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The Emergence of the Unmarked Pronoun: Chicheŵa Pronominals in Optimality Theory*

Joan Bresnan
Stanford University

In Optimality Theory a grammar consists of a ranking of constraints which are (i) universal and (ii) violable. Languages differ systematically *only* in their rankings of these constraints (Prince and Smolensky 1993). The latter is a powerful theoretical principle which plays a central role in the explanatory scope of OT (Smolensky 1996a,b), its learnability (Tesar and Smolensky 1996) and its consequences for linguistic typology (e.g. Legendre, Raymond, and Smolensky 1993). It is sometimes referred to as *richness of the base.*

According to the principle of richness of the base, systematic differences in the lexical inventories of languages cannot simply be derived from language-particular constraints on lexical features or morphology. All such differences must derive from the rerankings of universal constraints. From the perspective of generative syntax, however, this consequence initially seems implausible, even absurd: after all, it has now been almost universally accepted that much of syntax derives from the lexicon, but the lexicon itself has been regarded as the residual core of what cannot be predicted. In defence of this view it is often observed that the inventory of forms present in each language reflects a contingent and individual path of historical change and areal contact. Previous OT syntax work on deriving the lexicon (e.g. Grimshaw 1995 on empty *do*, Legendre, Smolensky, and Wilson 1995 on resumptive pronouns, Grimshaw and Samek-Lodovici 1995 and Samek-Lodovici 1996 on null and expletive pronouns, and Grimshaw 1996 on Romance clitics) does not explicitly address the issues of contingency and markedness taken up here.

While the contingency of the lexicon is inescapable, both phonologists and functional linguists have recognized that linguistic inventories also reflect universal patterns of markedness and are often functionally motivated by perceptual and cognitive constraints. I will argue in support of this conclusion by showing how different inventories of personal pronouns across languages may be formally derived by the prioritizing of motivated constraints in Optimality Theory. The contingency of the lexicon—exemplified by accidental lexical gaps—then acts as a simple filter on the harmonic ordering derived by the general theory.

In what follows I will make three simplifying assumptions. First, I will assume without argument that elements which function as personal pronouns are not structurally uniform across languages, but show formal variation, as schematized in (1). The range of structures available to pronominal arguments includes the null structure (for zero or null pronouns), affixal structure on a head (for morphologically bound pronouns, also called 'pronominal inflections'), the structure of clitics (syntactically positioned but phonologically dependent), the structure of weak or atonic pronouns, and of (ordinary) pronouns, which can bear primary sentence accents.

(1) **Range of personal pronominal forms:**
Zero Bound Clitic Weak Pronoun

This assumption is in accordance with longstanding typologically oriented work within functional syntax (e.g. Givón 1976, 1983, 1984, 1990, 1995, Nichols 1986, Van Valin 1996) and lexical functional grammar (e.g. Mohanan 1982, Simpson 1983, 1991, Kameyama 1985, Bresnan and Mchombo 1986, 1987, Andrews 1990, Austin and Bresnan 1996, Bresnan 1995, 1996b), as well as with recent work within Optimality Theoretic syntax (Grimshaw and Samek-Lodovici 1995, Samek-Lodovici 1996). On this conception of pronominal elements, what universally characterizes a pronoun are its referential role and functions, not its syntactic category.

Second, for purposes of this initial study I will further simplify the problem by considering only the three types of pronominal forms shown in (2):

(2) **Range of pronominal forms to be derived:**
Zero Bound Pronoun

For concreteness, I will take the pronominal inventory of Chicheŵa, which includes both morphologically bound and free pronouns (Bresnan and Mchombo 1986, 1987), as the target to be derived. And third, although Chicheŵa subject inflections are markers of grammatical agreement as well as pronominality (Bresnan and Mchombo 1986, 1987), space limitations preclude an analysis of agreement and its relation to pronominal inflection here.

1 Marked and Unmarked Pronominal Forms

Our goal, then, is to derive the pronominal inventory of Chicheŵa—both the analytic and the synthetic forms of pronouns—from the ranking of universal constraints within Optimality Theory. Let us begin with the reasonable assumption that we can identify personal pronouns crosslinguistically by their semantic, information structural, and morphosyntactic properties. Semantically, they have variable reference and minimal descriptive content; in information structure they may be specialized for reference to topical elements (Givón 1976, 1983, 1984, 1990: 916ff); morphologically they usually distinguish the classificatory dimensions of person (allowing for participant deixis and inclusion/exclusion relations among participants), number (singular, dual, trial/paucal, and plural), and gender (classifications into kinds) (Givón 1984: 354–5). We can abbreviate these three types of properties by the features PRO, TOP, and AGR in (3). Not all pronouns need have all these features, but these are the types of features that identify personal pronouns crosslinguistically, and in terms of which universal optimality-theoretic constraints on personal pronouns can be stated.

