

Positional Bases in Upper Necaxa Totonac
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ABSTRACT

In this paper I explore four Upper Necaxa Totonac positional bases (a closed class of bound morphemes with locative meanings): *-xu*: 'in vertical', *-kutu* 'out vertical', *-nu*: 'in', and *-ftu* 'out'. I show that on one hand, the first pair of positional bases encodes information for two dimensions: VERTICAL and IN/OUT. On the other hand the second pair of positional bases is actually unmarked for the counterpart dimension HORIZONTAL, remaining only the IN/OUT distinction. As a result, these four Positional Bases in Upper Necaxa Totonac do not constitute a symmetrical two-dimensional system.

1. INTRODUCTION

Upper Necaxa Totonac (UNT)¹ presents a system with two pairs of lexemes distinguishing the IN/OUT features. One member of each pair also encodes the dimension VERTICAL; however the other member does not encode the corresponding HORIZONTAL dimension. In other words, there are two neutral or unmarked bases that encode IN/OUT, and two marked bases which apart from encoding IN/OUT, they also encode VERTICAL:

-nu: 'in'
-ftu 'out'
-xu: 'in vertical'
-kutu 'out vertical'

These definitions are based on three main arguments:

- i) The unmarked bases (*-nu*: 'in' and *-ftu* 'out') appear in both contexts: where there is VERTICALITY and where there is HORIZONTALITY involved. Conversely, the marked bases (*-xu*: 'in vertical' and *-kutu* 'out vertical') are restricted to VERTICAL contexts.

¹ Spoken in Chicontla, Patla and Cacahuatlán, Puebla, Mexico.

- ii) If this were a truly productive four-way system, we would expect all four bases to be equally productive. However, the combinatorial potential of the positionals with the body part prefixes is not the same for all bases. Two bases (*-nu*: 'in' and *-ftu* 'out') combine with most of the prefixes, one base (*-xu*: 'in vertical') combines with a good number of prefixes, and one base (*-kutu* 'out vertical') combines with very few prefixes.

- iii) The asymmetry in the productivity of the four bases is also shown by the different degree of lexicalization of the positionals. Two bases (*-xu*: 'in vertical' and *-kutu* 'out vertical') have mostly lexicalized meanings, and the other two bases (*-nu*: 'in' and *-ftu* 'out') have both transparent and lexicalized meanings.

2. POSITIONAL BASES IN UPPER NECAXA TONAC

Positional bases are bound morphemes. One of the most productive and frequent groups of morphemes that combine with the positional bases in UNT is the body part terms.

As the particular combination of body part prefixes and positional bases are stative verbs, they can be fully inflected for tense (past, present, future) as well as for subject and object person (1st, 2nd, 3rd) and number (singular, plural)²:

- (1) a. *ik-a?a-nú:* *a?asliwít*
 1SUBJ-ear-in earring
 'I'm wearing earrings'
- b. *ij-?eł-nú:* *káble*
 PST-mouth-in cable
 'the cable was unplugged'

(Beck 2004:41)

Stative verbs can also form active structures by adding the inchoative prefix *ta-* or the causative prefix *ma-*. Thus, apart from being inflected for tense, person and number, active verbs are also inflected for aspect (imperfective, perfective, perfect, progressive). Conversely, stative verbs do not accept inflection for any aspect other than imperfective, as these verbs denote states without beginning or ending points (Beck 2004). Therefore, for each combination of a body part prefix and a positional base, there would ideally be a stative form, an inchoative form, and a causative form.

² Abbreviations used in this paper: 1,2,3=first, second, third person; IDF=indefinite; PL=plural; POS=possessive; SUBJ=subject; OBJ=object; LOC=locative; PTN=partonymic; INCH=inchoative; CS=causative; PST=past; FUT=future; PRG=progressive; PF=perfect; PFV=perfective; ADD=additive, MTV=mirative.

