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The Encoding of Spatial Relations in Lushootseed

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1.0 Pieroe's (1932) classification of signs into icons, indexes and symbols reflects three different relationships between form (signum) and referent (signatum). The relation between form and referent in a symbol is arbitrary, or non-motivated, while in an icon or index it is motivated, or non-arbitrary. Motivation in an indexical relation is based on contiguity of form and referent, while in an iconic one it is based upon resemblance.

Pieroe distinguishes two types of icon, the image and the diagram. In an image the resemblance between form and referent can be perceived with less reliance on conventional or arbitrary rules than in a diagram. The form of imagic icons, such as photographs or onomopoeic words, has the same qualities as the referent. However, conventional rules play a part in the interpretation of images. People unused to photographs must learn how to see the forms in them, and onomopoeic words in one language may strike the non-speaker as being rather unnatural (as, for example, animal calls). The form of a diagrammatic icon, such as a blueprint, graph or mathematical formula, does not share the same qualities as its referent. Rather, both contain corresponding relations, and understanding that correspondence depends upon knowledge of conventional rules. Examples of diagrammatic iconicity in language are reduplication, to indicate plurality, distribution, intensification or diminution, and 'sequencing', the presentation of events in a sentence or text in an order which corresponds to their actual occurrence, or their felt importance. (see Jakobsen 1971).

1.1 Diagrammatic Iconicity in Lushootseed

The purpose of this paper is to show that spatial relations are encoded in the semantic sub-structure of Lushootseed, and that the means by which they are encoded can be described as a kind of diagrammatic iconicity.

I will attempt to show that phonemes carry information about the spatial dimensions of the referents of morphemes of which they are part. That information can be said to be the 'sense component' of a phoneme. The sense component does not correspond to a specific shape, but rather it encodes several different features, or dimensions, of spatiality. The sense component and the referent share a set of corresponding spatial dimensions, so that the relation between them can be described as one of diagrammatic iconicity. Figure 1 on the following page presents the spatial dimensions that are part of each sense component, and the phoneme or phonemes which carry each sense component. Figure 1 covers only the sense components of consonants. Vowels appear to have sense components as well, and their significance is discussed below in section 5.

The main part of this paper (sections 3, 4 and 5) will be concerned with specifying the nature of the sense components. However, in the following section (2) I will first discuss the correspondence between the primary spatial dimensions (the configurations ENCOMPASSED, TRANSITIONAL and EXTENDED) of the sense components and the kinds of spatial configurations upon which a system of orientation and location is based.

2.0 The Orientational System

Lushootseed has a set of terms which are used to orient the speaker, or locate an object within different contexts. There are three different contexts in which orientation occurs, and they correspond to contrastive domains of the

Spatial Dimensions of the Sense Components

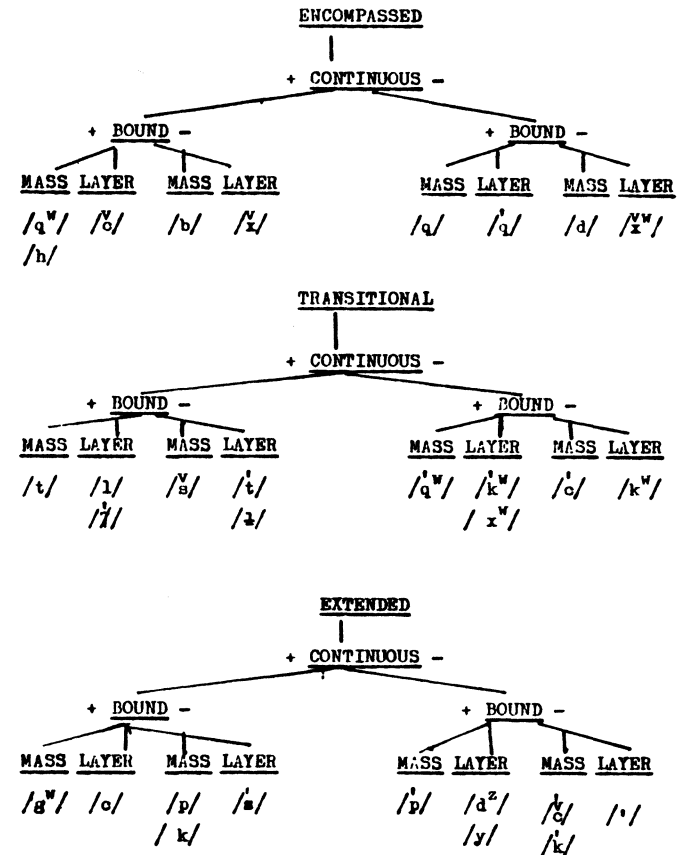


Figure 1

natural and social world.

