1. The numeral roots

The Great Tzotzil Dictionary (Laughlin 1975, hereafter abbreviated as GTD) lists 23 roots which are labelled numeral roots. These fall into two categories: native Tzotzil roots and roots borrowed from Spanish for the higher multiples of ten.

The native Tzotzil roots are:

JUT 'a little'
JAY 'how many, several'
JUN 'one'
CHAT 'two'
CHIB 'two'
TOX 'three'
CHAN 'four'
VOT 'five'
VAK 'six'
VUK 'seven'
VAXAK 'eight'
BALUN 'nine'
LAJUN 'ten'
BULUCH 'eleven'
TOB 'twenty'

The roots borrowed from Spanish are:

TRENTA (treinta) 'thirty'
KWARENTA (cuarenta) 'forty'
SINKWENTA (cincuenta) 'fifty'
SESENTA (sesenta) 'sixty'
SETENTA (setenta) 'seventy'
TOCHENTA (ochenta) 'eighty'
NOVENTA (noventa) 'ninety'
SYEN (cien) 'hundred'

2. Prefixes formed directly from the numeral roots

I will first discuss the morphology of the numbers from one through nineteen, and then return to describe the formation of the larger numbers. Numbers in Tzotzil have two forms: prefix forms which are affixed to a numeral classifier, and free forms which occur alone. The classifier to be used is determined by the noun that the number modifies. The free form is used when the noun does not have an associated classifier. The prefix forms of the numbers from two through ten, as well as the prefix form of the indefinite JAY, have the same shapes as the roots from which they are derived, as follows:
Rule (1): numeral root prefix
   value = x → value = x
   x in [2,12]

That is, from a numeral root whose numerical value is x, where x is between two and twelve, there is a stem of the same form as the root, which is a prefix with numerical value x. For example, the prefix form of the number two is cha7-, from the root CHA7 'two.' (See also the GTD data set, items 1 and 5-15.) These prefixes, affixed to numeral classifiers, form nouns of type nle. vo7- 'five' plus a classifier, however, forms a n5, i.e. an unpossessed noun. For an explanation of this fact, see below, section 14.

The prefix form for the number twelve is laiccha7-, which is listed in the GTD under the root LAJUN. This form seems to be a contraction of lajun 'ten' plus cha7- 'two.' The prefix form buluch- 'eleven' is listed in the GTD under the root BULUCH. Perhaps, however, it should be derived, like laiccha7-, from a contraction of baijun 'nine' plus cha7- 'two.' J. Haviland (to appear, 1952) considers this a possible derivation. The root JUT does not have a corresponding prefix form.

3. The -teens

From the prefix forms for the numbers three to nine are derived prefixes for the numbers thirteen through nineteen, as follows:

Rule (2): prefix from Rule (1) + prefix
   value = x + lajun- → value = x + 10
   x in [3,9]

That is to say: take a prefix from the set produced by Rule (1), whose numerical value (call it x) is greater than or equal to three and less than or equal to nine. Attach this prefix to the prefix lajun- 'ten,' to produce a new prefix whose numerical value is x + 10. For example: chan- 'four' plus lajun- produces chan-laun- 'fourteen.' (See the Haviland data set, items 4-7, and compare the free-standing forms in the GTD data set 33-39.)

Rule (2) also seems to apply to jaw- 'several, how many?' The meaning of the resulting form is 'however many, how many?' The corresponding free-standing form carries the implication of a great number (GTD data set 16, 20).

4. Free-standing numbers in -Vb

Rule (3): prefix from Rules (1)-(2) + nle
   value = x + \{a,b\} → value = x
   \{c,d\}

This rule forms the free-standing forms of numbers from their prefix forms. For example, the free-standing form of the number three is toxib, from the prefix form tox-. (See the GTD data set 17-39; Haviland data set 1-19.) I do not know what determines which vowel
occurs with which prefix. This appears to be irregular and lexically determined.

Although the GTD does not list any form $\underline{jut-}$, there is a form $\underline{juteb}$ 'a little,' from the root JUT. There are also a number of forms from a stem $\underline{jutuk}$ (GTD data set 17-18, 112-116). Thus it seems that $\underline{juteb}$ is formed by Rule (3) from a non-occurring stem $\underline{jut-}$. The form $\underline{chib}$ seems to be a contraction of $\underline{cha7}$ plus $\underline{4h}$, although the GTD lists it under a root CHIB (see below, section 14).

Rule (3) seems to apply to all the available bases. All of the stems output by this rule can go on to act as bases for further derivations, with the following exceptions: $\underline{la'icheb}$, $\underline{javib}$, and $\underline{javlajuneb}$. Lack of derived forms from these stems may be due to gaps in my data.

5. Partial reduplication of the smaller numbers

The first syllable of a number in Tzotzil can be reduplicated, to form a stem meaning 'by or in x's, every x,' as follows:

Rule (4): number $\rightarrow$ number value = x (by reduplicating the value 'every x' entire first syllable)

For example, $\underline{tox-}$ 'three' has a corresponding stem $\underline{tox7ox-}$ 'by or in threes, every three.' Only the first syllable is reduplicated, as shown by the forms $\underline{la'jun}$ 'ten' and $\underline{lajlajun}$ 'every ten.' For other examples, see the GTD data set 71-94, and also the textual data, items 25, 31-32.

The input to rule (4) can be almost any type of number. I have not put into this rule any information on the stem class of the output number, because this seems to depend on the stem type of the input number. When the input is a prefix form (output of Rule (1)), the output is a prefix form. This prefix attaches to a numeral classifier to form a n5, that is an unpossessed noun. When the input is a free form (from Rule (3)), the output is also an unpossessed noun.

I have examples of reduplicated prefix forms for all the numbers from two to ten, with the exception of eight. There are also a few reduplicated free forms in $\underline{-7h}$. The GTD does not list any reduplicated forms for the numbers thirteen to nineteen. I don't know whether the missing forms are impossible or simply rare.