- (2) a. xa: **ak-ftú** tsamá: tjiwif
 NEG head-out this stone
 'the rock isn't sticking out of the ground'
- b. na-ta-**ak-ftú** if-tan?eǵé? kjiwǵ
 FUT-INCH-head-out 3POS-roots tree
 'the roots of this tree will come unburied'
- c. na-ma:-**ak-ftu**-kán if-tan?eǵé? kjiwǵ
 FUT-CS-head-out-IDF 3POS-roots tree
 'they are going to pull up all the roots of the tree'

(Beck 2004:41-2)

Once we have described the constructions we are looking at in this paper, and provided the arguments to divide the positional bases in two groups (the unmarked and the marked), we will provide examples and discuss the data in the next sections.

3. CONTEXTS WHERE BASES APPEAR

Two bases (*-xu*: 'in vertical' and *-kutú* 'out vertical') consistently appear only in VERTICAL contexts. In contrast, the other two bases (*-nu*: 'in' and *-ftú* 'out') appear in both HORIZONTAL and VERTICAL contexts. As we mentioned before, this distribution makes us think that two bases are marked for VERTICALITY, whereas two bases are unmarked for the distinction HORIZONTAL/VERTICAL. Thus, because *-nu*: 'in' and *-ftú* 'out' are unmarked we find the following distribution:

- i) *-nu*: and *-ftú* in HORIZONTAL contexts
- ii) *-nu*: and *-ftú* in VERTICAL contexts
- iii) *-nu*: and *-ftú* in ambiguous contexts
- iv) *-xu*: and *-kutú* in VERTICAL contexts

First, we will show examples of *-nu*: and *-ftú* in HORIZONTAL contexts.³

- (3) a. ta-laka-**nu**:-má:ǵ tsamá: ?awátǵa nak=tǵik
 INCH-face-in-PRG that boy LOC=house
 'that boy is looking into the house (from outside)' (LM-E)
- b. if-laka-**ftú** tjiwif nak=if-laká-n tapá:k
 PST-face-out stone LOC=3POS-face-PTN wall
 'there was a rock sticking out of the wall' (NS-DB)

In these examples, the HORIZONTAL sense is given by the context and not by the positional base *per se*. This is shown by the fact that the same positional bases, *-nu*: and *-ftú*, can also appear in VERTICAL contexts:

- (4) a. xa: ma:-**ak-nú**:-?o:-ǵ tjiwif na-**ak-ftu**-tawi:lá
 NEG CS-head-in-all-PFV stone FUT-head-out-come.to.be
 'they didn't bury the stone completely, it's going to stick out a bit' (LB-DB)
- b. ma:-**mak-ftú** kakáux puská:t
 CS-body-out peanut woman
 'the woman helps taking out the peanuts (from the ground)' (NS-E)

Examples in (4) show that *-nú*: and *-ftu* appear in clear VERTICAL contexts. This illustrates the fact that these bases are marked neither for HORIZONTALITY nor for VERTICALITY. Thus, *-nú*: and *-ftu* only encode the IN/OUT features.

In addition, these same bases appear in contexts where it is not very clear if there is VERTICALITY or HORIZONTALITY:

- (5) a. ?en?a-**ftú** mangéra nak=támbo
 nose-out hose LOC=bucket
 'the (very end of the) hose is sticking out of the bucket' (NS-E)
- b. ǵtunǵtun ik-a:-kiǵ-ta-mak-**nú**:-ǵ tsamá: lakstín s'atán
 IDPH 1SUBJ-ADD-mouth-INCH-body-in-PFV that small plum
 'I threw the plums into the (children's) mouth' (RM-DB)

On the other hand, *-xu*: and *-kutú*, appear only in VERTICAL contexts:

- (6) a. tu:-**xú**: nak=pásu á?-tín fanát
 foot-in.vertical LOC=vase CLS=one flower
 'the (stem of a) flower is in the vase' (CF-E)
- b. ik-pu:-**kutu**-má:ǵ kin-?a:wá:x
 1SUBJ-interior-out.vertical-PRG 1POS-nixtamal
 'I'm taking my nixtamal out (of the pot)' (AV-E)

In this section we have shown that the distinction HORIZONTAL/VERTICAL is not present in all the four bases. To prove this, we provided four groups of examples: i) *-nu*: and *-ftú* in HORIZONTAL contexts, ii) *-nu*: and *-ftú* in VERTICAL contexts, iii) *-nu*: and *-ftú* in ambiguous contexts, and iv) *-xu*: and *-kutú* in VERTICAL contexts. The outcome is that two bases (*-xu*: and *-kutú*) encode always VERTICALITY; whereas two bases (*-nú*: and *-ftu*) are unmarked for the HORIZONTAL/VERTICAL dimensions, as they appear in both contexts.