2.1 The House - An Encompassed Framework for Orientation

One set of terms refers to orientation and/or location within a house. The house is a framework with a central focus and an encompassing periphery. Traditionally, the household fire was at the center of the house, or household unit within a large house. Orientation or location within the house is expressed as being towards or away from the fire.

'alq^w 'away from center; away from fire' 2

'alq^w-bi-d (away from center - indirect - transitive)
'behind something (inside a building)!

sula 'center'

sula-d (center-transitive) 'place it in the center'

sula-tr^w (center-causative) 'bring it out from the wall'

2.2 The Shore - A Transitional Framework for Orientation

Outside the house one framework consists of the contrastive domains of land and water and the boundary created by their juncture, the shoreline. Two of the orientational terms refer to movement across the boundary of the shoreline, and two refer to movement which is limited or contained by this boundary.

A. Movement across the shoreline:

ca^w'k^w 'located out in the river, lake or sound-from the perspective of land'

ta^t 'located away from shore, up landward - from the perspective of water'

B. Movement limited by the shoreline

cu^b 'go up from shore, go up the river bank'

ki^w 'go down to the water's edge'

The term 'transitional' used to describe this configuration refers to the transition from one domain to another and to the focus on the boundary between the distinct domains.

2.3 The Flow of Current - An Extended Framework for Orientation

The third framework for orientation is based upon the sense of extension in space caused by the flow of current (downstream), or caused by movement against the current (upstream).

qix^w 'located upstream'

ta^yil 'go upstream'

ax^vad 'located downstream'

q^wic 'go downstream'

The sense of movement or extension due to the external force of the current is also suggested by the metaphoric use of q^wic 'go downstream' to mean 'one who cheats' (one who circumvents work to achieve an end). The root tay 'go on a raid', probably related to ta^yil 'go upstream' also suggests an extension against an external force.

Figure 2 summarizes the relation between the three orientational frameworks and the spatial dimension of configuration that is part of the sense component of a phoneme. ENCOMPASSED, TRANSITIONAL and EXTENDED are the three forms of the spatial dimension of configuration.

spatial dimension	ENCOMPASSED	TRANSITIONAL	EXTENDED
orientational framework	house	shoreline	current flow

(figure 2)

The two systems can be said to share the same underlying 'diagram' of spatial relations.

In the next section I will discuss the kinds of diagrams

formed by the different spatial dimensions of the sense components.

3.0 The Spatial Dimensions

As indicated in Figure 1, the sense components of phonemes consist of the following spatial dimensions:

Configuration: ENCOMPASSED / TRANSITIONAL / EXTENDED

Continuity: +/- CONTINUOUS

Boundedness: +/- BOUND

Internal Differentiation: MASS/LAYER

On the following page Figure 3 arranges the sense components so those that contrast in a single dimension can be more easily compared. Roots composed of phonemes whose sense components contrast in terms of a single dimension will be compared in order to illustrate the properties of those spatial dimensions.

3.1 The Dimension of Configuration : ENCOMPASSED/TRANSITIONAL/ EXTENDED

A sense of the spatial properties of the three types of configuration will be indicated first by listing some of the words (beginning with the appropriate phoneme) in which extended, transitional or encompassing spatial relations are strongly marked.

