

THE INTERACTION OF FOCUS AND CONSTITUENT ORDER IN SAN DIONICIO ZAPOTEC¹

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ABSTRACT: San Dionicio Ocotepc Zapotec, an Otomanguean language spoken in Oaxaca, shows word order inversions associated with interrogatives and negative foci. This paper offers a treatment of these facts in an optimality theoretic implementation of LFG and supports the view that linear precedence statements should be formulated in terms of violable constraints.

1 Order and PS-rules

In the standard theory conception of phrase structure rules, they encode both dominance relationship and precedence relationships. Various linguists have suggested that these two ideas can be disentangled so that the PS-rules tell us only what the dominance relationships are, while a separate set of rules or principles tell us what the linear order should be. Within Lexical Functional Grammar, such ideas have been proposed by Falk (1983). They also figured

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The orthography for SDZ is adapted from the practical orthographies for other Zapotec languages spoken in the Valley of Oaxaca. In the SDZ orthography, <x> = *zh* (a voiced alveopalatal sibilant) before a vowel and *sh* (a voiceless alveopalatal fricative) before a consonant, <xh> = *sh* (a voiceless alveopalatal sibilant), <dx> = *j* (a voiced alveopalatal affricate), <ch> is as in English, <c> = /k/ before back vowels, <qu> = /k/ before front vowels, and <eh> = epsilon (a mid front lax vowel). SDZ is a language with four contrastive phonation types: breathy <Vj>, creaky <VV>, checked <V'>, and plain <V>.

Glosses use the following abbreviations: anim = animative, com = completive aspect, inan = inanimate, p = possessed, q = question.

prominently in GPSG (Gazdar, Pullum, Klein, and Sag (1985), continuing into HPSG (Pollard and Sag 1987). Within older styles of government-binding theory, such ideas were proposed by Farmer (1980, 1984) and Stowell (1981).

In sharp distinction to these approaches, much recent work within the Minimalist Program (Chomsky 1995) has adopted Kayne's (1994) Linear Correspondence Axiom, which can be summarized as follows

- 1) "...the human language faculty is in fact rigidly inflexible when it comes to the relation between hierarchical structure and linear order. Heads must always precede their associated complement position. Adjunctions must always be to the left, never to the right...This inflexibility extends to specifiers, too, which I argue to be an instance of adjunction. Hence, specifier positions must invariably appear to the left of their associated head, never to the right." (Kayne 1994:vii)

In Kayne's view, apparent counterexamples result from the application of movement rules.

In this paper, I will argue in favor of the position that PS-rules encode only dominance relationships. Linear precedence, I will suggest, is the result of violable optimality-theoretic constraints. My account will be framed within the optimality-theoretic implementation of Lexical Functional Grammar proposed by Bresnan (1998).

2 Word order in San Dionicio Zapotec

San Dionicio Ocotepéc Zapotec (hereafter SDZ) is an Otomanguéan language spoken in Oaxaca, Mexico. The basic word order of this language is VSO, with head initial NPs and PPs:

- 2) Û-díny Juààny bèh'cw re' cùn yàg.
com-hit John dog that with stick

'John hit that dog with a stick'.

There are two preverbal positions for elements with special discourse functions. Topics and foci (contrastive or interrogative) appear in one position, negative foci occur in a second position. The overall phrase structure of SDZ is shown in figure 1.

