

CHAPTER 2 THE SOUNDS

This chapter presents the speech sounds of Navajo, the syllable structure, phonological processes, and concludes with a brief discussion of the development of Navajo orthography.

1. The Sound inventory

Navajo writing reflects pronunciation in a fairly straightforward way.

1.1 The Vowels

Navajo vowels show a contrast for length and nasality and high and low tone, with rising and falling tones only on long vowels. The vowels occur in four basic positions:

Navajo	IPA
/a/ 'ayání, buffalo	[a] as in father
/e/ 'e'e'aah, sunset	[e] as in met
/i/ 'ił, branch	[ɪ] as in bit
/o/ ch'osh, insect	[o] as in note

Short vowels occur freely in any syllable: initial, medial, and word final.

/a/ 'at'oh, nest	gah, rabbit	dooda, no
/e/ 'e'e'aah, sunset	dego, up	diné, man, people
/i/ 'i'í'á, sun has set	tin, ice	ni, you
/o/ 'ólta', school	hosh, cactus	tó, water

Long vowels are indicated in writing with a double vowel: /aa/, /ee/, /ii/, and /oo/. The long vowel is a Navajo particular feature; therefore, we give only those examples here:

Navajo	IPA
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/aa/	laanaa, wishful thinking; saad, word	[aa]
/ee/	ntsíhákees, thinking; 'azee', medicine	[ee]
/ii/	hastiin, man; 'atiin, road	[ii]
/oo/	dooda, no; tooh, body of water	[oo]

The long /i/ is noteworthy because it is a tense vowel, having the quality of the vowel in the English word *bead*, while the short /i/ is lax.

Tone

Navajo vowels have low or high tone. A high tone vowel is indicated by an accent mark over the vowel. The short and the long vowels may be high toned as in the following examples:

Short High Tone	Long High Tone
/á/ 'ádin, none	/áá/ t'áá, just
/é/ ké, shoe	/éé/ 'éé', clothing
/í/ tsídii, bird	/íí/ díí, this, these
/ó/ tó, water	/óó/ dóó, and

Long vowels, written as two vowels can also have a rising or falling tone. When a low long vowel is followed by a particle that has a high tone, the second vowel becomes high, resulting in a rising tone; and when a high long vowel is followed by a particle with low tone, then the second vowel becomes low, resulting in a falling tone as exemplified here:

Rising Tone	Falling Tone
/aá/ ch'aásh, going somewhere?	/áa/ nahóóltáągo, after the rain
/eé/ neésh hółq, you have some?	/éé/ deinécyóód, they are leading it
/íí/ 'ólta'díísh, at school?	/íi/ doo yit'íí da, it's invisible
/oó/ hágoónce', good bye	/óo/ dóola, bull (toro)

Nasalization

All vowels in Navajo may be nasalized: both short and long. Nasalized vowels are marked by a diacritic under the vowel: /ǎ/, /ǣ/, /ǐ/, and /ǒ/. When a vowel is immediately preceded or followed

by a nasal consonant /m/, or /n/, the vowels become nasalized although they are not marked with the diacritic when written: *másí/mósí* ‘cat’, *ma’ii* ‘coyote’, *ní* ‘he/she said’, *naadiin* ‘twenty’. The nasality of the consonant spreads onto the vowel, much in the same manner as with the English words *mint*, *men*, *more*, *thin*, *think*, and *tin*. Navajo nasalized vowels are similar to the nasalized vowels in French. Below are additional examples showing nasalization on short and long vowels:

Short Vowel

/ǎ/ shǎ’, how about
 /ɛ̃/ doohɛs, it will itch
 /ĩ/ tǫ’, let’s go
 /ɔ̃/ tsé’édɔ’ii, a fly

Long Vowel

/ǎǎ/ ’ǎǎ’, uh huh, yeah
 /ɛ̃ɛ̃/ sɛɛs, wart
 /ĩĩ/ ’ádĩih, it is dwindling
 /ɔ̃ɔ̃/ deedsɔ̃h, it burst

