one marks the feature  $[\pm 2]$  on T as morphologically inaccessible in SG.PRESENT contexts; this implies that 2. and 3. person cannot be distinguished by inflection operations (they are both defined as  $[-1]$  in morphology). The second impoverishment rule marks the feature  $[\pm 1]$  on T as morphologically inaccessible in SG.PAST specifications; consequently, 1. and 3. person are both  $[-2]$  in morphology, and cannot be distinguished by pre-syntactic morphological realization. Consequently, we expect that Icelandic does not have (referential subject argument) pro-drop, and this prediction is borne out.

German also exhibits syncretism in 1.SG.PAST and 3.SG.PAST contexts; the syncretism is system-defining because it shows up in all inflection classes (weak inflection, strong inflection, and the verb *sein* ('be')), independently of individual inflection marker specifications. This syncretism is accounted for by the same impoverishment rule that is operative in analogous contexts in Icelandic. In addition, German has system-wide 1.PL and 3.PL syncretisms in both past and present tense contexts. Again, this motivates a straightforward impoverishment rule, which marks  $[\pm 1]$  features as inaccessible in plural contexts. As with Icelandic, it correctly follows that German does not have (referential subject argument) pro-drop.<sup>6</sup>

In contrast to German and Icelandic, the verb inflection system of Modern Irish at first sight gives the impression of being "morphologically poor"; however, there are (limited) pro-drop options (see McCloskey & Hale (1984)).

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<sup>6</sup>In fact, it is a common property of all Germanic languages – including the earliest ones of which we have records – that they exhibit syncretism in 1.SG.PAST and 3.SG.PAST contexts. See Müller (2006b) on the consequences this has for alleged instances of pro-drop in Gothic, Old Norse, Old High German, and Old English.

However, closer inspection reveals that all instances of syncretism are due to radically underspecified inflection markers; there is no room for impoverishment (or, for that matter, non-radical underspecification) here because the contexts in which the syncretic forms show up do not form a natural class. Similarly, there is no evidence for person feature impoverishment in languages like Korean, where there is no person marking in the first place. Therefore, pro-drop in these languages is also expected to be possible.

Interesting problems are raised by Russian. Consider the system of verb inflection in Russian in the present tense:

(3) *Present tense conjugation in Russian: čitat' ('read')*

1.SG	čita-ju	1.PL	čita-em
2.SG	čita-eš'	2.PL	čita-ete
3.SG	čita-et	3.PL	čita-jut

There is no syncretism here, hence, no impoverishment rule. Consequently, subject pro-drop is predicted to occur.<sup>7</sup> There is some disagreement as to whether Russian has genuine pro-drop; alternatively, subject pronoun omission could be an instance of contextually licensed ellipsis. See, e.g., Růžička (1986) and Perlmutter & Moore (2002) for the former view, and Franks (1995) and Junghanns (2005) for the latter. A main reason for doubting the pro-drop nature of subjectless finite sentences in Russian is that subject omission is more restricted than in, say, Italian, or indeed other Slavic languages, and that there is an asymmetry between 1./2. person vs. 3. person contexts, with the former ones permitting subject omission somewhat easier than the latter ones; in line with this, Russian differs from some other pro-drop languages in that overt subject pronouns can be used in non-emphatic contexts. However, in some cases, omitting the subject of a finite clause is in fact the only possibility to achieve a certain reading in Russian. In my view, this is a strong argument for the existence of subject *pro* in Russian because subject omission cannot possibly be accounted for by invoking some kind of contextually licensed ellipsis here – the item that would have to be elided does not exist with the intended interpretation in the first place. The data in question involve a generic interpretation of the omitted subject in 3.PL and 2.SG contexts (see Müller (1988); also see Suñer (1983), Montalbetti (1984) on a comparable phenomenon in Spanish).

(4) a. Ob    étom *pro* mnogo govorjat  
           about this – much talk-3.PL

<sup>7</sup>More precisely, pro-drop is not excluded by (1). There might in principle be other factors blocking pro-drop.

- ‘There is much talk about this.’  
 b. *Pro* prosjat [ PRO ne kurit’ ]  
 – ask-3.PL not to smoke  
 ‘It is requested that there is no smoking.’  
 c. Ètu knigu *pro* pročityvaeš’ za dva časa  
 this book – read-2.SG. in two hours  
 ‘This book can be read in two hours.’