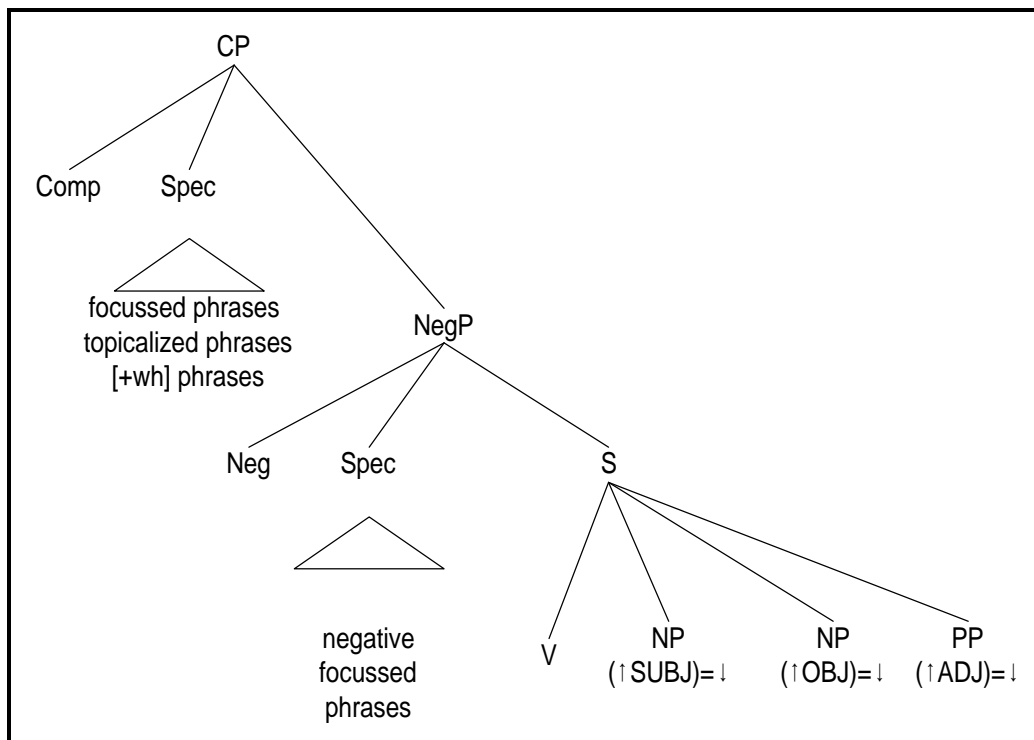


Figure 1 Proposed clause structure for SDZ

Both subjects and objects may appear in [Spec, CP] when they bear a special discourse function (focus or topic):

- 3) Juààny ù-díny bèh'cw cùn yàg.
 John com-hit dog with stick
 'John (TOPIC/FOCUS) hit the dog with a stick.'
- 4) Bèh'cw ù-díny Juààny cùn yàg.
 dog com-hit John with stick
 'John hit the dog (TOPIC/FOCUS) with a stick.'

Wh-phrases appear in the same [Spec, CP] position. Since only one phrase may appear in [Spec, CP], the following S is necessarily verb initial:²

- 5) a. ¿Cálòd gwíí Juààny?

² The S can, however, be preceded by negation and negative focussed phrases, as discussed below.

where com:go John

‘Where did John go to? 5:3

b. *¿Cálòò Juáàny gwíí?
where John com:go

Wh-movement is obligatory, as shown by the following contrast:

6) ¿Túú ù-díny Juààny cùn yàg?
what com-hit Johnwith stick

‘What (anim.) did John with a stick?’³

*¿Ù-díny Juààny túú cùn yàg?
com-hit Johnwhat with stick

The Comp position is filled in yes-no questions by the particle *lá*, which cliticizes to the following word:

7) ¿Lá=Juáány gù Móòny zè’èh lò ìnyá’?
q=John or Ramón com:go to field

‘Was it John or Ramón who went to the field?’

8) ¿Lá=bèh’ty Juáány bzìiny?
q=com:kill John rat

‘Did John kill the rat?’

Examples like (7) show that the Comp position precedes the [Spec, CP] position.

I assume that the Zapotec clause is dominated by S, which is a non-endocentric category in this language, though nothing in what follows hinges crucially on this.⁴ Then the following linear precedence constraints will give us the right order:

³ SDZ uses the wh-words *xhíí* ‘what, which’ for inanimates and *túú* ‘who, what, which’ for animates (both people and animals). I’ve glossed the examples with the appropriate English wh-word.

⁴ As suggested by King (1995), Bresnan (1998), Universal Grammar allows clauses with both endocentric (IP) and lexocentric (S) organizations. Some VSO languages are best analyzed with the LFG analogue of head-movement to INFL; others show a flatter syntax.

9) X < Comp (heads precede complements)

X < Spec (heads precede specifiers)

SUBJ < OBJ < ADJ (less oblique arguments precede more oblique arguments)

Note that Spec and Comp are not differentiated from each other by phrase structure position.

The fact that wh-movement is obligatory suggests that SDZ shows the effects of a constraint like the following:

10) Align (IntF, L, CP, L)

Align the left edge of interrogative focus phrase with the left edge of CP.