Syllabic N

The syllabic consonant /ń/ or /n/ appears in certain Navajo words like: *ndaané* ‘they are playing’, *ntsískees* ‘I’m thinking’, *ńt’éeé* ‘it was’, *ndi*, ‘but’, or *ndaaz* ‘it is heavy’. These words are sometimes written and pronounced with the vowel /i/ after the /n/: *nidaané* ‘they are playing’, *ntsískees*, *ńt’éeé/ńt’ééé*, ‘it was’, *nidaaz* ‘it is heavy’. The syllabic *n* is like a vowel in that it can have a low or high tone and in that it can form a syllable even no vowel follows it.

Diphthongs

When two different vowels come together, they form a vowel cluster called diphthong. We have the Navajo diphthongs listed below: some are lengthened by their environment in the manner they cluster.

/ai/ hai, winter

/aii/ yíigaii, it became white; Naakaii, Spanish

/aai/ shínaaí, my older brother (also a variation of the two above)

/ao/ daolyé, they are called, ínánáolta’, it is tied to it also

/aoo/ ’aoo’ (’ouu’), yes, naoosh’éeh doo, I will have it

/ei/ séí, sand

/eii/ ’eii, that, wolyéii, one it is called

/oi/ deesdoi, it is warm (weather

/ooi/ ńitsooígíí, the yellow one

/ouu/ 'ouu', yes, it occurs only in this word

Vowels: Articulatory Chart

	Front	Central	Back
High	i		
Mid	e		o
Low		a	

1.2 The Consonants

In the following is a list of Navajo consonants listed in the order of the English Convention and where the English equivalent is provided when possible. Their differences between the two will be discussed as necessary.

NAVAJO:

ENGLISH:

b	bis, adobe	[p] as in stop
ch	chaha'oh, shade house	[ch] as in church
ch'	ch'ah, hat	-
d	dibé, sheep	[t] as in stop
dl	dloh, laughter	[gl], [bl] as in glow, blow
dz	dził, mountain	[dz] as in adze
g	gah, rabbit	[k] as in skin
gh	Ghąąjı', October	-
h, x	hosh/xosh, cactus	[h] as in hide
hw	hwiih, satiated	[wh] as in white
j	jooł, ball	[j] as jewel
k	ké, shoe	[k] as in kill

k'	k'ad, now	-
kw	kwe'é, here	-
/ʔ/	'e'e'aah, sunset	hiatus as in “oh oh”, “uh huh”
l	látsiní, bracelet	[l] as in letter
/ʎ/	as in fid, smoke	-
/m/	as in másí/mósí, cat	[m] as in mother
/n/	as in naaki, two	[n] as in now
/s/	as in sis, belt	[s] as in sit
/sh/	aa in shash, bear	[sh] as in shoot
/t/	as in tó, water	-
/t'/	as in t'eesh, charcoal	-
/tʃ/	as in tʃah, ointment	-
/tʃ'/	as in tʃaakaʃ, skirt	-
/ts/	as in tsin, tree	[ts] as in cats
/ts'/	as in ts'in, bone	-
/w/	as in woláchíí', red ant	[w] as in wide
/x, h/	as in xosh/hosh, cactus	[h] as in hide
/y/	as in yas, snow	[y] as in yellow
/z/	as in zas, snow	[z] as in zoo
/zh/	as in zhq', fun thing, entertainment	[zh] as in leisure

English speakers tend to hear b as p, d as t, g as k, dz as ts because of their brevity and lack of aspiration. It helps to know that Navajo does not have the aspirated consonant /p/ in any form originally; however, puppy in Navajo is /pabii/ for some younger speakers. It is only a borrowed term.