Still, Russian raises another potential problem for the impoverishment-based approach to pro-drop embodied in (1): Russian has what looks like radical person impoverishment in the past tense, where forms bear gender and number markers (in singular and plural contexts, respectively), but no person markers; see (5).

(5) *Past tense conjugation in Russian: čitat’* (‘read’)

	MASC	FEM	NEUT		MASC	FEM	NEUT
1.SG	čita-l	čita-l-a	čita-l-o	1.PL	čita-l-i	čita-l-i	čita-l-i
2.SG	čita-l	čita-l-a	čita-l-o	2.PL	čita-l-i	čita-l-i	čita-l-i
3.SG	čita-l	čita-l-a	čita-l-o	3.PL	čita-l-i	čita-l-i	čita-l-i

There are two potential problems in connection with (5). First, assuming that the presence of one impoverishment rule affecting T (perhaps vacuously) suffices to block *pro* licensing by T in general, an impoverishment approach to the instances of person syncretism in (5) would be incompatible with the claim that Russian has pro-drop. And second, it seems that pro-drop can in fact take place in past tense contexts (see Růžička (1986), Müller (1988)):

- (6) Anna postupila verno [CP čto *pro* rešila [CP stat’ vračom ]]  
 Anna acted correctly that she decided to become doctor

That said, Dobrova (2002) claims that there is indeed an asymmetry between past and present tense with respect to pro-drop; in her study of the acquisition of pronouns in Russian, she states that “Russian children started using the 1. person pronoun [...] only in the past (where there is no pro-drop in Russian), but not in the pro-drop present or future.” If correct (and more than an issue of markedness), this would make Russian a partial pro-drop language, with pro-drop confined to a certain domain (present tense) and impossible in another (past tense). Partial pro-drop is not compatible with (1), so this would imply that (1) needs to be modified. However, in view of examples like (6), I do not take such a move to be motivated on the basis of Russian, and continue to assume that Russian can in principle have pro-

drop in all tenses (as well as persons). It then remains to be shown that the instances of syncretism in (5) do not involve person impoverishment even though they appear to be completely systematic.

The (tentative) solution I would like to propose is essentially diachronic. The inflected past tense forms are historically *l*-participles (with the auxiliaries that originally accompanied the participles dropped in modern Russian); as such, they never realized any person features in the first place (those features had been located on the auxiliaries). Impoverishment can then be taken to be irrelevant because the inflection markers for past tense are not specified for person features for historical reasons: The markers did not realize person features to begin with; they have been re-analyzed as finite markers in parallel with the disappearance of associated auxiliaries, and they simply have not acquired the potential to realize person features in their new function. As a reaction to that, a past tense T in Russian is never specified for person features (i.e., neither in the lexicon, nor in the syntax) – if no item in the grammar can morphologically indicate a distinction, the distinction is lost. Thus, the analysis given for pro-drop in Russian past tense contexts is identical to that given for pro-drop in languages like Korean (Japanese, Chinese).

All in all, it seems that the impoverishment-based approach to morphological richness makes the right predictions for pro-drop options in a number of languages. However, so far I have only addressed a few languages in detail (and they must be addressed in some detail because the presence of syncretism as such does not say anything under present assumptions – a simple surface-oriented analysis is not enough); thus, the present analysis is in need of a broader empirical basis. Against this background, I discuss the relation between morphological richness (conceived of as absence of person impoverishment) and pro-drop in a number of further languages in the remainder of this paper. In section 3, I investigate the issue of partial pro-drop from the present perspective, and envisage a possible minor modification of the analysis. In section 4, I address the interaction of pro-drop and syncretism in verbal paradigms in a variety of typologically different languages, many of them lesser-studied.

### 3. Partial Pro-Drop

As it stands, the present approach predicts that a single impoverishment rule applying to T that leads to person feature neutralization in any domain (tense, mood, number, gender) blocks pro-drop throughout. As argued above, this consequence is likely to be tenable for Russian, but at first

sight it looks problematic for other pro-drop languages, among them Arabic (see Kenstowicz (1989)) and Italian (see Rizzi (2002)); also see Neeleman & Szendrői (2005).

Consider Arabic first – more precisely, Bani-Hassan Arabic (spoken by a Bedouin clan in the Jordanian desert). Kenstowicz (1989, 273) observes that pro-drop in Bani-Hassan Arabic is impossible if the verb appears in a form that cannot inflect for person, and possible otherwise. This is shown in (7). The embedded verb inflects for person in the perfect form (that Kenstowicz characterizes as [+tense,+person]) in (7-b), but not in the participle form ([+tense,-person]) in (7-a).