ENCOMPASSED

q^wulu 'encircle'

h^adiw 'enter a building'

q^vax^wucid 'cover'; q^vax^wali 'quiver for arrows'; q^vik^w 'stuff into'.

s^ab^hi 'hoop'; h^alaw^h 'bubbling up'; bulux^w 'round, sphere'

x^aq 'wrap around'; x^alabac 'hollow cedar tree'; x^aac 'cover'

q^abalic 'roll it up'; s^aq^alik^w 'blanket'; s^aq^alak^w 'circle'

q^aq 'gather into a lump'

q^ak^w 'inside a small confining place'

x^wuk^wdis 'buttoned, hooked, fastened'; x^waq^w 'bind'

Figure 3

Configuration			
ENCOMPASSED	TRANSITIONAL	EXTENDED	Other Dimensions
/q ^w /i/h/	/t/	/g ^w /	+ CONTINUOUS+ BOUND+ MASS
/o/	/t ⁱ /i/l/	/c/	+ CONTINUOUS+ BOUND+ LAYER
/b/	/b ^a /	/p/; /k/	+ CONTINUOUS-BOUND+ MASS
/x/	/t ⁱ /; /z/	/s/	+ CONTINUOUS-BOUND+ LAYER
/q/	/q ^w /	/p/	-CONTINUOUS+ BOUND+ MASS
/q/	/k ^w /; /x ^w /	/a ² /; /y/	-CONTINUOUS+ BOUND+ LAYER
/a/	/o/	/c/; /k/	-CONTINUOUS-BOUND+ MASS
/x ^w /	/k ^w /	/t/	-CONTINUOUS-BOUND+ LAYER

TRANSITIONAL

The TRANSITIONAL configuration, like the shoreline framework for orientation, reflects transitions between distinct domains, transitions in the boundary between distinct domains, or simply a focus on the transitional boundary.

təd^{il} 'go to bed'; təq 'close, block'; tuk^w 'immerse'
ləc 'come down hard on'; lu 'hole in the ground'; lu^w 'old'
ʔip 'encircle in one's grasp'; ʔal 'put on clothing, encase'
sex^waq 'carrot'; sed^{al} 'go outside'; sik^w 'emerge from water'
təba 'fall into water'; təq 'adhere'; tised 'arrow, bullet'
ləlp 'vibrate'; ləp 'blink'; ləlad 'park a car'; ləlalil 'go ashore'
kəlu 'skin, hide'; kəp-1 'affinal relationship'; kəp-1 'spill, pour'
k^wit 'go to the water's edge'
xə^s 'throw, broadcast, potlatch'; x^wit 'fall, drop from height'
x^was 'urinate'
cəq 'windpipe'; cəx^v 'wear out'
cis 'nailing, hammering'
kəda 'take, get, hold'; kəda^v 'climb hill'

EXTENDED

kəda^k 'horn, antler'; kəax^w 'more than one go for a walk'
kə^d 'down'; kə^wihi 'call to, invite'
cəq 'jab'; osk^w 'straight'; okusəd 'cane'; oq^wul 'post, sticking up'
paka 'scatter'; p(a)q^w 'smoke of a fire'; pax^v 'spread'; pus 'throw'
kiis 'stand up'
saq^w 'fly'; saxəp 'jump or run fast'; sidu 'swing aside, turn'
pəq^w 'drift, throw into water'; pili 'flat, broad'
d^{al} 'turn, reverse side of'; də^k 'travel, be unstable'
d^{ix} 'first'; də^{ub} 'kick'
ca 'dig out'; cit 'near'
ʔab 'reach, extend'; əʔ 'come toward'; ʔibə^v 'travel on land'
ʔix^wi 'throw away'; utəb 'stretch'; ux^w 'go'; ulu^w 'travel by water'

Groups of two or three roots which contrast only in one of the types of configuration (ENCOMPASSED/ TRANSITIONAL/ EXTENDED) will be compared in order to show the contrastive dimension in relief.

The sense components of /x/ and /t/ contrast only in terms of the configurations ENCOMPASSED/ TRANSITIONAL. That distinction is illustrated by comparing the following roots:

ʔəq 'wrap around'
təq 'thick, like dough pressed together, adhere'

The sense component of the final consonant /q/ consists of the dimensions ENCOMPASSED -CONTINUOUS +BOUND +MASS. When /q/ is in first position, these qualities are in focus, as in qil 'incarcerate'; qit 'circle around'; qəbəlid 'roll it up'; qəbəqəbayus 'bat (the mammal)', an animal which sleeps rolled up inside itself. All these roots refer to an encompassed, bound mass in which the center is discontinuous from the periphery. Both ʔəq 'wrap around' and təq 'layered thickness, adhere' refer to actions which both have a sense of applying an outer layer to a discontinuous inner mass. ʔəq 'wrap around' refers to an encompassing form of this action, while təq 'layered thickness, adhere' refers to a transitional form.

