Stem Alternation in Thcho Yatıì Classificatory Verbs: A Cognitive Semantic Account

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Abstract: This paper investigates the phenomenon of 'classificatory verbs,' i.e., a set of motion and positional verbs that show stem alternation depending on the semantic features of one of their arguments. The data is drawn mainly from Tłįcho Yatiì Multimedia Dictionary, Nicholas Welch's field notes, and other documentary sources of the language. Tłįcho classificatory verbs are presented and analyzed in detail. The paper argues that Tłįcho Yatiì classificatory verbs belong to four semantic subclasses and that these subclasses show a decreasing degree of stem alternations related to argument classification. The inconsistency in stem alternation is triggered by the presence or absence of some semantic features that determine the number of stem allomorphs. Locative verbs are affected by the [COMFORT] feature, and the other three sets are influenced by [TRANSFER], [INITIAL AGENTIVE] and [FINAL AGENTIVE] features. Moreover, the paper outlines a sematic feature geometry that accounts for the observed regularities in classificatory verb stems and their possible variations intra- and cross-linguistically.

Keywords: classificatory verbs- Dene (Athapaskan) languages- feature geometry-semantic features- Tłıcho Yatıı (Dogrib)

1. Introduction

In Dene (previously known as Athapaskan) languages, several verbs are called 'classificatory.' These are a set of motion and positional verbs that show stem alternation depending on the semantic features of one of their arguments, the subject in intransitive verbs or the object in transitive verbs. The verb stem is differentiated as to the nature of the entity involved. According to Hoijer (1945:13), classificatory verb stems in Dene languages "refer not to a characteristic type of event, such as *stand* or *give* or *fall*, but to the class of object or objects conceived as participating in such an event, whether as actor or goal." Accordingly, there is no single verb corresponding to the English verbs like *lie* or *bring* since the verb stem varies as to the nature of the entity referred to. To illustrate, the following table shows the different classificatory verb categories related to the verb 'be located' in Mescalero Apache (Rushforth, 1991: 253, cited in Aikhenvald, 2000: 155):

- <i>'</i> ą	'a single, solid, round inanimate object'
-tį	'a single animate object'
-la	'dual objects of any kind; a ropelike object'
-tą	'elongated, rigid object; a stick-like object'
-ł-tsuus	'flexible object; a cloth-like object'
-ka	'contents of a shallow, open container; a cup- or dish-like object with its
	contents; a rigid container with its contents'
-jaash	'plural objects of any kind; uncontained dry and loose or granular'
-tłe	'uncontained wet or damp mass; dough- or mud-like substance'
-ł-tą	flexible container with its contents'
- <i>'a</i>	'indefinitely shaped single solid object'

Table (1): Stem alternation in Mescalero Apache verb 'be located'

The consensus among researchers (e.g., Blankenship, 1997; Carter, 1976; Fortescue, 2006; Henry & Henry, 1965; Hoijer, 1945; Poser, 2005; Rushforth, 1991; Willie, 2000) is that in classificatory verbs the stems have lexical semantic features that describe specific physical properties of the entities referred to: number, animacy, shape, size, consistency, rigidity, solidity, etc. These characteristics are implied by the verb stem rather than the underlying subject or object. That is, the same entity can be assigned different characteristics by the verb stem, for example, a Koyukon word meaning 'fish' can refer to different entities like frozen or dried, fresh, boiled, a meal of fish, plural fish depending on the verb stem that it associates with (Henry & Henry, 1965:113). Carter (1976: 30) suggests that classificatory verb stems reflect a taxonomy of situations involving objects rather than a taxonomy of the objects themselves.

Although the phenomenon of classificatory verbs exists in other language families (for details, see Aikhenvald, 2000: 153-158), Fortescue (2006:266) points out that it is typologically rare since it is "associated with certain languages of the polysynthetic, headmarking type, especially those of North America." Additionally, this phenomenon does not involve a consistent number of stems in all languages. According to Blankenship (1997: 94), some languages like Dene Suhné (Chipewyan) distinguish four categories of physical objects while others like Navajo and Western Apache distinguish twelve or thirteen categories (for more details, see e.g., Allan, 1977; Axelrod, 2000; Basso, 1968; Cook, 1984; de Reuse, 2006; Fernald, 2002; Krauss, 1968; Landar, 1965; Poser, 2005; Witherspoon, 1971).

This paper investigates Thicho Yatıl classificatory verbs in details and shows that they belong to four semantic subclasses. The verbs involved do not have the same number of stems within or across subclasses. The paper argues that inconsistency in stem alternations correlates with the presence/absence of semantic features. Moreover, the paper outlines a sematic feature geometry that accounts for the observed regularities and variations language internally and cross-linguistically. The remainder of this paper is organized as follows. Section (2) provides a short overview of Tłıcho Yatıì and its verbal morphology. Section (3) mentions the different sources of data that this paper relies on. Section (4) describes and examines classificatory verbs in Thicho and explains the types of classificatory verbs, reasons for the (in)consistency in stem inventories, and the organization of classificatory stems in a specific geometry, respectively. Section (5) summarizes and concludes the paper.

2. Background

Thicho Yatiì (aka Dogrib) is one of the Dene languages spoken by 1,735 people (Statistics Canada, 2017) in the Northwest Territories, specifically in a region between Great Bear and Great Slave lakes. Thicho Yatiì is often further specified as belonging to the Mackenzie geographical subgrouping of Canadian Athapaskan (the Northeastern branch of the Northern Dene languages), a classification it shares with its closely related sister languages Slave and Dene Suhné (Chipewyan) (Rice & Saxon, 2008: 699).

Like other Dene languages (e.g., Navajo, Dene Sųłiné, and Hupa), Tłįchǫ is an SOV language with head-final clausal syntax. According to Sapir (1915), verbs exhibit both subject and object agreement in person and number. The verb has a prefixing morphology in the form of a template that allows several prefixal slots, that is, a verb consists of a stem preceded by several inflectional morphemes indicating subject agreement, mode, aspect, conjugation, etc., that are arranged in a linear order (see table (2) below). Besides, most verbs contain thematic prefixes (i.e., prefixes that are not inflectional) occupying a leftward position. To illustrate, the different prefixes preceding a typical verb appear in (1):

```
1 Natlyseèchì.¹
na-tly-se-è-chì
back-dog-1SG.OBJ-PFV.3SBJ-bring
'Dogs brought me back.' (i.e., 'I came back by dogsled.')
(Welch, 2015: 265, citing TCSA 2007)
```

The verb stem -chì 'bring' occurs at the right edge of the phrase preceded by five prefixes occupying specific positions according to the template provided in table (2) below. The leftward order of these prefixes is as follows: (i) the null third person singular subject agreement, (ii) the aspectual marker \grave{e} - indicating accomplishment and perfectivity, (iii) the object agreement se- 'me', (vi) and (v) the incorporated elements (the noun tl_{l} 'dog' and the adverb na- 'back.'