- (7) a. Fariid gaal \*innu *pro*/inn-ha mištarya al-libaas  
 Fariid said that pro/that-she has bought.[-pers] the dress  
 b. Fariid gaal innu *pro* ištarat al-libaas  
 Fariid said that she bought.[+pers] the dress

Consider next Italian. First, (8) illustrates that there is no syncretism in the present indicative conjugation in Italian. Pro-drop is possible in these contexts, as expected.

- (8) *Italian conjugation, present indicative: parlare*

	Present		Present
1.SG	parl-o	1.PL	parl-iamo
2.SG	parl-i	2.PL	parl-ate
3.SG	parl-a	3.PL	parl-ano

However, Italian subjunctives involve a reduced set of forms. As shown in (9), there is a syncretism affecting all three persons in SG.PRESENT contexts, and a syncretism affecting 1. and 2. person in SG.PAST contexts.

- (9) *Italian conjugation, present and past subjunctive: parlare*

	Present	Past		Present	Past
1.SG	parl-i	parl-ass-i	1.PL	parl-iamo	parl-ass-imo
2.SG	parl-i	parl-ass-i	2.PL	parl-iate	parl-as-te
3.SG	parl-i	parl-ass-e	3.PL	parl-ino	parl-ass-ero

From a morphological perspective, the question is whether there is evidence for impoverishment in (9). At first sight, one might think that there is, at least in present tense singular subjunctive contexts, where there is no person distinction anymore. However, closer scrutiny reveals that impoverishment cannot be involved in deriving the syncretism in (9). The present tense singular forms differ from the past tense singular forms in (9) in lacking a tense

marker (*-ass*); the person marker *-i* is quite evidently the same in present and past tense contexts in the singular subjunctive. This marker has an inhomogeneous distribution (five out of six cells in the singular paradigm), which cannot be captured by invoking a natural class for either impoverishment or marker underspecification – there is no set of features that characterizes 1.SG.PRESENT, 2.SG.PRESENT, 3.SG.PRESENT, 1.SG.PAST, and 2.SG.PAST contexts but not 3.SG.PAST contexts. Therefore, in order to fully derive the syncretism in (9) by providing *-i* with a single specification, it seems best to assume that *-i* is a radically underspecified marker for the person slot in subjunctive forms of the Italian verb; and *-e* is a more specific marker that blocks *-i* in 3.SG.PAST contexts. See the underspecified entries for inflection markers in (10).<sup>8</sup>

- (10) a.  $-e \leftrightarrow [-1, -2, -pl, +subj] ([+past])$   
 b.  $-i \leftrightarrow [-pl, +subj]$

Given that impoverishment is not involved in (10), the present approach predicts that pro-drop should be possible in subjunctive contexts, too; i.e., there should be no case of partial pro-drop here. Rizzi (2002, 20) argues that this is almost, but not quite the case. He states that “the double ambiguity of the past subjunctive is perfectly tolerable, [(11-a)] is acceptable on both interpretations, while the triple ambiguity of [(11-b)] is not, and an overt second person pronoun [as in (11-c)] becomes obligatory here.” This view is shared by Poletto (1993), who notes: “In the present subjunctive there is only one pronoun which is obligatory: the second singular. Third person and first person pronouns are not obligatory at all. Moreover, if there is a clitic reflexive on the verb, the subject pronoun is not obligatory anymore.”

- (11) a. Credevano che *pro* partissi  
 they believed that I/you would leave.SUBJ.PAST

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<sup>8</sup>An account of this syncretism thus requires a *subanalysis* of markers. This can be achieved by assuming a more articulate syntactic structure (with two relevant functional heads in the numeration, viz., Agr in addition to T), or by assuming the concept of fission (in either Noyer’s (1992) or Halle & Marantz’s (1993) sense). In stem-and-paradigm approaches, subanalysis is brought about by postulating different rule blocks (see Anderson (1992), Stump (2001)). Also see the contributions in Müller & Trommer (2006) for many more cases of subanalysis motivated by partially syncretic forms. – Note that the system of verb inflection in subjunctives involves *multiple exponence* (Matthews (1974)), in the sense that past tense can be realized by two exponents. Extended exponence is handled in terms of contextual features here (which are given in brackets); but see also Müller (2006a) for an alternative approach in terms of *enrichment* operations, which parallel impoverishment operations.

