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The Morphology of Zapotec Pronominal Clitics

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The Morphology of Zapotec Pronominal Clitics

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1. Introduction¹

All Zapotec languages appear to show an alternation between full NP subjects of verbs and clitic subjects, at least for some persons. Subject clitics do not cooccur with a postverbal, non-pronominal subject.

Consider the following examples from San Dionicio Ocotepéc Zapotec (SDZ), one of the Valley Zapotec languages:

- (1) Û-dàw réé=bíiny gèhèht. 'The people ate tortillas.'
com-eat pl=person tortilla
- (2) Û-dàw=réhby gèhèht. 'They ate tortillas.'
com-eat=3p tortilla
- (3) *Û-dàw=réhby réé=bíiny gèhèht. 'The people they ate tortillas.'
com-eat=3p pl=people tortilla

Like many Zapotec languages, SDZ does have a construction in which a full noun phrase appears at the left periphery of the clause, coreferential with a clitic pronoun. In previous work (Broadwell 2002), I have argued that these are external topics adjoined to the CP node:

¹ I thank Lee Bickmore, Pamela Munro, and Andrew Spencer for helpful comments and discussion. Special thanks to Luisa Martínez, who provided all the SDZ data discussed here. A considerably longer version of this paper is available at <http://www.albany.edu/anthro/fac/broadwell.htm>

The orthography for SDZ is adapted from the practical orthographies for other Zapotec languages spoken in the Valley of Oaxaca. In the SDZ orthography symbols have their usual phonetic values, with the following exceptions. <x> = /ɣ/ before a vowel and /ʃ/ before a consonant, <xh> = /ʃ/, <dx> = /dʒ/, <ch> = /tʃ/, <c> = /k/ before back vowels, <qu> = /k/ before front vowels, and <eh> = /ɛ/. Doubled vowels are long. SDZ is a language with four contrastive phonation types: breathy <Vj>, creaky <V'V>, checked <V'>, and plain <V>.

Glosses use the following abbreviations: 3 = 3rd person (ordinary), 3p = 3rd person plural, 3a = 3rd person animal, 3i = 3rd person inanimate, 3r = 3rd person respected, aff = affirmative, det = determiner, com = completive aspect, con = continuative aspect, cop = copula, neg = negative, p = possessed, pl = plural.

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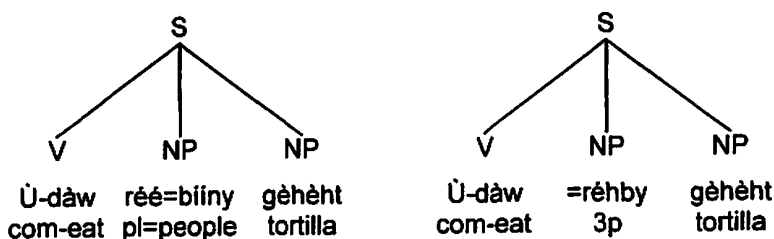
- (4) Juáàny, ù-dàw=bí gèhèht. 'Juan, he ate tortillas.'
 Juan com-eat=3 tortilla

Nonetheless, it is certainly true that clitics and full NPs are in complementary distribution in postverbal position.

2. A syntactic approach to the clitic pronouns

In an important paper on Zapotec pronouns, Marlett (1993) presents a straightforward account of this complementarity between full NPs and clitic pronouns. In his account, the clitic pronouns are generated in the same syntactic position as the full NPs, but are phonologically dependent on the preceding word.

Thus the tree structures for (1) and (2) above might be as follows:



The *=rehby* morpheme is just like a syntactic word, but it attaches itself to the preceding word in the phonology.

In addition to the clitic forms of the pronouns, SDZ also has independent forms, as in the following examples:

- (5) a. Ù-náá Juáàny là'à=rèhby. 'Juan looked at them.'
 com-look:at Juan det=3p
 b. *Ù-náá Juáàny=rèhby.
 com-look:at Juan=3p
- (6) a. Ù-zíí' Juáàny rrèhgáàl pàjrr là'à=rèhby. 'Juan bought presents for them.'
 com-buy Juan present for det=3p
 b. *Ù-zíí' Juáàny rrèhgáàl pàjrr=rèhby.
 com-buy Juan present for=3p

Here, the independent form of the pronoun is found by adding the the determiner *là'à* to the clitic form, and the clitic form is ungrammatical.

Though Marlett's (1993) account is not completely explicit on the conditions under which the determiner appears, the following outline seems to accurately portray his view:

- (7) a.) Clitics like =*rehby* are syntactically and prosodically dependent pronouns.
b.) As syntactically dependent words, these pronouns require adjacency to a projection of the head of the phrase.
c.) As prosodically dependent words, the clitics require a preceding host of the right etymological type. Borrowed words are not of the right etymological type.

If either of the conditions in (b) or (c) is not met, then the determiner *là'à* is inserted to provide an acceptable host for the clitic. For example, in (5), the clitic would not be adjacent to the head of the phrase (which is V, not NP). Therefore condition (b) fails to hold, and the clitic needs an inserted determiner to serve as its host. In example (6), the clitic would be adjacent to the head of the phrase (P), but because the preposition *pàjrr* 'for' is borrowed from Spanish, it is not of the right etymological type. It thus cannot host the clitic, and once again, the determiner is inserted to serve as host.