Like verb phrases, other syntactic structures in Tłįchǫ are also head-final (i.e., the head follows its complements) as can be seen in (2). In (2a) the quantifier l_{ϕ} 'lots' follows the noun l_{twe} 'fish', the same pattern occurs in (2b) where the adposition gots ' $\dot{\phi}$ 'to' comes after the proper name Edz_{0} . In (2c) the complementizer gha follows hayedi 'tell'.

```
2 a) Łiwe ło gòhłj.
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liwe lo gòhlì fish lots exist 'There are lots of fish.'

b) Negolà Edzo gots'ò natla.

negolà Edzo gots'ò na-Ø-tla

Nicholas Edzo to THM-IPFV.3SBJ-walk

'Nick is walking to Edzo.'

-

¹ The following abbreviations appear in the glosses: 1= first-person; 2= second-person; 3= third-person; AR= areal; CLF= classifier; DA= disjoint anaphor; FUT= future; ITER= iterative; IPFV= imperfective; NEG= negation; OBJ= object; OPT= optative; PFV= perfective; PL= plural; POSS= possessive; REFL= referential pronoun; SBJ= subject; SG= singular; SOV=subject object verb; THM= thematic prefix.

c) Detà hayedi ha gha natomòehja. ha-ye-Ø-dı de-ta ha gha na-tomo-eh-ja THM-DA²- IPFV.3.SBJ- tell **REFL-father** back-THM-PFV.3.SBJ-**FUT** to run

'He ran home to tell his dad.' (Welch, 2015:264, citing ANON 2013)

Table (2) summarizes the linear ordering or prefixal morphological positions in the Thcho verb (Ackroyd, 1982, cited in Hucklebridge, 2016: 14)3 (for more details of Tłycho verbal morphology, see Al-Bataineh, 2020):

	00	0	1	2	သ	4	Ŋ	6	7	∞	9	10	11	12	
AFFIX SLOTS	Obj. of Incorp. Postposition	Incorp. Postposition	Adverbial	Distributive	Customary	Incorp. Stem	Number	Object	Deictic Subject	Aspect	Conjugation	Mode	Subject	Classifier	Stem
nàwhehzè 'I hunted.'			nà								whe	n	h	l	zè
'eghàlaenda 'She works.'	'e	ghà				la				e	Ø	Ø	Ø	Ø	nda
nigots'iwhi 'Let's (PL) get up.'			nı				go		ts'e		we	Ø	Ø	h	wı

Table (2): The prefixal morphological positions in the Tł₁cho verb

The verbal prefixes are classified into two categories, namely, the 'conjunct' and the 'disjunct' prefixes, according to their phonological behavior; the conjunct prefixes in positions 8- 12 sometimes coalescing with each other but seldom with the disjunct prefixes in positions 00- 4, which are more isolating (i.e., there are restrictions on the fusion process). The prefixes in positions 5-7 seem to fall between the two categories, either being assimilated into one or the other. Table (2) is intended to be used for reference when particular verbal prefixes are mentioned below (for further details about the given template, see Ackroyd (1982) and Jaker (2012), and for an overview of similar templates in other Na-Dene languages, see Kari (1989)).

² The disjoint anaphor (DA) is "a morpheme that indicates that a third-person argument must be noncoreferential with another third-person argument in the clause, generally the subject"(K. Rice & Saxon, 2008: 708).

³ The columns in the table use traditional Deneist descriptive terminology, for which the standard modern equivalents are as follows: Aspect= Substituation Aspect, Conjugation= Situation Aspect, Mode= Viewpoint Aspect, and Classifier= Voice/Valence

3. Sources of data

The data is drawn mainly from "Tłįchǫ Yatiì Multimedia Dictionary" (2006), Nicholas Welches's fieldnotes⁴ collected between 2007 and 2014 (for details, see Welch (2016a)), the Tłįchǫ version of the Bible, Ackroyd's (1982) Dogrib Grammar and other documentary sources of the language like A. Jaker, Sangris, & Sundberg (2013).

4. Classificatory verbs

In addition to the complexity of verbal morphology explained above, verb stems in Tł₁cho and other Dene languages show alternation for syntactic reasons like number, mode, situation aspect, and viewpoint aspect (e.g., a verb meaning 'SG.go' has three stems: -da, -zha and -zha in the momentaneous situation aspect for the imperfective, perfective, and optative, respectively (Ackroyd, 1982: 68)). In addition to these syntactic factors which affect all verbs, classificatory verbs also exist in Tł₁cho that show further differentiation as to the nature of the verb argument. The various lexical semantic features are implied by the verb stem rather than the underlying subject or object as can be seen in $(3a-c)^5$:

```
3 a) whe-20: be located (chunky object)
   Sadzeè dawhezo.
   sadzeè
              da-whe-20
              up-PFV.3SG.SBJ-be located (chunky object)
   clock
   'The clock is up (on the wall).'
   b) whe-la: be located (plural or ropelike objects)
   Mì taı wha k'e dawhela.
   mì tai
              wha
                     k'e
                             da-whe-la
   net three pole
                             up-PFV.3PL.SBJ-be located (plural or rope-like objects)
                     on
   'Three nets are hanging on the pole.'
```

c) whe-ty: be located (one animate object)