³ At the end of the English translation, the two first letters identify the speakers; and the next letter(s) stands for the data source: DB for the *UNT-Database*, and E for data collected specifically for this research by the author via elicitation.

4. COMBINATORIAL POTENTIAL OF THE POSITIONAL BASES WITH THE BODY PART PREFIXES

If UNT had a symmetrical four-way two-dimensional system, we would expect all body part prefixes to combine with all four positional bases. In other words, all the possible combinations of *-xu:* 'in vertical', *-kutú* 'out vertical', *-nu:* 'in', and *-ftu* 'out' with body part prefixes would have to be equally accessible for new word formation.

However, in our data analysis we found that not all the body part prefixes can be combined with all positional bases.⁴ Of the body part prefixes we searched for in the *UNT Database* and tried in elicitation, 93.75% (15/16) could combine with *-ftu* 'out', 87.5% (14/16) could combine with *-nu:* 'in', 75% (12/16) could combine with *-xu:* 'in vertical', and 37.5% (6/16) could combine with *-kutú* 'out vertical'.⁵

This outcome indicates that the most productive bases, i.e. the ones that combine with more prefixes, are *-ftu* 'out', and *-nu:* 'in'.⁶ The positional base *-xu:* 'in vertical' is also quite productive as it can be combined with three quarters of the body part prefixes we tried. In the case of *-kutú* 'out vertical' we found a limited number of combinable prefixes. Consequently, we can say that regarding combinatorial potential, only three of the four bases are fairly productive.⁷

In sum, the combinatorial potential of the positional bases with body part prefixes shows that *-ftu* and *-nu:* are the bases that combine with most body part prefixes. The fact that these bases are so active implies that they embrace most of the possible meanings when positional bases and body part prefixes combine. Therefore, as we pointed out before, the four positional bases in UNT do not constitute a two-dimensional symmetrical system.

⁴ From the large number of UNT body part prefixes, we selected only 16 (following Levy 2006). These parts include the main dimensions such as anterior, posterior, superior, inferior, lateral, interior and around. The corresponding prefixes are the following: *aʔa-* 'ear', *ak-* 'head', *akpu-* 'crown', *tʃa-* 'shin', *ʔe-* 'back', *ʔeʔ-* 'mouth (interior)', *ʔenʔa-* 'nose', *laka-* 'face', *maka-* 'hand', *maʔ-* 'body', *pa-* 'belly', *pij-* 'neck', *pu-* 'interior', *tampu-* 'bottom', *ti-* 'leg', *tu-* 'foot'.

⁵ We elicited all the combinations we did not find in the *UNT Database*. Detailed information is shown in *Tables 1* and *2* (see appendix)

⁶ Nevertheless, it is worthy of note the fact that most of the combinations with *-nu:* and *-ftu* belong to the wearing event class.

⁷ These results coincide with the description corresponding to Papanla Totonac, where Levy (1994) reports three bases as very productive and one slightly productive.

5. DEGREE OF LEXICALIZATION

In our data, we found that for some bases there are more lexicalized forms than for others.⁸ In this section we will describe the situation for each positional base and give examples of lexicalized and non-lexicalized forms when found.

