

Harley and Ritter’s reason for treating MINIMAL this way is the existence of the “constructed” dual (Corbett 2002) in Hopi and in Zuni, illustrated in (3) and (4). In these languages, nouns and verbs have singular and plural forms, but no distinctive dual forms. A dual interpretation arises when a plural noun appears as the subject of a singular verb. For Harley and Ritter, the plural subject contributes the feature GROUP, while the singular verb contributes MINIMAL, giving the dual interpretation.

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|-----|---|-----|---|
| (3) | Hopi (Corbett 2000: 169) | (4) | Zuni (Corbett 2000: 170) |
| | a. pam wari
that.SG run.PERFV.SG
‘He/she ran.’ | | a. ?a:w-akcek(?i) ?a:-kya
PL-boy go-PAST
‘Two boys went.’ |
| | b. puma yúutu
that.PL run.PERFV.PL
‘They (pl) ran.’ | | b. hon ?a:-kya
I.PL.NOM go-PAST
‘We (two) went.’ |
| | c. puma wari
that.PL run.PERFV.SG
‘They (two) ran.’ | | |

This paper provides a new account for the Zuni and Hopi data given above, and accounts without further stipulation for the Zuni pronoun system, as described by Newman (1965), Nichols (1997) and Corbett (2000). The analysis avoids the inconsistent use of features as both marked and default, such as Harley and Ritter’s use of MINIMAL described above, and accounts for the observed syncretisms in the pronoun system.

2. Theoretical context and assumptions

I adopt the Minimalist Program (Chomsky 2000), and the theory of agreement set forth in Béjar (2003). For Béjar, ϕ -features like number and person can probe separately. When a probe finds a matching target, the features of the target are copied onto the probe in an operation called Value. In Zuni, the only Probe at issue is number.

I also assume the theory of Distributed Morphology (Halle and Marantz 1993), whereby the insertion of vocabulary items (VIs) takes place at the end of syntactic computation. At the point of vocabulary insertion, the VI bearing the greatest subset of the features being spelled out is inserted. It is therefore possible that some features are active in syntactic computation without being overtly spelled out by VIs.

Finally, I assume (Trubetzkoy 1939, 1969, Dresher 1998, 2002), that the interpretation of an element bearing a given feature or set of features depends on the contrasts in which that element participates. In phonology, this situation can easily be seen in the vowel inventories given in (5).

- (5) a. Three-vowel system

i	u [Back]
a [Low]	

- b. Five-vowel system

i [High]	u [Back, High]
e	o [Back]
a [Low]	

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In a three-vowel system using the features [Low] and [Back], /i/ is completely underspecified, while in a five-vowel system which also uses [High], /i/ is specified as [High], and the fully underspecified vowel shows up as /e/. [Back] is realized as /u/ in the three-vowel system, and as /o/ in the five-vowel system.

Corbett (2000: 41) informally notes a similar phenomenon in number systems: “[T]he meaning of ‘plural’ will vary according to the system of which it is a part.” If a language uses only singular and plural, then plural includes groups as small as two. In contrast, if a language also has a dual, then plural includes groups no smaller than three. Thus, the interpretation of a plural nominal will depend on how many grammatical numbers the language makes use of. The analysis proposed here makes crucial use of the fact that the interpretation of a given feature depends on the contrasts in which it participates.

3. Two views of the dual

The traditional feature-geometric view of a three-way number system (Harley 1994, Béjar 1998, Béjar and Hall 1999), given in (1), is repeated here as (6)a.¹ In this system, a two-way number system would have the specifications in (6)b. A second approach, to be argued for here, is given in (7).