```
Bebìa yek'e whetį noò.
bebìa ye-k'e whe-tį noò
baby DA-on PFV.3SG.SBJ- be located (one animate object)
'The baby was lying on it.'
```

Classificatory verbs do not merely agree with category membership of their subject or object arguments, as demonstrated by the data in (3). Different verb stems may be used with the same noun as in (4) below (Nicholas Welch, p.c):

4 a) *Soomba whe-chth* money PFV.3SG.SBJ-be located (**cloth-like**)

⁴ I would like to express my appreciation to Nicholas Welch for providing the data discussed in this paper, for his constant support and for his insightful comments, constructive feedback, and helpful suggestions on earlier drafts that help me in clarifying a number of theoretical and empirical issues. All errors remain mine.

⁵ All subsequent examples are drawn from the Tłįchǫ Yatìı Multimedia Dictionary (Tłįchǫ Community Services Agency 2007) unless stated otherwise.

'The money (bills) is sitting there.'

- b) *Soòmba whe-20*
 - 'The money (a coin) is sitting there.'
- c) Soòmba whe-**la**
 - 'The money (coins) is sitting there.'

In these examples, although the same noun soomba 'money' is used, each sentence implies a different type of money since the verb stem provides the semantic features of the subject. According to Willie (2000), the fact that the same noun appears with different classificatory verbs indicates that there is no matching of identical features between the verb and the preceding noun, that is to say, the verb does not agree with the noun; instead it assigns properties to the noun because of its selection restrictions. In (3) above, the semantic features of the classificatory verb give information about the kind of money involved, and the noun soomba 'money' is assigned specific features by the verb stem. In the following section, classificatory verbs in Tłycho are discussed in more details.

4.1 Types of classificatory verbs

In their analysis of classificatory verbs in several Dene languages, Davidson, Elford, & Hoijer (1963: 30-31, cited in Rice, 1998:103) and Leer (1991:293-295) note four kinds of verbs that commonly exhibit classificatory constructions: stative verbs, transitive verbs denoting handling or moving, transitive verbs denoting throwing or dropping, and intransitive verbs of nonvolitional motion, as illustrated in table (3):

Set A: stative verbs ("locative verbs"; no movement; orientation of object at rest {e.g., *sit, lie, be in position, be in location*})

Set B: verbs of handling, manipulation, continuing manual contact {e.g., give, hand, take, put, handle, lower, pick up, bring, carry, misplace}

Set C: verbs of partially controlled action initiated by agent {e.g., toss, throw, throw out/ dispose of, hang up, set down, drop, lose, push over}

Set D: verbs of free movement; movement independent of agent {e.g., fall/tip over}

Table (3): Types of classificatory verbs

In Theo, the given four sets of verbs form the only categories of classificatory verbs ⁶. These sets are not identical to each other; they differ in form and meaning and in the number of categories distinguished (i.e., the number of stems conveying qualitative features is not the same in all sets.). Set A includes stative or locative verbs indicating no movement of the entity referred to (i.e., the argument is at rest). Although this set includes positional verbs 'be in location', 'lie', 'sit', 'stand', 'squat', 'kneel', etc. only the verb 'be located, lie' shows full alternation of verb stem as shown in table (4) below:

⁶ Some other Dene languages have minor additional categories of classificatory verbs, such as those denoting eating and drinking (S. Rice, 2009).

Category	'lie'
default/ chunky entity	whe ? q
container	whe <i>htq</i>
sticklike/ rigid entity	whe <i>tq</i>
clothlike entity	whe <i>chi</i>
ropelike entity	whe <i>la</i>
plural inanimate entity	whe <i>la</i>
animate entity	whe <i>t</i> į
plural animate entity	geèhte

Table (4): Stem alternation of 'lie' (in the imperfective and third person arguments)

The other positional verbs in this set have reduced stem paradigms. The verb 'stand' shows only three stems depending on animacy and number features of the argument, as demonstrated in (5):

```
5 a) Dechį nàįza
      dechį
              nà-1-2a
              THM-PFV.3SG.SBJ-stand up (sticklike object)
      stick
      'The stick is standing up.'
   b) Dedìt tèenàwo
      dedìı tèe-nà-Ø-wo
      moose water-THM-IPFV.3SG.SBJ-stand up (animate)
      'The moose is standing in the water.'
   c) Ełek'èdaà nàts'eèhzha
      ełek'èdaà
                             nà-ts'eè-h-z.ha
     one after another
                             THM-IPFV.1PL.SBJ-CLF-stand up (plural animate)
     'We are standing up in line.'
   d) Ts'ı nàchjèzha jlè kọ
              nà-chi-è-zha
      ts'ı
                                                                  ılè
              THM-stick-PFV.3SG.SBJ-stand up (plural inanimate) past tense marker
      tree
      ko
```

'There used to be trees standing there.'

there

In (5a,b), the verb 'stand' shows a stem change for inanimate singular objects like *dechų* 'stick', and it becomes -2a and -wo. Sentences (5c,d) demonstrate another stem occurring for plural entities, namely, -zha, which is invariable for animacy. Although the stem -2a is used for inanimate singular entities, it can also be utilized for animate arguments like in the following expressions meaning squat and kneel (derived from 'stand up') in (6):

```
6 a) Nàtl'àgots',,,h2a
      nà-tl'à-go-ts'e<sub>l</sub>-h-2a
      THM- buttocks- AR- IPFV. 1PL.SBJ - CLF- stand up (plural animate)
      'We are squatting.'
   b) Nàgòts',,,h2a.
      nà-gò-ts'11-h-2a
      THM- knee- IPFV.1PL.SBJ- CLF- stand up (plural animate)
      'We are kneeling.'
```

Similarly, reduced paradigms of stem inventories also appear in other locative verbs, namely, $\partial -da/-ke/-kw'e$ 'sit SG/ DUAL/ PL' and $g\hat{o}-2\rho/-la$ '(area) be located SG/ PL.' As can be seen in (7a-d) below, these verbs show stem alternations depending on number feature of the argument:

a) Setì nàke segà geke.

```
nàke
                            se-gà
                                                  ge-ke
1sg.poss-daughter
                      two
                             1sg.obj-beside
                                                 IPFV.3DUAL.SBJ-sit
                                                                        (dual
 animate)
```

'My two daughters are sitting with me.'

b) Ts'alı detsi k'e dageèhkw'e.

```
ts'alı
        detsį
              k'e
                       da-geè-h-kw'e
frog
        log
                       up-IPFV.3PL.SBJ-CLF-sit (plural animate)
               on
'There are frogs sitting up on a log.'
```

c) Yee kòa gò20.

```
kòa
                    gò-Ø-20
vee
over there shack AR-IPFV.3SG.SBJ-sit (singular inanimate)
'There is a shack there.'
```

d) Nàzedìi kộ lọ gòla.