The roots grouped together below further illustrate the three types of configuration, ENCOMPASSED, TRANSITIONAL and EXTENDED:

EXTENDED də^p-il 'turn, as in the seasons' turning'.
 ENCOMPASSED qəp 'gather, form a lump'
 EXTENDED də^{il} 'turn away from in disgust'
 TRANSITIONAL kə^wil 'peer, peek, look from behind something'
 ENCOMPASSED qil 'get in conveyance'

EXTENDED	<u>pa-t</u>	'thick (dimension)'
ENCOMPASSED	<u>ba</u>	'full from food and drink'
EXTENDED	<u>sali</u>	'two'
TRANSITIONAL	<u>tal</u>	'slice, split open'
ENCOMPASSED	<u>xal</u>	'mark, write, decorate'
EXTENDED	<u>ciq(i)</u>	'poke, jab'
TRANSITIONAL	<u>ʔiq</u>	'emerge'
EXTENDED	<u>sik^w</u>	'tear apart'
TRANSITIONAL	<u>ʔik^w</u>	'hook'

3.2 The Dimension of Continuity (+/- CONTINUOUS)

The dimension of continuity refers to the presence or absence of a break or disruption in either the boundary of an entity, the relation of an entity to its context, the momentum of an action, etc.

The following pairs of roots contrast only in the dimension of CONTINUITY and thus present it in relief.

A. ENCOMPASSED Forms

+CONTINUITY	<u>bək^w</u>	'ball'
-CONTINUITY	<u>dək^w</u>	'put inside small, confining place'
+CONTINUITY	<u>xat-^vxat-a-dis</u>	'hard, solid (like a board)'
-CONTINUITY	<u>xʔt^v</u>	'tear, torn'
	<u>xʔt-is^w</u>	'silver diver' (a bird that disrupts the surface of water by diving).

B. TRANSITIONAL Forms

+CONTINUITY	<u>tu'(u)</u>	'saliva, spit'
-CONTINUITY	<u>q'u'(u)</u>	'gather, collect'
+CONTINUITY	<u>ʔil</u>	'far, remove to a distance'
-CONTINUITY	<u>kʔil^w</u>	'peer, peek, look from behind something'

+CONTINUITY	<u>lu'</u>	'hole in but not through something'
-CONTINUITY	<u>kʔlu'</u>	'hollow'
+CONTINUITY	<u>ʔa^v</u>	'what is understandable' (<u>dx^wʔa^vsucid</u> 'Lushootseed')
-CONTINUITY	<u>xʔa^v</u>	'scatter, distribute' (<u>xʔa^v-alik^w</u> 'potlatch')
	<u>-alik^w</u>	'patterned activity'

C. EXTENDED Forms

+CONTINUITY	<u>gʔd^w</u>	'down'
-CONTINUITY	<u>ʔad-il</u>	'drift and lodge on shore'
+CONTINUITY	<u>s-g'a^w</u>	'one's own'
-CONTINUITY	<u>pa'</u>	'try to do something, taste it'
+CONTINUITY	<u>ca^w</u>	'straight'
-CONTINUITY	<u>dʔk^w</u>	'travel, wander, be unstable'

3.3 The Dimension of Boundedness (+/-BOUND)

The presence of the dimension BOUND (+BOUND) focuses on the delimiting boundaries of an entity or an event, while -BOUND focuses on that which is delimited. The spatial sense of +/- BOUND depends upon the configuration (ENCOMPASSED, TRANSITIONAL or EXTENDED) in which it occurs. Within an ENCOMPASSED configuration +BOUND refers to containing, delimiting or encompassing properties, and -BOUND refers to delimited, contained or encompassed ones. Within a TRANSITIONAL configuration, the presence of the dimension +BOUND signals a transition within a bound framework, or transition from a central point to or through a periphery. The dimension -BOUND reflects the transitional qualities of the entity itself, or a transition within an unbound or extensive framework. Within an EXTENDED configuration the dimension +BOUND reflects the property of extension that is due to the summation of many bound increments. -BOUND refers to non-incremental extension. (Note that extension against the current's flow

requires repeated or incremental applications of force, while extension with the current's flow can be seen as non-incremental extension).