(3) Crosslinguistic properties of personal pronouns:
PRO — variable referentiality
TOP — topic-anaphoricity
AGR — classification by person, number, gender

Bound and free personal pronouns can be represented in a language independent way using these feature types, as illustrated in part by (4):

(4) Feature types of bound and free personal pronouns:

$$\text{Bound: } \begin{bmatrix} \text{TOP} \\ \text{PRO} \\ \text{AGR} \end{bmatrix} \quad \text{Free: } \begin{bmatrix} \text{PRO} \\ \text{AGR} \end{bmatrix}$$

(4) represents bound pronominals as universally specialized for topic anaphoricity, and free syntactic pronouns as unmarked for this property.

The morphologically bound pronouns of Chicheŵa are in fact specialized for topic-anaphoric functions, as documented by Bresnan and Mchombo 1986, 1987. They are used for anaphora to a discourse topic, a crosslinguistically general pattern (Givón 1976, 1983, 1984, 1990; Lambrecht 1981, 1994).

(5) Discourse topics (Bresnan and Mchombo 1987: 768):

(a) *Fîsi anadyá ḿkângo. Á-tá-ú-dya, anapítá ku San Francîsco.*
hyena ate lion(3) he-serial-it(3)-eat he-went to S.F.
'The hyena ate the lion. Having eaten it, he went to S.F.'

(b) *Fîsi anadyá ḿkângo. Á-tá-dyá íwo anapítá ku San Francísco.*
hyena ate lion(3) he-serial-eat it(3) he-went to S.F.
'The hyena ate the lion. Having eaten it (something other than the lion), he went to S.F.'

In contrast to the synthetic pronominal in (5a), the analytic pronoun in (5b) is interpreted as referring to topics not mentioned in the previous sentence. Thus the example (5b) is bizarre, disconnected as a discourse. Within sentences, the bound pronominals are used for resumption in relative clauses and clefts, and for coreference with syntactically dislocated topic constituents, as illustrated in (6) and (7):

(6) Dislocated topics (Bresnan and Mchombo 1987: 769):

(a) *mkángó uwu fîsi a-ná-ú-dy-a.*
lion(3) this hyena SM-past-OM(3)-eat-indic
'This lion, the hyena ate it.'

(b)?* *mkángó uwu fîsi a-ná-dy-á ǐwo*
lion(3) this hyena SM-past-eat-indic it(3)
'This lion, the hyena ate it.'

(7) Resumptive relativization (Bresnan and Mchombo 1987: 769):

(a) *Ndi-ku-lír-ír-a mkángó u-méné fîsi á-ná-ú-dy-a.*
I-pres-cry-appl-indic lion(3) 3-rel hyena SM-past-OM(3)-eat-indic
'I'm crying for the lion that the hyena ate.'

(b)?* *Ndi-ku-lír-ír-a mkángó u-méné fîsi á-ná-dy-á íwo*
I-pres-cry-appl-indic lion(3) 3-rel hyena SM-past-eat-indic it(3)
'I'm crying for the lion that the hyena ate.'

The free pronominals are excluded from the syntactic and discourse environments in which a corresponding bound pronominal can be used; instead, they serve for introducing new topics or for contrastive focus.

These facts are consistent with the proposed language-independent analysis in (4), but they do not explain why the bound form is represented as more specialized in its functions than the free form. In fact, phonologically reduced pronominal forms such as bound pronominals are often taken to be the unmarked referent coding devices (Givón 1983, 1990: 916ff, 1995: 50; Comrie 1996); yet (4) represents them as marked for the property of topic anaphoricity (TOP). Moreover, the free pronominal form of Chicheŵa, as we have seen in the above examples, appears to be equally specialized in its non-topic-anaphoric uses. What, then, is the motivation for treating the free pronoun as unmarked for the topic-anaphoric property rather than taking it to be marked for an opposite property?