When there is no overt complementizer, I will assume that the Comp node is also absent from the tree, and that a wh-phrase in [Spec, CP] fully satisfies this constraint. This constraint suggests a simple tableau like the following:

11)

		Align (IntF, L, CP, L)
a.	ʔTúú ù-díny Juààny cùn yàg? (What hit John with stick)	
b.	*ʔÙ-díny Juààny túú cùn yàg? (Hit John what with stick)	*

3 Objects of prepositions

When we question the object of a preposition in this language, we get a surprising result:

12) ʔXhíicùn ù-díny Juààny bèh'cw?
what with com-hit John dog

‘What did John hit the dog with?’

This pattern has been labelled ‘pied-piping with inversion’ (Smith Stark 1988), and it is found in all Zapotecan languages and in many other Mesoamerican languages as well (e.g. Tzotzil, Aissen 1996). (12) is the only grammatical order for this question in SDZ. It is ungrammatical to have either of the following:

13) a. *_çCùn xhí ù-díny Juààny bèh'cw?
with what com-hit John dog

b. *_çXhí ù-díny Juààny bèh'cw cùn?
what com-hit John dog with

The ungrammaticality of (13b) seems to be due to an undominated constraint in SDZ that forbids preposition stranding.⁵ I will assume that this prohibition is one of a family of harmony constraints, which call for correspondence between the various representations of a sentence. In particular, the constraint needed here requires that an f-structure constituent (ADJUNCT) correspond to a c-structure constituent (in this case, PP) .

14) Harmony of Constituency -- ADJUNCT (HConADJ)

An f-str constituent with the function ADJUNCT must correspond to a c-structure constituent.

Since it is well-known from studies of extraction and island effects that different sorts of constituents show varying degrees of resistance to extraction, I will assume that (14) is one of a family of harmony constraints which may have different rankings in various languages. I will also follow Kaplan and Zaenen (1989) in assuming that the constraints on possible long-distance dependencies are best stated in terms of f-structure functions, rather than c-structure categories.

However, rather than capturing the effect of island effects through restrictions on uncertainty equations, as in Kaplan and Zaenen (1989), the approach advocated here treats the conditions on extraction through violable constraints.

The following ranking of constraints will select the correct candidate.

15)

⁵ Although these examples use a preposition borrowed from Spanish (*cun* 'with' < Spanish *con*), the facts described work identically in sentences with native prepositions.

		HCon-ADJ	Align (IntF,L, CP, L)	X < Comp
a.	¿Ù-díny Juààny bèh'cw cùn xhí? (Hit John dog with what)		*!***	
b.	¿Cùn xhíí ù-díny Juààny bèh'cw? (With what hit John dog)		*!	
c.	¿Xhíí ù-díny Juààny bèh'cw cùn? (What hit John dog with)	*!		
d.	¿¿Xhíí cùn ù-díny Juààny bèh'cw? (What with hit John dog)			*

This result falls out easily from the optimality theoretic point of view, but is difficult to get in standard movement analyses.⁶

What is of special interest here is that the ordering of heads before complements is treated as a violable constraint.

4 Questioning specifiers

In SDZ, specifiers of NP normally follow the head:

- 16) x-pèh'cw Juààny 'John's dog'⁷
p-dog John
- bèh'cw re' 'that dog'
dog that

We also see pied-piping with inversion for genitives and demonstratives. Compare the following statements and questions.

⁶ See Broadwell (1999) for a more extended discussion of the difficulty of deriving these facts under a movement-based account.

⁷ In SDZ alienable possession, the possessed N has a /x-/ prefix, and the initial consonant of the noun stem is devoiced. In a few cases there are irregular changes to the initial consonant, e.g. yàg 'stick', x-cyàg Juààny 'John's stick'.

17) Juààny cù'á [_{NP} x-pèh'cw Màríí].
John com:grab p-dog Mary

'John grabbed Mary's dog.' 4:214

*Juààny cù'á [_{NP} Màríí x-pèh'cw].
John com:grab Mary p-dog

18) ¿_[NP] Túú x-pèh'cw] cù'á Juààny?
who p-dog com:grab John

'Whose dog did John grab?' 4:214

*¿_[NP] X-pèh'cw túú] cù'á Juààny?
p-dog who com:grab John

These sentences show that the possessor may not precede the possessed in a declarative. But in an interrogative, this is the only grammatical order. The following sentences make the same point for demonstratives:

19) Juààny cù'á bèh'cw re'
John com:grab dog that

'John grabbed that dog.'