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|---|--------------------|-------------------|------------------|---|---|---|--|--|--|--|-------|-------|--|--|---|--|--|---------|---|--------------------|-------------------|---|---|--|--|--|-------|
| <p>(6) a. Three-way number system:</p> <table style="margin-left: 40px; border-collapse: collapse;"> <tr> <td style="text-align: center; padding-right: 20px;">i. <u>Singular</u></td> <td style="text-align: center; padding-right: 20px;">ii. <u>Plural</u></td> <td style="text-align: center;">iii. <u>Dual</u></td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">#</td> <td style="text-align: center;">#</td> </tr> <tr> <td></td> <td style="text-align: center;"> </td> <td style="text-align: center;"> </td> </tr> <tr> <td></td> <td style="text-align: center;">GROUP</td> <td style="text-align: center;">GROUP</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">g</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">MINIMAL</td> </tr> </table> | i. <u>Singular</u> | ii. <u>Plural</u> | iii. <u>Dual</u> | # | # | # | | | | | GROUP | GROUP | | | g | | | MINIMAL | <p>b. Two-way number system:</p> <table style="margin-left: 40px; border-collapse: collapse;"> <tr> <td style="text-align: center; padding-right: 20px;">i. <u>Singular</u></td> <td style="text-align: center;">ii. <u>Plural</u></td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">#</td> </tr> <tr> <td></td> <td style="text-align: center;"> </td> </tr> <tr> <td></td> <td style="text-align: center;">GROUP</td> </tr> </table> | i. <u>Singular</u> | ii. <u>Plural</u> | # | # | | | | GROUP |
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| | GROUP | GROUP | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | g | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | MINIMAL | | | | | | | | | | | | | | | | | | | | | | | | | |
| i. <u>Singular</u> | ii. <u>Plural</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| i. <u>Singular</u> | ii. <u>Dual</u> | iii. <u>Plural</u> | | | | | | | | | | | | | | | | | | | | | | | | | |
| # | # | # | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | >2 | | | | | | | | | | | | | | | | | | | | | | | | | |
| i. <u>Singular</u> | ii. <u>Plural</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | >1 | | | | | | | | | | | | | | | | | | | | | | | | | | |

The system in (7) embodies Corbett’s (2000: 41) comment that the meaning of the plural depends on how many number values the system uses. The feature specification of the dual in (7)a is identical to that of the plural in (7)b. The narrower semantic range of the dual in (7)a arises from the fact that the [>1] feature in that system may have a dependent, [>2]. In both systems, [>1] separates singulars (not >1) from non-singulars (>1). In (7)a, non-singulars are further divided into plurals (>2) and duals (>1 but not >2).

Both systems capture Greenberg’s (1963: 94) Universal 34, which states that no language has a dual unless it also has a plural, as in both cases, the system with only

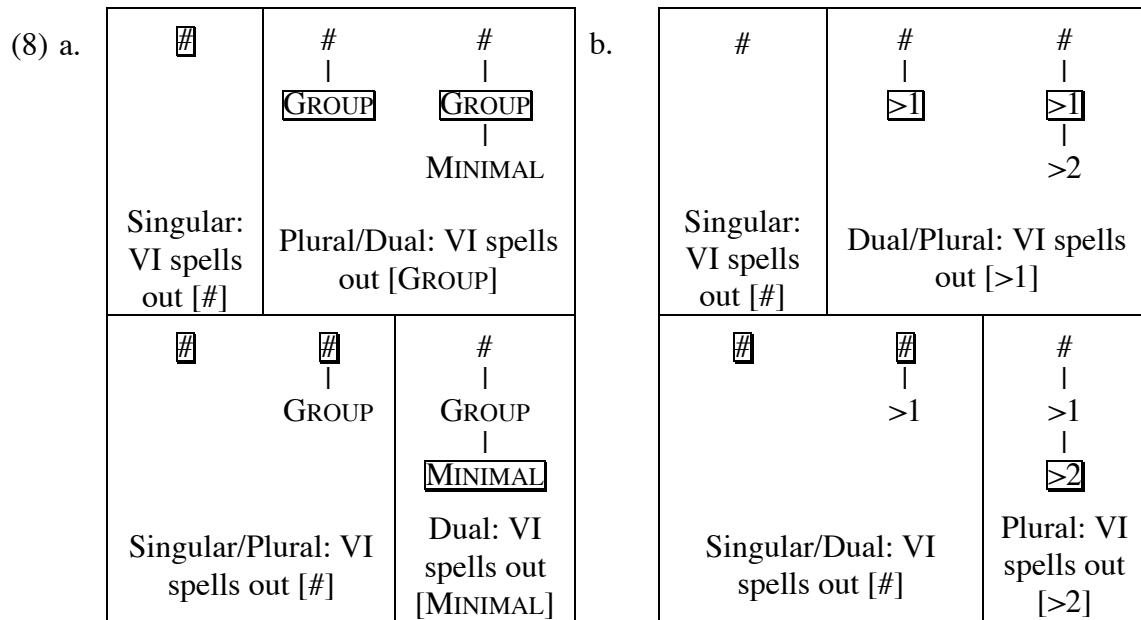
¹ INDIVIDUATION is replaced by the symbol #, for brevity and economy of presentation. # may also be identified with Ritter’s syntactic category #; see Cowper and Hall (2002).

