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REDUPLICATION AND ANOMALOUS RULE ORDERING IN COPALA TRIQUE

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0. Reduplication is a process that often seems to be associated with exceptions to the application of phonological rules. Either reduplicated forms are exempt from the application of a rule, as described by Munro and Benson[1] for Luiseño, or else they are subject to the application of a rule in environments where it would not be expected to apply, as in certain Tagalog examples mentioned by Bloomfield.[2] In this paper, I discuss a problem of the second type in Copala Trique.[3]

1. Reduplication is often defined as an affix, for example, Bloomfield,[4] or sometimes as extending to an entire root, for example, Sapir.[5] These definitions are too narrow to include Copala Trique reduplication, in which one or more words are repeated. (Copala Trique words rarely exceed three syllables, and nonnuclear syllables have such severe limitations on the occurrence of phonological features that reduplication within the word would be virtually impossible.) This reduplication signals continuation, repetition, or intensification of a predicate. The most common kind of repetition involves a verb root. Examples:[6]

(1) utu^{35} utu^{35} žini^{3} (scratch scratch boy) *The boy scratches a lot.*

(2) giri^{34} giri^{34} žoʔ^{3} tãh^{34} duʔwą^{3} žoʔ^{3} (took-out took-out it thorn mouth-of it) *It kept on taking thorns out of its mouth.*

It is possible to repeat the subject as well as the verb with no change in meaning. Examples:

(3) utu^{35} žini^{3} utu^{35} žini^{3}

(4) giri^{34} žoʔ^{3} giri^{34} žoʔ^{3} tãh^{34} duʔwą^{3} žoʔ^{3}

It is also possible to repeat the verb more than twice to signal greater degrees of continuation, repetition, or intensification. (Examples in this paper are limited to three repetitions, although I believe there is no clearly defined upper limit.) Examples:

(5) utu^{35} utu^{35} utu^{35} žini^{3}

[1] Pamela Munro and Peter John Benson, "Reduplication and Rule Ordering in Luiseño," *IJAL* 39 (1973): 15–21.

[2] Leonard Bloomfield, *Language* (New York: Henry Holt & Co., 1933), p. 222.

[3] Copala Trique is a Mixtecan language spoken by about eight thousand people in the districts of Juxtlahuaca and Putla, Oaxaca, Mexico. The data for this paper were gathered on field trips to San Juan Copala from 1962 to 1973 under the auspices of the Summer Institute of Linguistics. I wish to thank my husband, Bruce, for his helpful comments on this problem, and also C. Henry Bradley, Donald Frantz, Richard Rhodes, and David Thomas for reading earlier drafts of this paper and criticizing them.

[4] Bloomfield, p. 218.

[5] Edward Sapir, *Language* (New York: Harcourt Brace & Co., 1921), p. 79.

[6] Copala Trique has the following phonological units: fortis stops p, t, k; lenis stops b, d, g; affricates ȼ, č, ʈ; fortis sibilants s, š, ʂ; lenis sibilants z, ž, r; nasals m, n; lateral l; semivowels y, w; laryngeals ʔ, h; long vowels a, e, i, o, u; short vowels ą, ę, ǫ; nasalization ˜ ; tones 21, 32, 3, 34, 35, 4, 5, 53.

(6) giri^{34} giri^{34} giri^{34} žo?^{3} tãh^{34} du?wą^{3} žo?^{3}

It is also possible for each of the three repetitions to include a subject, but the first two act as a unit; either both have a subject, or both do not.[7] Examples:

(7) utu^{35} žini^{3} utu^{35} žini^{3} utu^{35} žini^{3}

(8) giri^{34} žo?^{3} giri^{34} žo?^{3} giri^{34} žo?^{3} tãh^{34} du?wą^{3} žo?^{3}

(9) *utu^{35} žini^{3} utu^{35} utu^{35} žini^{3}

(10) *utu^{35} utu^{35} žini^{3} utu^{35} žini^{3}

There is also repetition of manner adverbs, in which case the adverb comes first in the clause.[8] Examples:

(11) nanah^{34} nanah^{34} nari?^{3} žini^{3} (slow slow learn boy) *The boy learns very slowly.*

(12) nanah^{34} nanah^{34} nanah^{34} nari?^{3} žini^{3}

Verbs modified by manner adverbs are never repeated, however, although the adverb may be, as in example (11), and the verb may be repeated when not modified by an adverb. Examples:

(13) *nanah^{34} nari?^{3} nari?^{3} žini^{3}

(14) *nari?^{3} nari?^{3} žini^{3} nanah^{34}

(15) nari?^{3} nari?^{3} žini^{3} *The boy learns a lot.*

Verbs modified by adverbs of time and location, however, are not subject to the above constraint, nor have I ever found such adverbs repeated. Examples:

(16) nari?^{3} nari?^{3} žini^{3} ki^{3} (learn learn boy yesterday) *The boy learned a lot yesterday.*

[7] This restriction applies only within a sentence. It is common to repeat entire sentences in identical or similar form, either to stall for time, or to indicate continuation, repetition, or intensification. This paper, however, is restricted to examples that occur within a sentence.