*Juààny cù'á re' bèh'cw.
John com:grab that dog

20) ¿Túú bèh'cw cù'á Juààny?
which dog com:grab John

'Which dog did John grab?'

*¿Bèh'cw túú cù'á Juààny?
dog which com:grab John

Note that the interrogative *túú* is the equivalent of both 'who, whose, what (animate)' and 'which (animate)' in SDZ. Within a NP, the 'whose' reading is differentiated by the presence of the /x-/ possessive prefix on the noun. The same is true for *xhúú*, which is the equivalent of both 'what (inanimate)' 'whose (inanimate)' and 'which (inanimate)'.

As in English, it is ungrammatical to attempt to extract either a determiner or a possessive from the NP without pied-piping the NP:

21) *¿Túú cù'á Juààny bèh'cw?
which com:grab John dog

(Which did John grab dog?)

22) *¿Túú cù'á Juààny x-pèh'cw?
who com:grab John p-dog

(Whose did John grab dog?)

These facts are easily handled if we posit the following constraints:

23) $X < \text{specifier}$

X precedes the specifier within XP

24) Harmony of Constituency -- OBJ

An f-structure constituent with the function OBJ must correspond to a c-structure constituent.

Then the following tableau (for the possessive case) shows how the correct candidate is selected.

25)

		HConOBJ	Align (IntF,L, CP, L)	X < Spec
a.	¿Túú cù'á Juààny x-pèh'cw? (Whose John grabbed dog?)	*!		
b.	¿Túú x-pèh'cw cù'á Juààny? (Whose dog grabbed John?)			*
c.	X-pèh'cw túú cù'á Juààny? (Dog whose grabbed John?)		*!	

5 Inversion in negative contexts

We see nearly identical effects in sentences with negative focussed elements. Focus negation is always accompanied by fronting of the focussed object to preverbal position.

The negative agrees with the fronted XP in animacy—*rùtèh'cà* is used with an animate focus; *xtéh'cà* is used with an inanimate focus. The negative focussed NP is preceded by an interrogative/indefinite pronoun. *Túú* is for animates; *xhíú* is for inanimates.

- 25) Juáány rú-tèh'cà túú bzìny be-'ty-bí.
John anim-not any mouse com-kill-3

'John didn't kill any mice.' 4:175

- 26) X-téh'cà xhíú gèhht ù-dáòw-à.
inan-not any tortilla com-eat-1s

'I didn't eat any tortillas.' 4:241

This fronting is obligatory, like the obligatory fronting of wh-phrases:

- 27) *Juáány rú-tèh'cà be-'ty-bí túú bzìny.
John anim-not com-kill-3 any mouse

(John didn't kill any mice.)

- 28) X-téh'cà ù-dáòw-à xhíí gèhht.
inan-not com-eat-1s any tortilla

(I didn't eat any tortillas.)

The negative and negative focus positions come before the verb; the subject may either be in situ after the verb or may appear in the topic/focus position.

- 29) X-téh'cà xhíí gèhht ù-dáò Juààny.
inan-not any tortilla com-eat John

'John didn't eat any tortillas.' 5:33

- 30) Juààny x-téh'cà xhíí gèhht ù-dáò.
John inan-not any tortilla com-eat

'John didn't eat any tortillas.' 5:33

If the negative focussed element is the object of a preposition, we get pied-piping with inversion, just as in the questions:

- 31) Rú-tèh'cà túú lò ù-déhhdy Màríí cààrrt.
anim-not anyone to com-give Mary letter

'Mary didn't give the letter to anyone.' 5:35

*Rú-tèh'cà lò túú ù-déhhdy Màríí cààrrt.
anim-not to anyone com-give Mary letter

- 32) Rú-tèh'cà túú x-pèh'cw ù-díny Màríí.
anim-not anyone p-dog com-hit Mary

'Mary didn't hit anyone's dog.'