The following contrastive pairs of roots illustrate the properties signalled by the dimension of boundedness:

A. ENCOMPASSED Forms

- +BOUND (containing) q^wal(a) 'drive, herd, expel, drive off'
 -BOUND (contained) ba^l(a) 'cure by shaman'(expels evil spirits)
 +BOUND (containing) v^oba' 'carry on back'
 -BOUND (contained) x^gb 'very heavy'

B. TRANSITIONAL Forms

- +BOUND(center-periphery) t^od^zil 'go to bed'
 -BOUND(extended) v^sd^zal 'go outside'
 +BOUND(center-periphery) v^lal 'put on clothing, encase'
 -BOUND(extension) tal 'slice, split open'
 +BOUND(center-periphery) lu'(u) 'hole in but not through'
 -BOUND(extension) tu'(u) 'hole through something'

C. EXTENDED Forms

- +BOUND (incremental) pi^gw 'flatus'
 -BOUND (non-incremental) ci^gw-il 'become rotten, decay'
 +BOUND (incremental) g^wd 'down, below'
 -BOUND (non-incremental) psd 'dirt, soil, bury'

3.4 The Dimension of Internal Differentiation (MASS/LAYER)

This dimension signals the presence or absence of internal differentiation in an entity or event.

A. ENCOMPASSED Forms

- MASS bi^g 'smash, crush' (force applied to whole mass)
 LAYER xi^g 'fell a tree' (force creating inner layer)

- MASS q^osi' 'male sibling of either parent while parent living'
 LAYER q^osed 'partition in a long house'. That partition would separate the family of one's q^osi' in a long house containing several related families.

B. TRANSITIONAL Forms

- MASS v^ssq 'high up'
 LAYER i^zq 'thick like dough pressed together, adhere'
 MASS q^wol 'ripe, warm, cook, bake, burn'
 LAYER k^wol-'affinal relationship'
x^wol-k^w 'wrap around, intoxicated'
 MASS v^sob-^zd 'bag net'
 LAYER t^ob-^zs 'braid'

C. EXTENDED Forms

- MASS g^wil(i) 'dig up something buried'
 LAYER cil(i) 'upbear, place in receptacle, dish up'
 MASS pal-ic 'go over a point'
 LAYER d^zal 'reverse the side of'
 MASS pa^g 'worthless, junk'
 LAYER d^za^g 'mixed up, confused'

4.0 The Sequencing of Spatial Dimensions

In section 3 I attempted to describe or illustrate each of the spatial dimensions of a sense component by contrasting roots that differed in terms of a single spatial dimension. In this section I will discuss the effect on the meaning of a root as a whole of certain sequences of spatial dimensions. I will examine those roots in which the initial and final consonants differ only in terms of a single spatial dimension in order to illustrate the ways in which the contrast or sequencing of spatial dimensions is reflected in the meaning

of the root.

4.1 Sequencing of the Dimension of Continuity

A. ENCOMPASSED Forms

The sense components of /b/ and /d/ differ only in terms of the dimension of continuity. A root with the sequence b-V-d might be expected to signal the juxtaposition of continuity and discontinuity or the development from one to the other in an entity or event. bad 'father' and bāda 'offspring' embody a concept that juxtaposes continuity and discontinuity from oneself, and also signals the development from continuity with oneself to discontinuity.