The following chart of consonants is from Young & Morgan (1980: xxii):

Consonants

	Bilabial	Alveolo-Palatal	Palato-Velar	Glottal
STOPS				
Voiceless				
Unaspirated	b	d	g	
Aspirated			k, kw	
Glottalized		t'	k'	'
SPIRANTS				
Voiced		z, zh	gh,	
Voiceless		s, sh	h (x), hw	h
LATERALS				
Voiced		l		
Voiceless		ɬ		
AFFRICATES				
Voiceless				
Unaspirated		dz, j, dl		
Aspirated		ts, ch, tʃ	t (tx)	
Glottalized		ts', ch', tʃ'	t'	
Nasal	m	n		
SEMI-VOWELS	w		y	

2. Syllable Structure

Languages differ with respect to the kinds of syllables that occur. Navajo allows syllable of the following forms, where *C* is a consonant and *V* is a vowel: (CV) *ni*, (CVV), *ch'aa* (CVC), *sis*, and (CVVC) *naash*. In Navajo a consonant may be written as a cluster of letters: /ch'/, /ts'/, /tʃ'/, and /dz/ are all digraphs, two letters indicating a single speech sound. A vowel with no consonant (V) is not a possible syllable in Navajo. Some Navajo words are sometimes written with an initial vowel, but in fact these words always begin with a glottal stop; thus what appears to be a (V) syllable is actually a (CV) syllable. The glottal stop in Navajo is represented as a consonant in the consonant charts in the next section.

3. Phonological Processes

Words are often built of smaller meaningful parts (stems, prefixes, clitics). When these parts come in contact with one another to form a word, the consonants and vowels in these parts affect each other. The result is that the sounds change in predictable ways. A phonological process is a predictable sound change. This section presents the most important ones for Navajo.

3.1 The D-effect

Navajo has a consonant mutation process that linguists call the “d-effect.” This process is evident in all Athabaskan languages, except those on the Pacific Coast (see Hoijer 1971, Howren 1971, Kari 1973, McDonough 1990, 1992). By this process, the initial consonant of the verb stem (inflected root of the verb) is altered when preceded by a /d/. A /d/ segment can appear in this position in one of two ways: one of the so-called “classifiers,” a position 9 prefix, can be a /d/; or a /d/ will appear if the position 8 subject marker is the first person dual-plural /iid-/.

The examples below illustrate the d-effect, grouped by the speech sounds that are involved. The d-effect has different results depending on what sound appears immediately after /d/, and the examples are grouped accordingly. Each group of examples begins with a word that does not undergo d-effect, because no /d/ is present in them. The example in which d-effect has occurred have the segment that results from the d-effect typeset in bold.¹

One class of d-effect results in an affricate-like segment:

(1)	d + z = dz	yizzoh	(yi + si + 0 + 0 + zoh)	‘S/he drew a line’
			4 7 8 9 stem	
		yis dz oh	(yi + si + 0 + d + zoh)	‘A line was drawn’
			4 7 8 9 stem	
		sézoh	(si + í + 0 + zoh)	‘I drew a line’
			7 8 9 stem	
		siid z oh	(si + iid + 0 + zoh)	‘We drew a line’
			7 8 9 stem	
	d + zh = j	yízhí’	(yi + 0 + 0 + zhi’)	‘I named him/her’
			4 8 9 stem	
		yíjji’	(yi + iid + 0 + zhi’)	‘We named him/her’
			4 8 9 stem	

¹ Some additional comments: the material inside parenthesis shows what linguists take to be the basic form of each meaningful unit within the verb; the numbers indicate the position of each prefix according to YM’s (1987) verb chart. Linguists normally assume that every verb must have a subject marker, a mode prefix, a classifier, and a stem. All of these except for the stem can be null. When this is the case with the examples shown here, we indicate the prefix by a zero (0).

d + l = dl	ch'ínílóóz	(ch'í + ni + 0 + 0 + lóóz) 1b 7 8 9 stem	'I led it out'
	ch'édlóóz	(ch'í + yi + 0 + d + lóóz) 1b 4 8 9 stem	'It was led out'
	ch'íniidlóóz	(ch'í + ni + iid + 0 + lóóz) 1b 7 8 9 stem	'We led it out'