6. The number one

The root for the number one, JUN, forms some rather odd stems. These stems resemble the stems for the other small numbers, but they are not formed regularly. The prefix form of the number one is $\underline{j-}$, and the free-standing form (listed as stem type num) is $\underline{jun}$. There is no form in $\underline{-j1}$ from this root. The root jun also produces a second prefix form $\underline{ju-}$ 'each' (GTD data set 2-4, 64-66, 69). This root also produces two partially reduplicated forms:
juju- as in juju-  jujun 'one  apiece' and in juju-tob
'every twenty' (GTD data set 67-68).

juljun 'one only' (GTD data set 71; textual data 33).

7. Other numeral morphology

The smaller numbers also produce nouns in -ej and -je, meaning
'x days from today' and 'x days ago.'

Rule (5): prefix from Rule (1) + ej ⇒ nle
value = x

Rule (6): prefix from Rule (1) + je ⇒ nle
value = x

For example, 7oxej 'three days from now' is formed from 7ox-
'three.'

The only forms in -je and -ej listed in the GTD are from the
smaller numbers. The non-occurrence of yo7ej in my data seems to be an
accidental omission, and similar forms for numbers larger than seven may
only be rare, not impossible (J. Aissen, personal communication). There
is at least one other example of Rule (6), applying to a non-numerical
base. This is the stem volje 'yesterday' from the P-root VOL, which has
a transitive verb stem vol meaning 'to wrap up, carry in bundle.'
(See the GTD data set 95-106.)

There are also a few fully reduplicated stems and stems in -tik
from some of the smaller numbers:

chabjetik 'every other day'
chabjechable 'every other day'
7oxletik 'about three days ago'
7oxle7oxle 'about three days ago'
vaktevakte 'walking about with six toes'

(See the GTD data set 107-111.)
vaxakibvaxakib 'every week'
jujunjujun 'one by one'?

(See the textual data 28.)

8. Noun and verb compounds from the smaller numbers

The prefix forms of the smaller numbers, especially cha7- 'two,'
can be affixed to transitive verb stems to form verb stems meaning 'do
y so as to produce x sections,' or 'do y with x objects.' For example,
chan-pakan (tv.) 'fold over twice /paper, clothes/, fold into four
sections' from chan- 'four' and pakan (tv.) 'double over, fold a lot of'
(root PAK). (See the GTD data set 192-202). There are also a large
number of verb stems with prefix cha7- 'two' meaning 'do x again.' For
example, cha7-7och (iv.) 'reenter' from 7och (iv.) 'enter.' (See the
GTD data set 167-191.)

There are also a number of nouns with numerical prefixes such as
7ox-tzelav 'three-sided' from 7ox- 'three' and tzelav (root Tzel X)
'three.' (See the GTD data set, items 143-158.) In addition, the GTD
lists a number of assorted compounds and expressions involving numeral
roots (see the GTD data set 119-142, 159-161).

9. Numeral roots borrowed from Spanish

The numeral roots borrowed from Spanish behave differently from the
native Tzotzil roots. The Spanish roots produce only two stems: a
free-standing numeral and a form in -tik. There is also one Spanish
numeral classifier, mil 'one thousand' (GTD data set 118). The free-
standing numerals from Spanish roots have exactly the same forms as the
roots themselves, and are of stem type nle. The suffix -tik can be
added to all these free-standing numerals, except svyn, to form a word
meaning 'by or in x's, every x,' where x is the value of the free-
standing numeral. These forms seem to be parallel to the stems derived
by partial reduplication from the native Tzotzil numeral stems.

10. Multiples of twenty

The nle stem tob 'twenty' is the unique entry listed under the
root TOB in the GTD. I find it interesting that this form ends in -b,
but it may have no connection with the other free forms in -Vb. This
root does not give rise to any prefix forms. tob occurs with the
prefixes 1- and 1u-, which suggests that it might be a numeral classi-

fier. However, the GTD also gives the form ta q-tob-al 'at the price
of twenty,' in which tob seems to be acting like a noun.

The other multiples of twenty are not formed from the stem tob,
but from the stem vinik, as follows:

\[ \text{Rule } (7): \text{ prefix } + \text{vinik } \Rightarrow \text{nle} \]
\[ \text{value } = x \]
\[ \text{x in } [2,19]? \]

For example, chan- 'four' plus vinik produces chan-vinik 'eighty.'
For more examples, see the GTD data set, items 42, 44, 45, 48, and the
Haviland data set 11, 13-16. The stem -vinik seems to be a numeral
classifier, related to the noun vinik 'man.' In my data, there are no
examples of any morphological suffixes after -vinik. Its use to design-
ate multiples of twenty is probably due to the fact that a man has
twenty fingers and toes. Numbers ending in -vinik are free-standing
forms, which can occur without a numeral classifier. After these
numbers, a numeral classifier can still be used, introduced by the pre-
position ta. For example, see the Haviland data set 9-10. Still larger
numbers can be formed by using other numeral classifiers, such as mil
'thousand' (GTD data set 118; Haviland data set 19), or by using the
noun svyn 'hundred' (GTD data set 56; Haviland data set 20).

Classifying -vinik as a numeral classifier raises the question of
whether the ending -Vb of free-standing numbers could also be a numeral
classifier. This would simplify describing the structure of a numeral
expression, since all numeral expressions would then have a classifier.
However, there are several problems with labelling -Vb a classifier.
First of all, unlike most (if not all) numeral classifiers, -\textit{vb} changes its vowel depending on the number to which it is suffixed. Secondly, the forms in -\textit{vb} are the bases for further derivations, including the formation of numbers between multiples of twenty (see below, section 11). There is also a fully reduplicated form, in which -\textit{vb} is reduplicated along with the rest of the number (textual data 28).