- b. Credono    che *pro*            parta  
           they believe that I/\*you/he leave(s).SUBJ.PRES
- c. Credono    che tu    parta  
           they believe that you leaveSUBJ.PRES

It can thus be concluded that pro-drop is not blocked altogether in subjunctive present tense contexts; only second person *pro* is illegitimate, but even this problem can be remedied. This may suggest that there is no general impossibility of pro-drop here, and that the restriction at hand is one of identification of content rather than formal licensing (see Rizzi (1986)).

Summing up so far, clear cases of partial pro-drop phenomena that can be traced back to massive syncretism in well-defined subdomains of the system of verbal inflection cannot be substantiated for either Russian or Italian. However, things may be different in Bani-Hassan Arabic. Assuming that partial pro-drop phenomena do exist, the present approach lends itself to the following modification: Instead of assuming that categories as such (like T) are subject to impoverishment, only categories of a certain type (such as  $T_{\text{past}}$ ,  $T_{\text{subj}}$ , or indeed  $T_{\text{present-perfect}}$  in Bani-Hassan Arabic) are in fact subject to impoverishment (perhaps vacuously, as before); i.e., impoverishment does not spread from the domain that it is motivated for. The Pro Generalization can then stay as in (1), repeated here as (12).

(12) *Pro Generalization:*

An argumental *pro* DP cannot undergo Agree with T if T has been subjected (perhaps vacuously) to person feature neutralizing impoverishment in the numeration.

#### 4. Pro-Drop in the Presence of Syncretism

Cysouw (2001) offers a comprehensive discussion of possible person syncretisms from a typological perspective, and he also provides information about pro-drop options in the relevant languages. Based on his work, I go through six relevant cases in this section, with two languages exhibiting syncretism that affects 2. and 3. person (Wambon and Kenuzi-Dongola), two languages exhibiting syncretism that affects 1. and 3. person (Spanish and Koiari), and two languages exhibiting syncretism that affects 1. and 2. person (English and Hunzib). By and large, the conclusion will be that the impoverishment-based approach to morphological richness and pro-drop is corroborated by the empirical evidence. In particular, I will show that, among the languages that exhibit syncretism in their verbal paradigms,

those that do not permit pro-drop do suggest morphological analyses incorporating impoverishment, and those that do permit pro-drop do not lend themselves to morphological analyses that rely on impoverishment. This way, we can make sense of the observation that pro-drop may freely occur in languages despite the presence of syncretisms in verbal paradigms, and despite the possibility that these syncretisms may be amenable to an account in terms of natural classes of persons. As a result, a standard counter-argument against correlating morphological richness and pro-drop (see, e.g., Cysouw (2001, 51) and Zifonun (2001, 57)) can be rebutted.

#### 4.1. Wambon

Wambon is a Trans-New Guinea language (spoken in the Indonesian part) that exhibits syncretism of 2. and 3. person forms in its verbal paradigm (data from Vries (1989), cited after Cysouw (2001, 42)); see (13).

(13) *Verb inflection in Wambon*

- a. andet-*ep*-mbo  
eat-1.SG-PAST  
'I ate.'
- b. andet- $\emptyset$ -mbo  
eat-2./3.SG-PAST  
'You/he/she/it ate.'

Unlike languages like Icelandic (see above) and Dutch, which show the same pattern of syncretism in verb inflection, Wambon has free subject pro-drop. Consider now possible morphological analyses of the 2./3. person syncretism in Wambon, as in (14).

- (14) a. (i)  $-ep \leftrightarrow [+1, -2]$   
 (ii)  $-\emptyset \leftrightarrow [ ]$   
 b. (i)  $-ep \leftrightarrow [+1, -2]$   
 (ii)  $\emptyset \leftrightarrow [-1]$   
 c. (i)  $-ep \leftrightarrow [+1, -2]$   
 (ii)  $-\alpha \leftrightarrow [-1, +2]$   
 (iii)  $-\beta \leftrightarrow [-1, -2]$   
 (iv)  $-\emptyset \leftrightarrow [ ]$   
 (v)  $[\pm 2] \rightarrow \emptyset / [-1]$  \_\_\_\_\_ (impoverishment)  
 d. (i)  $-ep \leftrightarrow [+1, -2]$ .  
 (ii)  $-\alpha \leftrightarrow [-1, +2]$   
 (iii)  $-\emptyset \leftrightarrow [-1]$