I'll call this a syntactic account of the clitics, since it assumes that clitics are generated by the syntax, just like other words, and that they are attached to their hosts via a phonological process. This account is appealing in its simplicity and its use of independent parameters of phonological and syntactic dependency. However, in this paper I would like to suggest that this approach faces a number of problems which limit its success when applied to SDZ. In particular, I will argue that clitic pronouns show sensitivity to a wider range of features than has been so far realized. The features that are relevant include person, animacy, and part of speech. I will suggest that when the full range of data is considered, the resulting paradigm is best treated as a sort of morphological paradigm, where pronominal clitics are added by a morphological component (Anderson 1996, Stump 2001, Legendre 2000a,b, Spencer 2001).

3. Background

3.1 Independent pronouns and their semantics

Table 1 shows the independent forms of the pronouns in SDZ. Where two forms appear, the first is found in stressed position and the second in unstressed positions:²

² SDZ has two underlying tone levels tones (H, L) and two contour tones (HL, LH), as well as underlying toneless stems. In this table and the next table, the independent and clitic pronouns are shown with their underlying tones, and toneless syllables have no tone mark. The surface realization of toneless syllables is dependent on interaction with the other tone rules of the language.

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Table 1

	singular	plural
1 st	nàà'	dáánùùn
2 nd ordinary	líí'	là'àt
2 nd formal	gyèhbù	gyèhbtù
3 rd ordinary human	là'ehby, lèh'ehby	là'arahby
3 rd respected human	là'ab	là'arab
3 rd reverential	là'ání'	là'aréhní'
3 rd male to male	là'xrà'	là'rèhxrà'
3 rd animal	là'am	là'aram
3 rd inanimate	là'ehn, lèh'ehn	là'àrehn

As can be seen in this table, the third person forms of the pronouns all begin with some form of *là'à*, as does the 2nd person ordinary plural. *Là'à* also occurs as an independent determiner used with focussed noun phrases.

The 2nd person ordinary vs. formal distinction resembles the Spanish *tú/Usted* distinction. The formal pronouns appear to consist of an additional morpheme *gyèhb* followed by the clitic forms of the ordinary 2nd person singular (=ù) and plural (=tù).

The respected pronouns are typically used for adult humans older than the speaker, and ordinary pronouns for those of about the same age or younger. In some narratives, however, respected and ordinary pronouns serve to differentiate between two characters of similar ages – in a way roughly equivalent to ‘the younger one’ and ‘the older one’.

Reverential pronouns are used for talking about a class of things that might be approximately described as ‘holy’ or ‘heavenly’, which includes dead people, the saints, angels, God, Jesus, or statues of the saints in a church. It does not appear to include any living humans. It does not include items such as the sun, the moon, water, tejate, or tortillas (as reported for San Lucas Quiavini Zapotec by Munro and Lopez (1999)).

Male to male pronouns are used by males talking about other males, primarily those the same age or younger than the speaker. My primary consultant for SDZ is female, so she does not volunteer these forms. However, she will use such pronouns in quoting male speakers, and will supply them in elicitation contexts. Male speakers may also use regular human pronouns in referring to other males, but understanding the social/contextual/discourse factors involved in the alternation awaits future study.

Animal pronouns are used for living animals only – dead animals are referred to with inanimate pronouns. Animal pronouns are not used for babies and children (as in San Lucas Quiavini, Munro and Lopez 1999); ordinary human pronouns are used to refer to babies and children.

3.2 Clitic pronouns

The clitic forms of the pronouns are as shown in table 2:

Table 2

	singular	plural
1 st	=à'	=nú, =n, =àn
2 nd ordinary	=ù	=tú, =t, =àt
2 nd formal	=gyèhbù	=gyèhbtù
3 rd ordinary human	=bi, =by, =ehby	=rehby
3 rd respected human	=ba, =b, =ab	=rab
3 rd reverential ³	=ní'	=réhni'
3 rd male to male	=xrà'	=réhxrà'
3 rd animal	=ma, =m, =am	=ram
3 rd inanimate	=ni, =ny, =ehny	=rehny

Several clitics vary in their realization depending on the phonology of the preceding word. Briefly, the =CV form is found after a consonant and either =VC, =C, or =Cy is found after a vowel.

4. Problem one – etymological sensitivity to the host

4.1 Environments for clitic pronouns

The SDZ clitic pronouns are used in a variety of syntactic contexts – as subjects and objects of verbs, as objects of prepositions, and as the restriction of a quantifier:

- (8) B-gwíf=**by** Juáàny 'He saw Juan.'
com-see=3 Juan
- (9) B-gwíf=**by=mà** 'He saw it (animal).'
com-see=3=3a
- (10) lè'èn=**rèhny** 'in them'
in=3pi
- (11) Tyóóp=**ráb** ù-qui'n=**ráb** bèh'l. 'Two of them ate meat.'⁴
two=3rp com-eat=3pr meat

Marlett's (1993) account predicts that the clitic form will be used if the pronoun is adjacent to the head of the phrase and the phrase is of the right etymological type.

³ An apparently identical clitic =ní' is also used for reflexive possessors, but I will not discuss it in this paper.

⁴ The verb root in this example is /-qui'n/ 'to eat' which is more polite than /-dàw/ 'to eat' seen in previous examples. Because the subject here is referred to with a respected pronoun, it is more appropriate to use the polite form of the verb.