11. Between two multiples of twenty

Numbers larger than twenty, but not multiples of twenty, are formed using the next multiple of twenty larger than the number, as follows:

\begin{align*}
\text{Rule (8): free numeral in } & -\text{vb} \\
\text{value} &= x + \begin{cases} 
\text{output of Rule (7)} \\
\text{value} &= 20y \\
\text{y in [2,?]}
\end{cases} \\
\Rightarrow & \text{nprh} \\
\text{value} &= x + 20(y - 1)
\end{align*}

For example, \texttt{chib} 'two' plus \texttt{cha7-vinik} 'forty' produces \texttt{chib xcha7-vinik} 'twenty-two' (see the Haviland data set 9-10, 17-18). Numbers of this type are listed in the GTD without possessive affixes, but they are listed as being: npfr(num & num/num/num/cpl4r). 4f designates nouns which are always possessed. This means that the second word in the numeral phrase actually occurs in possessed form (see the GTD data set, items 41, 43, 45, 47). I do not know what is possessing the multiple of twenty. Perhaps it is possessed by the set of items to be counted. See also Haviland (to appear, 152) and Cowan (1969, 39). Haviland (to appear, 152-53) and Cowan (1969, 39) also mention a second system for forming these numbers, using the preposition-like word xchiluk.

12. Other morphology of the larger numbers

Like the small ones, the large numbers can be partially reduplicated, using Rule (4). The multiples of twenty reduplicate to form unpossessed nouns, such as \texttt{joxfox-vinik} 'every sixty.' The noun phrases from the other large numbers reduplicate to form noun phrases, such as \texttt{lajlajuneb chan-vinik} 'every seventy.' Many of the reduplicated large numbers listed in the GTD are marked as archaic. See the GTD data set, items 84-94.

13. Rule Ordering

So far, I have described the rules in an order which facilitated explanation of the rules. However, certain of the rules, those to which I have assigned numbers, seem to apply in a linear order, as follows:

\begin{itemize}
\item Rule (1): prefixes formed directly from stems.
\item Rule (2): prefixes of numbers thirteen to nineteen.
\item Rule (3): free-standing numbers in -\textit{vb}.
\item Rule (7): multiples of twenty.
\item Rule (8): numbers larger than twenty, not multiples of twenty.
\end{itemize}
Rule (4): partial reduplication (the output cannot serve as the base for further rules).
Rules (5) and (6): days back into the past and forwards into the future (the output cannot serve as the base for further rules).

I have ordered Rule (4) near the end because that makes the semantics of partial reduplication easier to handle.

14. Morphophonemics

The form chill occurs in places where the form cha7 + vb would be expected (GTD data set 21, Haviland data set 10, 18). Therefore, chill seems to be an irregular product of Rule (3), perhaps a contraction of cha7 + ib. The forms lajchab and lachaeb (Haviland data set 3) seem to be contractions of lajcha7 + eb. Aside from cha7 and chill, there is yet a third form for the numeral two: chab, in which b replaces t. This form occurs in the following stems in place of cha7:

- chable, nle (GTD data set 100)
- chabletik, n5 (GTD 107)
- chabkchabje, n4f (GTD 109)

and in the following stems where we would expect a reduplicated form in -vb:

- chabchab, n5m (GTD 73)
- chabchab cha7-vhnik, npfr (GTD 85).

The root CHAN 'four' has two allomorphs. chan- occurs in most forms, but chon- occurs in: chonel 'four days from today' and chonje 'four days ago' (GTD data set 97 and 102).

There are four numeral roots beginning with the consonant y: v07 'five,' vak 'six,' vuk 'seven,' and vaxak 'eight.' Two of these, vak and vaxak, always occur with initial y. v07 and vuk, on the other hand, alternate with the forms 07 and uk. The difference in behavior between these two pairs of roots seems to be due to the fact that what is now a y in v07 and vuk was originally different from what is now a y in vak and vaxak. For example, Delgaty and Sanchez (1978, 458) give the following forms for San Andres Tzotzil (free-forms) jo7ob 'five,' vakib 'six,' jukub 'seven,' vaxakib 'eight.' And Cowan (1969, 39) gives the forms for Huixtoc Tzotzil: xo7 'five,' vak 'six,' xuk 'seven,' vañak 'eight.' ('s' corresponds to 'x' in our orthography and 'x' corresponds to 'j'). Also, Kaufman (1971, 91) gives the following forms for Tzeltal: Ho7 'five,' vak 'six,' huk 'seven,' wásuk 'eight.' ('s' corresponds to 'x' in our orthography; 'H' is a morphophoneme, realized as φ in some environments and as /h/ in others. 'h' (as in huk) also alternates with φ, but in a distinct set of environments.)

Thus v07/07 and vuk/uk are derived from forms J07 and JUK, by three rules:

Rule (a): J → φ /C
Rule (b): since the forms created by (a) take the set A prefixes which occur with vowel-initial stems, the initial consonant must be deleted before the appropriate set A form is selected.

Rule (c): \( j > v \) elsewhere

These rules only survive in frozen forms. Regular forms, in which the \( y \) is retained, also occur where the \( v \) might be expected to disappear. However, the forms with no \( y \) appear only where predicted by these rules. Thus we have the forms: \( Jo7ob \) (always possessed, initial \( v \) disappears after A-prefixes), \( vo7- \) (unpossessed) and \( vo7ob \) (optionally possessed); \( lajuneb \) \( Jo7- \) vinik (second word always possessed, initial \( v \) disappears after A-prefixes) but \( vo7- \) vinik (optionally possessed); \( vo7o7 \) cha7- vinik (\( \tau \) and \( v \) have the same phonetic value), \( vo7o7- \) vinik (unpossessed) and \( vo7vo7- \) (unpossessed); \( yu7ub \) (unpossessed form), \( yu7ubal \) and \( yu7ubal \) (both are possessed forms); \( yu7ub- \) but also \( yu7ub- \) (unpossessed); as well as some other regular forms with \( y \) retained. See the GTD data set, items 8, 10, 24-25, 27, 35, 37, 47-48, 76, 78-79, 86, 94, 99, 103, 105.

REFERENCES


Appendix I: Emendations to the DATA SET

In compiling a list of examples from the GTD, I noticed several entries in which the stem classification seems to be incorrect:

- \( lajuneb \) \( chan- \) vinik (45) is listed as a vphr rather than an nphr.
- \( chan- \) te7 mok (155) is also listed as a vphr rather than an nphr.
- \( vak- \) (9) is listed as num(n & nocpd), which seems to be a typographical slip for n(num & nocpd).
vaxak- (11) is listed as num(num & nccpd), which may also be a mistake for n(num & nccpd).