[8] A related phenomenon, outside the scope of this paper, is the repetition of a numeral, meaning *each*: wa^{34} zę^{3} gwendǫ^{32} yo?ǫ^{4} yo?ǫ^{4} yo?ǫ^{4} nih^{3} žuku^{3} yo?^{3} (exist possessed story one one one plural-definite animal that) *Each and every one of those animals has its story.*

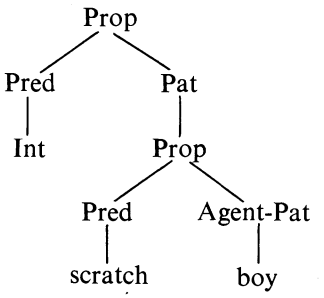

Fig. 1

(17) nari?^{3} nari?^{3} žini^{3} niãh^{21} (learn learn boy here) *The boy learns a lot here.*

2. In a generative semantics model, each of the above examples includes a logical structure predicate of intensification (Int).[9] In most of the above examples, Int is the predicate (Pred) of a higher proposition (Prop), with the remainder of the example serving as its patient (Pat), as seen in figure 1, the logical structure tree for example (1). In examples (16) and (17), however, adverbs of time and location are predicates higher than Int, as seen in figure 2, the tree for example (17). In

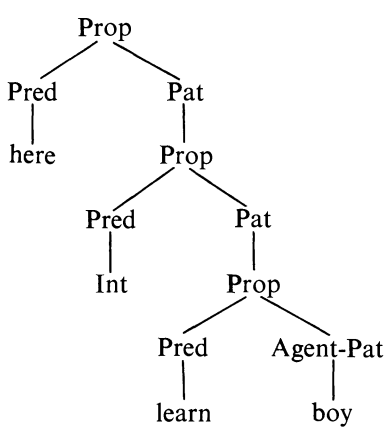

Fig. 2

[9] There does not seem to be a need to posit separate logical structure predicates of continuation, repetition, and intensification; the difference among these seems rather to lie in the nature of the next lower predicate. If the predicate is a

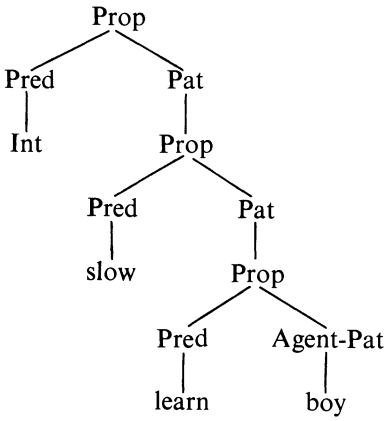

Fig. 3

example (11), the manner adverb is a predicate lower than Int, but higher than the remainder of the example, as seen in figure 3. In examples with more than two repetitions, there appears to be a further Int predicate, as seen in the tree for example (5) (fig. 4).[10]

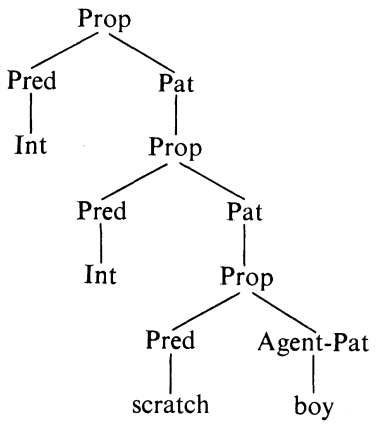

Fig. 4

There seems to be a fixed rank of scope among these predicates, with location and time at the highest rank, followed by Int (which may occur more than once), then manner, and finally the main verb, even though some of these predicates are optional. For example, in (15) manner does not occur, and therefore, Int ranks directly above the main verb.[11]

In Copala Trique, Int is sometimes manifested by one of a set of adverbs that can be glossed *much* or *very* and sometimes manifested (as in the examples given in this paper) by reduplication. The mechanism for deriving the reduplicated forms is a copying rule. Two major questions must be asked about such a rule: what is its domain, and what is its ordering relative to other rules of the grammar?