4.2 Etymological sensitivity in verbs and prepositions

The etymological condition is that the clitic host must count as a ‘native’ Zapotec word. Borrowed Spanish words which serve as verbs and prepositions generally cannot host clitics. Let us examine the prepositions first. It is generally true that borrowed prepositions require the independent pronouns, while native prepositions require the clitic forms:

- (12) Û-lù'ù Juáany gèhèht lè'èn=rèhny/*lè'èn là'à=rèhny.
 com-put Juan tortilla in=3pi/ in det=3pi
 ‘Juan put the tortillas in them.’ 6:168
- (13) Û-zíí' Juáany rrèhgáal pàjrr là'à=rèhby/*pàjrr=rèhby
 com-buy Juan present for det=3p/ for=3p
 ‘Juan bought presents for them.’ 6:169

Here the native preposition *lè'èn* ‘in’ is followed by the clitic pronoun, while the borrowed preposition *pàjrr* ‘for’ is followed by the independent pronoun.

As one might expect, there is occasionally some inconsistency between the actual etymology of the word and its treatment in the lexicon. For example, *xpàrrt* ‘in place of’ is treated like a native Zapotec word for the purposes of the clitic pronouns, though it is originally borrowed from Spanish *parte*. *Zi'cy* ‘like’ is a native Zapotec word, but it is treated like a non-native for the purposes of this (and other) rules.

- (14) xpàrrt=bi ‘in his/her place’
 in:place:of=3
 *xpàrrt lèh'=éhby
 in:place:of det=3
- (15) zi'cy lèh'=éhby ‘like him/her’
 like det=3
 *zi'cy=bi
 like=3

The situation with verbs is somewhat more complex. We may distinguish two types of verbal borrowings in SDZ. Both involve a Zapotec verb (typically *riùny* ‘to do/make’) which serves as the head of the verbal expression.

In Type I borrowings, the verb and the borrowed element are distinct words, which are generally separated from each other by the subject. In such cases, the verb is a complex made up of two parts – the Zapotec *riùny* ‘to do/make’ and a borrowed Spanish word, which may be etymologically a noun, verb, or adjective.

In Type II borrowings, a borrowed Spanish adjective element has been incorporated into the

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Zapotec verb, and the two form a single word, which is the causative of that adjective.⁵

- (16) a.) B-èèny Juáany próméhèhs là'á=réhby TYPE I
 com-make Juan promise det=3p
 'Juan promised them.'
- b.) B-èèny-mùráád Juáany lèh'=èhn. TYPE II
 com-make-purple Juan det=3i
 'Juan made it purple.'

Note the word order difference between the two types. In Type I, the Spanish element intervenes between the subject and object. In Type II borrowing, both the subject and the object follow the complex of Zapotec verb + borrowed adjective.

In SDZ, we find etymological sensitivity with object clitics only in type I borrowings. Consider the following:

- (17) B-èèny Juáany próméhèhs là'á=rèhby. 'Juan promised them.'
 com-do Juan promise det=3p
 *B-èèny Juáany próméhèhs=rèhby.
 com-do Juan promise=3p
- (18) B-èèny cùràndéhèhr liimp là'á=réhby. 'The healer cured them.'
 com-do healer curing det=3p
 *B-èèny cùràndéhèhr liimp=réhby.
 com-do healer curing=3p

In SDZ, all type I borrowings show this pattern. The object in such cases must be expressed by an independent pronoun, because the preceding word is not of the right etymological type. The subject in all these cases follows a native Zapotec verb, so it shows normal cliticization:

- (19) B-èèny=bí próméhèhs là'á=rèhby. 'He promised them.'
 com-make=3 promise det=3p

In contrast, type II verbal borrowings do not appear to show etymological sensitivity to the etymology of the host, and subject clitics freely attach to the preceding V+adj unit

- (20) B-èèny-sàláád=à lèh'=èhn. 'I made it salty.'
 com-make-salty=1s det=3i

⁵ A different range of verbs show type II (incorporated) borrowings in San Lucas Quiavini Zapotec (Munro and Lopez 1999). However, the SDZ equivalents of the forms cited in Munro and Lopez are all type II borrowings.

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- (21) B-èèny-mùràád=bf lèh'=èhn. 'S/he made it purple.'
com-make-purple=3 det=3

For verbal borrowings of this sort, the subject appears as an ordinary clitic.

It seems that the best account of this difference distinguishes the subject and object clitics according to their etymological sensitivity. Note that in the type I borrowings, it is the object clitics which follow the borrowed element, while in the type II borrowings, it is the subject clitics. Thus the correct generalization is that subject clitics will attach to a verb of any etymological type, but object clitics will only attach to a native verb.

4.3 Etymological insensitivity with other parts of speech

The etymological sensitivity just discussed is restricted to the clitics that appear on verbs and prepositions. Although the clitics on nouns are apparently identical, they happily attach to borrowed Spanish nouns. There are two subcases – in the first, the clitic is the possessor of the noun, and in the second, it is the subject of a nominal predicate:

- (22) a.) x-tiiw=à 'my uncle'
p-uncle=1s
b.) x-máchèhèhd=à 'my machete'
p-machete=3ref
- (23) X-tiiw=à, gùriéhéngw=bà 'My uncle, he is a gringo.'
p-uncle=1s gringo=3r
- (24) Rricw=tú 'You (pl.) are rich.'
rich=2p

As these examples show, there is no problem in attaching clitics to borrowed Spanish nouns.

Adjectives and quantifiers also show no effects for borrowed vs. native words. Clitics attach to both without difficulty. In the first case, the clitic serves as subject of a predicate adjective. In the second case, it serves as the restriction of a quantifier.