Also, cha7-vinik 'forty' (42) is not listed in the Tzotzil-English section of the dictionary, but only in the English-Tzotzil half.

In addition to the above, there are a number of stems which are classified differently from other stems formed by the same morphological process. Those differences which seem to be significant or non-random have been noted above. The examples which seem to be due either to random gaps in data, or to errors in the dictionary, or to arbitrary lexical constraints are as follows:

Tochenta 'eighty' (54) is listed as nla, unlike the other Spanish-root numbers, which are nle.

7ox-vinik 'sixty' (44) is listed as n5, rather than as nle.

chonej 'four days from today' (97) is listed as n5, rather than as nle.

vakje 'six days ago' (104) is also listed as n5, rather than as nle.

Appendix II: DATA SET from the GTD

1. jay-__, n(num & nccpd)le. how many?, several, few. (JAY)
   jay-kot ka7. how many horses? (or) several horses.
2. jun, num. one. (JUN)
   pero jun vinik yech. But he is a unique man.
   Scolding speech; mi jun Jobel mi jun Chamul muk' yilojon yilel. It seems as if he didn't see me either in San Cristobal or in Chamula.
3. jun ... jun, num ... num. the one ... the other. (JUN)
4. j-__, n(num & nccpd)le. one. (JUN)
5. cha7-__, n(num & nccpd)le. two. (CHA7)
6. 7ox-__, n(num & nccpd)le. three. (7OX)
7. chan-__, n(num & nccpd)le. four. (CHAN)
8. vo7-__, n(num & nccpd)5. five. (VO7)
9. vak-__, num(n & nccpd). six. (VAK)
10. vuk-__, n(num & nccpd)le. seven. (VUK)
11. vaxak-__, num(num & nccpd)le. eight. (VAXAK)
12. balun-__, n(num & nccpd)le. nine. (BALUN)
13. lajun-__, n(num & nccpd)le. ten. (LAJUN)
14. buluch-__, n(num & nccpd)le. eleven. (BULUCH)
15. lajcha-__, n(num & nccpd)le. twelve. (LAJUN)
16. jay-lajun-__, n(num & num & nc)cpd5. however many, how many.
   jay-lajun-7ech'el. how many times?, as many times as.
17. juteb, num. a little /1 only/. (JUT)
   Scolding speech; mi j-set' mi juteb. not a pinch, not a jot.
   Ritual speech, when offering liquor; ch'ambon i j-set'e,
   ch'ambon i jutebe. Accept from me the drop, accept from me the
trifle