B. TRANSITIONAL Forms

The sense component of /l/ and /ʃ/ contrast with that of /k^w/ and /x^w/ only in terms of the dimension of continuity. Roots beginning with /l/ or /ʃ/ and ending with /k^w/ or /x^w/ might be expected to refer to a transition from continuity to discontinuity in the referent, or in some other way contrast these two qualities. Conversely roots beginning with /k^w/ or /x^w/ and ending in /l/ or /ʃ/ might be expected to reflect a sequence from the discontinuous to the continuous in the referent, or simply signal the contrast in the two qualities.

lɔk^w 'put in the mouth'

luk^w 'dip net'

lɔx^w 'stab, cut up'

lux^w-us 'pry bark off' (us-face, upper surface)

ʃk^w-ɔd 'chop it'

ʃux^w 'thing is cold' (used in euphemisms for death)

The above roots all signal some sort of sequence from the continuous to the discontinuous. The opposite effect is signalled by the followings:

k^wɔl- 'affinal relationship' Non-kin (discontinuous relation)
are made into kin (continuous relation).

k^wlu^w/k^wal 'skin or hide'

k^wal-tɔd 'fish skin'

x^wɔl-k^w 'wrap around, intoxicated'

k^waʃ 'vulgar term for sexual intercourse'

All these word signal a transition from discontinuity with a body to continuity with it.

C. EXTENDED Forms

One root which illustrates the sequence or transition from continuity to discontinuity within an extended framework is pak(a) 'scatter, distribute'. The sequence or transition from discontinuity to continuity is illustrated, somewhat more abstractly, by ʋɔɔ 'tell, report, inform, news'. The flow of information in this case creates continuity where there had been discontinuity.

4.2 Sequencing of the Dimension of Internal Differentiations

MASS/LAYER

A similar kind of root-internal contrast can be observed when initial and final consonants contrast only in the dimension of internal differentiation. Either the dimensions of MASS and LAYER are juxtaposed, or a shift in focus is signalled from one to the other.

A. ENCOMPASSED Forms

A shift in focus from LAYER to MASS is signalled by the sequence of sense components in ʋib 'grab with pressure (as a hawk would do), claw'. Focus is placed first on the action of grabbing, second on the encompassed mass. In contrast, in qig 'incarcerate' the focus shifts from MASS to LAYER. qig 'incarcerate' focuses primarily upon the encompassed mass,

and secondarily shifts focus to the encompassing layer.

B. TRANSITIONAL Forms

The internal shift in focus from MASS to LAYER in the transitional configuration is illustrated by tul-, a root which occurs in the following forms:

s-tul-x^w 'river'

s-tul-ig^wəd 'blood'

tul-il 'cross a river or other body of water' (Shomish and Southern dialects).

tul(u) 'interpret, translate' tulud 'follow one's own blaze (on a trail)'.
(on a trail)'.
The root tul- signals the contrast of a mass in transition within an outlined (layered) course.

An inverse shift in focus, from LAYER to MASS is signalled by the root ʔat- that occurs in the form ʔatəd 'seine, salmon webbing trap'. The primary focus is on the peripheral layer, the webbing or net, while the secondary focus is on the masses-water and fish- that flow through it.

C. EXTENDED Forms

Several roots in the EXTENDED configuration which signal a contrast of MASS and LAYER have counter parts in the ENCOMPASSED and TRANSITIONAL configurations. Compare:

ʔuq^w 'whittle' /^w/ LAYER
/q^w/ MASS ENCOMPASSED+CONTINUOUS+ BOUND

x^w-ciq^w-di-d 'take parts out' (x^w- 'container')
/o/ LAYER EXTENDED +CONTINUOUS +BOUND
/g^w/ MASS

Both ʔuq^w and -ciq^w signal an alteration in or through the outer layer which affects a mass.

Or, compare
s.tuləx^w 'river' /t/ MASS
tul- s.tulig^wəd 'blood' /l/ LAYER TRANSITIONAL +CONTINUOUS
+BOUND
tulil 'cross body of water'

g^wəc- g^wəoil 'wade or stand in /g^w/ MASS EXTENDED+CONTINUOUS
shallow water' /o/ LAYER +BOUND

tul- signals a transition of a mass in relation to an outlined (layered) course, while g^wəc- signals an extension of a mass in relation to a differentiated (layers of air/water) context.

4.3 Sequencing of the Dimension of Boundedness

The contrast of +BOUND/-BOUND in a sequence of sense components signals a shift in focus from delimiting structure to delimited substance. This shift in focus is often reflected in a sense of transformation or re-structuring.