First we will present data for the most lexicalized base, *-kutú* 'out vertical':

- (7) a. na-ik-pu:-**kutú** kin-lúfu nak=kartón
 FUT-1SUBJ-interior-out.vertical 1POS-clothes LOC=cardboard.box
 'I'll take out my clothes from the box' (LM-E)⁹
- b. ʔeʔ-**kutú** wɑ:
 mouth-out.vertical tamal
 'the tamales come out (the pot is too full)' (CF-E)
- c. laka-**kutu**-má:l xka:n
 face-out.vertical-PRG water
 'he is on the surface of the water' (AV-E)

The only documented combination of this base and a body part prefix in the *UNT Database* is the one shown in (7a); speakers use this particular combination as a transitive verb meaning 'scoop out with hand, make a hole in the earth'.

When we elicited other body part prefixes with *-kutú*, the speakers rejected almost all the combinations. Still, consultants gave some sentences as the one in (7b) and (7c); even though speakers did not find the examples ungrammatical, sentences sounded very unusual to them. Notice in (7c), where the scene is a man swimming in the river (backstroke style), that the speaker did not add *ta-* 'inchoative' or *ma-* 'causative' to make this form an active verb. However, the verb is marked for progressive aspect (recall that stative bases can only be inflected for imperfective aspect; unlike active bases, which can be inflected for any of four aspects).

In sum, the few times we found *-kutú* in combination with body part prefixes, it is highly lexicalized.

⁸ We will follow Lehmann's (2002:14) definition of lexicalization in the sense of linguistic units entering the inventory and becoming holistic. In the lexicalization process there can also be a shift from implied to coded (or conventional) meaning. Furthermore, whenever a linguistic form falls outside the productive rules of grammar it becomes lexicalized.

⁹ Even though *pu.kutú* should not be glossed as 'interior-out.vertical' but as 'scoop out with hand' because it is a lexicalized form, I am parsing the construction for the reader to see all the components I want to show. The same stands for the rest of the examples in this section.

Second, we show the examples for *-xu:* ‘in vertical’:

We got some examples where the combination of the body part prefix and the positional base is totally transparent.

- (8) a. *ma:-laka-xú:* *nak=pastél* *if-tsí:* *tsamá: s’áta*
 CS-face-in.vertical LOC=cake 3POS-mom that boy
 ‘the mother makes the boy put the face in the cake (to try it)’ (NS-E)
- b. *ta-?en?a-xú:-l* *nak=kin-tása*
 INCH-back-in.vertical-PFV LOC=1POS-cup
 ‘he went to put his nose in my cup’ (AV-E)
- c. *tu:-xú:* *nak=kubéta*
 foot-in.vertical LOC=bucket
 ‘his foot is inside the bucket’ (AV-E)

In example (8a) the speaker described a party where the person celebrating a birthday has to try the cake ‘sticking’ the face in it. To describe this scene the speaker used *laka-xú:* ‘face-in.vertical’, the meaning of this predicate is compositional and it is exactly what happened: the face of the boy entered into the cake in a VERTICAL trajectory. Examples (8b) and (8c) show similar situations, with very literal meanings: a nose inside a cup and a foot inside a bucket, respectively.

There are also examples with *xu:-* that show some degree of lexicalization:

- (9) a. *ik-?e:-xú:* *nak=puťú:n*
 1SUBJ-back-in.vertical LOC=mud
 ‘I’m in the mud’ (CF-DB)
- b. *ik-ta-ti:-xú:-ma:l* *nak=xká:n*
 1SUBJ-INCH-leg-in.vertical-PRG LOC=water
 ‘I am going into the water’ (LB-DB)

In the example (9a) the combination *?e:-xú:* ‘back-out.vertical’ has been documented in the *UNT Database* as an intransitive verb meaning ‘to be in mud’. We can rebuild the meaning if we think that when someone is in the mud it is because the person slips and the body part that has contact with the mud is the back, otherwise why else to be in the mud. Here we say that the form is lexicalized because the meaning has been conventionalized, as it is restricted to a specific context (i.e. a muddy ground).

The combination shown in (9b) is also documented in the *UNT Database* as a ‘be half-into, partially submerged in water’. We can follow the semantic motivation if we think that if we get into the water using the legs, we end up being only partially submerged. Again, this combination is restricted to a specific context (i.e. water).