18. jutebal, num5. a little bit. (JUT)
   yu7 van jutebal ti ye 7une. lit., As if he had a little bit of
   speech! i.e., As if he hadn't a word to say! /sarcastic/.
19. javib, nle. several, however many, how many? /implying a great
   number/. (JAY)
20. jay-lajuneb, n(num & ncomps)le. however many, how many? (JAY)
21. chib, nle. two. (CHIB)
22. toxib, nle. three. (TOX)
23. chanib, nle. four. (CHAN)
24. vo7ob, nle. five. (VOT)
25. 707ob, nle. five. (VOT)
26. vakib, nle. six. (VAK)
27. yukub, nle. seven. inan. poss.; svukubal (or) yukubal. (VUK)
28. vaxakib, nle. eight. (VAXAK)
29. baluneb, nle. nine. (BALUN)
30. lajuneb, nle. ten. (LAJUN)
31. buluchib, nle. eleven. (BULUCH)
32. lajheb, nle. twelve. (LAJUN)
33. tox-lajuneb, n(num & ncomps)le. thirteen. (TOX)
34. chan-lajuneb, n(num & ncomps)le. fourteen. (CHAN)
35. vo7-lajuneb, n(num & ncomps)le. fifteen. (VOT)
36. vak-lajuneb, n(num & ncomps)le. sixteen. (VAK)
37. vuk-lajuneb, n(num & ncomps)le. seventeen. (VUK)
38. vaxak-lajuneb, n(num & ncomps)le. eighteen. (VAXAK)
39. balun-lajuneb, n(num & ncomps)le. nineteen. (BALUN)
40. tob, nle. twenty /absolute form always occurs as j-tob/. (TOB)
   ta stobal. at the price of twenty /cents or pesos/
41. lajuneb cha7-vinik, nphr(num & num/num & ncomps/4f). thirty.
   (LAJUN)
42. cha7-vinik, n(num & ncomps)le. forty. (CHAT7) (only entered in
   the English-Tzotzil section)
   (LAJUN)
44. tox-vinik, n(num & ncomps)5. sixty. (TOX)
   (LAJUN)
46. chan-vinik, n(num & ncomps)le. eighty. (CHAN)
47. lajuneb to7-vinik, nphr(num & num/num & ncomps/4f). ninety.
   (LAJUN)
48. vo7-vinik, n(num & ncomps)le. hundred. (VOT)
49. trenta, nle. thirty. (TRENTA)
50. kwarenta, nle. forty. (KWARENTA)
51. sinkwenta, nle. fifty. (SINKWENTA)
52. sesenta, nle. sixty. (SESENTA)
53. setenta, nle. seventy. (SETENTA)
54. tochenta, nla. eighty. (TOCHENTA)
55. noventa, nle. ninety. (NOVENTA)
56. syen, nle. hundred. (SYEN)
57. trentatik, n5. by or in thirties, every thirty. (TRENTA)
58. kwarentatik, n5. by or in forties, every forty. (KWARENTA)
59. sinkwentatik, n5. by or in fifties, every fifty. (SINKWENTA)
60. sesentatik, n5. by or in sixties, every sixty. (SESENTA)
61. setentatik, n5. by or in seventies, every seventy. (SETENTA)
62. 7ochentatik, n5. by or in eighties, every eighty. (TOCHENTA)
63. noventatik, n5. by or in nineties, every ninety. (NOVENTA)
64. ju-____, n(num & nccpd)5. each. (JUN)
               ju-likel. every few minutes.
65. ju-jun, num(num & nccpd)5. one each. a piece. (JUN)
66. ju-jun tal, nphr(num/num & nccpd/&) dr. each person, everyone.
       (JUN)
67. ju-ju-____ ju-jun, nphr(n/num & nccpd/ & num/num & nccpd/). one
       ___ apiece /bowl, handful, etc/.. (JUN)
68. juju-tob, num(num & nccpd)5. in or by twenties, every twenty.
       (JUN)
69. ju-tob, num(num & nccpd)5. in or by twenties, every twenty.
       (JUN)
70. ju-juntik, num(num & nccpd)5. very few. (JUN)
71. junjun, num. one only. (JUN)
72. junjun ___, nphr(num & n4d). one ___ /eared, armed, legged/.
       (JUN)
73. chabchab, num5. by twos. (CHA7)
               chabchab ju-jun. two a piece.
74. 7ox7ox-____, n(num & nccpd)5. by or in threes, every three. (7OX)
75. chanchan-___, n(num & nccpd)5. by or in fours, every four. (CHAN)
76. vo7vo7-____, n(num & nccpd)5. by or in fives, every five. (VO7)
77. vakvak-____, n(num & nccpd)5. by or in sixes, every six. (VAK)
78. vukvuk-____, n(num & nccpd)5. by or in sevens, every seven. (VUK)
79. vukuk-____, n(num & nccpd)5. by or in sevens, every seven. (VUK)
80. balbalun-____, n(num & nccpd)5. in or by nines, every nine.
       (BALUN)
81. balbaluneb, n5. in or by nines, every nine. (BALUN)
82. lajaljun-____, n(num & nccpd)5. by or in tens, every ten. (LAJUN)
83. bulbuchib, n5. in or by elevens, every eleven. (BULUCH)
84. ju-jun cha7-vinik, nphr(num/num & nccpd/ & num/num & nccpd/4f).
       in or by twenty-ones, every twenty-one. (JUN)
85. chabchab cha7-vinik, nphr(num & num/num & nccpd/4f). in or by
       twenty-twos, every twenty-two. (CHA7)
86. vo7vo7 cha7-vinik, nphr(num & num/num & nccpd/4f). by or in
       twenty-fives, every twenty-five. (VO7)
87. lajaljuneb cha7-vinik, nphr(num & num/num & nccpd/4f). in or
       by thirties, every thirty /archaic/.. (LAJUN)
88. cha7cha7-vinik, n(num & nccpd)5. in or by forties, every forty.
       (CHA7)
89. lajaljuneb 7ox-vinik, nphr(num & num/num & nccpd/4f). in or by
       fifties, every fifty /archaic/. (LAJUN)
90. 7ox7ox-vinik, n(num & nccpd)5. in or by sixties, every sixty.
       (7OX)
91. lajaljuneb chan-vinik, nphr(num & num/num & nccpd/4f). in or by
       seventies, every seventy /archaic/.. (LAJUN)
92. chanchan-vinik, n(num & nccpd)5. in or by eighties, every
       eighty. (CHAN)
93. lajaljuneb 707-vinik, nphr(num & num/num & nccpd/4f). in or by
       nineties, every ninety /archaic/.. (LAJUN)
94. vo7vo7-vinik, n(num & nccpd)5. in or by hundreds, every hundred
       /archaic/.. (VO7)
95. cha7ej, nle. day after tomorrow. (CHA7) ta scha7ejal. on the second day after /a particular day being discussed/.
96. 7oxej, nle. three days from now. (70X)
97. chonej, n5. four days from today. (CHAN)
98. vakej, nle. six days from now. (VAK)
99. vuкеj, nle. seven days from today. (VUK)
100. chabje, nle. the day before yesterday. (CHA7) ta schabjeal. two days before /a particular day being discussed/.
101. 7oxje, nle. three days ago. (70X)
102. chorje, nle. four days ago. (CHAN)
103. vo7je, nle. five days ago. (V07)
104. vakje, n5. six days ago. (VAK)
105. vuкеj, nle. seven days ago. (VUK)
106. VOL P, P(2) vol, tv. wrap loosely /head in scarf while holding onto ends/, wrap up /clothes, tortillas/, carry in bundle. volje, nle. yesterday.
107. chabjetik, n5. every other day. (CHA7)
108. 7oxjetik, n5. about three days ago. (70X)
109. chabjehabhje, n4f. every other day. (CHA7)
110. 7oxje7oxje, n5. about three days ago. (70X)
111. vāktesvākte, av. walking about with six toes. (VAK)
112. jutuk, n5. a little, almost, nearly. (JUT) jutuk xa muk' xlok' xch'ulel. he almost died.
   jutukon xa ya7el. I feel sick.
   jutuk mu junuk limite. nearly one bottleful.
113. jutuktit, aj. rather few. (JUT)
114. jutukaj, iv. become rare or scarce, lessen (sickness). (JUT)
115. jutukib, iv. lessen (sickness, work). (JUT)
116. jutukibitas, tv. settle or quell argument. (JUT)
117. mu jayuk, nphr(num & n5). be unable to finish. (JAY)
   mu jayuk ka7i. I could not finish (or) I could not hear
   everything.
   mu xa jayuk jchakbe ti sk'obike. I could not shake all their
   hands.
118. MIL X (Sp, mil).
   mil, no. thousand.
119. jun 7o7on, vphr(num/pres/ & n4d). happy, contented. (JUN)
120. jun 7o7on 7a7i, vphr(num/pred/ & n4d // tv). feel happy. (JUN)
121. junul 7o7on, nphr(num4f or n4d). wholeheartedly, wholehearted.
   (JUN)
   muk' bu sjunul yo7on xchi7uk li 7orten 7albile. He does not
   agree with the law.
122. chib 7o7on, vphr(num/pred/ & n4f). sad, discontented, uneasy,
   unhappy. (CHIB)
   chib yo7on t xbat ta 7olon ja7 li 7oy yajchamele. He is not
   happy that he has to go to the lowlands because he has a
   patient (or) a sick member of the family.
   chib yo7on t xbat ta 7olon yu7un yan sba svayich. He is unhappy
   over going to the lowlands because he had a nightmare.
123. chib k'opal, vphr(num/pred/ & n4f). uncertain. (CHIB)  
    chib sk'oplal mi xibat mi nu xibat. It is uncertain whether I will go or not.