The reduced forms are indeed unmarked in the sense of having fewer morphemes or less phonological content. However, they are not unmarked in the sense of being the forms used under neutralization of oppositions. These two senses of unmarkedness are clearly distinguished in German, where *unmarkiert* refers to the value of a morphosyntactic category or feature under neutralization of oppositions, and *merkmallos* refers to the element in the paradigm having fewest morphemes or least phonological material (Bernard Comrie, p.c. June 30, 1996). The neutralization interpretation is the sense of morphosyntatic unmarkedness used in Jakobson's analysis of the Russian verb system: "If Category I announces the existence of A, then Category II does not announce the existence of A, i.e. it does not state whether A is present or not. The general meaning of the unmarked Category II, as compared to the marked Category I, is restricted to the lack of 'A-signalization'" (Jakobson 1931[1984]: 1). Jakobson (1931[1984]: 1–2) gives the example of a Russian feminine gender noun *oslíca* 'she-ass' being the marked category used only for a female animal of the species, where the corresponding masculine gender noun *osël* 'donkey' is used for animals of both sexes. However, in a specific context of contrast the female meaning may be cancelled, leaving only the male meaning: *èto oslíca?* 'Is it a she-ass?' —*nét, osël* 'no, a donkey'.

As Bresnan and Mchombo 1986, 1987 show, the morphologically bound pronominal forms in Chicheŵa are indeed specialized for the topic-anaphoric use, while the free syntactic pronoun is a more general form: where a bound pronominal form is lacking, the free pronoun takes on the syntactic and discourse functions of the bound form, filling gaps in the morphological paradigm. This constitutes a classic case of markedness in Jakobson's 1931 sense: depending on context, the unmarked (neutral) form can be used either inclusively, subsuming the marked form, or exclusively, in opposition to the marked form.

The crucial evidence is that the restrictions on the use of the free pronouns appear only where a contrasting synthetic form exists (Bresnan and Mchombo 1987: 768–75). Thus, verbs have an optional pronominal object inflection, and the independent object pronoun in the VP is contrastive, as we see in (5)–(7). Similarly, Chicheŵa has a bound pronominal form for the preposition meaning 'with, by':

Chicheŵa (Bresnan and Mchombo 1987: 869):

(8) a. *ndí* *íye*
with/by her/him (class 1)

b. *năye* < **na + ĭye*
with/by+her/him (cl 1) with/by her/him (cl 1)

(9) a. *ndí* *íwo*
with/by it (class 3)

b. *năwo* < **na + ĭwo*
with/by+it (cl 3) with/by it (cl 3)

These contrast in the same way as the verbal object pronominals, as illustrated in (10a,b):

(10) a. *mkángó uwu ndi-na-pít-á nawó ku msika*
lion(3) this I-rm.pst-go-indic with-it(3) to market
'This lion, I went with it to market.'

b.?* *mkángó usú ndi-na-pít-á ndí íwó ku msika*
lion(3) this I-rm.pst-go-indic with it(3) to market
'This lion, I went with it to market.'

Significantly, in contexts where a bound pronominal form is lacking, the free pronoun takes on the communicative functions reserved for the synthetic forms elsewhere. For example, in contrast to the preposition *ndí* 'with, by', which has contracted pronominal counterparts (8)–(9), the preposition *kwá* 'to' occurs only with free pronouns:

(11) a. *kwá íyo*
to him (class 3)

b. **kwăyo* < *kwa* + *ĭyo*
to+him (cl 3) to him (cl 3)

With *kwá*, the uses of the independent pronoun subsume the uses of the contrasting bound and free pronominals elsewhere. Examples showing the free pronoun taking on the functions of the bound pronominals are given in (12), showing coreference with dislocated topics, and in (13), showing anaphora to a discourse topic.

(12) *mfúmú iyi ndi-ká-kú-neněz-a kwá íyo*
chief(3) this I-go-you-tell.on-indic to him(3)
'This chief, I'm going to tell on you to him.'

(13) *ndikufúná kuónána ndí ḿkángó wănu; mu-nga-ndí-téngere kwá íwo?*
I-want to-meet with lion your you-could-me-take to it
'I want to meet your lion. Could you take me to it?'

The overall picture, then, is that the morphologically bound pronominals are specialized forms reserved for topic anaphoric uses, while the free pronouns are general, neutral forms. As in Jakobson's 1931 example of the she-ass and the donkey, the free pronoun is the unmarked form: it subsumes the meaning of the marked form (the bound pronoun), but in contexts of contrast it takes on the opposite meaning. Or, to put the situation in terms of the concept of paradigm, the free syntactic pronouns can be seen to fill the functional gaps in the morphological paradigms of bound pronominal forms.

