On Initial Vowel Doubling in St. Lawrence Island Yupik[1]

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0. Introduction

The Eskimo branch of the Eskimo-Aleut linguistic family consists of Inuit-Inupiaq, Sirenikski, which was spoken in Russia and is now almost extinct, and Yupik. While Inuit-Inupiaq constitutes a continuum of mutually intelligible dialects, Yupik can be divided into four languages: Central Alaskan Yupik and Alutiiq Alaskan Yupik in Alaska, Naukanski in Russia, and Central Siberian Yupik.[2] Central Siberian Yupik is spoken by 1,050 people on St. Lawrence Island, Alaska, and called St. Lawrence Island (SLI) Yupik and by 300 people on the coast of Chukotka, Russia, and called Chaplinski (Krauss 1995). The present work does not concern Central Siberian Yupik as a whole but only SLI Yupik, the variety spoken on St. Lawrence Island. There are two reasons why I restrict my work to SLI Yupik: first, the Russian studies on Chaplinski have not yet adequately covered the prosody of the language and have often misunderstood the length of vowels, while the studies on SLI Yupik are essentially accurate in their transcription and analysis of phonology. Second, the dialectal differences between SLI Yupik and Chaplinski, especially the phonological ones, still need to be studied.

For further details of other languages of the Eskimo-Aleut linguistic family, see Woodbury (1984), and for Eskimo languages in Russia, including SLI Yupik in particular, see

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Abbreviations and symbols used in the present work are:ABM ablative-modalis case; ABS absolutive case; C consonant; DIM diminutive; du. dual; F voiced velar fricative; HAB habitual; IND indicative mood; ITR interrogative mood; LOC locative case; N noun; OPT optative mood; pl. plural; REL relative case; sg. singular; SLI St. Lawrence Island; V vowel/verb; 3R reflexive-third person; / / phonemic representation; // // morphophonemic representation; # word boundary; - morpheme boundary; | foot boundary; . syllable boundary.

The phonemic inventory is as follows: vowels i, u, a, ɨ, consonants p, t, k, kʷ, q, qʷ, v, l, z, y, r, ɣ, ɣʷ, ẏ, ẏʷ, f, ɬ, s, ʂ, x, xʷ, χ, χʷ, h, m, n, ŋ, ŋʷ, ɱ, ɲ, ŋ, ŋʷ. The phonemic symbols used are standard American usage.

[2] Naukanski, Central Siberian Yupik, and Sirenikski were together called Asiatic Eskimo by the Russians.

de Reuse (1994) .

SLI Yupik has a peculiar phonological process which has been called "initial syllable lengthening" or "e-hopping"[3] : when a stem having the shape of $(C_1)VC_2\underline{ɨ}(C_3)$- ($C_3$=velar fricative) is followed by a suffix and made into the sequence $(C_1)VC_2\underline{ɨ}\underline{C}V$... in the derivational process, the initial vowel of the stem is lengthened, doubled, to be precise, with the deletion of ɨ into the shape $(C_1)V_iV_iC_2\underline{C}V$[4] ... as in the examples below[5]. I will use the term "initial vowel doubling" to refer to this phenomenon in this paper.

(1a) /qaya/ [qɑya] "top" //qayɨ// (ɨ → a / _#)

(1b) /qaayŋani/ [qɑ́·yŋani] "on the top of it" //qayɨ-ŋani// (top-LOC.3sg.sg.)

(2a) /atɨq/ [atəq] //atɨɣ̇// "name" (ɣ̇ → q / _#)

(2b) /aatχituq/ [á·tχetoq] "it doesn't have a name"

< atɨɣ̇ituq < //atɨɣ̇-(ŋ)it(ɨ)-(ɣ)uɣ̇// (name-PRV-IND.3sg.)

(3a) /itɨχtuq/ [itə́χtoq] "s/he entered" //itɨɣ̇-tuɣ̇// (enter-IND.3sg.)

(3b) /iitχi/ [î·tχe] "(you sg.) enter!"

< itɨɣi < //itɨɣ̇-(ɣ)i// (enter-OPT.2sg.)

In (1b), the stem //qayɨ// with the locative case marker //-ŋani// is realized as /qaayŋani/ with the initial vowel doubled. In (2b), the stem //atɨɣ̇// with the derivational suffix //-ŋitɨ//, which in turn is followed by //-ɣuɣ̇//, is realized as /aatχituq/ with the deletion of the suffix initial consonant ŋ. In (3a), the stem //itɨɣ̇// "to enter" with the inflectional suffix //-tuɣ̇// is realized as /itɨχtuq/ without initial vowel doubling because it does not form the sequence

[3] The e stands for /ɨ/ in the orthography.