124. chibaj 707on, vphr(iv & n4d). become disconsolate or depressed,  
    become sad or unhappy. (CHIB)  
    ichibaj yo7on muk' xbat. He grew sad that he wasn't going.  
    ichibaj yo7on ti t xk'openbat ta yan li alekome. He became  
    depressed because his fiancée had an affair with someone else.  
    ichibaj 70 yo7on li labal k'opetike. She became unhappy over  
    the endless quarrels /daughter-in-law/.

125. chibet 707on, vphr(av & n4d). feeling disconsolate or depressed,  
    feeling sad or unhappy, feeling nauseated. (CHIB)  
    xchibet yo7on t xve7 ti mi mu sna7 x7atin xve7 li schi7ile.  
    He feels nauseated eating with a person who doesn't wash  
    before the meal.  
    xchibet yo7on yik' smalal. With a heavy heart she took him as  
    her husband.

126. chibetik 707on, vphr(av & n4d). Cf chibet 707on (plu). (CHIB)  
127. chibal k'op, nphr(numatt & n)5. self-destructive talk. (CHIB)

128. LETANIA N (Sp, letania).  
    letanya, n5. Rogation Day /Monday before Ascension Day/.  
    ba letanya, nphr(n type n)5. First Rogation Day /Monday before  
    Ascension Day/.
    chib letanya, nphr(num4e type n)5. Second Rogation Day  
    /Tuesday before Ascension Day/.
    7oxib letanya, nphr(num4e type n)5. Third Rogation Day  
    /Wednesday before Ascension Day/.
    chanib letanya, nphr(num4e type n)5. Fourth Rogation Day  
    /Thursday before Ascension Day/.
    vo7ob letanya, nphr(num4e type n). Fifth Rogation Day  
    /Friday before Ascension Day/.

129. buch'u junukal, nphr(pt & num5). which one, which one?, whichever  
    person, which person? (JUN)

130. jun tak' in, nphr(num & n)5. one real /formerly/. (JUN)  
131. jun tak'in majell, nphr(nphr/num & n/5 of n)5. 160 cardfuls  
    /wool/. (JUN)

132. chib tak'in, nphr(num & n)1a. twenty cent piece /two bits/.  
    (CHIB)

133. jun-ab, n(num & n/contr of jabil/ cpd)5. next year. (JUN)  
134. jun-abi, n(num & n/contr of jabil/ cpd)le. last year. (JUN)

135. jun 7olil, nphr(num & n)3d. woman's cousin younger than ego  
    /archaic/. (JUN)

136. jun ch'amalil, nphr(num & n)3d. male's cousin younger than ego  
    /archaic/. (JUN)

137. jun me'ilil, nphr(num & n)3d. aunt /maternal, paternal, wife of  
    maternal or paternal uncle/, female cousin older than ego. (JUN)

138. jun nich'onil, nphr(num & n)3d. male's cousin younger than ego  
    /archaic/. (JUN)

139. jun totil, nphr(num & n)3d. uncle /maternal, paternal, husband of  
    maternal or paternal aunt/, male cousin older than ego. (JUN)

140. chanib 70k, nphr(num & n)1e. marsh alligator lizard. (CHAN)

141. chanib 70k chon, nphr(nphr/num & n/ type n)5. cf. chanib 70k.  
    (CHAN)
142. chantiko, nle. four-horned ram. (CHAN)
143. Tox-tu, n(num & ncppd)le. 'three months,' a temperate "vine." (70X)
144. Tox-tzelav, n(num & ncppd)5. three-sided /fruit, stem/. (70X)
145. chan-tzelav, n(num & ncppd)5. four-sided, winged /stem/. (CHAN)
146. chan-tzelav 7ak', nphr(n(num & ncppd/ type n). 'four-ridged vine.' (CHAN)
147. chan-tzelav tzele-pat, nphr(n(num & ncppd/ type n/ x & ncppd/). shrubby butterfly bush. (CHAN)
148. chan-tzelav kinya, nphr(n(num & ncppd/ type n). 'four-ridged banana.' (CHAN)
149. chan-tzelav lo7obol, nphr(n(num & ncppd/ type n). 'four-ridged banana.' (CHAN)
150. chan-tzelav sun, nphr(n(num & ncppd/ type n). 'four-ridged sun' (sun, n5. bush sunflower). (CHAN)
151. cha7---, n(num & ncppd)3d. step--. used with kin term of nuclear family and wife's brother /infra/. (CHA7)
152. cha7-utz'il, n(num & ncppd)3d. second of younger siblings after first has died. (CHA7)
153. Tox-jisomal chij, nphr(n(num & ncppd/ type n)5. lit., tripartite blanket, i.e., wedding blanket. (70X)
154. Tox-jistobil, n(num & ncppd)4f. yarn-embroidered shoulder seams of woman's blouse. (70X)
155. chan-te7 mok, vphr(n(num & ncppd/ type n)5. fence with four rails for horse corral. (CHAN)
156. vak-nab, nphr(n(num & ncppd)le. rainbow. Term learned from Chamulas. (VAK)
157. vuku-pat, n(aJ & ncppd)5. big dipper /Ursa Major/. (VUK)
158. balun-7ok'oles, n(num & ncppd)5. tropical mockingbird. (BALUN)
159. joha7-kuch 7e, agn: nphr(n(num & tvcppd/ type n). person with tooth sticking out above row of teeth. (CHA7)
160. vaxak-men, n(num & xcppd)5. creator god. (VAXAK)
161. treinta, nld. .30-30 rifle, thirty cents or pesos. (TRENTA)
162. cha7-jot, n(num & ncppd). Ritual speech, woman praying, referring to husband who conceals existence of mistress; two-faced. (CHA7) cha7-jot ti sbae cha7-jot ti saate. He has two countenances, he is two faced.
163. cha7-koj, agj(num & ncppd). homosexual, hermaphroditic. (CHA7)
164. jocha7-jot sat, agn(nphr/num & ncppd type n5/). supernatural two faced devil. (CHA7)
165. Tox-lot, n(num & ncppd)5. constellation comprised of the three stars of Orion's belt: delta, epsilon, xi. (70X)
166. Tox-lot j7elek", nphr(n(num & ncppd/4d of agn). constellation; comprising theta, l, d of Orion. (70X)
167. cha7-fal, tv(num & tvcppd). repeat /words/. (CHA7)
168. cha7-thayan, iv(num & ivcppd). reappear. (CHA7)
169. cha7-thik', tv(num & tvcppd). remarry. (CHA7)
170. cha7-7och, iv(num & ivcppd). reenter. (CHA7)
171. cha7-tzak, tv(num & tvcppd). recapture. (CHA7)
cha7-tzako ta vun. Rewrite it!
172. cha7-chon, tv(num & tvcppd). resell, act as middleman. (CHA7)
173. cha7-jam, tv(num & tvcppd). reopen. (CHA7)
174. cha7-javan, tv(num & tvcppd). turn right side up again. (CHA7)
175. cha7-kil ba, rv(num & rvcppd). drag self again. (CHA7)
176. cha7-kuch, tv(num & tvcpd). carry again /heavy burden/ /person rests and then carries it, or burden is taken part way and left, then carried the rest of the way/, have homosexual relations with /man/. (CHA7)