```
nàzedìi kò
               ło
                      gò-Ø-la
store
        there many AR-IPFV.3SG.SBJ-sit (plural inanimate)
'There are lots of stores.'
```

To sum up, locative verbs in set A do not show the same level of stem alternations. We can notice that there are three groups: (i) full alternation: only one verb 'be located, lie' which has eight different stems corresponding to semantic features of the argument, (ii) alternation only for animacy and number features: the verb 'stand', (iii) alternation only for number feature: the verbs 'sit' and '(area) be located'. This alternation in the number of stems does not only exist in Tlıcho but also in other Dene languages like Dene Sułiné (Chipewyan) as table (5) demonstrates (S. Rice, 2002: 69):

'stand'	'sit'	'lie', 'sleep' ('be- at- rest')
the y į	the da	(jq) thεtų (animate object)
		(jq) the ltį (dead object)
		(jq) the $\mathbf{2q}$ (round object)
		(jq) thetq (sticklike object)
		(jq) the lchúdh (flat, flexible object)
		(jq) the kár (flattened, formerly taller object)
		(jq) thε kq (liquid object)
		(jq) the ltq (contained object)
		(jq) thε dzάι (granular object)
		(jq) the la (e.g., a book, a plurality of objects)
'3sg is standing'	'3sg is sitting'	'3SG is lying (here)'

Table (5): Stem alternation of Dene Suliné locative verbs (in the imperfective and third person arguments)

In sharp contrast to positional verbs discussed so far, handling verbs included in set B above show consistency in their stem alternation. Verbs in this set include those related to handling, manipulation and continuing manual contact (e.g., *give*, *hand*, *take*, *put*, *handle*, *pick up*, *bring* and *carry*). Consider table (6) below:

Category	'give'	'hand over'	'pick up'	'take home'	'take out/ remove'	'put down'	'carry'
default/ chunky entity	weghàts'e 2à	wetl'aàts'ee2à	nıts'ıìh 2à	etats'e 2à	kàts'e2 à	nèts'e2à	k'ets'e ?à
container	weghàts'e t į	wetł'aàts'ee t į	nıts'ıìh t į	etats'e t į	kàts'e t į	nèts'e t į	k'ets'e t į
sticklike/ rigid entity	weghàts'e t į	wetl'aàts'ee t į	nıts'ıìh t į	etats'e t į	kàts'e t į	nèts'e t į	k'ets'e t į
clothlike/ small entity	weghàts'e chi/ tsi	wetl'aàts'ee cht/ tsi	nıts'ıìh chı / tsı	etats'echi/ tsi	kàts'echı/ tsi	nèts'echi/ tsi	k'ets'echi/ tsi
heavy entity	weghàts'e xe	wetł'aàts'ee xe	nıts'ıìh xe	etats'e xe	kàts'e xe	nèts'e xe	k'ets'e xe
plural inanimate entity	weghàts'e le	wetl'aàts'ee le	nıts'ıìh le	etats'e le	kàts'e le	nèts'e le	k'ets'e le
animate entity	weghàts'e tè	wetł'aàts'ee tè	nıts'ıìh tè	etats'e tè	kàts'e tè	nèts'e tè	k'ets'e tè
many entities	weghàts'e wa	wetł'aàts'ee wa	nıts'ıìh wa	etats'ew a	kàts'e wa	nèts'e wa	k'ets'e wa

Table (6): Stem alternation of handling verbs (in the imperfective and first-person plural arguments)

As can be seen in the table above, handling verbs show consistency in their stem alternation. In each row, the same stem is repeated regardless of the handling verb, for example, the stem -2à 'default' chunky entity' exists in all verbs. The following sentences related to clothlike or small entities are illustrative⁷:

8 a) Dechikàà ejak'è kàe**chı** ha.

> dechikàà kà-e- chi ejak'è

board window THM-IPFV.3SG.SBJ-take out (clothlike/ small entity)

ha **FUT**

'He will take out the board from the window.'

b) Kwe niitsi ha.

kwe ha

THM-OPT.3SG.SBJ-pick up (clothlike/ small entity) FUT rock

'He is going to pick up the rock.'

c) Nekw'ohzeè k'ehchı-le.

ne-kw'oh2e-è k'e-Ø-h-chi-le

2sg.poss-shirt-pns THM-IPFV.3SG.SBJ-CLF-carry (clothlike/small entity)-NEG

'He doesn't have/ carry your shirt.'

d) Dechi dzo nèehchi.

dechį dzo nè-eh-**chi**

stick here THM-PFV.1SG.SBJ-bring (clothlike/small entity)

'I brought the stick here.' (A. Jaker, Sangris, & Sundberg, 2013:162)

e) Nezeh seghàihchi.

ne-2eh se-ghà-ih-chi

1SG.OBJ to-OPT.1SG.SBJ-give (clothlike/small entity) 2sg.poss-jacket

'Give me your jacket.' (A. Jaker et al., 2013:216)

As can be seen in (8 a-e), all handling verbs meaning take out, pick up, carry, bring and give have the same stem for the entity referred to (in this case clothlike or small object). Regarding verbs in set C; verbs related to partially controlled actions (e.g. toss, throw, hang up, drop, lose, and push), the consistency in the stem alternation found above does not appear in this set. That is to say, verbs in this set have different stems to refer to the same semantic feature. In (9a,b) below, -tsi and -xà are used for animate entities, and in (9c,d) tsi and -tl'i are used for rigid objects:

9 a) kàts'ehtsi 'push out'

Xàyıhtso.

xà-ye-1-h-tso

THM-DA.OBJ-PFV.3SG.SBJ-CLF-push out (animate entity)

'He pushed him out.'

⁷-chi and -tsi are used interchangeably in some Tłicho dialects (i.e., some dialects distinguish between ch and ts while some do not).

```
b) hodàts'eehxà 'throw down'
  Hodàyeehxà gà ts'ehlį làat'į.
  hodà-ye-e-h-xà
                                                                      ts'ehłį
                                                               gà
  down-DA.OBJ-IPFV.3SG.SBJ-CLF-throw (animate entity)
                                                               and
                                                                      shaking
  làat'ı
  seem-do
  'He throws him down and he shakes.'
c) wets'eehtsi 'push'
  Behtsıì wets'eehtsı.
  behtsiì we-ts'ee-h-tsi
           THM-IPFV.1PL.SBJ-CLF-push (rigid entity)
  sled
  'We are pushing the sled.'
d) ots'eehtl'i 'throw away'
  Dechi òihtl'ì.
  dechį go-gha-į-h-tl'i
  stick AR-for-IPFV.2SG.SBJ-CLF-throw away (rigid entity)
  'Throw the stick away.'
```

In addition to the use of the different stems to refer to the same semantic feature, we can notice that the same stem *-tsi* is used for animate and rigid objects with the verb 'push.' This stem is also used with other semantic classes as well. In (10) below, the same stem is also used for plural animate, heavy and cloth objects:

```
10 elets'eehchi 'push each other' (crowd) goyitts'eetsi 'push inside' (heavy object) tets'ehchi 'push under water' (cloth object)
```

In her study of classificatory verbs in Cherokee, Blankenship (1997: 95-96) notices that some classificatory verbs do not have distinct stems for all semantic classes. She indicates that

classes can be missing for semantic reasons. For example, 'fall over' has no form for COMPACT, LIQUID, or FLEXIBLE, since none of those kinds of items could stand upright. In other cases, although a plausible meaning might exist, there is still no distinct stem for one or more of the classes. In such a case, a form is borrowed from another class.

Agreeing with Blankenship (1997), I find that unlike verbs in sets A and B above, verbs in set C lack some stems; they do not have the full alternation found in previous sets. Because these verbs are deficient, they borrow stems from other classes, and one stem becomes the default one which can be used with nouns related to different semantic categories. The same situation also appears in set D including verbs of free motion; movement independent of the agent (e.g., *fall/tip over*) but with more reduction in stem inventory. The stem -*kw'i* is invariable for animacy and number in (11a-d), and the stem -

tl'i can be used for several semantic classes including liquid, rigid singular and plural entities in (12a-c):

11 a) Nàwikw'i sòò!

nà-wi-kw'i sòò

THM-OPT.2SG.SBJ-fall (animate singular entity) warning expression

'Don't fall!'

b) Nàts'ekw'ı.

nà-ts'e-kw'i

THM-IPFV.1PL.SBJ-fall (animate plural entity)

'We fall down.'

c) Kwe kıdàekw'ıh ha.

kwe ki-dà-e-kw'ih ha rock down-up-IPFV.3SG.SBJ-fall (rigid singular entity) FUT

'The rock is going to fall down.'

d) Nesoòmbaà xàekw'ı sòò.

ne-soòmbaà xà-e- kw'i sòò

2sg. Poss- money out-IPFV.3SG. SBJ-fall (plural entity) warning expression

'Your money might fall out.'

12 a) Tso hodàetl'ì.

tso ho-dà-e-**tl'ì**

AR-up-IPFV.3SG.SBJ-fall (**liquid entity**) rain

'Rain is falling down.'

b) Nòdawò 2eh gha nezi, weghà nàtl'ì-le t'à.

nòda-wò 2eh gha weghà nà-Ø-tl'ì-le nezį,

lynx-skin jacket for good for ITER-IPFV.3SG.SBJ-fall (rigid entity)-

NEG

t'à

because

'Lynx fur is good for jackets, because the hair does not shed.'

c) Įt'ò này**tl'y** nọò.

įt′ὸ̀ nà-1-tl'1 noò

THM-PFV.3SG. SBJ-fall (plural entities) evidently leaf

'The leaves have fallen.'

To sum up this section, we noticed that there are four sets of classificatory verbs in Thicho. The first set including locative verbs has only one verb, viz., 'lie, be in location,' that shows a complete stem alternation, and other positional verbs are considerably limited in their inventories. The second set including handling verbs shows consistency in stem alternation. The other two sets related to partially controlled actions and free movements seem inconsistent and limited in their stem alternation. These findings beg important questions: (i) Why do some classificatory verbs show consistent and full stem alternation while others do not? (ii) Why do not classificatory verb sets include some semantically related verbs, for example, set B does not include handling verbs meaning *catch*, *touch*, *move* or *lift*? (iii) Why are other types of verbs (e.g., motion verbs) non-classificatory? The following subsection addresses these questions.

4.2 Classificatory verbs and other verb types

The fact that some classificatory verbs show consistent and full stem alternation while others do not can be accounted for by proposing a semantic solution, the paper argues that the semantic features of the verb determine its stem inventory. Regarding the first set related to positional verbs, we noticed that 'lie' is the only verb in this set that has different stems corresponding to the entity referred to, other verbs meaning 'sit,' 'stand,' 'kneel,' 'squat' are limited in their stem alternation. This phenomenon is related to the fact that locative verbs are human posture verbs that are semantically extended to conceptualize the existence and location of inanimate objects. Although all these verbs show similar semantic extensions in many languages, they do not have the same domain of use (see, e.g., Newman (2002) for a cross-linguistic overview). In English, for example, *lie* has a much wider use than *sit* or *stand*. The domain of *lie* extends to arguments which cannot cooccur with other posture verbs (13a,b) or to one of them (13c,d):

- 13 a) The clothes are lying/?sitting/?standing on the floor.
 - b) Palmerston North lies/?sits/?stands north of Wellington.
 - c) The mattress is standing/lying / ?sitting on the floor.
 - d) The computer lies/ sits/?stands on a desk in our house. (Newman, 2002:7-9)

The distribution of these posture verbs indicates the following hierarchy: lie > sit > stand > squat, kneel with an increasing restriction on the choice of the argument (the last verbs occurring only with animate objects) ⁸. The reason behind this hierarchy is that the verb lie refers to a general, long-lasting state with "the longest duration or extendedness" (Lichtenberk, 2002) and the least sensorimotor control relative to other posture verbs. In other words, the verb lie has the most comfortable posture and the most prolonged duration than other locative verbs, and the hierarchy above corresponds to the semantic feature [COMFORT]; lie (representing the most comfortable posture) can be used with all types of arguments (i.e., no restrictions at all), and a verb like squat (representing the least comfortable posture) can be used only with animates, and other verbs like sit and stand show different degrees of restrictions in-between. Returning to our discussion of Tłącho locative verbs, 'lie' is the only positional verb that can be used with all kinds of arguments; hence, it has full stem alternation. In sentences (5-6) above, 'stand' can only be used with animates like humans or animals (e.g., dedit 'moose') or inanimates extended vertically like decht 'stick' or ts't 'tree'. Verbs like 'squat' and 'kneel' can only be used with humans

⁸ This hierarchy seems valid for a number of languages like Arabic, English, Manam and other Oceanic Languages (Lichtenberk, 2002: 305) Russian and Germany (Aikhenvald, 2000:153), but it is not claimed to be universal as this claim needs to be cross-linguistically investigated (which is not within the scope of the paper).

9. In support of this argument, S. Rice (2002: 72) notes that "the size of the Dene [Suliné] posture stem inventories correlates with the lack of control. The greater the stem set, the lesser the amount of control required for the posture." To illustrate, she further indicates that

whereas all physical objects can be said to 'lie' or 'be at rest', thus necessitating a relatively large 'lie' or 'be at rest' stem inventory, only a subset of living animate objects (humans and certain animals) can 'sit', while only humans and even a smaller handful of largish mammals can 'stand' (S. Rice, 2002: 72)10.

Furthermore, unlike other posture verbs in Tłıcho, 'lie' (in its extended use to inanimate entities) has a general, rather than a specific use. That is to say, although 'lie' can be used to mean 'sit' in some contexts, this use is different from another related verb, namely, Ø-da/ -ke/ -kw'e 'sit SG/DUAL/PL' which indicates actual sitting position (in sentences like (7) above). This general use of 'lie' makes it the default, unmarked positional verb, therefore, it is the only posture verb that undergoes the final evolutionary stage in the grammaticalization process: POSTURE > LOCATIVE/ EXISTENTIAL USE > ASPECTUAL, and it becomes an aspectual marker 11 (for a detailed cross-linguistic discussion of this process, see Kuteva (1999) and for supportive analyses, see Kilian-Hatz (2002) and Lichtenberk (2002)).

Unlike Thcho 'lie' and other positional verbs related to static location (no movement) of the object, other classificatory verbs (those in sets B, C, and D above) indicate a movement of an entity. Regarding verbs related to handling, manipulation and continuing manual contact (e.g., give, pick up, bring and carry), these verbs, unlike verbs of partially controlled actions and free movement (in sets C and D), show consistent full stem alternation. Although they have complete stem inventory, they do not include some semantically related verbs like *catch*, *touch*, *move* or *lift* ¹². *Yexèlaedi* 'touch with the hands; put hands to' has one invariable stem exemplified in (14a-c):

