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UNDERSPECIFICATION AND UNIVERSAL DEFAULTS FOR PERSON AND NUMBER FEATURES

Rebecca Hanson University of Calgary
Heidi Harley University of Arizona
Elizabeth Ritter University of Calgary

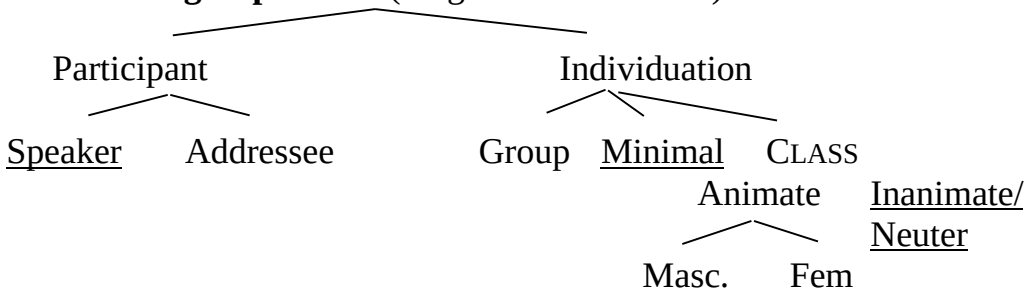
0. Introduction

Since Greenberg's important typological work in the 1960's, it has been recognized that person, number and gender features are systematically organized cross-linguistically. Most morphological theories, however, fail to capture this fundamental fact. Ritter and Harley (1998) have proposed that morphological features are organized in a feature geometry, and that this explains both the observed regularities, and the possible variations. Our assumption that this geometry is provided by Universal Grammar makes strong predictions about the acquisition of personal pronouns. In the first part of this paper, we discuss acquisition facts which not only provide independent support for this geometry, but additionally motivate universal defaults for major organizing nodes, specifically 1st person for [Participant] and 3rd person, singular for [Individuation]. In the second part of the paper we explore the consequences of the postulation of universal defaults by investigating relatively complex person systems.

1. The morphosyntactic feature geometry

Before looking in detail at the acquisition of pronouns, let us briefly discuss the formal aspects of the feature geometry. The specific structure of the geometry we assume is supplied in (1). The underlined features are the ones that we assume to be the defaults, as motivated in section 2.2 below.

(1) **Referring Expression** (=Agreement/Pronoun)



The morphological features which make specific person, number and gender distinctions are, respectively, dependent on the three major class nodes ([Participant], [Individuation], and [Class]) in the geometry in (1). These major class nodes are in turn dependent on a root node which we call [Referring Expression]. On the [Participant] side of the geometry, the discourse-dependent person features are encoded. This subtree is active for 1st person (encoded by [Speaker]) and 2nd person ([Addressee]), but not for 3rd person.

The [Individuation] side of the geometry is responsible for organizing the discourse-independent features, notably number and gender. In (1), number features are direct dependents of [Individuation] while gender/noun class features are not; these are dependents of the third organizing node, [Class]. Having the [Class] node as a dependent of the [Individuation] node captures the cross-linguistic dependency of gender on number (cf. Greenberg 1963). In terms of number features, [Minimal] encodes 'singular' while [Group] encodes non-singular numbers. The gender features encoded under the [Class] node will not be directly addressed in this paper.

1.2 Theoretical framework

Phonological theory has made extensive use of feature underspecification in both child and adult language, and we will draw on some of that research here. While there are several versions of underspecification theory, the general claim which we adopt is that the unmarked dependent of a given node is not specified underlyingly. We also adopt the position that features are unary rather than binary, and contrasts are represented via the presence or absence of a feature rather than through '+' and '-' values. Finally, in the spirit of Avery and Rice (1989) we assume that the underspecification of default features can be overridden in order to

represent a relatively marked contrast in the system. In other words, the interpretation of an underspecified node is inventory driven. We will illustrate this more fully in Section 4 below.

2. The Feature geometry and the acquisition of pronouns

The acquisition of pronouns, specifically their order of emergence, has received only sporadic attention in the literature, and there has been no previous attempt to approach the process using a feature geometry. There is, however, a good deal of research in phonology dedicated to the acquisition of the feature geometry. We draw especially on Rice and Avery (1995) and Brown (1997) in our approach to the acquisition of morphological features.

2.1 Acquisition of the feature geometry

Following Brown (1997), we assume that language acquisition is a structure building, rather than structure pruning, process; that is, UG provides a minimal initial structure which is elaborated in response to contrasts detected in the input. In this view, acquisition proceeds from the top down (i.e. from the root node): a given node must be acquired before its dependents. In this way, the geometry captures the global uniformity apparent in child language. However, given this constrained general learning path, the specific learning path is free to vary across children. The available nodes may be elaborated in any order, thus allowing for variability.