In this analysis privative features have been used to represent pronominal content. The feature TOP, for example, stands for a privative or monovalent feature, which has only a single (the 'marked') value.[1] Such features give rise to benign ('permanent', 'inherent', or 'trivial') underspecification in the sense of Steriade 1995. With this type of representation, the meaning or function of an underspecified pronoun is not fully determinate from its featural characterization alone (cf. Frisch 1996, Reiss 1997), but depends on its relation to other pronominal elements in the paradigm. Thus our representations provide a good formal model of the Jakobsonian conception of morphosyntactic markedness, which as we see from the example of the she-ass and the donkey, allows for precisely this ambivalence in the unmarked form. The meaning or function of the unmarked pronoun depends not on its inherent features alone, but on its relation of dynamic competition with other members of the pronominal paradigm.

2 The Theoretical Framework

Within OT morphosyntax, then, the universal content of personal pronominals (which will be the 'input') will consist of all possible combinations of the pronominal feature types in (3), represented as feature matrices. The universal candidate set of structural analyses of pronouns will include bound and free pronominals as in (4); these are formally representable as pairings of structural analyses (such as a morphological affix *af* or a syntactic category X^0) with the functional content of pronouns represented by a feature matrix. See (14).

(14) Candidate pronoun types as structure-content pairs:

$$\text{Bound:} \quad < af, \begin{bmatrix} \text{TOP} \\ \text{PRO} \\ \text{AGR} \end{bmatrix} > \qquad \text{Free:} \quad < X^0, \begin{bmatrix} \text{PRO} \\ \text{AGR} \end{bmatrix} >$$

Thus each candidate is a structural analysis (whether morphological or syntactic) of specified pronominal content. Which of the ways of structurally analyzing pronouns will appear in the inventory of a given language depends on how the candidates are harmonically ordered by the language. The harmonic ordering is induced by the strict dominance ranking of universal constraints. One candidate is more harmonic than another if it better satisfies the top ranked constraint on which the two forms differ (Grimshaw 1995, Smolensky 1996c). Crucially, the candidates need not be perfect analyses of the input; as illustrated in (15), they may overparse or underparse the input pronominal content. (Overparsing is marked with a box, underparsing by a feature outside of the matrix.)

(15) **Optimality Theory**

$$\begin{array}{llll}
 & \textsc{input} & \textsc{candidates} & \textsc{output} \\
 & & \nearrow < \emptyset, \begin{bmatrix}\text{TOP}\\ \text{PRO}\end{bmatrix} > & \\
\text{(a)} & \begin{bmatrix}\text{PRO}\\ \text{TOP}\end{bmatrix} & \rightarrow < af, \begin{bmatrix}\text{TOP}\\ \text{PRO}\\ \boxed{\text{AGR}}\end{bmatrix} > & < af, \begin{bmatrix}\text{TOP}\\ \text{PRO}\\ \boxed{\text{AGR}}\end{bmatrix} > \\
 & & \searrow < X^0, \begin{matrix}\text{TOP}\\ \begin{bmatrix}\text{PRO}\\ \boxed{\text{AGR}}\end{bmatrix}\end{matrix} > & \\
 & & \vdots &
\end{array}$$

(b) GEN: INPUT$\rightarrow$ CANDIDATES

(c) EVAL: CANDIDATES $\rightarrow$ OUTPUT

Are there well-defined GEN and EVAL functions that meet the specifications we have just set out for (15)? GEN must satisfy two fundamental requirements of OT: (i) the universality of the input implied by 'richness of the base' and (ii) the recoverability of the input from the output, implied by the 'containment' or 'correspondence' theories of the input-output relation (Prince and Smolensky 1993, McCarthy and Prince 1995). Because 'richness of the base' implies that the input must be universal, the syntactic GEN cannot simply be defined as mapping a set of language-particular 'lexical heads' or morphemes onto structural forms. A more abstract and crosslinguistically invariant characterization of the input is required. Because the recoverability of the input from the output is fundamental to the learnability of OT (Tesar and Smolensky 1996), the input must either be contained in the output or must be identifiable from the output by a correspondence. Hence the candidate set cannot simply consist of syntactic forms (such as strings of morphemes parsed into phrase structure trees) alone.

Both of these requirements can met by defining GEN formally as an LFG (as proposed in Bresnan 1996a and Choi 1996). This provides a mathematically well-defined correspondence between feature structures (representing language-independent content) and constituent structures (representing the variety of surface forms). The universal input can be modelled by sets of f-structures, which provide an abstract and form-independent characterization of morphosyntactic content. The candidate set can consist of pairs of a c-structure and its corresponding f-structure, which may be matched to the input f-structure by correspondence. This definition of GEN also satisfies the basic intuition shared by many that the input to an OT syntax should provide a semantic interpretation for candidate forms: the f-structures of LFG were originally proposed as schematic, grammaticalized representations of semantic interpretations (Kaplan and Bresnan 1982[1995]), and recent work within formal semantics has validated this conception by showing how f-structures can be read as underspecified semantic structures, either Quasi-Logical Forms or Underspecified Discourse Representation Structures (Genabith and Crouch 1996).