- (25) a.) Gííby=bà. 'He is stingy.' NATIVE
stingy=3r
b.) Máál=bà. 'He is bad.' BORROWED
bad=3r 'El es malo.'
- (26) a.) tsùù'=ràb 'ten of them' NATIVE
ten=3pr
b.) mĩily=ràb 'a thousand of them' BORROWED

thousand=3pr 'mil de ellos'

The problem for a theory of the pronominal clitics is how to account for the fact that the clitics are sensitive to the native/borrowed status of the host only when attached as objects of prepositions or verbs. The clitics don't show sensitivity to borrowed status when attached to nouns, adjectives, or quantifiers, nor when appearing as the subject of a verb. How could we state a rule of determiner insertion that was sensitive to distinctions like this?

5. Problem 2 – Object clitics are a subset of subject clitics

A second problem is that only a subset of the clitics listed can appear as the objects of verbs. They are the following:

- (27) =ma '3rd person, animal'
- =xrà' '3rd person, male to male'
- =ni '3rd person, inanimate'
- =ní' '3rd person, reverential'
- =rehby '3rd person plural, ordinary'
- =rab '3rd person plural, respect'
- =réhni' '3rd person plural, reverential'
- =réhxrà' '3rd person plural, male to male'
- =ram '3rd person plural, animal'
- =rehny '3rd person plural, inanimate'

Note that the two most common singular pronouns for humans, =ba '3rd person, respected' and =bi '3rd person, ordinary' do not appear on the list, though their corresponding plurals do. Consider the following contrast:

- (28) *B-gwíí=àt=bà. 'You (pl). saw him/her (respected).'
- com-see=2p=3pr
- (29) B-gwíí=àt=ràb. 'You (pl). saw them (respected).'
- com-see=2p=3pr

We should also note here that clitics marking the object of a verb are restricted to the subset listed in (27) above. However, the clitics marking the object of a preposition are not restricted in this way. The full range of prepositional objects may be expressed by a clitic:

- (30) cuèh'=éhby 'beside him/her'
- beside=3
- cuèh'=éh=à 'beside me'
- beside=1s

The problem for a syntactic approach to the clitics is how to account for when the determiner

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là'à is inserted and when it is not inserted. How could we state a rule that obligatorily inserts the determiner before *=bi* '3rd person (ordinary)' when it is the object of a verb, but not when it is the object of a preposition?

6. Problem 3 – Object clitic impose restrictions on the subject

Another problem is that most object clitics impose restrictions on the subject. They may only be used if the subject is pronominal. Consider the following examples, which show that both fronted and in-situ non-pronominal subjects are incompatible with object clitics.

- (31) a.) *Juáàny b-gwíí=ràb. 'Juan saw them (respected).'
Juan com-see=3a
- b.) *B-gwíí Juáàny=ràb.
com-see Juan=3a
- (32) a.) TJuáàny b-gwíí là'à=ràb. 'Juan saw them (respected).'
Juan com-see det=3pr
- b.) TB-gwíí Juáàny là'à=ràb.
com-see Juan det=3pr

As these examples show, use of the object clitic is banned for a non-pronominal subject, even if the object clitic would be adjacent to the verb due to the fronting of a prominent subject.⁶

Object clitics may also not be used if the subject is an interrogative pronoun, though the clitic would also be adjacent to the verb in these instances:

- (33) a.) ¿Túú ù-náá là'=ám? 'Who looked at it (animal)?'
who com-look:at det=3a
- b.) *¿Túú ù-náá=ám?
who com-look:at=3a

The problem for the syntactic approach is finding a way to state the rule of determiner insertion before object clitics that is sensitive to the fronted, pronominal, and/or interrogative status of the subject.

7. Problem 4 – The object clitics *=ni* and *=ma*

Among the object clitics, *=ni* '3rd person inanimate' and *=ma* '3rd person animal' have distributions which are different than other clitics. Both appear in cases where they are not adjacent to the head of the phrase. Consider (34a) and (34b), where the object clitics follow the

⁶ Here I will call the fronted subject 'prominent', without committing myself to which discourse function it plays. Fronted subjects appear to be topical in some instances, focal in others. See Broadwell (2002) for more discussion.

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subject. In contrast, other object clitics do not appear in this position, as (35a) and (35b) show.

- (34) a.) B-gwíí Juáàny=**nì**. 'Juan saw it (inanimate).'
com-see Juan=3i
- b.) B-gwíí Juáàny=**mà**. 'Juan saw it (animal).'
com-see Juan=3a
- (35) a.) *B-gwíí Juáàny=**rèhby**. 'Juan saw them.'
com-see Juan=3p
- b.) *B-gwíí Juáàny=**xrà**'. 'Juan saw him.'
com-see Juan=3m

=*ni* and =*ma* also share the property of attaching to non-native hosts. Consider the following examples which show that =*ni* and =*ma* may attach to Spanish borrowings. In this respect they differ from other object clitics, such as =*rehby* '3rd person plural ordinary'.

- (36) a.) R-ùùny Juáàny próméhèhs=**nì**. 'Juan promised it (inan.).'
hab-do Juan promise=3i
- b.) B-èèny Juáàny próméhèhs=**mà**. 'Juan promised it (animal).'
com-do Juan promise=3a
- c.) *R-ùùny Juáàny próméhèhs=**rèhby**. 'Juan promised them.'
hab-do Juan promise=3p

The distribution of =*ni* '3rd person inanimate' is also significantly freer than other object clitics (including the =*ma* '3rd person animal' object clitic) in one other way. =*ni* is unique among object clitics in that it may appear on a verb with a fronted or interrogative subject.