[4] SLI Yupik does not have vowel clusters consisting of unlike vowels on the taxonomic phonemic level. A sequence of unlike vowels on the morphophonemic level changes into two identical vowels. As Krauss (1975) pointed out, it is an assimilation process that occurs according to the hierarchy i ≫ a ≫ u. Thus, //ai, ia, iu, ui// change into /ii/ and //au, ua// into /aa/.

[5] I put the morphophonemes that are deleted by the morphophonemic rules in parentheses as a matter of convenience. All the morphophonemic rules are applied before initial vowel doubling occurs besides the devoicing rule that is recursive. In SLI Yupik, voiced consonants except for y are devoiced when they are adjacent to voiceless consonants (Krauss 1975). I do not give morphophonemic rules exhaustively but only when they need to be explained. Morphophonemic rules of SLI Yupik are comprehensively covered in Jacobson (1990) and Badten et al. (1987).

$(C_1)VC_2\underline{\text{ɨ}}\underline{C}V$.... In (3b), on the other hand, the same stem with the inflectional suffix //-ɣi// is realized as /iitxi/ with doubling.

Krauss (1975) pointed out this process and called it "e-hopping" on the basis of its surface characteristic, the leftward movement of the vowel mora over the intervening consonant, without making any explanations of why this phenomenon occurs. Jacobson (1984, 85, 90) called it "initial syllable lengthening." He attempted to explain it by what he called the "stem-stress principle." However, its conditioning factor was still unexplained. The purpose of this paper is to examine this process and its conditioning factors from the data that I have obtained through my fieldwork and to explain it as a prosodic process.

1. Conditions of Initial Vowel Doubling

When initial vowel doubling occurs, the underlined consonant of the sequence $(C_1)V_iV_iC_2\underline{C}V$... is either a stem-final velar fricative (C_3) or a suffix-initial consonant (-C). The occurrence of initial vowel doubling seems to depend on the consonant in that underlined position. What kinds of consonants cause initial vowel doubling and what kinds do not? In this section, I will examine all of the consonants that can possibly be in that position. Before we investigate the consonants in the $\underline{C}$ position, in the following subsection we take a look at the stems that are subject to initial vowel doubling.

1.1. The stems $(C_1)VC_2\text{ɨ}(C_3)$-

When a stem that has the shape of $(C_1)VC_2\text{ɨ}(C_3)$- is followed by a suffix and made into the sequence of $(C_1)VC_2\text{ɨ}CV$..., the initial vowel of the stem is doubled into the shape of $(C)V_iV_iCCV$.... It should be noted that the final consonant of the stem in question is one of the velar fricatives **ɣ**, **ɣ̇** or **x̣**. Initial vowel doubling does not occur with a stem that already has the sequence of # (C)V.Cɨ.CV(V)(C).... For example, initial vowel doubling occurs with the stem //nakɨɣ̇-// in (4), while it does not occur with the stem //pitɨkɨsɨŋiiɣ̇-// in (5).

(4) /naakx̣ax̣tuq/ "he (the little one) is an accurate shot"
//nakɨɣ̇-ax̣tɨ-ɣuɣ̇// (be.an.accurate.shot-DIM-IND.3sg.)

(5) /pitɨkisɨŋiixtuq/ "he stood on his toes" (Badten et al. 1987: 162)
//pitɨkisɨŋiiɣ-tuɣ// (stand.on.one's.toes-IND.3sg.)

I have found 81 stems in Badten et al. (1987), listed below, that undergo initial vowel doubling.[6]

(a) (C)VCɨ-[7]

1.	//xatɨ-//	"upper part of body or garment; torso; blouse"
2.	//xutɨ-//	"tooth"
3.	//xutɨ-//	"old-fashioned wooden urine tub"
4.	//iqɨ-//	"lower cheek; corner of mouth"
5.	//iyɨ-//	"eye"
6.	//mayɨ-//	"winnings in a game"
7.	//naɬɨ-//	"something in line"
8.	//naɬɨ-//	"Nalla (place name)"[8]
9.	//payɨ-//	"edge of opening; mouth of passage way; area near exit"
10.	//qayɨ-//	"top; surface"
11.	//qulɨ-//	"upper part; area above; gunwale of boat; ten"
12.	//quŋɨ-//	"the midst; the middle of an area; main idea; center; source, core"
13.	//qutɨ-//	"land"
14.	//satɨ-//	"skin side of a pelt"
15.	//sayɨ-//	"front of body; front of mountains; entrance way of house"
16.	//tumɨ-//	"footprint"
17.	//tuŋɨ-//	"vicinity"
18.	//tuyɨ-//	"shoulder"