*Rú-tèh'cà x-pèh'cw túú ù-díny Màríí.
anim-not p-dog anyone com-hit Mary

These facts suggest that there is a constraint which favors candidates in which the left edge of a negative focussed constituent aligns with the right edge of the negative element, along the following lines:

- 33) Align(NegF, L, Neg, R)

Align the left edge of a negative focussed item with the right edge of the negation.⁸

Substituting this constraint for Align(IntF, L, CP, L) in the tableau above will yield the right word order for these sentences.

6 Complications

What happens when we attempt to question the specifier of the object of a preposition in SDZ? The following examples show that there are two grammatical results:

- 35) Ù-díny Juààny bèh'cw cùn yàg ré'.
com-hit John dog with stick that

'John hit the dog with that stick.'

- 36) ¿Cùn xhíí yàg ù-díny Juààny bèh'cw?
with which stick com-hit Johndog

'With which stick did John hit the dog?'

- 37) ¿Xhíícùn yàg ù-díny Juààny bèh'cw?
which with stick com-hit Johndog

(Which with stick did John hit the dog?)

Three other logically possible candidates are ungrammatical:

- 38) *¿Xhíí yàg cùn ù-díny Juààny bèh'cw?
whichstick with com-hit John dog

- 39) *¿Yàg xhíí cùn ù-díny Juààny bèh'cw?
stick which with com-hit John dog

- 40) *¿Xhíí yàg ù-díny Juààny bèh'cw cùn?

⁸ This constraint is not completely parallel to the constraint on interrogative focus, since that constraint aligned the interrogative focus with the left edge of CP.

There do not appear to be any clauses in SDZ with both an overt complementizer and a wh-phrase. If we posit an empty Comp, we could restate the constraint on interrogative focus as Align(IntF, L, Comp, L), but empty nodes are not in keeping with Economy of Expression (Bresnan, forthcoming).

which stick com-hit Johndog with

Exactly the same facts are found with the possessive:

- 41) ¿Cùn túú x-cyàg ù-díny Juààny bèh'cw?
with whose p-stick com-hit John dog

'With whose stick did John hit the dog?'

- 42) ¿Túú cùn x-cyàg ù-díny Juààny bèh'cw?
whose with p-stick com-hit John dog

(Whose with stick did John hit the dog?)

- 43) *¿Túú x-cyàg cùn ù-díny Juààny bèh'cw?
whose p-stick with com-hit John dog

- 44) *¿X-cyàg túú cùn ù-díny Juààny bèh'cw?
p-stick whose with com-hit John dog

- 45) *¿Túú x-cyàg ù-díny Juààny bèh'cw cun?
whose p-stick com-hit Johndog with

We find the same two possibilities for negative focus:

- 46) Rú-tèh'cà túú lò chèh' ù-dèhhdy Màrì cààrrt.
anim-not anyone to husband com-give Mary letter

'Mary didn't give the letter to anyone's husband.'

- 47) Rú-tèh'cà lò túú chèh' ù-dèhhdy Màrì cààrrt.
anim-not to anyone husband com-give Mary letter

'Mary didn't give the letter to anyone's husband.'

The two grammatical possibilities for such questions, with suggested labels, are shown below:

- 48) a. Prep Wh N (P-initial question)
b. Wh Prep N (Wh-initial question)

The P-initial questions are easier to deal with, so I will address them first.

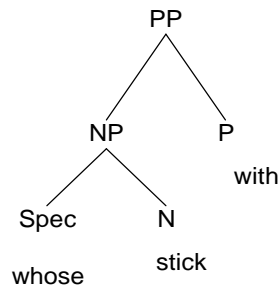
The key to explaining why P-initial questions occur is understanding the constraints that rule out alternative candidates. Consider again the following pair (repeated from above):

- 49) ¿Cùn túú x-cyàg ù-díny Juààny bèh'cw?
 with whose p-stick com-hit John dog

‘With whose stick did John hit the dog?’

- 50) *¿Túú x-cyàg cùn ù-díny Juààny bèh'cw?
 whose p-stick with com-hit John dog

The candidate sentence in (50) requires a structure like the following for PP:



Note that in this structure, two ordering constraints— $X < \text{Comp}$ and $X < \text{Spec}$ —are violated. We have seen that individually both of these constraints are outranked by Align (IntF,L, CP, L).