singular and plural uses a proper subset of the features needed to specify singular, dual and plural, capturing the fact that three-way systems are crosslinguistically marked with respect to two-way systems. The crucial difference between them is the language-internal status of the dual. In (6), the dual in a three-way system is more marked than the plural, whereas in (7), the plural is more marked than the dual. While it is not at all clear which is to be preferred on the basis of inherent properties of dual and plural, empirical evidence from syncretic forms can be found to prefer (7) over (6). In Distributed Morphology, syncretisms arise when the number of distinct feature structures to be spelled out exceeds the number of available VIs. In such a case, one VI will be the best match for more than one representation, and the surface form will be ambiguous between these representations. Let us now look at the syncretisms permitted by the systems in (6)a and (7)a above, if there are only two VIs available to spell out the three representations.

In (6)a, there are two possibilities. If the more marked of the two VIs bears the feature GROUP, then the plural and the dual will surface as the marked form, in opposition to the less-marked singular. Alternatively, if the more marked VI bears the feature MINIMAL, then the singular and the plural will surface as the less marked form, in opposition to the more-marked dual. These possibilities are schematized in (8)a.

The third logically possible syncretism, in which singular and dual are spelled out by one form, with a separate morpheme for the plural, cannot be captured by this system.

The syncretisms predicted by the system in (7)a are shown in (8)b.



We now have a clear empirical difference between the two systems. A system using GROUP and MINIMAL cannot account for languages in which syncretic singular/dual forms are distinguished from plurals, while a system using [>1] and [>2] cannot account for languages in which syncretic singular/plural forms are distinguished from duals. Both systems can account for languages in which syncretic dual/plural forms are distinguished from singulars. A second, though less obviously testable, difference is that the dual carries more features in the first of these systems, while the plural is more highly specified in the second.

4. Zuni number marking

According to Newman (1965), full nominals in Zuni are marked with one of two suffixes, indicating singular and plural. The singular suffix varies with the noun class, while the choice of plural suffix depends on whether the stem is monosyllabic or polysyllabic. Examples are given in (9), from Newman (1965: 56).

(9)	Class	root	singular	plural	gloss
1.	(monosyllabic root)	lu	lu-ʔleʔ	lu-weʔ	'ash'
	(polysyllabic root)	noʔli	noʔli-nne	noʔli-ʔweʔ	'nose'
2.		le	le-mmeʔ	le-weʔ	'board'
3.		lupa	lup-ʔe	lupa-ʔweʔ	'box of ashes'

Nichols (1997) describes two other classes of nouns. In the first, the singular is unmarked, while the plural bears the prefix *ʔa:w-*, and in the second, the noun shows no number marking at all, but nonetheless triggers plural agreement on the verb. We leave these details aside, noting only that the marking of nominals is described as reflecting a singular-plural distinction.

Verbs in Zuni are inflected to agree with the number of their subjects.² Agreement with a plural nominal is marked; otherwise the verb is not marked overtly for number.

As shown in (4) above, Zuni makes use of what appears to be a two-way number marking system for nouns and verbs to “construct,” in Corbett’s terms, a three-way system with a singular, a dual and a plural. The dual interpretation arises when a plural subject appears with a singular (actually, unmarked) verb, as shown in (10), from Corbett (2000: 170).³

(10)	a.	hon ʔa:-kya 1.PL.NOM go-PAST 'We (two) went.'	c.	hon ʔa:w-a:-kya 1.PL.NOM PL-go-PAST 'We (pl.) went.'
	b.	ʔa:w-akcek(ʔi) ʔa:-kya PL-boy go-PAST 'The (two) boys went.'	d.	hoʔ ʔa:-kya 1.SG.NOM go-PAST 'I went.'

I would like to suggest that the term “singular,” applied to the verbs in (10)a, (10)b, and (10)d, is a misnomer. Rather, it should be viewed as a syncretic form, spelling out both singular and dual representations. The verb form in (10)c spells out plural, in opposition to singular and dual. The pronouns in (10)a and (10)c, and the subject nominal in (10)b, are also syncretic forms, spelling out both dual and plural representations, while

² This oversimplifies matters considerably. According to Nichols (1997), the verb agrees with both subjects and objects, as well as other arguments. We are concerned here only with the number marking itself, and not with the choice of argument triggering the agreement. For simplicity, we limit the data to subject-verb agreement in intransitive clauses.

³ Newman (1965) briefly mentions this construction, and describes it as involving a singular nominal and a plural verb. Both Corbett (2000), giving data provided by Lynn Nichols, and Harley and Ritter (2002) describe it as involving a plural nominal and a singular verb. I follow the latter authors.

