

Glottal Assimilation and Hardening  
in Kwakiutl<sup>1</sup>

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1. Introduction.

Hardening, a term used by Wakashan linguists to describe the effect of glottalization on stem-final consonants which is caused by a certain group of suffixes, has been traditionally assumed to be the result of diachronic processes (Sapir 1938, Swadesh 1948). Such solutions were hypothesized because there seemed to be no surface phonological evidence which would account for hardening by a process of glottal assimilation, and have led researchers to posit either morphophonemes (Sapir 1938, Swadesh 1948) or underlying segments (Rose 1976). In Kwakiutl, however, some surface phonological evidence exists which indicates that hardening is the result of glottal assimilation between the initial segment of a suffix and a stem-final consonant. This paper acquaints the reader with these few scant clues and briefly discusses the implications which they have for earlier work.

2. Hardening.

The following table presents the relationships between plain consonants and hardened consonants. Voiceless stops and affricates become their homorganic glottalized counterparts, while fricatives for the most part become sonorants.<sup>2</sup>

Stops-

Plain	p	t	ʔ	c	k	kʷ	q	qʷ	wənq - əq hole - inside
Hardened	p̣	ṭ	ʔ̣	c̣	ḳ	ḳʷ	q̣	q̣ʷ	wónənq̣əq̣ having a a deep hole hole inside (363)

Fricatives-

Plain	ɬ	s	x	xʷ	ʃ	ʃʷ	nəs - əq dry fish - inside		
Hardened	ɬ̣	ɣ̣	or	č̣	ṇ	ẉ	ʃ̣ʷ	ẉʃ̣	ná'čəq̣ fish not properly dried inside (363)

Sonorants-

Plain	m	n	l	y	w	han - əq - əla dish - among more than two - -continuative (363)
Hardened	ṃ	ṇ	ḷ	ỵ	ẉ	nañaq̣əla to have dish standing among (337)

Only voiceless obstruents and sonorants are affected by hardening suffixes, as the following data exemplify.

Stem Final /d, ɬ, e/

d	gʷəd - əq to untie - inside	gʷəuáq̣ (363) to untie inside
ɬ	gúl - əq to scoop inside	- a S.C. gú'ʔg̣əlaqa (363) to scoop out inside

ə ʔaːle - qa ʔáleqa (363)  
to search among more than two to search among

### 3. Glottal Assimilation.

Although the majority of hardening suffixes in Kwakiutl do not have a surface suffix-initial "hardening" segment (see Sapir 1938), the following data suggest that some suffixes have an initial segment which causes glottal assimilation to preceding voiceless obstruents.

#### Suffix-Initial /k/

##### A. Glottal Assimilation

ʔasut - kən - iʔ ʔapsutəniʔ (357)  
one side - body - nom. one side of body

məx - kəgaʔ məŋgaʔ (358)  
to strike - make a noise to begin to sound like striking

bəkʷ - kəla bəkʷala (FN)  
man - noise man's noise

nap - kən napən (FN)  
hair - body hair on body

xʷəs - ap - kən xʷədʔapən (FN)  
hit - back - body hit on back of head

##### B. No Assimilation

ʔola - kən ʔólaʔkən (357)  
real - body able bodied

ləm - kən ləmʔkən (357)  
scabby - body to be scabby on body

mul - xʔid - kəla mulxʔidkəla (358)  
thanks - aspect - noise song of thanks

#### Suffix-Initial /xʔ/

##### A. Glottal Assimilation

čeq - xʔənʃ čéqənʃ (305)  
winter dance - season winter dance season

čus - xʔənʃ čuyənʃ (305)  
to dig - season season for digging

mas - xʔənʃ mayənʃ (305)  
which - season which season

##### B. No Assimilation

nəm - xʔənʃ nómʃənʃ (305)  
one - season one winter, one year

wáxa - xʔənʃ wáxaxʔənʃ (305)  
many - season number of winters

mu - xʔənʃ muxʔənʃ (305)  
four - season four winters, four years

#### Suffix-Initial /gaʔ/

##### A. Glottal Assimilation

ləp - gaʔla lápəla (351)  
spread - to perform no action without previous consideration to spread at once without looking

kʷət - gaʔələ kʷətələ (FN)  
to stick - hold on to stick onto something

ʔax - gaʔələ ʔaxələ (350)  
to be - to move on something above to get on a thing

duxʷ - gaʔələ duxʷələ (350)  
to see - suddenly to see suddenly

##### B. No Assimilation

sən - gaʔələ séngaʔələ (FN)  
to think - hold on to thought of an idea

wən - gaʔla wəwəngəla (351)  
drill - to perform no action without previous consideration to drill without looking

sən - gaʔaʔəla  
plan - to move above

xən - gaʔaʔəla  
snare - to move above

Suffix-Initial /kaʔ/

A. Glottal Assimilation

gəlt - kaʔis  
long - belly

čəkʷ - kaʔis  
short - belly

čəx - kaʔis - əla  
pain - belly - cont.