Consider the following examples, which contrast =*ni* '3rd person inanimate' with =*ma* '3rd person animal' and =*rehby* '3rd person plural ordinary':

- (37) a.) Juáàny ù-zíí'=**iny**. 'Juan bought it (inanimate).'
Juan com-buy=3i
- b.) *Juáàny ù-zíí'=**àm**. 'Juan bought it (animal).'
Juan com-buy=3a
- c.) *Juáàny ù-náá=**rèhby**. 'Juan looked at them.'
Juan com-look:at=3p
- (38) a.) ¿Túú ù-náá=**èhny**? 'Who looked at it (inanimate)?'
who com-look:at=3i

com-eat=3

b.)*? Û-dàw lèh'=éhby.
com-eat det=3

This is as we would expect if the determiner is only inserted as a last resort. Yet the object clitic and object independent pronoun do not show a similar complementarity. Both are fully acceptable – if anything, my consultant tends to volunteer the independent pronoun more frequently.

The syntactic approach to the clitics treats insertion of the determiner as a “last resort” mechanism, which supplies clitics with a host when no other host is available. But for the examples just discussed, there is a perfectly acceptable host for the clitic, and in fact the clitic form is grammatical. So why should speakers resort to the insertion of a determiner when a shorter, simpler, clitic form is possible?

9. Toward a paradigm-function solution

Recent realizational approaches to morphology have addressed the issue of clitic placement in some detail, taking as a starting point the idea that clitics are like affixation applied to phrases, rather than to words. The affixal material is added by a set of rules in a morphological component (Anderson 1992, Stump 2001). I will adopt the formalisms of Stump’s Paradigm Function Morphology here.

In the following pages, I will outline a morphological approach to the clitics and argue that it avoids many of the difficulties of the syntactic approach.

9.1 Features

The following chart shows the feature assignments I will assume:

	Num:Sg	Num:Pl
1	=à'	=nú, =n, =àn
2, Ordinary	=ù	=tú, =t, =àt
2, Formal	=gyèhbù	=gyèhbtù
3, Animate, General, Ordinary	=bi, =by, =ehby	=rehby
3, Animate, General,	=ba, =b, =ab	=rab
3, Animate, Restricted, Male-	=xrà'	=réhxrà'
3, Animate, Restricted,	=ní'	=réhni'
3, Animate, Restricted,	=ma, =m, =am	=rám
3, Inanimate	=ni, =ny, =ehny	=réhny

We also need a small number of additional features. First is a feature for the clitic hosts:

(43) Native = {Yes, No}

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Second, we need the standard grammatical functions (SUBJ, OBJ, POSS, ...) and the feature PRED for both clitics and hosts. PRED is merely the semantic value assigned to a particular word. For example, the word *Juan* has the feature [PRED 'Juan'] and the word *gèhèht* has the feature [PRED 'tortilla']. We can use the PRED feature to distinguish pronouns, whose reference is determined in discourse, by the feature [PRED 'pro'].

9.2 Realization rules

Using these features, the morphological rule that adds the *=rehby* clitic for subjects of a verb can be formalized as follows:

(44) $R_1 \{SUBJ: 3PI, Animate, Gen, Ord, 'pro'\} ([V]) \div =rehby$

A rule of this sort is called a realization rule.

Decoding the formalism, rule R_1 says a verb with a 3rd person plural animate, general, ordinary pronoun subject adds an affix *=rehby*. The subscript 1 identifies the rule block within which the morphology applies (here the first rule block).

Using this formalism the complete set of realization rules is as follows:

$R_1 \{SUBJ: 1Sg, 'pro'\} ([V]) \rightarrow =\grave{a}'$	$R_1 \{SUBJ: 1PI, 'pro'\} =n\acute{u}$
$R_1 \{SUBJ: 2Sg, Ord, 'pro'\} ([V]) \rightarrow =\grave{u}$	$R_1 \{SUBJ: 2P, Ord, 'pro'\} ([V]) \rightarrow =t\acute{u}$
$R_1 \{SUBJ: 2Sg, Form, 'pro'\} ([V]) \rightarrow =gy\grave{e}hb\grave{u}$	$R_1 \{SUBJ: 2PI, Form, 'pro'\} ([V]) =gy\grave{e}hb\grave{t}\acute{u}$
$R_1 \{SUBJ: 3Sg, Animate, Gen, Ord, 'pro'\} ([V]) \rightarrow =bi$	$R_1 \{SUBJ: 3PI, Animate, Gen, Ord, 'pro'\} ([V]) \rightarrow =rehby$
$R_1 \{SUBJ: 3Sg, Animate, Gen, Resp, 'pro'\} ([V]) \rightarrow =ba$	$R_1 \{SUBJ: 3PI, Animate, Gen, Resp, 'pro'\} ([V]) \rightarrow =rab$
$R_1 \{SUBJ: 3Sg, Animate, Restr, Male, 'pro'\} ([V]) \rightarrow =xr\grave{a}'$	$R_1 \{SUBJ: 3PI, Animate, Restr, Male, 'pro'\} ([V]) \rightarrow =r\acute{e}hxr\grave{a}'$
$R_1 \{SUBJ: 3Sg, Animate, Restr, Rever, 'pro'\} ([V]) \rightarrow =n\acute{i}'$	$R_1 \{SUBJ: 3PI, Animate, Restr, Rever, 'pro'\} ([V]) \rightarrow =r\acute{e}hni'$
$R_1 \{SUBJ: 3Sg, Animate, Restr, Animal, 'pro'\} ([V]) \rightarrow =ma$	$R_1 \{SUBJ: 3PI, Animate, Restr, Animal, 'pro'\} ([V]) \rightarrow =ram$
$R_1 \{SUBJ: 3Sg, Inan, 'pro'\} ([V]) \rightarrow =ni$	$R_1 \{SUBJ: 3PI, Inan, 'pro'\} ([V]) \rightarrow =r\acute{e}hny$

9.3 Rules of referral

What of the realization rules that add affixes to other parts of speech? One might think that we would need separate rules for objects of verbs, prepositions, quantifiers, and nouns, adding considerable redundancy to the system.