We also found a number of lexicalized forms with *xu:-*:

- (10) a. *akpu-xu:=tsá*
 crown-in.vertical=already
 ‘it’s late (around 1pm)’ (CF-E)
- b. *pa:-xu:-má:l* *kin-káflj* *?alı:* *if-?a:lwá:?*
 belly-in.vertical-PRG 1POS-hen have 3POS-egg
 ‘the hen is roosting, it has eggs’ (RM-DB)

In (10a) we find a combination that has been documented in the *UNT Database* as an adverb meaning ‘just afternoon, around 1pm’. This combination is not a verb (as all the forms we have been showing) but an adverb, i.e. different lexical categories. Even though we can rebuild the *akpu-xu:* ‘crown-in.vertical’ composition thinking about the movement of the sun, the meaning has been conventionalized. Thus, we consider this a lexicalized form.

A similar situation is shown in (10b) where we have another example of lexicalization: *pa:-xú:* ‘to brood (hens)’. The meaning has been conventionalized as the combination of ‘belly’ plus ‘come out vertically’ is not literally ‘brood’. The fact that it is an active form is also significant because, again (as in example 7c) the form is inflected for progressive aspect in spite of not having *ta-* ‘inchoative’ or *ma:-* ‘causative’.

In sum, *-xu:* is mostly found in lexicalized constructions, however we can also find a good number of constructions with transparent meanings.

Next, we will provide examples of the unmarked bases. Concerning forms with *-nu:* ‘in’, there are some examples of transparent forms:

- (11) a. *ta-?en?a-nú:-l* *if-pu:wá* *?awátfá*
 INCH-nose-in-PFV 3POS-plate boy
 ‘the boy stuck his nose in his plate’ (LB-DB)
- b. *ik-ta-maka-nu:-má:l* *nak=if-kíl-nj* *lamé:ti*
 1SUBJ-INCH-hand-in-PRG LOC=3POS-mouth-PTN bottle
 ‘I’m sticking my finger into the mouth of the bottle’ (RM-DB)

In (11a) we can literally find the sum of the parts conforming the verb *ta-?en?a-nú:* ‘put nose inside’. The same for (11b) where we show the verb *ta-maka-nu:* ‘put one’s hand inside’.

Also examples that show lexicalized meanings have been documented:

- (12) a. ta-[?]e:-nú:-ł pól[?]nú
 INCH-back-in-PFV cloud
 ‘the clouds have gone’ (LB-DB)
- b. tju:wá pól[?]tu kin-kawayúx na-ik-mak-nú:
 now all IPOS-horse FUT-1SUBJ-body-in
 ‘now I’m going to put all of my horses into the (betting) pot’ (MR-DB)

The verb in (12a) ta-[?]e:-nú: has been documented in the *UNT-Database* as the intransitive form ‘move to one side’. This meaning is hard to find by compositionality, as it is hardly the sum of ‘INCHOATIVE’ plus ‘back’ plus ‘in’. Furthermore, the IN feature, the actual component we are analyzing in this paper, does not seem to be salient in this particular combination.

The meaning encoded in mak-nú: in example (12b) is also difficult to follow by composition. In the *UNT Database* it is registered as ‘to wager something’. This is clearly a conventionalized meaning that is not the addition of parts; therefore it is lexicalized.

In sum, -nu: ‘in’ has, both highly lexicalized and transparent meanings. However, most of the combinations with -nu: are not lexicalized.

Finally, we will show some sentences with -ftu ‘out’. The following ones are examples of transparent forms:

- (13) a. na-ik-ta-[?]en[?]a-ftú
 FUT-1SUBJ-INCH-nose-out
 ‘I’ll take out what I have in my nose’ (LM-E)
- b. xu: pa:-ftú
 MTV belly-out
 ‘look, his belly is uncovered (he is removing his shirt)’ (AV-E)

In (13a) there is an intransitive verb where something is effectively going OUT from the nose. The same in (13b) where the stative verb indicates that the belly is OUT, it is uncovered with clothes.

Lastly, there are sentences where we can see much more lexicalized meanings.