A. ENCOMPASSED Forms

A concrete sense of restructuring is indicated by such roots as qəx^w 'crack, split, half'; qada 'steal; back up'; and q^wib 'prepare, fix, make', while a more abstract sense is indicated by ɬəc^w 'mind, inner thought, sense, understanding, count'.

B. TRANSITIONAL Forms

Restructuring or transformation within the transitional configuration involves a shift from a form with a defined center and periphery to a more extensive, unbound form (or vice versa).

Shift in focus from s-structure with center and periphery to one without this form is signalled by roots such as q^wiq 'lose a spouse through death'; tal(a) 'slice, split open' and tal-x 'lose balance backwards'. Roots such as ɬal 'land, dock, go ashore, park a car' and ɬəl-p 'vibrate, quiver,

wriggle' signal a shift in focus from an extensively structured action to one that takes place within a peripheral boundary.

C. EXTENDED Forms

In the extended framework roots such as piḡ^v-ḡd 'spirit power'; 'ay 'change, store, cache' and 'ay'find' consist of a sequence of sense components that contrast in the dimension of boundedness. They all signal a sense of restructuring or transformation.

5.0 The Sense Components of Vowels

The sense components of vowels correspond to the spatial dimension of configuration, but are less specifically spatial. The sense of /u/ 'completion, result' derives directly from the aspectual prefix 'u-' with the same meaning, and the sense of /a/ 'intrinsic' has been described, from a different perspective, as the qualities of /a/ as an affix (Heas and Hilbert 1981). Figure 4 lists the sense components of the vowels, together with the spatial dimensions they (roughly) correspond to.

<u>Vowel</u>	<u>Sense Component</u>	<u>Corresponding spatial Dimension</u>
/a/	intrinsic	ENCOMPASSED
/u/	completion, result	ENCOMPASSED
/ə/	transformation, change in boundaries	TRANSITIONAL
/i/	change of position, location	EXTENDED

Figure 4

The sense components of vowels will be illustrated by their occurrence, alternately, within the same sequence of consonants.

A. Vocalic Alternation in Encompassed Forms

The sequence b-V-l refers to a range of related meanings which is limited or specified by the occurrence of a particular vowel. The range of meanings is determined by the sense components of the initial and final consonants. For b-V-l the range is for circular or other encompassed forms in which /ə/ indicates that the boundaries will be relatively fluid or changing, /i/ indicates that the form undergoes some change in position or location. /u/ indicates a framework in which the boundaries no longer undergo any sort of change, and /a/ specifies an internal or intrinsic locus for the form. These qualities are evident in the following words:

- bəlawp 'bubbling up'
- dx^vbiloḡp 'fall on rump' (dx^v- is the somatic prefix limiting the range of the suffix (i)ḡ 'curved object' to a body part. -ḡp 'bottom' further specifies that the body part is the buttocks)
- bulux^v 'round' sphere'
- ball 'forget'
- a.baluoid 'in-law when link is deceased'

Other contrasts within the encompassed framework are:

- /ə/ 'change of boundaries' vs. /i/ 'change of position'
- ḡeq^v 'wrap around'
- ḡiq^v 'scratch itch'
- ḡəḡed 'partition in a long house'
- ḡis 'peek by moving curtain aside'
- /i/ 'change in position' vs. /a/ 'intrinsic'
- ḡ^vil 'lost, turned around'
- ḡ^val 'lack control'

B. Vocalic Alternation in Transitional Forms

- /u/ 'completive' vs /ə/ 'transitional' vs /i/ 'change of position' vs /a/ 'intrinsic'

ʔs.k^wulu 'hollow'
k^wɔl 'affinal relationship'
k^wil 'peer, peek, look over shoulder'
k^wal-o 'wrench back of body'

/u/ 'completive' vs /i/ 'change in position'

suk^w 'cedar bark still on tree'
sik^w 'rip, tear, take apart'

/u/ 'completive' vs /ə/ 'transitional'

tux^w indicates contrastive clause ('yet, merely, just')
təx^w 'pull, drag'
lux^w-us 'pry bark off'
ləx^w 'stab, out up'

/u/ 'completive' vs /a/ 'intrinsic'

tu 'spit/ tu'ad 'saliva'
ta- 'hunger, thirst'

/ə/ 'transitional' vs /i/ 'change in position'

ʔə 'deep beneath the surface'
ʔiə 'encircle in one's grasp'

/i/ 'change of position' vs /a/ 'intrinsic'

k^wi 'determiner of remote, vague or hypothetical matters'
k^wa 'leave it alone' and 'modal particle denying absolute certainty.'