[R] - qəy - kaʔis  
Distributive - many -  
belly

gəy - kaʔis  
inside - belly

gəy - kaʔis - əla  
hold - belly - Cont.

səngaʔaʔəla (350)  
to have planned

xəngaʔaʔəla (350)  
snare gets caught

gəltis (326)  
long belly

čəkʷis (326)  
short belly

čəniʔsələ (326)  
pain outside of stomach

qəxqəʔis (326)  
many in body

gaʔis (326)  
to have inside of body

gaʔisələ (326) AA<sup>4</sup>  
to hold crossways in  
front of stomach

B. No Assimilation

la - kaʔis - ən - d  
to go - belly - Nom -  
Aspect

ʔu - kaʔis  
Loc. stem - belly

gəy - kaʔis - əla  
hold - belly - Cont.

laʔidʔənd (326)  
to enter belly, to go  
in front of body

ʔuʔis (358)  
branch side of a tree

giʔisələ (358) AA  
to hold crossways in  
stomach

As can be noted in the above examples, the suffix-initial segments /k, kaʔ, xʔ, gaʔ/, in most cases (see note 4) harden preceding voiceless obstruents

by assimilating to them. Although these suffixes do not harden sonorants (see note 5), they effect the exact same changes to all other stem-final sounds as do the other hardening suffixes (see chart). This suggests that they are hardening suffixes and indicates that hardening is most likely due to a process of assimilation, as Sapir and others have hypothesized. Further research among Wakashan languages, particularly comparative work, should hopefully unearth more interesting facts with regards to hardening and weakening.

Footnotes

1. This paper is a brief summary of the section on hardening presented in my M.A. Thesis, "Hardening and Weakening in Kwakiutl". The data for this paper are taken from Boas, "Kwakiutl Grammar" (1947) and from my field notes. I would like to thank Mrs. Freda Shaughnessy and "Tonica", Mrs. Mary Dick for their excellent resource work. The dialect of Kwakutl which this paper focuses on is "kʷakʷala". The examples from Boas are marked by page number and those from my field notes by (FN).

## 2. The phonemes of Kwakiutl are voiceless

stops /p t c ʔ k kʷ q qʷ/, voiced stops /b d dʷ

λ g gʷ ʒ ʒʷ/ glottalized stops /p̚ t̚ c̚ ʔ̚ k̚ k̚ʷ q̚ q̚ʷ/,

qʷ/, fricatives /s z x xʷ ʃ ʃʷ/, plain sonorants

/m n l y w/, glottalized sonorants /m̚ n̚ l̚ y̚ w̚/ [ʔm

ʔn ʔl ʔy ʔw], and vowels /i e a ə o u i· e· a· o·

u·/. The phonemes /k̚ k̚ʷ g x/ are palato-velar.

## 3. Today more frequently /xʷw̚/.

siXʷ - i	siXʷwi	(FN)
travel by boat - Nom.	ride in a boat	

## 4. The suffix /kaʔis/ sometimes hardens stem-final sonorants. Note that the examples marked AA have the same underlying form.

## 5. Although most suffixes which begin with these segments cause glottal assimilation, some do not. For example, the suffix /kəm/ "sign", "omen", does not cause hardening.

qəs - kəm	q̚i·qəs̚kəm	(357)
eat meat - sign, omen	sign that one will eat meat	
ʔik - kəm	ʔipʔix̚kəm	(357)
good - sign, omen	good sign, good omen	

Some /c̚/-initial suffixes assimilate to stem-final voiceless obstruents causing hardening.

lak - c̚imas	l̚ilak̚imas	(324)
hammer - classes or	things hammered	
characteristic conditions		
of things		

nanʔ - c̚a - d	n̚anʔc̚od	(346)
to shoot - inside - Aspect	to shoot in	

## References

- Boas, Franz. Kwakiutl Grammar, in Transactions of the American Philosophical Society, ed. H.B. Yampolsky and Z. Harris. Philadelphia (1947).
- Sapir, Edward. "Glottalized Continuants in Navaho, Nootka, and Kwakiutl" in Language 14 (1938).
- Swadesh, Morris. "A Structural Trend in Nootka" in IJAL 9.