Another class changes a fricative to a stop segment:

(2) d + gh = g	ch'íníyǐ	(ch'í + ni + 0 + 0 + ghǐ) 1b 7 8 9 stem	'I hauled it out'
	ch'égǐ	(ch'í + yi + 0 + 0 + ghǐ) 1b 4 8 9 stem	'It was hauled out'
	ch'íniigǐ	(ch'í + ni + iid + 0 + ghǐ) 1b 7 8 9 stem	'We hauled it out'

A third class results in a glottalized segment:

(3) d + ' = t'	baa ní'á	(baa ni + 0 + 0 + 'á) 7 8 9 stem	'I gave a SRO to him/her'
	baa yít'á	(baa yi + 0 + d + 'á) 4 8 9 stem	'A SRO was given to him/her'
	baa niit'á	(baa ni + iid + 0 + 'á) 7 8 9 stem	'We gave a SRO to him/her'

A final class results in a glottalized sonorant consonant:

(4) d + n = 'n	yínizh	(yi + 0 + 0 + nizh) 7 8 9 stem	'I picked it'
	yi'nizh	(yi + 0 + d + nizh) 7 8 9 stem	'It was picked'
	yii'nizh	(yi + iid + 0 + nizh) 7 8 9 stem	'We picked them'
d + m = 'm	háamááz	(há + ná + 0 + 0 + 0 + 0 + mááz) 1b 1d 4 7 8 9 stem	'I rolled it out'

	haii'mááz	(há + 0 + 0 + iid + 0 + mááz)	'We rolled it out'
		1b 4 7 8 9 stem	
d + w = 'w	yiwozh	(0 + 0 + 0 + wozh)	'S/he's ticklish'
		7 8 9 stem	
	yii'wozh	(0 + iid + 0 + wozh)	'We're ticklish'
		7 8 9 stem	
d + y = 'y	t'óó 'ahayóí	('a + ho + n + 0 + 0 + 0 + yóí)	'They are many'
		1b 1a 6c 7 8 9 stem	
	t'óó 'ahonii'yóí	('a + ho + n + 0 + iid + 0 + yóí)	'We are many'
		1b 1a 6c 7 8 9 stem	

In all cases in which the d-effect has occurred, /d/ appeared either as the classifier (in position 9) or as part of the first person dual/plural subject marker (in position 8). The segment /d/ can also appear in the inceptive verbal prefix in position 6, but this prefix does not trigger d-effect even when this prefix appears immediately before the stem:

(5)	dighááh	'It is starting to go along'
	(d + 0 + 0 + 0 + ghááh)	
	dilid	'It is starting to smolder'
	(d + 0 + 0 + 0 + ghááh)	
	dimáás	'It is starting to roll along'
	(d + 0 + 0 + 0 + máás)	

Linguists normally conclude from this that the d-effect process only applies in certain domains within the verb, those areas that are close to the verb stem.

3.2 Strident Assimilation

The strident consonants in Navajo are /s/, /z/, /ts/, /ts'/, /dz/, /sh/, /zh/, /j/, /ch/ and /ch'/. Some of these sounds are articulated with constriction in the anterior portion of the vocal tract (toward the front of the mouth). These are /s/, /z/, /ts/, and /dz/. The remainder are articulated farther back. Navajo speakers avoid pronouncing sounds from the two groups within a single syllable, and many speakers avoid it within a broader domain. Thus, we find verb stems like the following, which have two stridents in them that match with respect to anteriority:

(6)	zháásh 'erode'	zq́qs 'pull'	tsóos 'handle FFO'	shish 'gouge'
	j́jsh 'crush'	dzí́z 'pull, drag'	ch'osh 'crowded'	choah 'chew'

However, we do not find syllables of the following type in Navajo, which contain two strident consonants where one is anterior and the other is not:

(7) *shez *jaas *tsish *chos *zhas

Most speakers avoid an anteriority mis-match among stridents in broader domains than the syllable. The perfective form of certain verbs contains the position 7 prefix /si-/. When the /s/ in this prefix (which is anterior) appears with a stem that contains a non-anterior strident consonant, the /s/ changes to the non-anterior strident /sh/. In the examples below, no change occurs in (a-g) because the stem has no strident consonant in it. The remaining examples, however have stems that contain non-anterior strident consonants, and so /s/ changes to /sh/:

(8) Si-perfective:	/si-/		
a.	sidá	s/he is sitting	
b.	si'á	it is sitting (bulky object)	
c.	sidoh	it is hot	
d.	sizí	it is standing (stick-like)	
e.	silá	it is lying (rope-like)	
f.	sití	it is lying (rope-like animate)	
g.	sits'il	it shattered	
h.	shibéézh	it boiled	
i.	shich'il	it weathered	
j.	shijaa'	they sit (pebble-like)	
k.	shizhoozh	they lay (plank-like)	
l.	shíní'chíh	you gave it birth	/si+ni+ni+ł+chíh/
m.	hashíní'chaad	you carded it up	/ha+si+ni+ni+l+chaad/

Another prefix that undergoes strident assimilation is the position 1a prefix /dz-/, meaning 'away into ...' the sound /dz/ is an anterior strident. In examples (a-c) below, no change occurs and /dz/ is the sound that is pronounced. However, in (d) and (e), the non-anterior strident /sh/ appears and causes /dz/ to be pronounced as /j/, its non-anterior counterpart:

(9) /dz-/	'away into X'	(position 1a)
a.	taah dzíí'haal water tumble-into	I tumbled into the water (perf) /dz-yí-ł-haal/
b.	taah dzíí'né water throw-into	I made a throw into the water. /dz-yí-ł-né/
c.	'adzíí'kaad	'I slapped him' (2-perf) /'a-dz-yí-kaad/
d.	taah jishhaal water tumble-into	I tumble into the water (imp) /dz-ish-ł-haal/

- e. 'ajishkaad I slap out (imp)
/’a-dz-ish-kaad/

The fourth person subject marker /j/ is an anterior strident. Examples (a) and (b) below have this prefix, and it appears in them without being changed. In examples (c) and (d), /j/ changes to [dz] because of the non-anterior strident /z/ that appears later in the word.

- (10) /j-/ 4th person subject (position V)
- a. jiyá ‘(S)he’s eating it.’
 /j-i-yá/
- b. jilech ‘(S)he becomes’
 /j-i-lech/
- c. dzizyol ‘He blew spray’
 /j-iz-ł-yol/
- d. dzizdá ‘He sat down’
 /j-iz-dá/

Some speakers, but not all change the first person singular possessive prefix /sh-/ to [s-] when an anterior strident appears in the root of the possessed noun:

- (11) Possessed nouns: /shi-/ ‘my -’
- a. shimá my mother
- b. shizhé’é my brother
- c. shichidí my car
- d. shináá’ my eye
- e. shidá’í my uncle
- f. sitsilí or shitsilí my younger brother
- g. siziiz or siziiz my belt
- h. sitsii’ or sitsii’ my hair
- i. sidziil or sidziil my strength

In all these examples, a strident consonant in a prefix matches anteriority with a strident consonant that appears after it. With verbs, this change happens consistently; with possessed nouns, some speakers make the stridents harmonize and other speakers do not.

There is one morpheme that participates in a strident harmony process in the opposite direction from what we have seen thus far: the appearance of this prefix triggers assimilation on strident consonants that appear after it, rather than before it. This is the /s/ prefix that appears with verbs of destruction.