14 a) Yexèlaidi sòò.

ye-xèla-1-**d1** sòò DA-THM-OPT.3SG.SBJ-touch warning expression 'Don't let him touch it.'

b) T'à do eyaelii hazoò Zezì xèlageedi ha giiwo t'à wets'ò elegeehtsi.

t'à do eyaelii hazoò Zezì xèla-gee-di person disease because everyone Jesus THM-IPFV.3PL.SBJtouch

⁹ According to Croft (1994:158), "the difference between animates and inanimates is that an animate being's posture is only a transitory fact about the animate being, while the inanimate object's shape is (generally) an inherent property."

¹⁰ Thcho inanimate objects extending vertically can be used with 'stand', while Dene Suhnè 'stand' cannot be used with inanimate objects.

¹¹ The aspectual use of whe-stem is controversial in the literature, Bortolin (1998), A. Jaker (2012), and K. Rice (2000) consider it as a marker of a combination of accomplishment (lexical/inner aspect/Aktionsart) and perfectivity (viewpoint/outer aspect), while Wilhelm (2003, 2008) demonstrates that it does not correlate consistently with these categories. And in fact, it occurs in both perfective and imperfective of most stative verbs (Nicholas Welch, p.c.).

¹² The same phenomenon exist in Cherokee (Iroquoian) as pointed out by Blankenship (1997: 96).

ha g μ -w ϕ t'à wets' ϕ ele-gee-h-ts ι for IPFV.3PL.SBJ-want because towards each other-IPFV.3PL. SBJ-CLF-push

'So that those with diseases were pushing forward to touch him.' (Mark 3. 11)

c) Nexèlaedı.
ne-xèla-e-dı
2SG.OBJ-THM-IPFV.3SG.SBJ-touch
'She is going to touch you.'

Other semantically related verbs are the following: ts'e(h)li 'catch by net or fish hook' has only one stem -li; nagoeda '(area, person) move' is intransitive (with only one stem -da); dawiite 'be lifted up' is always translated in the passive (although it is not a passive form in Tłącho since it lacks the passivization d- classifier). These observations beg two questions: (i) Why do not these handling verbs have stem alternation (although they are supposed to be classificatory)? (ii) Why do verbs of partially controlled actions and free movement (in sets C and D above) have limited stem inventories? I argue that the answer to these questions lies in the defining semantic features that classificatory verbs have, which are [SPATIAL] (denoting a relation between the verb and the argument in a specific spatial domain) and [DIRECTION] (denoting a course along which something/someone moves). These two features are subsumed under the feature [PLACEMENT].

All classificatory verb sets seem to be classified into two groups: group one includes locational verbs (e.g., 'lie', 'sit', 'stand', etc.,) because they have the [SPATIAL] feature, and group two includes all other verbs in sets B, C, and D because they share the [DIRECTION] feature. Within the first group, 'lie' has the largest stem inventory because, unlike other locative verbs, it has the longest duration and the most comfortable posture (in addition to other reasons given above). In the second group, verbs sharing the [DIRECTION] feature have the following hierarchy (from the most to the least stem alternation consistency): handling verbs> partially controlled actions> free movements, because these sets are differentiated based on three minor features subsumed under the primary [DIRECTION] feature, namely, [TRANSFER], [INITIAL AGENTIVE] and [FINAL AGENTIVE]. [TRANSFER] denotes a change/ move from one person/place to another, [INTIAL AGENTIVE] denotes that the argument intentionally initiates the action (i.e., the external argument is the volitional or primary causer of the action expressed by a verb); and [FINAL AGENTIVE] denotes the extent to which the agent can determine or control the consequences of the action. To see why classificatory verbs in group two have the given hierarchy, consider the following table:

	[TRANSFER]	[INITIAL AGENTIVE]	[FINAL AGENTIVE]
Handling verbs (e.g., give, take, put, etc.)	+	+	+
Partially controlled verbs (e.g., throw away, drop, , etc.)	+	+	-
Free movements (e.g., fall, tip over, etc.)	+	-	-

Table (7): Semantic features affecting the (in)consistency in stem alternation

According to this table, handling verbs have consistent stem alternation because all verbs in this set denote the following: (i) a change from one place to another and from one person to another (i.e., [TRANSFER]); (ii) the argument intentionally initiates the action (i.e., [INITIAL AGENTIVE]); (iii) The doer has full control over the action and its consequences (i.e., [FINAL AGENTIVE]). Partially controlled verbs have less stem alternation because although they denote a transfer of an object from one person/place to another (i.e., [TRANSFER]), and they denote that the argument is the volitional or primary causer of the action (i.e., [INITIAL AGENTIVE]), they lack [FINAL AGENTIVE], that is to say, the agent cannot determine or control the consequences of the action (cf. 'throw away' vs. 'give'). The last set related to free movements shows the least stem alternation because it includes verbs that have the [TRANSFER] feature but lack both [INITIAL AGENTIVE] and [FINAL AGENTIVe]; the falling entity (i.e., animate or inanimate object) does not intentionally initiate the action and cannot determine or control the consequences of the action.

The claimed features do not only clarify the different stem alternations in the given sets, but also explain why some semantically related verbs are not classificatory (e.g., the verb 'touch' in (14) above), and why some semantically unrelated verbs like 'eat' or 'drink' are classificatory in some but not all Dene languages. According to S. Rice (2009), Koyukon and other non-Dene languages like Muskogee and Cherokee have a dedicated classificatory verb stem category for food substances regarding acts of eating and drinking, but these classificatory systems are not about eating and drinking as much as they are about how particular objects get transported to the mouth. In S. Rice's words (2009:128), "handling something into the mouth remains the dominant organizing schema for a majority of Dene eating predications." In a similar vein, Blankenship (1997:96) indicates that classificatory verbs in Cherokee include verbs like 'send' and 'wash' since these verbs represent concrete ways of handling objects. These arguments support the claim given above that the reason for stem alternation is the existence of semantic features in the verb; if these features are highly prominent, the stem varies in the language (like in Koyukon and Cherokee), otherwise it does not (like in Theho Yatıl), following Friedrich (1970:380) who argues that classificatory stems are "syntactic devices utilized by many languages of the world linguistically marking highly salient features of the physical world". What is regarded as 'salient' and requires a separate stem is a language-specific issue giving rise to variations in lexicalization patterns.

4.3 Semantic feature geometry of classificatory stems

In the previous subsection, it is proposed that (in)consistency in stem inventories is systematic to a great extent as evidenced by the existence of specific semantic features that influence stem alternation. What remains to be addressed in this paper is the question of how Theho speakers select the right stem and associate it to the intended referent, that is, how stems are grouped conceptually. Before proposing an answer to this question, let's reflect upon the widespread conception sketched above about the complexity of Dene verb morphology in general. Briefly, Dene verbs are considered to be "both polysynthetic marvel and nightmare" (S. Rice, 1998:99), and what is relevant to the discussion on classificatory verbs is the quote from Landar (1967: 268) that Dene "children are confronted with many problems of categorization early in life [that would lead them to] make mistakes because of stimulus generalization." However, this view is questionable because Dene children without speech impairment acquire their language without any special efforts or noticeable difficulty, and in McDonough's words (1996:235), "language learners themselves have no obvious difficulties with the languages in question."

Following McDonough's view, I claim that classificatory verbs do not pose any problem to Thicho speakers in their speech production and comprehension. That is, speakers do not need extra efforts to access or process sentences including classificatory verbs. To illustrate, let us consider a sentence like (8 b) above, repeated as (15):