In the following section we will show how the morphological feature geometry allows us to predict the observed uniformity and variability in the acquisition of pronouns, as described in ten studies involving six different languages.

2.2 The acquisition of pronouns: Evidence for universal defaults

The studies from which we draw our data are summarized in Table 1 below. In all cases, the first pronouns acquired as recorded in the study are placed in column 1, the second in column 2, etc. Note that entries in the same column of the table do not necessarily correspond to the same age or even the same stage of

acquisition – instead, they reflect the relative order in which the different pronouns are acquired.

Table 1 is arranged in three blocks. Block I includes studies A to D, which recorded 1st person as the initial pronoun. Block II consists of rows E, F and G and includes the studies that recorded 3rd person as the initial pronoun. Finally, rows H, I and J constitute Block III. This block includes the studies that began at a point where more than one pronoun was already acquired; thus, it isn't clear which pronoun emerged first. Note, however, that in all the Block III studies, the children always had both 1st singular and 3rd neuter from the initial session.

Table 1. Order of emergence of personal pronouns in ten acquisition studies.

	Language (Source)	**1**	**2**	**3**	**4**	**5**	**6**
A	**Mohawk** (Feuer, 1980)	1st person	2nd person	3rd person			
B	**English** (Chiat 1978)	1sg	3rd person	2nd person			
C	**French** (Clark, 1985)	1sg	2sg; 3sgm	2pl; 3plm	1pl	3plf	
D	**Kaluli** (Schieffelin, 1985)	1st, 2nd person	Others				
E	**ASL** (Petitto 1987)	Inanimate	1sg	2sg	3sg	Plurals	
F	**English** (Huxley 1970: D)	3sgn	1sg	3pl	1pl	3sgm; 3sgf	2sg
G	**Hebrew** (Berman1985)	3sgn (*ze)*	1sg; 3sgm	3sgf	2sg; all plurals		
H	**Mohawk** (Mithun, 1989)	Singular pronouns	3pl	1pl	dual		
I	**English** (Huxley 1970: K)	1sg; 3sgm; 3sgf; 3sgn	2sg	3pl	1pl		
J	**English** (Brown, 1973)	1sg; 2sg; 3sgn	Others				

Abbreviations: sg = singular; pl = plural; m = masculine; f = feminine; n = neuter/inanimate

A comparison of the observations reported in the different studies listed in Table 1 reveals significant variability across children in the order of emergence of specific personal pronouns. Note that out of the ten studies considered, no two report the same order of acquisition. However, there are some discernible patterns in both the uniformity and the variation, which are summarized in (2).

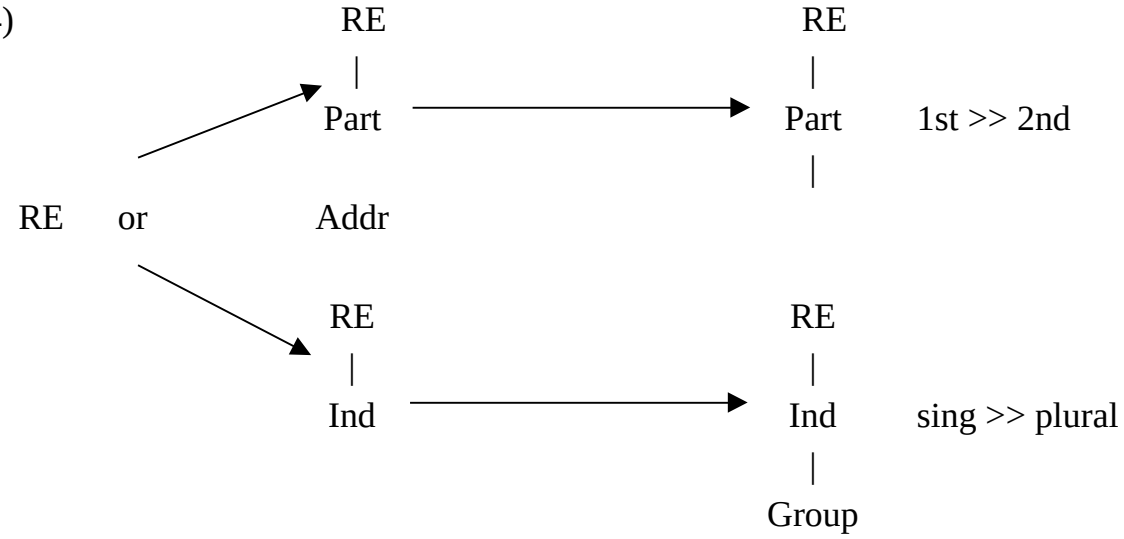
(2) a. uniformity: (i) initially 1st person singular or 3rd singular neuter/inanimate (see Bocks I and II)
(ii) 2nd person after 1st person
(iii) singular before plural
b. variability: (i) 2nd person relative to 3rd person (animate)
(ii) 2nd person relative to plurals