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- (13) a. i. hon ʔa:či ʔa:-kya
 1.PL.NOM DUAL go-PAST
 ‘We (two) went.’
 ii. hon ʔa:-kya
 1.PL.NOM go-PAST
 ‘We (two) went.’
- b. i. ʔa:w-akcek(ʔi) ʔa:či ʔa:-kya
 PL-boy DUAL go-PAST
 ‘Two boys went.’
 ii. ʔa:w-akcek(ʔi) ʔa:-kya
 PL-boy go-PAST
 ‘Two boys went.’

We see from (13) that *ʔa:či* optionally appears in the dual, regardless of the person of the subject. In fact, Corbett states that “no pronoun is found in the third person.” (Corbett 2000: 169). Given that in the dual, the verb is unmarked for number and is thus identical to the singular, and that third-person nominative pronouns are null, we might expect *ʔa:či* to be used more often than not in a third-person dual construction with a pronominal subject. In such a case, *ʔa:či* would be the only overt element distinguishing the singular construction from the dual.

Removing *ʔa:či* from the paradigm and reorganizing so as to make the syncretisms more salient, the pronominal system of Zuni is as shown in (14).

(14)

		Subject		Object	Possessive	
		Medial	Final	Medial	Medial	Final
1st	Singular	hoʔ	ho:ʔo	hom		homma
	Dual	hon	hoʔno	hoʔnaʔ		
	Plural			hoʔnʔa:wan		
2nd	Singular	toʔ	to:ʔo	tom		tomma
	Dual	ton	toʔno	toʔnaʔ		
	Plural			toʔnʔa:wan		
3rd	Singular	--		ʔan		ʔa:ni
	Dual			ʔa:čiyaʔ		
	Plural			ʔa:wan		

I adopt the system of person features in Harley and Ritter (2002). They use the feature [PARTICIPANT], with a dependent [ADDRESSEE]. A bare [PARTICIPANT] feature thus characterizes first person, while second person consists of [PARTICIPANT + ADDRESSEE].⁴ Third person is characterized by the absence of person features. For Case, I adopt a simplification of the system proposed for Old Church Slavonic by Béjar and Hall (1999). Subject case is the least marked, with object case involving a dependent feature [ACCUSATIVE] and Possessive case a dependent feature [OBLIQUE]. The person and case structures are given in (15) and (16). R is Harley and Ritter’s notation for Referring Expression, the root node for pronouns.

⁴ Harley and Ritter thus take SPEAKER to be the default interpretation of a bare PARTICIPANT node. In addition, in languages that distinguish inclusive from exclusive first-person forms, SPEAKER functions as a marked value. Since Zuni lacks this distinction, the feature SPEAKER is unnecessary.

- (15) a. First Person b. Second Person c. Third Person
- | | | |
|--------|--------|---|
| R | R | R |
| / \ | / \ | |
| PART # | PART # | # |
| | | |
| | ADDR | |
- (16) a. Subject b. Object c. Possessive
- | | | |
|------|------|------|
| CASE | CASE | CASE |
| | | |
| | ACC | OBL |

Putting the features of Person and Case together with the number features from (7) above, we have the representation in (17) for the second person plural possessive pronoun *toʔnʔa:wan*.

- (17)
- | | | |
|---------|------|---|
| R | | \ |
| / | | |
| PART # | CASE | |
| | | |
| ADDR >1 | OBL | |
| | | |
| | >2 | |

For completeness, I will also make use of a feature [Final], which distinguishes final from medial forms. This should not be taken as a substantive proposal for positional variation in Zuni; rather it simply permits an account of all the pronoun forms.

Let us first look at the first and second person plural possessive VI's *hoʔnʔa:wan* and *toʔnʔa:wan*. These forms are syncretic only for position, and thus lack the feature [Final]. Their feature specifications are given in (18), and they will spell out structures either with or without the feature [Final].

- (18) a. *hoʔnʔa:wan* b. *toʔnʔa:wan*
- | | |
|-------------|-------------|
| R | R |
| / \ | / \ |
| PART # CASE | PART # CASE |
| | |
| >1 OBL | ADDR >1 OBL |
| | |
| >2 | >2 |

Now consider the third person dual and plural forms *ʔa:čiyaʔ* (dual) and *ʔa:wan* (plural). These forms are syncretic both for position and for objective and possessive case. Following Béjar and Hall (1999), I assume that it is possible for a VI to spell out, not only specific features, but also degrees of markedness. These VIs thus spell out marked (ACC or OBL) as opposed to unmarked Case. Their feature specifications are given in (19), where X is a variable ranging over all (non-null) dependents of CASE.