C. Vocalic Alternation in Extended Forms

/ / 'transitional' vs /i/ 'change in position' vs /a/ 'intrinsic'

pəx^w-cut 'spouting of whale'
pixi 'shake down'
paxi 'spread'

/u/ 'completive' vs /a/ 'intrinsic'

puk^wəb 'pile'
-pak^w 'lie with hind end up'

/ə/ 'transitional' vs. /i/ 'change in position'

s-pəc 'feces'
pic 'wring it out'

/u/ 'completive' vs. /i/ 'change of position' vs. /a/ 'intrinsic'

d^wul-əu 'wave of water'
d^wil 'dislike intensely' (i.e. turn away from in disgust)
d^wal 'reverse the side of'

6.0 Conclusions

The encoding of shape or spatial relations has been documented for many languages, particularly those of the New World (Friedrich 1972 and references therein). Friedrich notes that these studies focus on numeral classifiers, classificatory verbs and locative shape affixes as the vehicles for communicating spatial information. The purpose of this paper has been to describe a kind of spatial information, more abstract than 'shape', encoded in what I refer to as the sense components of phonemes. Each sense component consists of a set of spatial dimensions. For consonants, these dimensions are configuration (ENCOMPASSED, TRANSITIONAL and EXTENDED), continuity (+/-CONTINUOUS), boundedness (+/- BOUND) and internal differentiation (MASS or LAYER). Vowels encode information analogous to the dimension of configuration, but more abstract and sometimes aspect-like in sense.

The encoding of spatial dimensions in the sense components of phonemes has been discussed as an example of diagrammatic iconicity. The diagrammatic icon (the sense component) and the referent share a corresponding set of spatial relations. In addition, the system of sense components as a whole is linked by a relation of diagrammatic iconicity to a system of orientation and location. The dimension of configuration (ENCOMPASSED vs. TRANSITIONAL vs. EXTENDED) is a salient

feature in the organization of both systems. The three con-figurational forms correspond to the contrastive domains of orientation: house, shore and river.

Haiman notes that while the structure of language may reflect the structure of thought, the presence of iconicity in language indicates that "the structure of thought, in its turn, reflects the structure of reality" (1980:537). As a system of conceptual organization, Lushootseed is particularly well attuned to the spatial dimensions of entities, events and relations in the world.

FOOTNOTES

1. Research for this paper was generously supported by the Melville and Elizabeth Jacobs Fund, the Wenner-Gren Society and Columbia University.
2. The reference for all English glosses is Hess 1976.

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Traces of "Abnormal" Speech in Lushootseed

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Sapir's highly provocative article, "Abnormal Types of Speech in Nootka" (Sapir, 1915), has not, to my knowledge, stimulated sufficient interest in the topic of "consonant play" among latter day researchers in the Northwest to provide papers on the topic in other languages of the region. The only one I am familiar with is Dell Hymes' "How to Talk Like a Bear in Takelma" (Hymes, 1979).¹ In particular, I do not believe anyone has published on the subject in a Salish language. As a small step toward closing this gap in our scholarly literature on Northwest languages, I present here the types of consonant change used in Northern Lushootseed.

The corpus from which these data come was collected in the 1950's and 1960's,² a time when the moribund state of Lushootseed was well advanced. It is possible, even probable, therefore, that Lushootseed consonant play was more extensive than the few types described here. Except for some nasalization, all cases have been culled from taped myths.

There are four broad categories of consonant change known to have been used by Lushootseed speakers. These are replacement by bilabials, palatalization, and two degrees of nasalization.

Examples of the first are few and all come from stories told by the same raconteuse.³ This class of changes replaces /t/ and /ʔ/ with /p/, and /w/ with /b/. The word *stáʔtadayʔ* 'girl' becomes *spáʔpadayʔ* on the lips of Rotten Log (*páqac*) on four occasions