On this conception of GEN, then, the input simply represents language-independent 'content' to be expressed with varying fidelity by the candidate forms, which carry with them their own interpretations of that content. The input f-structure corresponds to and is recoverable from the f-structure in the output pair.[2]

EVAL, as we have already discussed, consists of the following:

(16) EVAL

(i) A universal Constraint Set; constraints conflict and are violable.

(ii) A language-particular strict dominance ranking of the Constraint Set.

(iii) An algorithm for harmonic ordering: The optimal/most harmonic/least marked candidate (= the output for a given input) is one that best satisfies the top ranked constraint on which it differs from its competitors (Grimshaw 1995, Smolensky 1996c).

The existence of an appropriate EVAL, then, reduces to the discovery of universal constraints whose ranking generates the desired inventories of pronominal forms. We further require that these constraints be *motivated*. The constraints are our next topic.

3 The Constraints

To derive the personal pronominal inventories of English and Chicheŵa, we can use the relative ranking of a structural markedness constraint on pronominal candidates and the constraint(s) of faithfulness to the input.

(17) Constraints:

(a) ∅Top (Topic is unexpressed): TOP ⊃ ∅

(b) Faith (Faithfulness to the input): PARSE$^{\text{FEAT}}$

The faithfulness constraint (17b) is violated when a feature of the input, such as TOP, PRO, or AGR, is not analyzed by a candidate. In the present framework, this means that a violation occurs when the feature matrix of a candidate lacks the designated feature value present in the input.[3] The motivation for faithfulness in this framework is that it ensures the expressibility of the input content (Edward Flemming, p.c.).

The structural markedness constraint (17a) asserts that the least marked analysis of the topic-anaphoric property is the absence of any morphosyntactic expression at all. It is thus a constraint on the formal complexity of expression of the topic—a constraint on *merkmalhaft* forms. In one version or another, the generalization that the least marked expression of the topical element is no expression at all has been widely adopted. Givón (1984, 1990: 917) refers to it under the name 'referential iconicity'; see also Kameyama 1985. Haiman (1985b: ch. 3) regards it as an economy constraint which allows the most familiar and predictable material to be omitted (cf. Givón 1985). Recent examples include Grimshaw and Samek-Lodovici's 1995 constraint DropTopic, and Van Valin's 1996 scalar representation of the relative markedness of referential coding devices with zero pronominals at the most topical extreme.

Within the present framework, we interpret the constraint (17a) as follows: we are given a universal set of candidates that we represent formally as pairs of a pronominal feature matrix and a structural analysis, whether as a bound affix ('Bound'), head of a syntactic category such as X^0 ('Free'), or some other morphosyntactic form; constraint (17a) assesses a mark to any candidate whose feature matrix contains the TOP property and whose structural analysis is nonempty. The intuition is that if a pronoun is specialized for topic anaphoricity, its unmarked expression is empty, null, zero. This will penalize the bound pronominal form compared to the free pronoun, which is unspecialized or neutral for topic anaphoricity, and it will also penalize the bound pronominal form compared to the null or zero pronoun, to which we will come directly.

(18) Interpretation of constraint (17a):

	∅Top
Bound: [PRO, TOP, AGR]	*
Free: [PRO, AGR]	

If a language gives priority to this constraint ∅Top over the faithfulness constraint PARSE$^{\text{TOP}}$, an instance of (17b), the result will be that violations of the zero topic constraint are worse than violations of faithfulness: in other words, it is worse to express the topic property morphosyntactically than to represent it unfaithfully in a candidate structural analysis. Since this is true for any input (combination of pronominal content features), the marked topical pronominal inflections will be absent in such a language (all else being equal). Only the neutral free pronouns will occur in the inventory. English is such a language. (The ranking of the constraints is indicated by their left-to-right order in the tableaux columns.)