```
15 Kwe niitsi ha.
  kwe
             nı-ì- tsı
                                                          ha
             THM-OPT.3SG.SBJ- pick up (small entity)
  rock
                                                          FUT
   'He is going to pick up the rock.'
```

The speaker of this sentence assigns the semantic property 'smallness' to the noun kwe 'rock' by the utilization of the stem -tsi rather than other stems denoting different semantic properties. A speaker of a language like English needs to use an adjective like small to assign the same property to the noun. Therefore, while the verb stem suffices to modify the noun by providing more information about it, an English verb like give cannot serve the same task, and an adjective is needed. This claim is not to suggest that classificatory stems have an adjectival function, but to propose an ad hoc hypothesis that classificatory stems correlate with adjectives. That is, there is a relation between classificatory verbs and the number of adjectives. In languages like Tłicho which utilize verb stems instead of adjectives to assign properties to the noun, adjectives are not much needed like in languages like English, for example. Consequently, the number of adjectives may be reduced to a handful of lexical entities, or to put it the other way, classificatory verbs are used as a compensatory strategy for the lack of adjectives because "adjectives in Tłicho Yatıì are a small lexical class" (Welch; 2016:3), assuming a correlation between the presence of classificatory verbs and the lack of adjectives (a hypothesis that needs further investigation in other languages to be verified).

Returning to the question of how Tłycho speakers select the right stem and associate it to the intended referent, I argue that the selection of a specific stem follows a defined process which can be represented by a systematic geometry as the following one characterizing the different (encircled) stems of Thcho 'be located' (the minus sign does not mean that the feature is inactive or absent, rather it denotes 'the opposite of', for example, [-SG] means 'dual or plural', [-ANIMATE] 'inanimate', [-SOLID] 'nonsolid (i.e., liquid')', etc.,):

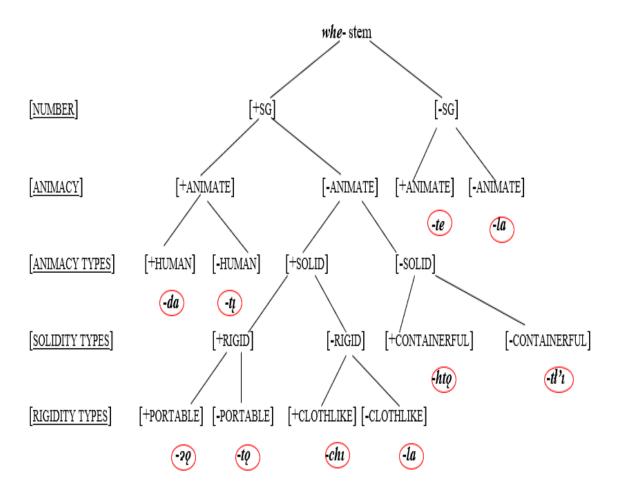


Figure (1): Feature geometry of 'be located' stem alternation

This representation is inspired by other geometric arrangements of features for other classifier systems (cf. Enrico, 1987; Friedrich, 1970), for phonology (e.g., Sagey, 1990, cited in Al-Bataineh, 2019:3), and morphosyntax (e.g., Harley & Ritter, 2002) which propose structured and organized features in a hierarchically way; lower features are linked with higher ones by dominating nodes. In the given geometry, the features encode semantic distinctions between the different possible stems related to 'be located.' Features in the first level are specified on the [NUMBER] tier which occupies the highest position because it exists not only in classificatory verbs but also in non-classificatory one (e.g., the verb 'kill (animals)' has three forms according to the number of the entity being killed: layeewhi 'kill one animal', *laewhi* 'kill one or two animals', *layeehde* 'kill plural animals'). The [NUMBER] tier dominates [ANIMACY] because these two major distinctions are present in all verbs whether they are classificatory or not (i.e., the lower tiers exist only in classificatory verbs). At the [ANIMACY] tier, stems related to [+SG] -te and -la can be selected since they cannot be specified further. The same operation applies at the [ANIMACY TYPES] tier for -da and -ti which are distinguished on the [+/- HUMAN] feature (cf. Croft, 1994:158; Davidson et al., 1963:40). More semantic specifications exist at the [SOLIDITY TYPES] tier (i.e., material consistency) where [+SOLID] is categorized for rigidity and [-SOLID] is categorized for [+/- CONTAINERFUL] (both -hto and -tl'i denote liquids which are differentiated according to whether they refer to entities in a container or not). At the [RIGIDITY TYPES] tier (i.e., individuation), more semantic features are needed to differentiate between rigid and flexible entities. [+RIGID] entails two sets classified according to their portability and they are expressed by -20 and -to. The [-RIGID] feature distinguishes between clothlike objects (-chi) and ropelike objects (-la).

The argument that classificatory verb stems are organized in a tree-like geometry leads to several claims. Firstly, the geometry of semantic features accounts for the observed regularities in classificatory verb stems and their possible alternations intra- and crosslinguistically. The regularities/ alternations in stem inventories are triggered by the presence/ absence of particular features, that is, the absence of two contrastive stems, for instance, -chi vs. -la above, can be claimed to be triggered by nonexistence of their distinctive feature [-RIGID] (to borrow a term from phonology, I claim that the distinctive feature [-RIGID] is underspecified, thus, its dependent features [+/- CLOTHLIKE] are not present in the paradigm, and in this case, another stem (most probably the default one) is used). Secondly, this geometry claims that the presence of a stem lower in the hierarchy entails the presence of its dominating nodes and their associated features, for example, the presence of stems distinguished on the basis of [+/- PORTABILITY] entails that the presence of other stems distinguished on the basis of [+/- SOLIDITY], [+/- ANIMACY] and [+/-NUMBER] (i.e., if a language has a feature lower in the geometry, it always has the higher features that dominate it).