- (iv)  $[+2] \rightarrow \emptyset/[-1] \underline{\quad}$  (impoverishment)  
 e. (i)  $-ep \leftrightarrow [+1,-2] \underline{\quad}$   
 (ii)  $-\emptyset \leftrightarrow [ \ ] \underline{\quad}$   
 (iii)  $[\pm 2] \rightarrow \emptyset/[-1] \underline{\quad}$  (impoverishment)

(14-a) involves radical underspecification of  $-\emptyset$ , and (14-b) regular (and minimal) underspecification; neither approach involves impoverishment. In contrast, (14-cde) rely on impoverishment. These latter approaches ensure that even if there were alternative markers like  $-\alpha$  and  $-\beta$ , these markers could never be used in Wambon verb inflection because the syntactic contexts for morphological realization are impoverished in such a way that the feature specifications of  $-\alpha$  and  $-\beta$  are never a subset of a target specification on a functional head. However, there is evidence arguing against impoverishment analyses of Wambon verb inflection. First, no system-wide pattern of syncretism can be detected in Wambon verb inflection. Second, the analyses in (14-ab) are obviously simpler than the analyses in (14-cde) since they require fewer marker entries (and fewer pre-morphological operations). Third, it is not clear how markers like  $-\alpha$  or  $-\beta$ , which might motivate impoverishment analyses, could be acquired in the first place, given that they are always suppressed by impoverishment; this leaves only option (14-e) among the impoverishment analyses, where impoverishment applies vacuously. Fourth and finally, there is a strong cross-linguistic tendency for null marking ( $\emptyset$ ) to correlate with radical underspecification; this is an instance of a meta-grammatical *Iconicity Principle* (see Wiese (1999); also see the pertinent remarks on null markers in Halle & Marantz (1993)). Iconicity considerations then argue against the analyses in (14-b) and (14-d), where the null marker is not radically underspecified. We may therefore conclude that, from a purely morphological point of view, (14-a) is the best analysis of the Wambon person markers in (13). This analysis does not rely on impoverishment, and the availability of pro-drop is thus expected under present assumptions.

#### 4.2. Kenuzi-Dongola

Consider next verb inflection in Kenuzi-Dongola, a Nubian Nilo-Saharan language (data from Reinisch (1879), discussed in Cysouw (2001, 43)). Again, there is a syncretism of 2. and 3. person ( $-im$ ), with another marker ( $-ri$ ) reserved for 1. person contexts.

##### (15) *Verb inflection in Kenuzi-Dongola*

- a. *ai*            *tóg-ri*  
 1.SG.PRON beat-1.SG  
 ‘I beat.’
- b. *er*            *tóg-im*  
 2.SG.PRON beat-2./3.SG  
 ‘You beat.’
- c. *ter*            *tóg-im*  
 3.SG.PRON beat-2./3.SG  
 ‘He/she/it beats.’

Some of the morphological analyses that seem a priori possible are given in (16).

- (16) a. (i)  $-ri \leftrightarrow [+1,-2]$   
 (ii)  $-im \leftrightarrow [ \ ]$
- b. (i)  $-ri \leftrightarrow [+1,-2]$   
 (ii)  $-im \leftrightarrow [-1]$
- c. (i)  $-ri \leftrightarrow [+1,-2]$   
 (ii)  $-\alpha \leftrightarrow [-1,+2]$   
 (iii)  $-\beta \leftrightarrow [-1,-2]$   
 (iv)  $-im \leftrightarrow [-1]$   
 (v)  $[\pm 2] \rightarrow \emptyset / [-1] \underline{\quad}$  (impoverishment)
- d. (i)  $-ri \leftrightarrow [+1,-2]$   
 (ii)  $-im \leftrightarrow [-1]$   
 (iii)  $[\pm 2] \rightarrow \emptyset / [-1] \underline{\quad}$  (impoverishment)