These patterns, particularly those in (2)a, strongly suggest that there are default interpretations for each of the organizing nodes in the geometry. The consistency in the initial pronoun as either 1st singular or 3rd singular inanimate conforms to the generalization that defaults are acquired first. Overall, the acquisition data indicates that the defaults are the following:

(3) Proposed UG-supplied Defaults
a. [Speaker] for Participant – therefore '1st person' acquired early
b. [Minimal] for Individuation – therefore 'singular' acquired early
c. [Inanimate] for Class – therefore 'neuter/inanimate' acquired early

A [Speaker] default at the Participant node is consistent with the early acquisition of first person; likewise, a [Minimal] default at the Individuation node allows us to predict that singular should also emerge early on. These two acquisition paths, illustrated schematically in (4) below, are predicted by the fact that Participant and Individuation have equal status in the geometry.

(4)



Because both Participant and Individuation are immediate dependents of the Root node, 1st and 3rd person are equally likely to appear as the first pronoun. Likewise, since [Addressee], [Group] and [Class] are all equally embedded in the geometry it is also predicted that they should be acquired later and that the relative order among them should vary, as seen in Table 1.

3. Against the acquisition of a feature bundle

It is worth noting that both the consistency and the variation in the data are problematic for a model that assumes that features are represented in unordered bundles. Compare, for example, the feature bundles in (5)a and (5)b, representing 1pl and 2pl respectively. If the features for '1st person', '2nd person' and 'plural' are unordered, we would expect to see very little consistency in their relative order of acquisition. In particular, the feature bundle model doesn't make any predictions about why 1st person comes before 2nd person; a similar problem arises with the acquisition of number.

(5) a. $\begin{pmatrix} +1 \\ -2 \\ pl \end{pmatrix}$ b. $\begin{pmatrix} -1 \\ +2 \\ pl \end{pmatrix}$

(1pl) (2pl)

We might therefore be led to assume a hierarchy of person and/or number features to account for the consistently early emergence of 1st person and singular pronouns. This kind of hierarchy has been independently proposed, and there are several versions of it. For illustration, consider the one in (6) proposed by Noyer (1992):

(6) Noyer's hierarchy: 1 > 2 > pl > dual > f

This model is able to account for only some of the acquisition data. For example, the French study in Row C of Table 1 conforms to its predictions. However, the Hebrew study in row G poses a problem because the feminine 3rd person pronoun was acquired before both 2nd person and plural.

Specifically to account for the acquisition data, Chiat (1986) proposed a different hierarchy, involving only person features, in which the order was 1st person >> 2nd person >> 3rd person. However, this model also proved inadequate. The most obvious difficulty, as Chiat noted, is the fact that the 3rd person inanimate pronoun consistently emerges alongside 1st person, rather than with the other 3rd person pronouns as expected.

In summary, it is not clear how previous models of feature organization can account for the acquisition facts. A model of unordered feature bundles, with or without a supplementary hierarchy, has particular difficulty with the variation: if features are unordered, there should be more variation than there is; and if they are ordered in a simple hierarchy, there should be less. On the other hand, we have seen that the Ritter and Harley geometry, with the proposed defaults, correctly predicts where there should be uniformity and where there should be variability in the acquisition data.

4. Over-riding the Defaults: Inclusive Pronouns

Next, we turn to the analysis of inclusive pronouns, which constitutes a second type of evidence for a geometric organization of pronominal features and for universal defaults in this geometry. Inclusive pronouns refer to both participants in the discourse, i.e. the speaker and the addressee(s). They contrast with 2nd person pronouns, which denote the addressee(s), and with 1st person

exclusive pronouns, which denote the speaker or the speaker and other individuals not party to the discourse.

4.1 Representing the Inclusive-Exclusive Distinction

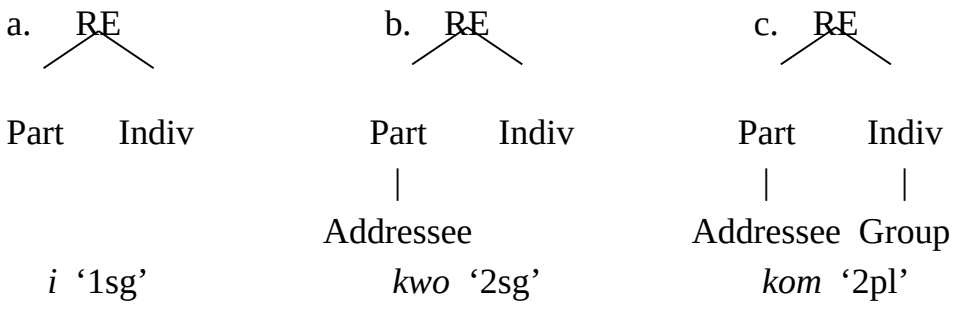
An example of a language with an inclusive pronoun is Marshallese, a Malayo-Polynesian language. The complete nominative pronoun paradigm for this language is given in (7):