- (14) a. ta-ak-ftu-má:ł nak=sipéj
 INCH-head-out-PRG LOC=hill
 ‘he is climbing the hill’ (LB-DB)
- b. na-ik-ta-tampu:-ftú lakatín na-ik-ya:wá: kin-tfik
 FUT-1SUBJ-INCH-bottom-out place FUT-1SUBJ-stand.smt.up IPOS-house
 ‘I’m going to rebuild, I’m going to build my house somewhere else’ (CF-DB)

In (14a) the intransitive verb ta-ak-ftu that according to the *UNT Database* means ‘go up, climb (hill)’, here the sense has been conventionalized and it is not the sum of the part composing the form. In (14b) we exemplify the verb ta-tampu:-ftu documented as an intransitive verb meaning ‘go backwards, retreat’.

In sum, -ftu: ‘out’ has also lexicalized and non-lexicalized meanings. However, most of the combinations with -ftu: are not lexicalized.

So far, these results seem to indicate that the VERTICAL positional bases (-kutú and -xu:) have a greater degree of lexicalization, whereas their counterparts (-nu: and -ftu:) have a smaller degree of lexicalization. This implies that -kutú and -xu: are not as free to form new words as -nu: and -ftu:. We found that the latter bases seem to constitute a more active transparent system.

Following this last idea, it is important to note that a number of verbs including -nu: and -ftu: are paired, i.e. we can find the same action or state performed both ways, IN and OUT. We can see examples of this in (15) where we have ‘to plug’ and ‘to unplug’ respectively.

- (15) a. na-ik-ma:-[?]el-nú: mangéra
 FUT-1SUBJ-CS-mouth-in hose
 ‘I’m going to connect the hose’ (RM-DB)
- b. ka-ma:-[?]el-ftu
 OPT-CS-mouth-out
 ‘unplug it! (the TV)’ (LB-DB)

Other cases we found in our corpus are ak-nu: ‘to be buried’ and ak-ftu ‘to be sticking up, to be half-buried’; a[?]pu:-nu: ‘put something on one’s head’ and a[?]pu:-ftu ‘take something away from one’s head’; laka-nu: ‘to look inside’ and laka-ftu ‘to look outside’; mak-nu: ‘to bury something’ and mak-ftu ‘to take out something from the ground’. These examples show the existence of an active transparent system formed by -nu: ‘in’ and -ftu: ‘out’; furthermore, this is no the case for -kutú ‘out vertical’ and -xu: ‘in vertical’, as we do not find parallel examples.

More evidence for the active transparent system -nu: / -ftu: is the case of wearing events. Even though they do not form part of the two-dimensional system as all of them

are lexicalized and do not encode spatial relations, they constitute a good argument to support the idea of *-nu:* and *-ftu:* not being marked with the VERTICAL/HORIZONTAL distinction and saving only the IN/OUT distinction.

- (16) a. **ta-pu:-nú:-ñj** **if-lúfũ**
 INCH-interior-in-PFV 3POS-clothes
 'He has put on his clothes' (LM-E)
- b. **na-ik-ma:-pu:-ftú** **if-lúfũ**
 FUT-1SUBJ-CS-interior-out 3POS-clothes
 'I help her to take off her clothes' (CF-E)
- (17) a. **tu:-nú:** **if-sapátu**
 foot-in 3pos-shoe
 'he wears his shoe' (RM-DB)
- b. **na-ik-ma:-tu:-ftú** **if-sapátu**
 FUT-1SUBJ-CS-foot-out 3POS-shoe
 'I take his shoe off' (AV-E)

In most of the cases the body part prefix is completely identifiable being the part that is dressed or undressed. There are some cases (such as *pu:-* 'interior') where the meaning is generalized to get dressed/undressed regardless of the particular clothing and/or the body part.

If UNT had an active four-part system, we would expect the VERTICAL bases *-kutú* and *-xu:* to form verbs of the wearing events group. For instance, activities like wearing shoes or socks are generally done following a VERTICAL trajectory, however speakers use *-nu:* and *-ftu:* instead where none of the axes is referred.