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- (19) a. ʔa:čiyaʔ : $\begin{array}{c} \text{R} \\ / \quad \backslash \\ \# \quad \text{CASE} \\ | \quad | \\ >1 \quad \text{X} \end{array}$ b. ʔa:wan : $\begin{array}{c} \text{R} \\ / \quad \backslash \\ \# \quad \text{CASE} \\ | \quad | \\ >1 \quad \text{X} \\ | \\ >2 \end{array}$

I now turn to the forms *hoʔnaʔ* and *toʔnaʔ*, which spell out dual and plural objective, as well as dual possessive. Under the system of number features being proposed here, this three-way syncretism can readily be captured with the feature specifications shown in (20).

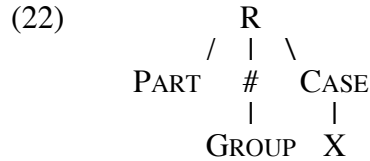
- (20) a. hoʔnaʔ : $\begin{array}{c} \text{R} \\ / \quad | \quad \backslash \\ \text{Part} \quad \# \quad \text{Case} \\ | \quad | \\ >1 \quad \text{X} \end{array}$ b. toʔnaʔ : $\begin{array}{c} \text{R} \\ / \quad | \quad \backslash \\ \text{Part} \quad \# \quad \text{Case} \\ | \quad | \quad | \\ \text{Addr} >1 \quad \text{X} \end{array}$

This representation is compatible with the three contexts in which the forms appear. It is also compatible with the context in which *hoʔnaʔa:wan* and *toʔnaʔa:wan* appear, but is blocked there by the closer match (>2, OBLIQUE) provided by those forms.

The syncretic forms *hoʔnaʔ* and *toʔnaʔ* provide evidence for the view of dual and plural presented here, and against the earlier approach using the features GROUP and MINIMAL. The relevant representations using GROUP and MINIMAL are given in (21). Since the first and second person forms are entirely parallel, only the first person representations are given.

- (21) a. hoʔnaʔ : $\begin{array}{c} \text{R} \\ / \quad | \quad \backslash \\ \text{PART} \quad \# \quad \text{CASE} \\ | \quad | \\ \text{GROUP} \quad \text{ACC} \\ | \\ \text{MINIMAL} \end{array}$ $\begin{array}{c} \text{R} \\ / \quad | \quad \backslash \\ \text{PART} \quad \# \quad \text{CASE} \\ | \quad | \\ \text{GROUP} \quad \text{OBL} \\ | \\ \text{MINIMAL} \end{array}$ $\begin{array}{c} \text{R} \\ / \quad | \quad \backslash \\ \text{PART} \quad \# \quad \text{CASE} \\ | \quad | \\ \text{GROUP} \quad \text{ACC} \end{array}$
 (objective dual) (possessive dual) (objective plural)
- b. hoʔnaʔa:wan : $\begin{array}{c} \text{R} \\ / \quad | \quad \backslash \\ \text{PART} \quad \# \quad \text{CASE} \\ | \quad | \\ \text{GROUP} \quad \text{OBL} \end{array}$
 (possessive plural)

Let us therefore assume that the VI *hoʔnaʔa:wan* has the fully specified representation in (21)b, and that *hoʔnaʔ* carries the most specific representation compatible with all three structures in (21)a, that is, (22).



The problem with this analysis arises when the two VIs compete for insertion in the possessive dual. The structure in (21)b matches the structure of the possessive dual more closely than does the structure in (22), and the analysis thus wrongly predicts that *ho?n?a:wan* should be inserted. There is no representation for the possessive plural that is incompatible with the possessive dual in a system in which the dual is more marked than the plural. Under this analysis, the only solution is to claim that there are two homophonous VIs *ho?na?* (and analogously, two homophonous VIs *to?na?*), one spelling out the accusative dual/plural, and the other spelling out the possessive dual. On this basis, I conclude that the features [>1] and [>2] permit a more elegant account of the Zuni pronoun system, and of Corbett's constructed dual, than do the features [GROUP] and [MINIMAL]. In addition, since the analysis presented here eliminates the inconsistent use of MINIMAL as both a default and a marked feature, it is to be preferred to the approach of Harley and Ritter (2002).

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