(19) Ranking for English:

(a)

	Input: [PRO, TOP]	∅TOP	FAITH
	Bound: [PRO, TOP, AGR]	*!	
⇒	Free: [PRO, AGR]		*

(b)

	Input: [PRO]	∅TOP	FAITH
	Bound: [PRO, TOP, AGR]	*!	
⇒	Free: [PRO, AGR]		

Conversely, if a language gives priority to the faithfulness constraint over the structural markedness constraint ∅TOP, it will include both bound and free pronominal forms in its inventory. For topic-anaphoric inputs, the bound pronominal will be more harmonic than the free pronoun; for non-topic-anaphoric inputs, the free pronoun will be more harmonic. Chicheŵa is such a language:

(20) Ranking for Chicheŵa:

(a)

	Input: [PRO, TOP]	FAITH	∅TOP
⇒	Bound: [PRO, TOP, AGR]		*
	Free: [PRO, AGR]	*!	

(b)

	Input: [PRO]	FAITH	∅TOP
	Bound: [PRO, TOP, AGR]		*!
⇒	Free: [PRO, AGR]		

Because of the principle that languages differ systematically *only* in their rankings of the universal constraint set, this (partial) theory makes the typological prediction that there are languages like English with free pronouns only and no bound pronominals, and languages like Chicheŵa with both free and bound pronominals, but no languages having only bound pronominals and lacking free pronouns. To the extent that this prediction is borne out, it provides evidence for our hypothesis that the free syntactic pronoun is the unmarked pronominal form (that is, the neutral, *unmarkiert*, form):

(21) **Markedness relation among bound and free pronoun inventories:**
Free pronouns only (English)
Both free and bound pronouns (Chicheŵa)
Bound pronouns only (none)

Thus far, however, we have artificially restricted the candidate set by excluding zero pronouns/null anaphors. We may formally analyze zero pronouns as the absence of structural analysis of topical pronominal content; in other words, zero pronouns lack any exponence at all (as in Mohanan 1982, Kameyama 1985, Simpson 1991). (Bound morphological inflections with pronominal content are analysed as pronominal inflections rather than zero pronominals (see Bresnan and Mchombo 1987, Austin and Bresnan 1996 for references). Where the other candidates (14) pair a feature matrix representing pronominal content with a morphosyntactic analysis (either bound morphology or a syntactic category), the zero or null pronominal pairs a pronominal feature matrix with nothing—no morphological or syntactic structure:

(22) Candidate personal pronoun types:

Zero: $< \emptyset, \begin{bmatrix} \text{PRO} \\ \text{TOP} \end{bmatrix} >$ Bound: $< \mathit{af}, \begin{bmatrix} \text{TOP} \\ \text{PRO} \\ \text{AGR} \end{bmatrix} >$

Free: $< \text{X}^0, \begin{bmatrix} \text{PRO} \\ \text{AGR} \end{bmatrix} >$

If nothing further were said, the zero pronoun would always be the optimal expression for topic-anaphoric pronominal content. Regardless of the ranking of our constraints (17), it would receive a higher harmonic ordering than either bound or free pronouns, as we see in (23). (The constraints are unranked in (23), as indicated by the absence of a column line seperating them.)

(23)

	Input: [PRO, TOP]	∅TOP	FAITH
⇒	Zero: [PRO, TOP]		
	Bound: [PRO, TOP, AGR]	*!	
	Free: [PRO, AGR]		*!

There are indeed many languages that have zero pronouns and lack morphological bound pronominals or agreement morphology, e.g. Chinese, Japanese, Malayalam (Mohanan 1982) and Jiwarli (Austin and Bresnan 1996). But Chicheŵa is not among them. How can the different inventories of Chicheŵa and these languages be derived?

There is one salient difference between null or zero pronouns and morphologically bound pronominals. That is that zero pronouns have no intrinsic specification for the classificatory properties of person, number, and gender (AGR), which are morphologically distinguished in overt pronominals, both bound and free. In Chinese and Japanese, which lack verbal agreement morphology, zero pronouns can be used for various persons and numbers. The same is true in Malayalam (Mohanan p.c., November 11, 1996). In Jiwarli, Austin and Bresnan (1996: 248–50) give examples of the zero pronoun used for third person singular object, third person dual subject, first person singular subject, first person plural subject, and second person subject; Jiwarli, too, has no agreement morphology. In Warlpiri, the Auxiliary registers agreement for subject and object, but as Simpson 1991 shows, in Warlpiri sentences with nominal main predicates, the Auxiliary is optional. In such Auxiliary-less sentences, the zero pronoun is not restricted in person or number (Austin and Bresnan 1996: 241–2; Simpson 1991: 141–3).