For example, it might appear that we need a rule like the following:

$$(45) \quad R_{\text{II}} \{ \text{OBJ: 3Pl, Animate, Gen, Ord, 'pro'} \} ([V \text{ [Native:Yes, SUBJ:Non-Interr, 'pro']}] \rightarrow \text{rehby})$$

But there is a problem with this rule. It seems to treat as accidental the fact *=rehby* is the realization for both Subjects and Objects that are 3rd person, Animate, General, Ordinary, 'pro'.

Here we can use an innovation in realizational approaches to morphology – *rules of referral* (Zwicky 1985, Stump 1993). These rules say that instead of independently stating a morphological rule for every feature combination, we can have some feature combinations defined as yielding a result which is identical to that of some other rule.

For instance, in Spanish the 2nd person formal is always identical to the 3rd singular. In such a case, we do not need a distinct rule for 2nd person formal. Instead, we may have a rule of referral like the following:

$$(46) \quad R_{\text{SUBJ: 2Sg, Formal}} (\text{Verb}, \Phi) = R_{\text{SUBJ: 3Sg}} (\text{Verb}, \Phi)$$

This rule says that anytime we encounter a verb with a 2nd person singular formal subject, we find the affix by looking at the result of 3rd person singular, keeping all other features Φ (tense, aspect, mood, etc.) constant.

Using this approach, the rules for adding affixes corresponding to possessors, objects of prepositions, and restrictions of quantifiers can all refer back to the rule for subjects:⁷

$$(47) \quad R_{\text{POSS}} (\text{Noun}, \Phi) = R_{\text{SUBJ}} (\text{Verb}, \Phi)$$

$$(48) \quad R_{\text{II}} \{ \text{OBJ} \} (\text{Prep} \{ \text{Native: Yes} \}, \Phi) = R_{\text{SUBJ}} (\text{Verb}, \Phi)$$

$$(49) \quad R_{\text{RESTRICTION}} (\text{Q}, \Phi) = R_{\text{SUBJ}} (\text{Verb}, \Phi)$$

These three rules tell us that there is complete identity between the affixes marking subject, possessor, object of a preposition, and restriction of a quantifier.

Note that a nice result of this approach is that objects of prepositions can be specified to get the same set of affixes as the subjects of verbs. There's no need to have all OBJ grammatical relations trigger the same kind of morphology.

To return to the case of objects of verbs, here we see only partial identity between the two sets, since most subject clitics are not available as object clitics. We can specify the partial identity with the following rules of referral:

⁷ For expository reasons, I have made some slight simplifications to Stump's original formalism.

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(50) $R_{II} \{OBJ: 3Pl, 'pro'\} ([V [Native:Yes, SUBJ:Non-Interr, 'pro'], \Phi]) = R_I \{SUBJ 3Pl, 'pro'\} (Verb, \Phi)$

(51) $R_{II} \{OBJ: 3Sg, Animate, Restricted, 'pro'\} ([V [Native:Yes, SUBJ:Non-Interr, 'pro'], \Phi]) =$
 $R_I \{SUBJ: 3Sg, Animate, Restricted, 'pro'\} (Verb, \Phi)$

The first rule of referral says that all 3rd person plural object clitics are identical to the subject clitics with the same features. The second rule says that 3rd person singular, animate, restricted clitics are identical to the subject clitics with the same features.

The 3rd person inanimate object clitic =*ni* and the animal clitic =*ma* are special cases, since they do not have exactly the same set of restrictions to native hosts, pronominal subjects, and non-interrogative subjects which are found with other object clitics. We can state their realization rules as follows:

(52) $R_{II} \{OBJ: 3Sg, Animate, Restricted, Animal, 'pro'\} ([V [SUBJ:Non-Interr], \Phi]) =$
 $R_I \{SUBJ: 3Sg, Animate, Restricted, Animal, 'pro'\} (Verb, \Phi)$

(53) $R_{II} \{OBJ: 3Sg, Inan\} (V, \Phi) = R_I \{SUBJ\} (Verb, \Phi)$

(52) is the rule of referral for the animal clitic =*ma*, and it says that the 3rd singular object clitic denoting an animal is identical to the subject clitic with the same features. This rule states that the verbal host of the clitic must have a non-interrogative, but it does not include the requirement of a native host and a pronominal subject which are found with other restricted clitics. Because (52) is a more specific rule than (51), it takes precedence over it.

(53) is the rule for inanimate objects, and it lacks all three restrictions typical of other object clitics, appearing on loan words, with non-pronominal subjects, and with interrogative subjects. Note, however, that this rule only applies to objects of verbs. When =*ni* is the object of a preposition, it follows the ordinary realization rule for other objects of prepositions, and resists attachment to a non-native host.

9.4 Exponence, alignment, and paradigm functions

These realization rules merely tell us which affix is added, without giving us the position of the affix. Stump's (2001) Paradigm Function morphology used realization rules that performed both functions. However, in the revision called *Generalized Paradigm Function Morphology*, which is advocated in Spencer (2003), and Luis and Spencer (to appear), there is a convincing argument that the identity of an affix (its *exponence*) ought to be separated from the placement of the affix (its *alignment*). This is due to the fact that identical affixes may sometimes show up in more than one position. Object clitics in Spanish, for example, precede finite verbs and follow non-finite verbs (the so-called 'Tobler-Mussafia law').