(7) Marshallese (Nominative Pronouns) Zewen (1977)

	Singular	Plural	
1ex	i	kim	(=me and other(s))
1in	---	je	(=me and you)
2	kwo	koṃ̊	(=you)
3	e	re	

The feature geometry for the first person singular form, assuming the universal defaults proposed above, is the combination of a bare Participant node ('1st person') and a bare Individuation node ('singular'). This geometry is depicted in (8)a below. The second person singular and plural forms are illustrated in (8)b and (8)c respectively. Both require the projection of an Addressee node as a dependent of Participant to provide the 2nd person interpretation. In addition, the plural pronoun in (8)c requires the projection of a Group node as a dependent of Individuation.

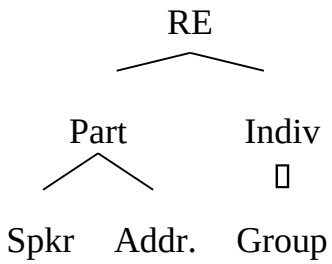
(8)



In order to represent the first person inclusive pronoun we propose that it is necessary to overtly project both the Speaker and Addressee nodes in the geometry, as shown in (9). Without a Speaker node, we would be forced to rely on

the default to fill in the 1st person interpretation, and it would be impossible to distinguish between the inclusive and the 2nd plural pronouns. Therefore, inclusive forms cannot be underspecified for first person: the UG-provided default representation of first person is overridden here.

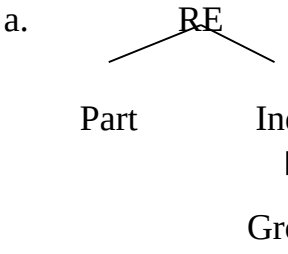
(9) *je* '1incl (pl)'



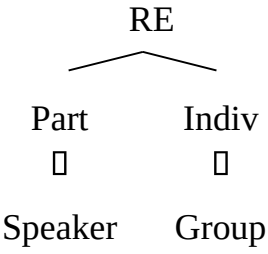
This brings us to the question of how to represent the 1st person exclusive plural pronoun – the one that refers to the speaker and some other individual(s). Two possibilities are illustrated in (10):

(10) *kim* '1excl(pl)'

a.



b.



Considerations of parsimony might suggest that the minimal representation in (10)a is the preferable candidate. On the other hand, given that this language overrides the default by projecting a Speaker node in the inclusive, it might make use of the Speaker node in the exclusive as well. Note that first person exclusive pronouns are less common than English-type 1st person plural pronouns. The geometry in (10)b, if correct, would reflect the relative markedness of the exclusive. The two candidates make different predictions for acquisition, a point to which we will return.

4.2 1st singular vs. 1st exclusive plural as a person contrast

The Marshallese data we have considered here underdetermines the geometric analysis of the exclusive. We now turn to the analysis of Maxakali and

Kwakiutl, languages for which (10)b is the only possible structure. These two languages, whose paradigms are reproduced in (11) and (12), are notable in that they appear to manifest number distinctions in 1st person only. In addition, both languages have a 1st person singular pronoun as well as a 1st person inclusive plural pronoun and a 1st person exclusive one. The crucial property that distinguishes these languages is the lack of an Individuation node.

(11) Maxakalí (Absolutive):

	singular	plural
1st excl	’ũg/ ’ũk	yũmũg
1st incl		’ũmũg
2nd	’ã	
3rd	’ã	

Popovich (1986: 352)

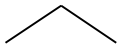
(12) Kwakiutl (Nominative)

	singular	plural
1st excl	-En	-Enuèxu
1st incl		-Ents
2nd	-Es	
3rd	--	

Boas (1911)

Exploiting the fact that 1st person plurals do not refer to a group of speakers, but rather to one speaker and one or more others, Ritter and Harley (1998) claimed that pronouns in these languages contrast only in person. Support for this approach comes from the observation that these languages normally make no morphological number or gender distinctions on nouns or verbs. Ritter and Harley developed an analysis for these languages that uses the four different [Participant] subgeometries available in the system, as shown in (13).

(13)

	1st sg	**2nd**	**1st excl pl**	**1st incl**
	Part	Part	Part	Part
		□	□	
		Addr	Spkr	Spkr Addr
Maxakali	’ũg/ ’ũk	’ã	yũmũg	’ũmũg
Kwakiutl	*-En*	*-Es*	*-Enuèxu*	*-Ents*

If number features are not present in the feature inventories of Maxakali and Kwakiutl, the only way to capture the contrasts among the four distinct 1st and 2nd person pronouns is by means of person features. Thus, in order to distinguish it