177. cha7-kuxes k'op, vphr(tv/num & tvcpd/ & n5). revive quarrel. (CHA7)

178. cha7-lok', iv(num & ivcpd). reappear. (CHA7)

179. cha7-lok'es, tv(num & tvcpd). take out again. (CHA7)

180. cha7-me7in, iv(num & ivcpd). recur (sickness). (CHA7)

181. cha7-me7intas, tv(num & tvcpd). cause to recur /sickness/, (CHA7)

182. cha7-meltzaj, iv(num & ivcpd). fix again, settle again /dispute/. (CHA7)

183. cha7-mes, tv(num & tvcpd). sweep again. (CHA7)

184. cha7-paj, tv(num & tvcpd). replant /posts/. (CHA7)

185. cha7-to1in, tv(num & tvcpd). acquire stepchild (woman). All other kin terms of nuclear family may take cha7- and suffix -in to produce verb form meaning acquire step-. (CHA7)

186. cha7-sut, iv(num & ivcpd). return again. (CHA7)

187. cha7-ta, tv(num & tvcpd). rediscover. (CHA7)

188. cha7-tik', tv(num & tvcpd). put in again. (CHA7)

189. cha7-toy, tv(num & tvcpd). lift up again, raise again. (CHA7)

190. cha7-vay, iv(num & ivcpd). fall asleep again. (CHA7)

191. cha7-vil, iv(num & ivcpd). fly again. (CHA7)

192. cha7-tz'alan, tv(num & tvcpd). pile one on top of another /bags of corn/. (CHA7)

193. cha7-javin, tv(num & tvcpd). split or slice in two. (CHA7)

194. cha7-latzan, tv(num & tvcpd). pile one on top of another /bags of corn/ (CHA7)

195. cha7-pakanpakan, tv(num & tvcpd). fold one inside another /clothes, paper/. (CHA7)

196. chan-pakan, tv(num & tvcpd). fold over twice /paper, clothes/, fold into four sections. (CHAN)

197. cha7-puxin, tv(num & tvcpd). fold over, fold in two /mat, paper/, double over /with blow/. (CHA7)

198. cha7-puxin ba, rv(num & rvcpd). be folded in two or doubled, kneel and bow low. (CHA7)

199. 7ox-puxin, tv(num & tvcpd). fold over three times /bridal headdress, rope/. (70X)

200. chan-puxin, tv(num & tvcpd). double over so as to make four /rope/. (CHAN)

201. cha7-lak'ta, tv(num & tvcpd). twine /thread, yarn/. (CHA7)

202. chan-lak'ta, tv(num & tvcpd). place four together so as to make one /thread, yarn/. (CHAN)

Appendix III: DATA SET from Haviland (to appear, 151-153)

When two forms are cited for one number, they are the free-standing form and the prefix form with the numerical classifier -kot.

1. lajuneb, lajun-kot. 10.
2. buluchib, buluch-kot. 11.
Appendix IV: TEXTUAL EXAMPLES

Numerical expressions without numeral classifiers

(1) Ta ti krixchano-etik 7une, yech 7i-laj ti s-vokol topic THE PEOPLE-pl pt THUS cp-FINISH THE A3-EFFORT ti 7ox-vinik ta s-jok' ti balamil-e. (OCK 188) THE 60 1cp [A3-DIG THE LAND-enc]
  'As for the people, all the efforts of the sixty men who dug up the ground ended like that.'

(2) 7i-y-ak' li cha7-vinik k'ak'al la li vo7 7une. (OCK 337) cp-A3-GIVE THE 40 enc THE WATER pt
  'He gave 40 days of rain.'

(3) Mu j-na7 mi vo7-lajuneh pexu k'u la xi tal y-ak'-ik NOT A1-KNOW Q 15 PESO WHAT enc enc CAME A3-PUT-3p 7o ta na taj Tantz 7une. (OCK 193) WITH IT prep HOUSE THAT WOMAN pt
  'I don't know if it was fifteen pesos or how much in exchange for which they came to leave that woman in her home.'

Numerical expressions with numeral classifiers

(4) Pero 7i-sk'el xa 7ox komel ta s-sat vak-vo7 x-ch'amal BUT cp-A3-SEE enc enc dr prep A3-EYE 5-nc A3-CHILD ti j7ik'al-e. (OCK 192)
  THE SPOOK-enc
  'But she had already seen the Spook's six children.'
(5) Ti mi mu 7av-ak'-be s-ve7el-e yuʔn la ta x-la,j comp 9 NOT A2-GIVE-io A3-MEAL-enc THEN enc icp-FINISH jay-voʔ ta jteklum. (OCK 371)
SEVERAL-nc prep Zinacantan Center 'If you didn't give it its meal then a number of people in the town would die.'