What is interesting about Kenuzi-Dongola is that regular pro-drop seems to be prohibited, with personal pronouns showing up in unmarked environments. This would suggest impoverishment at work. The question then is whether there is any evidence for a system-wide pattern of syncretism in this language; and indeed there is: The personal pronouns for 2. and 3. person (*er* and *t-er*) are extremely similar in their segmental make-up, and they differ a lot from the personal pronoun for 1. person (*ai*). Given subanalysis (see footnote 8), this may then plausibly be taken to indicate that a uniform system-wide impoverishment rule of the type in (16-d) is active in Kenuzi-Dongola.<sup>9</sup> A look into Reinisch’s (1879) original grammatical description provides an even stronger argument for impoverishment in Kenuzi-Dongola verb inflection. The inflection markers for present tense and aorist are listed

<sup>9</sup>Still, further research is required to substantiate this point, and to account for the initial *t* with 2. person pronouns. Furthermore, it is not yet clear whether *-im* in (16) should be radically underspecified ([  $\ ]$ ), or specified as  $[-1]$ , assumed in (16-d); but considerations related to iconicity might favour non-radical underspecification.

in (17).

(17) *Kenuzi-Dongala conjugation, present tense and aorist*

	Present	Aorist		Present	Past
1.SG	-ri	-si	1.PL	-ru	-su
2.SG	-im	-sum	2.PL	-ru	-su
3.SG	-im	-sum	3.PL	-ran	-san

(17) illustrates that the syncretism affecting 2. and 3. person in (15) is part of a system-wide pattern because it shows up both in present tense contexts and in aorist contexts, with different forms. Thus, an impoverishment analysis is strongly supported.<sup>10</sup>

The data presented so far are from the Dongola dialect of Kenuzi-Dongola; interestingly, the Kunuz variety described in Abdel-Hafiz (1988) has slightly different markers but instantiates essentially the same pattern.

### 4.3. Spanish

Cysouw (2001, 43) notes that Spanish exhibits a 1./3. person syncretism (as it shows up systematically in the Germanic languages in singular past tense contexts; see above), but only in some paradigms. Still, pro-drop is possible throughout. The syncretism of 1. and 3. person forms in the *pretérito imperfecto* is shown in (18).

(18) *Spanish pretérito imperfecto:*

- a. habl-*aba*  
speak-1./3.SG.PAST  
'I/he/she/it spoke.'
- b. habl-*aba-s*  
speak-2.SG.PAST  
'You spoke.'

As expected, there is little evidence for an impoverishment approach: Even though the syncretism shows up across inflection classes, there is no reason to consider it as a system-defining pattern because closer scrutiny reveals that it involves only a single inflection marker. The most straightforward analysis presumably views *-aba* (for the ar-conjugation; see (18)) and *ía* (for the er/ir-conjugations; cf. *com-ía*, *com-ía-s*) as separate tense/aspect

<sup>10</sup>Incidentally, the same conclusion can be drawn on the basis of the plural markers for 1. and 2. person.

markers (via subanalysis). The ending *-s* is specified as  $[-1,+2]$ , and  $-\emptyset$  emerges as a default marker, with a  $[ ]$  specification.

#### 4.4. Koiari

Like Wambon, Koiari is a Trans-New Guinea language (spoken in Papua New Guinea). Like Spanish, it exhibits syncretism in 1. and 3. person contexts in its verb inflection system; see (19) (the data are from Dutton (1996), cited here after Cysouw (2001, 44)).

(19) *Verb inflection in Koiari:*

- a. da        ereva-*nu*  
1.PRON see-1./3.SG.PAST  
'I saw it.'
- b. a        ereva-*nua*  
2.PRON see-2.SG.PAST  
'You saw it.'
- c. ahu      ereva-*nu*  
3.PRON see-1./3.PAST  
'He/she/it saw it.'

Koiari does not exhibit pro-drop; Cysouw states that “these pronouns [...] are obligatorily used”. Under the general approach adopted here, we are therefore led to expect that impoverishment is involved:  $[-1,+2]$  contexts and  $[-1,-2]$  contexts are neutralized to  $[-1]$  contexts for morphological realization. For the time being, I will leave it at that; to decide this question, a more careful morphological analysis of the whole system of argument encoding is called for.

#### 4.5. English

If one confines attention to the pattern in (20), it seems that English exhibits a syncretism of 1. and 2. person.