There are at least three plausible hypotheses about the domain of the copying rule. One is simply that the elements found repeated in the surface structure are copied: adverbs, verbs, and verbs plus their subjects. Int would be carried down through the derivation as an abstract symbol until after a subject is chosen from among the case elements of the main verb, and until after manner predicates are incorporated as adverbs in a lower proposition. Then the copying rule would delete Int and copy the first word of the next lower proposition, which will be either an adverb or a main verb. If the copied word is a main verb, its subject would optionally be copied also.

The second hypothesis is similar to the first. It posits that verbs and their subjects are copied by the rule, but some subjects are deleted later in the derivation by an

quality, it is intensified. If it is a state, process, or action that can be continued indefinitely, it is continued. If it is a process or action that is normally limited in duration (punctiliar), it is repeated.

[10] A special constraint must be posited when Int occurs more than once, in order to get an arithmetic series of natural numbers, rather than a geometric series of powers of two, which would result from a literal application of copying.

[11] Note that copied elements must come at the beginning of the clause, which is the focus position. This seems best explained by assuming that Int carries a semantic feature of focus, and that focus can occur only once per clause in a well-formed logical structure.

optional coreferential noun phrase deletion rule. This rule is independently motivated for Copala Trique to handle the derivation of motion verb phrases from a sequence of two clauses. Examples:

(18) ʔna^{ʔ3} žini^{3} utu^{35} žini^{3} (come boy scratch boy) *The boy comes scratching.*

(19) ʔna^{ʔ3} utu^{35} žini^{3}

This rule states that all but the last of a string of coreferential noun phrases are deleted in certain contexts. If verb plus subject (or adverb) is taken as the domain of the copying rule, then again copying must follow subject choice, but it must precede noun phrase deletion.

The third hypothesis states that the entire proposition that serves as the patient of Int is copied and then reduced by further application of the noun phrase deletion rule to arrive at the actual surface forms copied. All surface case elements except subject would have to be obligatorily deleted, for example, the direct object *thorn* and the nuclear locative[12] *its mouth* in example (2). Also, a propositional patient of a manner predicate in a copied proposition would have to be obligatorily deleted before the incorporation of the doubled manner predicate as an adverb in a lower proposition, because forms such as (20) do not occur.

(20) *nanah^{34} nariʔ^{3} žini^{3} nanah^{34} nariʔ^{3} žini^{3} (slow learn boy slow learn boy)

This hypothesis leads to positing a very early ordering for the copying rule; I am not presently aware of any rule that must precede it.

The advantage of the first hypothesis is that it is straightforward and posits no copying of constituents that must later be deleted, as do the second and third hypotheses. Its disadvantage, however, is that the rule must be stated in a more complicated way to encompass the surface diversity of copied elements. The second hypothesis simplifies the statement of the copying rule by allowing an independently motivated noun phrase deletion rule to optionally reduce copied subjects. The third hypothesis goes as far as possible in simplifying the copying rule, but at the price of copying case elements that must later be obligatorily deleted by the rule. No matter which hypothesis we prefer, however, copying seems to belong to the syntactic component of the grammar, either because it feeds the noun phrase deletion rule, as in the second and third hypotheses, or because the rule includes syntactic options, as in the first hypothesis.

3. Whichever hypothesis is chosen, however, there is an anomaly in the ordering of rules that apply later. Because copying and noun phrase deletion belong to the syntactic component of the grammar, they would normally be expected to precede all phonological rules, such as tone sandhi. Yet in Copala Trique, the one exception to the phonological regularity of tone sandhi is found in copied forms. Copying (first hypothesis) or noun phrase deletion (second and third hypotheses) seem to follow the tone sandhi rule.

Tone sandhi is caused by a group of five pronouns. It is regressive and applies automatically to the immediately preceding word. A word-final syllable checked by h that bears tone 3 or 53 loses the h and becomes tone 21. A word-final syllable that is open or checked by ʔ, and that bears tone 3, 35, or 53, becomes tone 32. All other combinations remain unchanged.

[12] A nuclear locative case element is one that is closely tied to the meaning of the verb; it is sometimes called target or range. Nuclear locative is quite different from peripheral locative, which gives the setting for the entire proposition and is probably best treated as a higher predicate.

Examples:

(21) nah^{3} *recline* + zo$^{?5}$ *thou* → na^{21} zo$^{?5}$

(22) gi^{4}nah^{53} *will-recline* + zo$^{?5}$ → gi^{4} na^{21} zo$^{?5}$

(23) nã$^{?3}$ *head-home* + zo$^{?5}$ → nã$^{?32}$ zo$^{?5}$

(24) utu^{35} *scratch* + zo$^{?5}$ → utu^{32} zo$^{?5}$

(25) atą^{53} *carry* + zo$^{?5}$ → atą^{32} zo$^{?5}$

(26) ačih^{34} *grow* + zo$^{?5}$ → ačih^{34} zo$^{?5}$

In copied forms, however, tone sandhi applies to the sequence of identical words that precedes the sandhi-causing pronoun. Thus we might expect to get example (27) if sandhi were completely automatic, but instead we get (28).