However, it seems that a candidate which simultaneously violates both ordering preferences is completely ruled out. To account for this, I will follow the now standard assumption in phonology that the conjunction of constraints may be separately ranked. The ungrammaticality of the following example also shows us that of the two ordering preferences, $X < \text{Comp}$ outranks $X < \text{Spec}$:

- 51) *¿X-cyàg túú cùn ù-díny Juààny bèh'cw?
 p-stick whose with com-hit John dog

We can account for success of the P-initial candidate relative to the other candidates with the following tableau:

		HCon-ADJ	X <Spec ^ X < Comp	Align (IntF,L, CP, L)	X < Comp	X<Spec
a.	¿X-cyàg túú cùn ù- díny Juààny bèh'cw? (Stick whose with hit John the dog)			*	*!	
b.	☞¿Cùn túú x-cyàg ù-díny Juààny bèh'cw? (With whose stick hit John the dog)			*		*
c.	¿Túú x-cyàg cùn ù- díny Juààny bèh'cw? (Whose stick with hit John the dog)		*!		*	*
d.	¿Túú x-cyàg ù-díny Juààny bèh'cw cùn? (Whose stick hit John the dog with)	*!				*

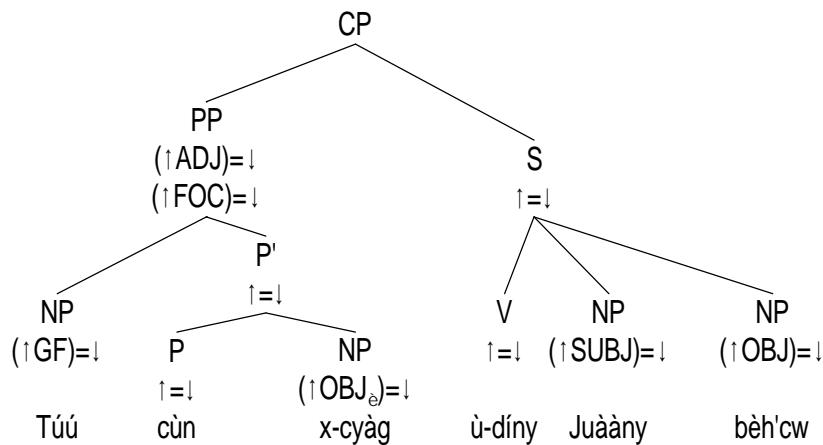
7 Wh-initial questions

The more puzzling pattern is the one seen in examples like the following:

- 52) ¿Túú cùn x-cyàg ù-díny Juààny bèh'cw?
 whose with p-stick com-hit John dog

(Whose with stick did John hit the dog?)

I will tentatively assign the following c-structure to this example:



This structure puts the initial wh-word in [Spec, PP]. Such a structure is possible, but should be marked, because *túú* ‘who’ and *x-cyàg* ‘dog (possessed)’ form an f-structure constituent, but not a c-structure constituent.

In accordance with the other harmony constraints, we can posit the following:

- 53) Harmony of Constituency -- OBJ_e

An f-structure constituent with the function OBJ_e must correspond to a c-structure constituent.

With this constraint we can now consider the full range of candidates:

		HCon-ADJ	X < Spec ∧ X < Comp	HCon-OBJ _ε	Align (IntF,L, CP, L)	X < Comp	X < Spec
a.	¿X-cyàg túú cùn ù-díny Juààny bèh'cw? (Stick whose with hit John the dog)				*	*!	
b.	☞¿Cùn túú x-cyàg ù-díny Juààny bèh'cw? (With whose stick hit John the dog)				*		*
c.	¿Túú x-cyàg cùn ù-díny Juààny bèh'cw? (Whose stick with hit John the dog)		*!			*	*
d.	☞¿Túú cùn x-cyàg ù-díny Juààny bèh'cw? (Whose with stick hit John the dog?)			*			*
e.	¿Túú x-cyàg ù-díny Juààny bèh'cw cùn? (Whose stick hit John the dog with)	*!					*

The constraints HCon-OBJ_ε and Align (IntF, L, CP, L) are unranked with respect to each other (as indicated by the dotted line), and so two candidates end up tying for best. Each violates one of these two constraints.

8 Conclusion

In this paper, I hope to have demonstrated that an approach which accounts for word-order variation through violable constraints is able to provide a simple explanation of some otherwise difficult facts in the syntax of San Dionicio Ocotepéc Zapotec.

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