(6) Yuʔn xa ch-i-la-j-otik chaʔ-voʔ liʔ-e. (OCK 371)
THEN enc icp-B1-DIE-lplin 2-nc HEREn-enc 'Then both of us will die here.'

(7) Ti-lok' jox-kot paloma-e. (OCK 375)
cp-GO OUT 3-nc DOVE-enc 'Three doves came out.'

(8) K'ajom la bak' j-set' x1 ʔune. (OCK 375)
ONLY enc MOVE 1-LITTLE BIT LIKE THIS pt '[The wall] only moved a little, like this.'

(9) Kontrato bat naʔtik jay-mil. (OCK 380-81)
CONTRACT GO WHO KNOWS HOW MANY-THOUSAND 'They went on contract. Who knows how many thousands.'

(10) Ch-a-k-ak'-be jay-mil-uk. (OCK 383)
icp-B2-Al-GIVE-io SEVERAL-THOUSAND 'I'll give you several thousand.'

Numbers in time expressions

(11) Ch'ipomaj' la te jayib k'ak'al ch'ipomaj la ʔun.(OCK 380)
BABY-SIT enc // THERE FEW DAY BABY-SIT enc pt '[Peter] baby-sat. He baby-sat there for a few days.'

(12) K'aj laʔ-juneb k'ak'al ch-i-tal. (OCK 197)
AFTER 15 DAY icp-B1-COME 'I'll come in two weeks.'

(13) Ta vaxakib ʔora k'ak'al-e yuʔn ʔo prep 8 HOUR DAY-enc THERE ARE enc SPOOK 'At eight o'clock there were still Spooks.'

(14) Vakib xa ʔu x-chiʔin ti s-maʔal yaʔel ʔune.(OCK 195)
6 enc MONTH A3-BE WITH THE A3-HUSBAND IT SEEMS pt 'She was together with her husband for six months.'

(15) Ti-bat ta mukenal noxtok joxib k'ak'al joxib ʔak'ubal,
cp-GO prep CEMETARY AGAIN 3 DAY 3 NIGHT ta mukenal 7i-bat. (OCK 370)
prep CEMETARY cp-GO 'He went to the graveyard, too. Three days and three nights. He went to the graveyard.'
From the above examples, it seems that time expressions occurring before the main clause have been topicalized out of the clause.

Numbers as predicates

'But I don't know if it was recently, two or three days before, that he passed by.'

'I don't know if the Spook had six or four children or what.'

'Three were the ropes with which the woman came out.'

'They were given 15 pesos.' literally: 'The pesos that they were given were 15.'

'Twenty-five is its price.'

'They figured out there how much money they would give each other, [how much] each one would get.'
(25) JayJay pexu ta x-k-ich'-tik 7un lavi lajcha-vo7-otik SEVERAL PESO icp-Al-RECEIVE-1plin pt // NOW 12-nc-B1plin 7une. (OCK 193) pt 'We'll get several pesos apiece since there are twelve of us.'

If pexu is acting as a noun here, it should be preceded by a free-standing numeral form. Although JayJay is not listed in the GTD, it looks like a regular partially reduplicated prefix form. Perhaps pexu is acting as a numeral classifier here.

(26) Ti 7o 1a y-ich'-oj mu j-na7 mi ju-p'ej s-riata AND THERE IS enc A3-BRING-pf [NOT Al-KNOW Q EACH-nc] A3-ROPE ti vinik-etik 7une. (OCK 193) THE MAN-pl pt 'And each of the men had brought, I don't know if it was one rope apiece.'

(27) K-ich' k-unin parte-tik ju-jun tal 7un. (OCK 194) Al-RECEIVE Al-LITTLE PORTION-1plin APiece dr? pt 'We've each gotten our little share.'

(28) Ta wakakibvaxakib k'al'k'al-e yu7n ju-jun ju-jun k-ol. (OCK 194) prep EVERY EIGHT DAY-enc EACH ONE Al-CHILD 'Every week I had another child,' literally: 'Every eight days, (there was) one of my children.'

wakakibvaxakib and ju-jun ju-jun seem to be parallel fully reduplicated forms.

(29) Yu7n 1a mak'lin-bil ju-jun 7ak'ubal. (OCK 371) enc FEED-ppf EACH NIGHT 'It was fed every night.'

(30) Laj la x-tuch'an-be ju-set' ta komon FINISH enc A3-CUT-io EACH-LITTLE BIT prep EQUALLY // 7i-x-ch'ak-be la 7un. (OCK 374) cp-A3-DIVIDE-IO enc pt 'After he had cut up each little bit for them equally, he portioned them out.'

(31) L-i-k'oapo 1a xo7okoj ya7al k'op 7un. (OCK 298) cp-BL-PRAY prep BY THREE-nc IT SEEMS PRAYER pt 'I prayed a set of three prayers.'

(32) T'uj-bil xa no xo7 cha7-kot xa 7i-kom, cha7cha7-kot CHOOSE-ppf enc enc enc 2-nc enc cp-REMAIN BY TWO-nc k'usî mut. (OCK 338) WHAT BIRD 'Just two were chosen to remain. Two apiece of each kind of bird.'
(33) Yu7un la junjun ti s-krem nop-em- ta BECAUSE enc ONLY ONE THE A3-BOY BECOME ACCUSTOMED TO-pf prep? label paxyal 7une. (OCK 168) DO NOTHING BUT HUNT pt 'She had just the one son who was used to going hunting all the time.'

NOTES

1. Additional abbreviations for glossing texts:
   prep--ta used as a preposition
   refl--ba used as a reflexive
   dr--directional
   topic--7a marking a topicalized element
   comp--complementizer, such as ti
   //--marks clause boundary
   [ ]--encloses a constituent. I only use this abbreviation when it seems necessary to clarify how I am parsing the sentence. In particular, the bodies of relative clauses are enclosed in brackets.