We can therefore explain the absence of zero pronouns in some languages by means of a universal constraint stating that pronominals have the referentially classificatory properties denoted by AGR, as in (24c). This constraint can be compared to a structural constraint on feature cooccurrence in phonology, such as [voice] $\supset$ [sonorant], which plays a role in deriving markedness relations in phonological inventories (Prince and Smolensky 1993: ch. 9; Smolensky 1996b). The functional motivation for the present constraint could be that pronouns (in the unmarked case) bear classificatory features to aid in reference tracking, which would reduce the search space of possibilities introduced by completely unrestricted variable reference (Haiman 1985b: pp. 190–1).

(24) Constraints:

(a) ∅TOP (Topic is unexpressed): TOP $\supset$ ∅

(b) FAITH (Faithfulness): PARSE$^{\text{FEAT}}$

(c) PROAGR (Pronouns classify for AGR): PRO $\supset$ AGR

In languages like English and Chicheŵa, which lack zero pronouns, this constraint will dominate the zero topic constraint (24a); zero pronoun languages like Chinese, Japanese, Jiwarli, and Malayalam will have the reverse ranking.

The table in (25) shows how these constraints are interpreted with respect to our three pronominal forms:

(25) Interpretation of constraints:

		∅Top	ProAgr
Zero:	[pro, top]		*
Bound:	[pro, top, agr]	*	
Free:	[pro, agr]		

It is clear that the two markedness constraints conflict and disagree only on the bound and zero pronominal forms. Now whenever ProAgr dominates ∅Top, the bound pronoun will be more harmonic than a zero pronoun. The inventories of pronominals admitted under the three rankings consistent with ProAgr $\gg$ ∅Top will therefore reduce to (21). In contrast, when ∅Top dominates ProAgr, the null pronoun will be more harmonic than the bound pronoun. Whether the null pronoun is more optimal than the free pronoun in this case depends on the relation of ∅Top to faithfulness. The three rankings consistent with ∅Top $\gg$ ProAgr yield the inventories in (26):

(26) **Markedness relation among null and free pronoun inventories:**
Free pronouns only (English)
Both free and null pronouns (Jiwarli)
Null pronouns only (none)

The constraints proposed here not only suffice to derive the pronominal inventories of head-marking languages like Chicheŵa, the typology they generate by rerankings explains the crosslinguistic fact that no languages contain zero pronouns or bound pronouns without also containing free pronouns. The free pronoun is the least marked pronominal form crosslinguistically. Let us now turn to the language internal distribution of pronominal forms in Chicheŵa, to see how the same theory also explains the emergence of the unmarked pronoun, which was originally observed by Bresnan and Mchombo 1986, 1987.

4 The Emergence of the Unmarked Pronoun

The present theory predicts a general complementarity between the bound and free pronominal forms in Chicheŵa: the bound forms are optimal for topical input, the free forms are optimal elsewhere. This happens because the markedness of bound pronominals is submerged by the higher ranked constraint of faithfulness to the input topicality. However, in Optimality Theory a form is grammatical not when it perfectly satisfies all constraints under a given ranking, but only when it better satisfies them than its competitors. Thus in conditions where the faithfulness difference between bound and free pronominals is neutralized or overridden, the relative unmarkedness of the free pronoun will emerge. This is what happens with pronominal objects of prepositions in

Chicheŵa.[4] It is an instance of the 'emergence of the unmarked' (McCarthy and Prince 1994).

In many head-marking languages, pronominal inflections may appear on all heads, including prepositions or postpositions. But Chicheŵa has a very small set of prepositions (*ndí* 'with, by' used for instrumentals, comitatives, passive agents, and inanimate causees, *mpâka* 'until, up to', *kwá* 'to' used for datives and animate causees); *ndí* alone has an alternant for bound pronominal forms (Sam Mchombo p.c.). This appears to be a contingent property of the Chicheŵa lexicon, which is not derivable from morphosyntactic principles. How can we account for such a contingency within the OT framework?

In Optimality Theory the morphosyntactic inventory of a language, modelled here as pairings of structural types (e.g. $\emptyset$, *af*, X^0) with grammatical content (e.g. [PRO, AGR, TOP]), is derived by the constraint ranking. The role of the lexicon is to pair this abstractly characterized inventory with phonological representations. Thus the lexicon does not tell us what the inventory of pronominal forms of a language is; it only tells us how they are pronounced. In this way, too, we can understand how to characterize the contingency of the lexicon, such as the existence of accidental lexical gaps (Bresnan 1996a). These are elements of the inventory which are admitted by the constraint ranking, but for which there happens not to exist a pronunciation (as suggested by Edward Flemming p.c.). Thus the presence of bound pronominal inflections in Chicheŵa is a systematic property of the language, derived by constraint ranking; the absence of bound pronominal forms for two of the three prepositions of the language is an unsystematic property which we treat by means of lexical gaps. If we assume that inventory elements normally must be phonologically realized to be used, then the existence of accidental gaps forces consideration of competing, realizable, candidates. ('Normally' refers to those inventory elements that are paired with nonnull morphosyntactic forms such as *af* or X^0; let us call these 'expressed' inventory elements.)