(27) *utu^{35} utu^{32} zo$^{?5}$

(28) utu^{32} utu^{32} zo$^{?5}$

In no other case does tone sandhi extend to any word but the immediately preceding one. For example, there are other instances of repetition of an identical word, such as:

(29) ni^{3} ni^{32} zo$^{?5}$ (mother-of mother-of thou) *your mother's mother*

The first instance of the word for *mother* does not take tone sandhi, that is, it is not (30), because the sequence of identical words does not result from the copying rule.

(30) *ni^{32} ni^{32} zo$^{?5}$

Also, there are other instances in which we can posit that a pronoun has been deleted, but which do not take tone sandhi, such as:

(31) ?na$^{?3}$ utu^{32} zo$^{?5}$ (come scratch thou) *You come scratching.*

Even though (31) is derived from the same logical structure as (32), it is not (33).

(32) ?na$^{?32}$ zo$^{?5}$ utu^{32} zo$^{?5}$ (< ?na$^{?3}$ + zo$^{?5}$ + utu^{35} + zo$^{?5}$)

(33) *?na$^{?32}$ utu^{32} zo$^{?5}$

Example (29) rules out the possibility of a minor extension of an automatic tone sandhi rule to cover repetitions of the identical preceding word. Example (31), on the other hand, rules out a rather simple global tone sandhi rule, which would permit any deleted pronoun to cause sandhi.

4. The best solution seems to be a nonautomatic, rather unusual sort of global tone sandhi rule that works in the following way: apply tone sandhi to the immediately preceding word, if applicable; then look at the word to its left and ask if it resulted from the application of the copying rule. If yes, repeat the tone sandhi rule; if no, proceed to the next step in the derivation.

Another solution, assuming the second or third hypothesis, would be to mark copied forms in some way that allows them to bypass noun phrase deletion on the first pass through the rules, delaying it until a second pass, after tone sandhi has applied. This is a trivial use of cyclic rules, having the simple effect of switching the order of two rules. Its only advantage is that it preserves the tone sandhi rule as a fully automatic rule. Otherwise, these two solutions seem to be functionally equivalent.

A third solution is to handle copying as a late phonological process, rather than as a syntactic one, and order it to follow the tone sandhi rule. Int would be retained as an abstract symbol from logical structure until far down in the phonological component. This solution provides a simple explanation for the occurrence of sandhi on each repetition of a copied verb, but at the price of losing the generalization that more is copied than appears on the surface. It is thus compatible only with the first hypothesis. The decision to copy a verb alone or a verb plus its subject hardly belongs, however, in the phonological component of a grammar.

A fourth solution is to treat the copying of a verb or adverb alone as a different

mechanism from the copying of a verb plus its subject. The latter would be a syntactic process, and the former a late phonological one, following the tone sandhi rule. This solution resolves the second objection to the third solution, but at the price of treating two very similar mechanisms as basically different.

Linguistics is a search for a small set of very general principles that explain a large set of seemingly diverse phenomena. Each of the above solutions violates generality in some way. Yet the only way to improve one counterintuitive or ad hoc formulation seems to involve the introduction of another. Can the meaning-to-sound model of language be refined in some way that allows Copala Trique reduplication and tone sandhi to be described as the quite general phenomena that they are? (Their interplay is easy to control in speaking Trique—the problem lies only in describing it formally.) Will a better, but quite different, model emerge?[13] Or will language, like its often illogical speakers, continue to elude the boxes we linguists create for it?

[13] My husband has suggested a quite different way to account for the actual reduplicated forms, using a model similar to the finite state grammars rejected by Noam Chomsky in *Syntactic Structures* (The Hague: Mouton, 1957), pp. 18–23. Informally stated, a speaker who wishes to intensify a clause he is uttering may do so by reduplication, if the clause is in normal verb-initial order (or if it is in manner-adverb-initial order), and if he has not proceeded too far along in the clause (by having already uttered non-reduplicable surface case elements). The speaker can optionally stop after a verb or after its subject, and he can repeat once or more what he has already said in that clause. Such a model is, of course, heretical to most present-day linguists, but note that it accounts quite nicely for the tone sandhi problem because the decision to stop and repeat is made after uttering the verb that was to be directly followed by a sandhi-causing pronoun and which has therefore already undergone sandhi.