Separating exponence from placement allows the same affix to appear in different positions, since alignment constraints may be sensitive to other morphological or syntactic features in the clause.

A paradigm function consists of three things – a specification of the stem and features to

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which the morphology applies, a statement of how the morphology is realized (the exponence), and a statement of the position of the morphology (the alignment).

So the paradigm function that adds the *=rehby* subject clitic to the verb *bgwii* ‘saw’ can be specified as follows:

- (54) For $\Phi = \{\text{SUBJ:3Pl, Hum, Animate, Non-Gen, Ord, 'pro'}\}$
 PF (BGwii, Φ) =_{def} a. stem stem (GWii, Φ)
 b. exponence $R_1 \{\text{SUBJ: 3Pl, Anim, Gen, Ord, 'pro'}\}$
 c. alignment ALIGN (*=rehby*, L, V, R)

Unpacking the formalism, this function says that in order to add the morphology for a 3rd, Pl, Animate, General, Ordinary pronominal object to the verb stem *gwii* ‘see’, we do the following:

- a.) pick the ordinary stem form *gwii* (i.e., not some irregular stem)
- b.) get the morphology which the realization rule yields for this combination, namely *=rehby*,
- c.) and align the left edge of *=rehby* with the right edge of the verb.

Since the placement of the affix *=rehby* is determined by an alignment constraint, this constraint can interact with other constraints in the system.

Most of the other subject and object clitics in the system will have a paradigm function like that shown in (54). That is, the ordinary verb stem is selected, and the result of the realization rule is aligned with the verb.⁸

The prominent exceptions are the 3rd person inanimate object clitic *=ni* and the 3rd person animal object clitic *=ma*. As previously discussed, these clitics may attach to words other than verbs. Recall the following examples:

- (55) a.) B-gwii Juáany=*ni*. ‘Juan saw it (inanimate).’
 com-see Juan=3i
- b.) B-gwii Juáany=*ma*. ‘Juan saw it (animal).’
 com-see Juan=3a

We can account for this by proposing slightly different alignment constraints for these clitics. The rule which adds the *=ni* clitic to the verb stem *gwii* ‘see’ is as follows:

- (56) For $\Phi = \{\text{OBJ: 3Sg, Inan, 'pro'}\}$
 PF (BGwii, Φ) =_{def} a. stem stem (GWii, Φ)
 b. exponence $R_1 \{\text{OBJ: 3Sg, Inan, 'pro'}\}$
 c. alignment ALIGN (*=ni*, L, Word, R)

⁸ Some Zapotec verbs do show irregular stems for the 1st person singular and/or plural, but I will not pursue that point here.

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The alignment constraint in this case simply says that =*ni* aligns to the right edge of some word. Unlike other subject and object clitics in the system, it is not constrained as to the part of speech of its host.

The alignment constraint for the animal clitic =*ma* is somewhat more complex. There are two subcases to be considered. In first case, the subject is a pronominal clitic and =*ma* aligns with the verbal host of this clitic. In the second case, the subject is the subject noun phrase, and =*ma* aligns with the noun.

However, the animal clitic =*ma* is not possible with a verb that has a fronted or interrogative subject, or with a complex post-verbal subject:

- (57) a.) *Juáány ù-zíí'=ám. 'Juan bought it (animal).'
 Juan com-buy=3a
- b.) *¿Túú ù-zíí'=ám? 'Who bought it (animal)?'
 who com-buy=3a
- (58) *Û-zíí' x-náán Juáány=mà. 'Juan's mother bought it (animal).'
 com-buy p:mother Juan=3a

The correct generalization can be stated as follows: =*ma* aligns with a constituent which contains phonological material corresponding to the subject of the sentence.

Lexical-Functional Grammar (Bresnan 1982, 2001, Dalrymple 2001) provides a simple way to refer to such a constituent. Constituent structure (c-str) is the representation of overt phrase-structure constituents, and functional structure (f-str) is an order-free representation of predicate-argument structure. The function N maps elements in c-structure to a corresponding element in f-structure. So the element or elements which map to the SUBJ are those for which the function N (SUBJ) holds true.

Using this notation, we can state the paradigm function for the animal clitic as follows:

- (59) For $\Phi = \{\text{OBJ: 3Sg, Animal, 'pro'}\}$
 PF (X, Φ) =_{def} a. stem stem (X, Φ)
 b. exponence $R_{\{ \text{OBJ: 3Sg, Animal, 'pro'} \}}$
 c. alignment ALIGN (=ma, L, Word_{N(SUBJ)}, R)

The alignment constraint here says that the left edge of =*ma* aligns with the right edge of a word, all or some of which corresponds to the subject. In this case of a verbal host, the preceding subject clitic corresponds to the SUBJ function; in the case of a subject NP, this constituent corresponds to the SUBJ function.

9.5 Optionality of object clitics

As we have seen, if the morphology yields a possible affix for some argument, then this affix is generally preferred over use of an independent pronoun:

- (60) a.) Û-dàw=bí. 'S/he ate.'
 com-eat=3
- b.)*? Û-dàw lèh'=éhby.
 com-eat det=3

We can formalize this observation by using a constraint *STRUC, which penalizes (unnecessary) syntactic structure.

- (61) *STRUC Avoid syntactic structure.