The constraint that expressed inventory elements must be lexically paired with phonological realizations is stated as LEX in (27):

(27) LEX:
Expressed inventory elements must be lexically paired with phonological realizations.

We then explain the emergence of the unmarked pronoun as object of a preposition:

(28) **Emergence of the unmarked pronoun:**

	Input: [‘to’(x),[PRO,TOP]$_x$]		LEX	PROAGR	FAITH	∅TOP
a	kwá+Bound	[‘to’(x), ...]	*!			*
b	kwá Null	[‘to’(x), ...]		*!		
⇒ c	kwá Free	[‘to’(x), ...]			*	

The bound pronoun (candidate a) fails LEX because it happens to have no pronunciation in the Chicheŵa lexicon; the null pronoun (candidate b) lacks agreement features. The free pronoun (candidate c) fails to parse the TOP input, but this faithfulness violation is less important than the preceding violations. Contrast this situation with the preposition *ndí* ‘with, by’ which has a lexically available (‘pronunciable’) allomorph that contracts with pronouns:

(29)

	Input: [‘with’(x),[PRO,TOP]$_x$]		LEX	PROAGR	FAITH	∅TOP
⇒ a	na-+Bound	[‘with’(x), ...]				*
b	ndí Null	[‘with’(x), ...]		*!		
c	ndí Free	[‘with’(x), ...]			*!	

The candidates in (29) will be among the infinite set of candidates for the input in (28), and vice versa. But these candidates will incur additional marks for unfaithfulness to the input PRED value ‘to(x)’, as illustrated in (30):

(30) **Emergence of the unmarked pronoun (continued):**

	Input: [‘to’(x),[PRO,TOP]$_x$]		LEX	PROAGR	FAITH	∅TOP
a	kwá+Bound	[‘to’(x), ...]	*!			*
b	kwá Null	[‘to’(x), ...]		*!		
⇒ c	kwá Free	[‘to’(x), ...]			*	
d	na-+Bound	[‘with’(x), ...]			*	*!
e	ndí Null	[‘with’(x), ...]		*!	*	
f	ndí Free	[‘with’(x), ...]			**!	

Again the unmarkedness of the free pronoun (c) in comparison to the bound pronominal form (d) emerges, this time from the cancellation of the higher ranking faithfulness violations.

If this theory is correct, then what appear merely to be accidental gaps in the distributional patterns of Chicheŵa pronominals are actually a window into the universal markedness relations among pronominal inventories across languages. Even more interestingly, we see the same kind of markedness structures that Optimality Theory has explained so successfully in phonology appearing in the domain of morphosyntax.

Notes

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[1]For cases where one value of an equipollent feature does not appear to be universally the 'marked' value, we may use sets of privative features (Steriade 1995, Frisch 1996), whose values are inherently incompatible. For example, a pair of privative features (e.g. TOP and FOC), could replace a binary equipollent feature (e.g. [$\pm$ NEW] as in Choi 1996); the fact that a single element cannot simultaneously have both properties TOP and FOC would follow from pragmatic considerations (as Bresnan and Mchombo 1987 argue) rather than the formal opposition of $\pm$ values.

[2]Specifically, the information about 'overparsing' and 'underparsing' shown in (15) is inferrable from the candidates (14) together with the marks they incur in violation of constraints on faithfulness to the input. See below.

[3]Violations of this constraint—called MAX in the correspondence theory of input-output relations (McCarthy and Prince 1995)—account for 'underparsing'. An 'overparsing' violation occurs when a feature of the candidate matrix has no correspondent in the input; this constraint is called FILL or DEP, and is not discussed in the present study.

[4]Other instances of noncomplementarity include subject pronominals in Chichewa, which involve obligatory grammatical agreement. Agreement and related phenomena such as pronominal 'doubling' are not discussed here. For the LFG theory, see Bresnan and Mchombo 1987, Andrews 1990, Bresnan 1996b, Börjars, Chapman, and Vincent 1996 and the references cited therein.

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