6. CONCLUSION

In this paper we have shown that Upper Necaxa Totonac does not present a symmetrical two-dimensional four-part system of positional bases. Instead, UNT has a system with one pair of marked lexemes encoding VERTICALITY plus the IN/OUT distinction; and one pair of unmarked lexemes encoding only the IN/OUT distinction (and not encoding HORIZONTALITY).

The arguments we discussed to support this thesis are the following:

- i) The distribution of the bases in different contexts.
-nu: 'in' and *-ftu* 'out' appear in both VERTICAL and HORIZONTAL contexts; whereas *-xu:* 'in vertical' and *-kutú* 'out vertical' are restricted to VERTICAL contexts.
- ii) The combinatorial potential of the positional bases with the body part prefixes.
-nu: 'in' and *-ftu* 'out' show more potential to be combined with prefixes, *-xu:* 'in vertical' combines with some prefixes, and *-kutú* 'out vertical' combines with very few prefixes.
- iii) The degree of lexicalization.
-xu: 'in vertical' and *-kutú* 'out vertical' occur mostly in lexicalized forms, whereas *-nu:* 'in' and *-ftu:* 'out', have both transparent and lexicalized meanings.

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APPENDIX

Table 1. Body Part Terms + Positional Bases according to the UNT Database and consultant preferences

	root	root				inchoative				causative			
		kutú	ftu	xu:	nu:	kutú	ftu	xu:	nu:	kutú	ftu	xu:	nu:
1	áʔa-	ear	✓	✓	✓	✓						✓	
2	áʔ-	head											✓
	ák-			✓			✓				✓		✓
3	áʔpu-	crown			✓	✓						✓	
4	tʃa-	shin	✓		✓								
5	ʔe:-	back			✓	✓	✓	✓			✓	✓	✓
6	ʔet-	mouth	✓	✓		✓		✓			✓		✓
7	ʔenʔa-	nose		✓	✓		✓	✓			✓	✓	✓
8	laka-	face	✓	✓			✓	✓	✓			✓	✓
9	máʔa-	hand				✓	✓	✓	✓			✓	
	maka-					✓	✓		✓			✓	
10	máʔ-	body			✓		✓	✓			✓	✓	
	mak-		✓			✓		✓			✓		✓
11	pa:-	belly		✓	✓		✓	✓	✓			✓	✓
12	pif-	neck					✓		✓			✓	✓
13	pu:-	vagina	✓		✓		✓	✓	✓			✓	✓
14	tampu:-	bottom					✓				✓		✓
15	ti:-	leg			✓	✓		✓	✓		✓	✓	✓
16	tu:-	foot			✓	✓		✓	✓		✓	✓	✓

- ✓ Found in Database and Elicitation
- ✓ Found in Elicitation and not in Database
- Not found in Database or Elicitation

Table 2. Combinatorial potential of Positional Bases with Body Part Prefixes

i) -ftu	'out'		
	áʔa-	'ear'	
	ák-	'head'	
	áʔpu-	'crown'	
	ʔe:-	'back'	
	ʔet-	'mouth'	
	ʔenʔa-	'nose'	
	laka-	'face'	
	maka-	'hand'	
			mak-
			pa:-
			pif-
			pu:-
			tampu-
			ti:-
			tu:-
ii) -xu:	'in'		
	áʔa-	'ear'	
	ák-	'head'	
	áʔpu-	'crown'	
	ʔe:-	'back'	
	ʔet-	'mouth'	
	ʔenʔa-	'nose'	
	laka-	'face'	
			maka-
			mak-
			pa:-
			pif-
			pu:-
			ti:-
			tu:-
iii) -xu:	'in vertical'		
	áʔa-	'ear'	
	áʔpu-	'crown'	
	tʃa:-	'shin'	
	ʔe:-	'back'	
	ʔenʔa-	'nose'	
	laka-	'face'	
			maka-
			mak-
			pif-
			pu:-
			ti:-
			tu:-
iv) -kúti'	'out vertical'		
	áʔa-	'ear'	
	tʃa:-	'shin'	
	ʔet-	'mouth'	
			laka-
			maka-
			pu:-