3.3 Raising (/ai/ → [ei])

In another common process, the vowel sequence /ai/ changes to [ei] when /a/ is part of a disjunct prefix (and is not preceded by a velar consonant: h, k, k', g or gh). This process occurs in many verbs. Here are some examples:

- | | | | | |
|------|-------------------------------------|---------------------|--|-----------------------|
| (12) | naashné
(na + sh + né) | 'I am playing' | neii'né
(na + iid + né) | 'We (du) are playing' |
| | ch'ííłteeh
(ch'í + 0 + ł + teeh) | 'S/he is moving it' | ch'ídeíłteeh
(ch'í + da + í + ł + teeh) | 'They are moving it' |

The examples above on the left do not show raising; the ones on the right, which differ minimally from those on the left, do show vowel raising. Note also that the /n/ is glottalized in the dual form due to application of the d-effect.

3.4 Stem vowel lengthening and tone effects with enclitics

Postverbal enclitics exert an influence on the vowel of the verb stem that precedes it. Short vowels in the verb stem are lengthened and high vowels have a falling tone.

- (13) a. Kinłánídi nanináago niíłtsá.
Flagstaff-at 2-go.CI-Sub 2-1-see.P
I saw you walking around in Flagstaff.
- b. T'áadoo niíłtsáa da.
Just.neg 2-1-see.P neg
I didn't see you.
- (14) a. Perudi hweesh'í
Peru-at areal-1-see.P
I have been to Peru.
- b. Japandi doo hweesh'í da.
Japan-at neg areal-1-see.P neg
I have not been to Japan.
- (15) a. Jake baa dzólní.
Jake 3-with good.character
Jake has good character.
- b. Jake doo ndi baa dzólní da.
Jake neg even 3-with good.character neg
Jake does not have good character.

3.5 Conclusion

Other phonological processes occur in Navajo. We have presented only some of the most common ones. Interested readers are directed especially to Kari (1973), McDonough (2003), and Faltz (1998).

4. The Development of Conventional Navajo Orthography

The conventional Navajo orthography is based on the “Young and Morgan” orthography adopted in May 1969, at the first Navajo Orthography Conference held in Albuquerque, New Mexico. The conference was jointly sponsored by the Center for Applied Linguistics and the Bureau of Indian Affairs to reach a compromise on a Navajo orthography for academic purposes. At this conference, issues of standardized spelling and morphophonemic vs. phonemic spelling were discussed. The participants at this first conference lacked the authority for official policy making; however, two council members were in attendance and it was assumed that they would deliver it to the Tribal Council to be considered as part of an official language policy but this did not materialize. At this first conference, there were only a few Navajo educators present and the only Navajo linguist present was the late Dr. William Morgan.

Since then, Navajo literacy has grown among Navajo speakers many of whom were educators and linguists. The second orthography conference was held in May 1976 in Window Rock, Arizona. The participants were mostly Navajo speakers who employed the orthography. It was essential that they make effective decisions be made on standardizing the Navajo orthography, unlike at the first conference where the concerns were non-speakers in attendance. Their concern was for refining the standardized Navajo orthography since the demand for quality written materials for the educational system was growing. The location in Window Rock made it more accessible to Tribal officials, council members who had the authority for policy making, along with Navajo educators, their students, and other community members. The Navajo language as a written language makes use of the English symbols, paying close attention to special linguistic difference with Navajo particular phonemes. Reichard writes that since Navajo has been written, it has been subject to pressure groups of all kinds, most of it being that, “if it cannot be written in English symbols, it may as well not be written.” A pressure groups consisting of anthropologists, linguists, ethnologists, missionaries; all have been recording Navajo in a complicated phonetic system for decades which they had trouble with understanding and the layman were completely at a loss because some Greek symbols were included and special symbols for sibilants as devised by Sapir and Hojier. People like Father Berard, a Catholic priest at St. Michaels Mission used it in his writing and it is said that he even changed his orthography at least three times during the writing of his publications. Actually Berard, and the pressure group, all followed the International system of phonetic transcription to record Navajo. These early publications in Navajo are still available today and can be easily deciphered by the Navajo speakers and the “Young and Morgan” orthography followers.