Since the (a) alternative above uses a single word to express the content of the clause, while the (b) alternative uses two words, (b) violates *STRUC. If we rank the constraint *STRUC higher than the alignment constraint for the affix =bi, then we get a tableau like the following:

	*STRUC
a. \varnothing Û-dàw=bí com-eat=3	
b. Û-dàw lèh'=éhby com-eat det=3	*

However, when we turn to object clitics the situation is more complex. Here, both the morphological and syntactic expression of pronominal objects is acceptable:

- (62) a. B-gwíí=àt=mà. 'You (pl). saw it (animal).'
 com-see=2p=3a
- b. B-gwíí=àt là'à=m. 'You (pl). saw it (animal).'
 com-see=2p det=3a

Within the logic of Optimality Theory, this implies that there must be some disadvantage to object clitics which outweighs. One possibility is the approach suggested by Trommer (2003), where he posits a constraint COHERENCE, which penalizes candidates where a word agrees with more than one argument. I will formulate this as follows:

- (63) COHERENCE (1) – A word must agree with at most one argument.

There is a presumably a family of such constraints with different weights – COHERENCE (1) specifying at most one agreement, COHERENCE (2) specifying at most two agreements, and so on. Overt agreement with more than three arguments is quite rare in the world's languages, so it may be that COHERENCE (3) is nearly always undominated.

Candidates like (62a) above involve two agreement morphemes – one for the subject and one

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for the object.

If we allow the constraint COHERENCE (1) to have an equal weight to *STRUC, then we can get the desired result:

	*STRUC	COHERENCE (1)
a. \varnothing B-gwí=àt là'=ám com-see=2p det=3a	*	
b. \varnothing B-gwí=àt=mà com-see=2p det=3a		*

10. Conclusion

The morphological approach to clitics outlined in this paper overcomes many of the problems associated with the syntactic model, which we must recognize as too simplistic to account for the full range of the data.

This morphological account is certainly more descriptively adequate, in that it allows the analyst to specify sensitivity to a wide range of syntactic, morphological, and etymological features that are relevant to the choice between independent and clitic pronouns in SDZ. The increase in descriptive adequacy is, of course, largely due to the increased formal power of these kinds of morphological rules plus the possibility of ranking alignment constraints.

I believe that the increase in formal power seems justified by the complexity of the data, and similar conclusions have been reached by researchers looking at clitics in other languages (e.g. Legendre 2000a on Romanian; Legendre 2000a, Spencer 2001 on Bulgarian.) The data do not yield to a simple syntactic solution, and we are led to conclude that Zapotec pronominal clitics show the sort of complexity typically associated with morphological paradigms.

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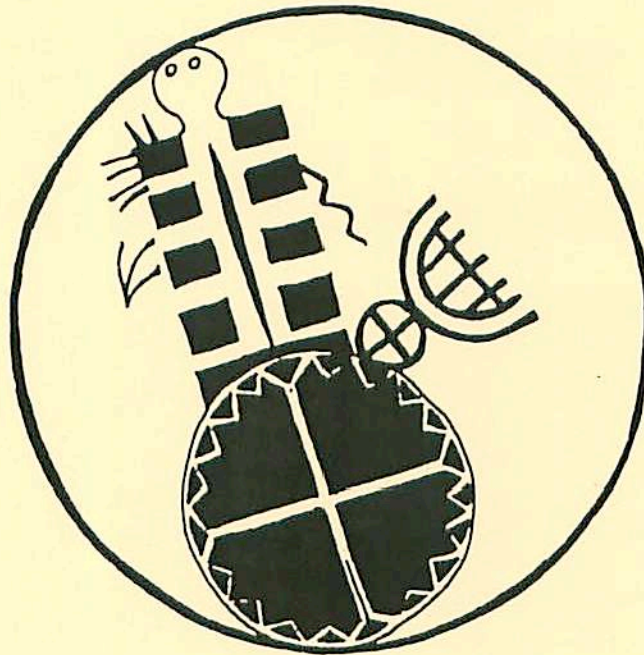
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REPORT 13

**SURVEY OF CALIFORNIA AND
OTHER INDIAN LANGUAGES**



**CONFERENCE ON OTOMANGUEAN AND OAXACAN
LANGUAGES**

**March 19-21, 2004
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INTRODUCTION

This volume of Survey reports is a sample of the papers heard at the Conference on Otomanguean and Oaxacan Languages (COOL), which took place at UC Berkeley March 19-21, 2004. There is more scholarly investigation being done on Otomanguean languages and other languages of Oaxaca today than ever before, yet unlike other groups such as Uto-Aztecanists and Mayanists, Otomangueanist and Oaxacanist scholars have not had a regular forum in which to meet and share their ideas. In 2000 a one-time conference took place at UCLA called *La Voz Indígena de Oaxaca*, organized by Pamela Munro, G. Aaron Broadwell, and Kevin Terraciano. As a result of this conference many of the participant linguists were able to make new and fruitful contacts with each other and several proposed that the conference should become a recurring event. With the help of the UC Berkeley Graduate Assembly, Graduate Division, Center for Latin American Studies, and the departments of Linguistics, Anthropology, and Ethnic Studies, four years after the original UCLA conference COOL was finally able to follow in its footsteps. Now there are plans for a third conference to be held very appropriately in the city of Oaxaca at the Centro Cultural Santo Domingo in 2006, organized by Alejandro de Ávila. We all hope that this will become an on-going event and it appears that COOL is on its way to becoming a regular, biannual and international conference.

Rosemary Beam de Azcona
COOL 2004 Organizer

CONFERENCE ON OTOMANGUEAN AND OAXACAN LANGUAGES

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