(20) *Verb inflection in English present tense singular contexts*

- a. I walk- $\emptyset$
- b. You walk- $\emptyset$
- c. She walk-*s*

The first thing to note here is that English, as a Germanic language, has inherited a system-defining syncretism for 1. and 3. person singular in past tense environments. Given that this Germanic syncretism is systematically derived by impoverishment, the fact that English does not have pro-drop is accounted for, independently of whether the syncretism in (20) can be traced back to impoverishment or not. Indeed, closer inspection reveals that the 1./2. person syncretism in (20) does in fact not instantiate a system-wide syncretism pattern (see Williams (1994)): With verbs like *be*, 1. and 2. person are distinct: *I am* vs. *You are*. Moreover, the syncretism in (20) is part of a more general regularity: The syncretic form also shows up in all plural contexts (*We walk*, *You walk*, *They walk*), and in the infinitive (*to walk*). Clearly, the null marker  $-\emptyset$  is simply the radically underspecified default form that fits everywhere (see Halle & Marantz (1993) and Williams (1994), among others); and it is blocked by a highly specific *-s* marker in 3.SG.PRESENT contexts.

#### 4.6. Hunzib

Finally, let me turn to an instance of syncretism that affects 1. and 2. person in Hunzib, a Nakh-Daghestanian language. Relevant data are given in (21) (from Berg (1995), cited after Cysouw (2001, 46); note that demonstratives are used in 3. person contexts because personal pronouns exist only for 1. and 2. person).

(21) *Verb inflection in Hunzib:*

- a. də      hīyaa-č̣      ãcu  
1.PRON open-1./2.PRES door  
'I (shall) open the door.'
- b. mə      bok'o.l-č̣o      heχe  
2.PRON gather-1./2.PRES walnut  
'You will gather nuts.'
- c. oλul hīyaa-∅      ãcu  
DEM open-3.PRES door  
'He/she opens the door.'

In contrast to what we have seen in English, this time there really is a syncretism affecting 1. and 2. person. The inflection marker  $-\check{c}(o)$  is used for 1. and 2. person in present tense contexts, and a null marker  $-\emptyset$  is used for 3. person. This suggests that 1. and 2. person form a natural class in Hunzib. Given that  $[\pm 3]$  also belongs to the inventory of primitive person features

that is in principle available for languages, we can assume that 1. and 2. person in Hunzib form a natural class characterized by the feature  $[-3]$  (either  $[\pm 1]$  or  $[\pm 2]$  is then also needed to distinguish 1. and 2. person in Hunzib). The crucial question is whether the syncretism in (21) is due to pure underspecification of an inflection marker, or to a systematic impoverishment rule. Again, the available evidence does not quite suffice to settle this issue. However, there is one fact that might possibly support an impoverishment approach: As noted by Cysouw (2001), the same syncretism pattern shows up in Lak, a related Nakh-Daghestanian language; this situation is reminiscent of the situation in 1. and 3. person singular past tense contexts in the Germanic languages.<sup>11</sup> If there is indeed impoverishment in Hunzib, the prediction is that there should be no regular pro-drop, in contrast to what is the case in the closely related language Tsez, which is a subject pro-drop language (see Polinsky & Potsdam (2002, 263)).

## 5. Conclusion

To sum up, by looking at a variety of typologically different languages, I have tried to investigate the viability of the approach developed in Müller (2006b). According to this analysis, only system-defining patterns of syncretism are relevant for determining morphological richness; other kinds of syncretisms are not. This difference is captured by the distinction between impoverishment and underspecification of inflection markers in a version of Distributed Morphology that must be pre-syntactic so as to allow morphological realization to have an influence on syntactic operations; and the main claim is that the abstract notion of impoverishment arguably offers a better means of measuring morphological richness (as relevant for pro-drop) than is available in more traditional conceptions of morphology. All in all, I think that the empirical evidence from Bani-Hassan Arabic, Italian, Wambon, Kenuzi-Dongola, Spanish, Koiari, English, and Hunzib that is discussed in the present paper corroborates the analysis developed in Müller (2006b) for languages like German, Icelandic, Modern Irish, Korean, and Russian, even though some of the conclusions drawn here have to be tentative for now.

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<sup>11</sup>Note that in general, an alternative to postulating the three primitive features  $[\pm 1]$ ,  $[\pm 2]$ , and  $[\pm 3]$  as part of the universally accessible inventory of person features would be to assume only two primitive person features, and derive the remaining natural class by introducing variables over feature values; i.e., by adopting the system of  $\alpha$  notation proposed in Chomsky (1965) and Chomsky & Halle (1968). However, this would not be compatible with an impoverishment approach.

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