Thirdly, the given features above can be placed on a continuum of a scale of markedness and complexity (cf. Enrico, 1987). Features like [NUMBER] and [ANIMACY] are unmarked and less complex than other features in the geometry depending on the claim that, unlike other features, [NUMBER] and [ANIMACY] play a significant role in the semantics and syntax of verbs cross-linguistically. Adani et al., (2010:2163, based on the findings of Carminati, 2005; De Vincenzi & Di Domenico, 1999) highlight that [NUMBER] is accessed faster and more reliably than any other features (such as [GENDER], [ANIMACY], etc.) because syntactically it has an independent functional projection, and semantically it is "more salient ... as it signals the cardinality of the noun and its computation requires the instantiation of one (singular) vs. more than one (plural) entities". [ANIMACY] also has equal significance. As correctly indicated by Croft (1994:157-165), in all predicate classifier systems, animate beings are distinguished from inanimate ones whereas features of material consistency are just "secondary distinctions", that is because animates "can be agentively self-moving, and more important, they can change shape". Other features in the geometry (i.e., [SOLIDITY], [REGIDITY], [PORTABILITY], etc.) are not only less salient and more marked but also acquired later than [NUMBER] and [ANIMACY]. Subrahmanyam et al., (1999:154), based on several language acquisition studies (e.g., Bloom, 1994; Dickinson, 1988; Prasada, 1993) argue that "names for solid substances are especially hard to acquire, as children's default construal is that of object, not substance". Soja (1992) and Soja et al., (1991), cited in Smith (1999:279), find that 2-year-old children generalize the exemplar's name "ignoring sameness or difference in shape". Generally speaking, the given studies support the view of qualitative features to be asymmetric concerning their complexity and markedness.

Fourthly, the meaning of each stem is determined by the semantic features present in its dominating nodes, for example, the meaning of -hto is the result of the features [+ CONTAINERFUL], [-SOLID], [-ANIMATE] and [+SG] which are not shared by another stem; thus, they provide a unique definition of -hto. The given features determine the plurality, animacy, material consistency (i.e., the degree of firmness, density, or stickiness of the element particles), and individuation (i.e., the distribution in space) of the entity referred to. From Lexical Semantics (i.e., Generative Lexicon theory) perspective, the given features provide sense delimitations of the verb stem by conveying the basic Qualia structure (i.e., the essential attributes or the interpretative space of an entity (Saint-Dizier, 2013:47)). The feature geometry affords the formal role (that distinguishes the object within a larger domain) and the constitutive role (that describes the parts of the object) whereas the verb root provides the event structure (i.e., the telic role (that defines the purpose and the function of the object) and the agentive role (that describes the actions which allow for the creation of the entity (for more details, see, e.g., Pustejovsky, 1991a, 1991b; Saint-Dizier, 2013).

Fifthly, in cases of mismatch between the intended referent and the verb stem (i.e., when the stem is used in violation of its selectional properties in a humorous, pejorative, or any non-literal use), the geometry above predicts an instance of a feature spreading from one tier to another (analogous to spreading in a phonology). For example, when a boy is obstinate and behaving lump-like, the speaker does not use a stem for animate human entities to describe him; instead the speaker uses a stem for solid entities. In such cases, the assignment of an unexpected feature can be represented in the following diagram in which the feature [+rigid] extends its domain of use (referred to as 'spreading') and replaces the [+animate] feature with the result that the boy is still understood to be an animate entity but resembles a lump.

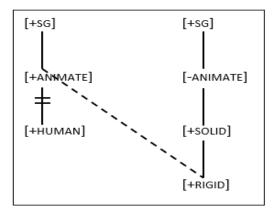


Figure (2): Spreading of a semantic feature

In sum, the discussion of feature geometry of classificatory stems is intended to reveal that stems are well-organized, and speakers can easily select the right one systematically, contra arguments in the literature that "children are confronted with many problems of categorization early in life" (Landar 1967: 268). However, the feature geometry is just a preliminary attempt to demonstrate that semantic features associated with stems can be analyzed in a principled way, further investigations are needed to test, modify, and develop the argued paradigm in the light of data from other classifier systems (i.e., noun, numeral, locative, and deictic classifier systems).

5. Summary and conclusion

This paper explores Theho classificatory verbs with a special focus on their stem alternation. The paper shows that four sets of classificatory verbs vary in their stem inventories. The first set including locative verbs has only one verb (i.e., 'be in location') that shows a complete stem alternation. The second set including handling verbs shows consistency in stem alternation, but the remaining two classificatory sets related to partially controlled actions and free movements seem inconsistent and have reduced stem paradigms. The paper argues that the inconsistency in stem alternation among the different semantic classes is caused by the presence or absence of some semantic features. Locative verbs are affected by the [COMFORT] feature, and the other three sets are influenced by [TRANSFER], [INITIAL AGENTIVE], and [FINAL AGENTIVE] features. Moreover, the paper proposes a preliminary geometry of semantic features associated with classificatory stems. The given geometry is hoped to account for the observed regularities in classificatory verb stems and their possible alternations intra- and cross-linguistically. The discussion of stem geometries claims that features are arranged hierarchically on the basis of dominance of major features to minor ones, the semantic features are placed on a continuum of a scale of markedness and complexity, and in cases of mismatch between the intended referent and the verb stem, spreading of a feature takes place in the form of extension of the domain of use to provide the desired meaning.

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