(b) (C)VCɨC- (nominal[9])

19.	//alɨx-//	"companion; other side of a pair"
20.	//anɨɣ-//	"burning or glowing ember"
21.	//atɨɣ-//	"name"
22.	//xayɨɣ-//	"shoulder blade"
23.	//xavɨɣ-//	"disk of cartilage on the outer part of the elbow joint"
24.	//inɨɣ-//	"crotch; armpit; kind of the very end of bay"

[6] It should be noted that there are "roots" of the shape (C)VCɨ(C)-. Roots must be expanded with certain suffixes before taking inflectional suffixes. Roots of the shape (C)VCɨ(C)- do undergo initial vowel doubling. However, since derivational suffixes that can attach to such roots are quite limited, it does not seem appropriate to include them in the current investigation, and thus, I do not discuss such roots here.

[7] All of them are nominal. Verbal stems that seem to have had the shape (C)VCɨ- historically have the shape (C)VVCɨ- underlyingly in present day SLI Yupik.

[8] This stem originated from the stem 7. //naɬɨ-// "something in line."

[9] Some of them are bivalent, that is, they can be both nominal and verbal.

25. //kakɨɣ-// "uppermost of traditional skin-covered house where roof poles meet and lashed together"
26. //kamɨɣ-// "boot"
27. //kanɨɣ-// "frost; to frost"
28. //kaŋɨɣ-//$_1$ "underhair; bird down"
29. //kaŋɨɣ-//$_2$ "cause; heart of the matter"
30. //kuɣɨɣ-// "brother of female"
31. //mumɨɣ-// "drumstick"
32. //natɨɣ-// "entry room of old style house; lower level; floor"
33. //papɨɣ-// "tail"
34. //patɨɣ-// "marrow"
35. //qaɣɨɣ-// "white caps"
36. //qakɨɣ-// "bitter taste; to taste bitter"
37. //qanɨɣ-// "mouth"
38. //qatɨɣ-// "bird's breast"
39. //saɬɨɣ-// "slash ice"
40. //savɨɣ-// "head unit of a whale harpoon; to harpoon"
41. //suɣɨɣ-// "sleeping sound"
42. //taŋɨɣ-// "solid part of something; ancestor"
43. //taqɨɣ-// "vein"
44. //tatɨɣ-// "bridge of nose"
45. //tuɣɨɣ-// "ice pick"
46. //tunɨɣ-// "mat; floor covering"
47. //umɨɣ-// "lid, cover; to close; to cover"
48. //unɨɣ-// "armpit; underarm; area between arm and body"
49. //uqɨɣ-// "lee side; south side"
50. //vuvIV%-// "walrus skin covering"

(c) (C)VCɨC- (verbal)

51. //aɬɨɣ-// "to sweep"
52. //aŋɨɣ-// "to affirm; to agree"
53. //apɨɣ-// "to tell"
54. //atɨɣ-// "to go down"
55. //avɨɣ-// "to divide into two"
56. //imɨɣ-// "to roll up; to coil up"
57. //ipɨɣ-// "to be sharp"
58. //itɨɣ-// "to enter"
59. //ivɨɣ-// "to wade"
60. //kinɨɣ-// "to dry"
61. //kumɨɣ-// "to scratch"
62. //maɬɨɣ-// "to be or get close"

63.	//matɨɣ-//	"to get stuck onto something; to come side by side with something"
64.	//nakɨɣ̇-//	"to be an accurate shot"
65.	//pakɨɣ-//	"to flex; to bend"
66.	//paɬɨɣ-//	"to brush off snow or dirt"
67.	//panɨɣ̇-//$_1$	"to starve to death"
68.	//panɨɣ̇-//$_2$	"to burn"
69.	//patɨɣ-//	"to hit with palm of hand"
70.	//patɨɣ̇-//	"to drain; to dry up; to evaporate"
71.	//payɨɣ̇-//	"to meet; to go to meet; to encounter"
72.	//qaɣɨɣ̇-//	"to burst; to pop open"
73.	//qaɬɨɣ-//	"to speak; to utter something; to talk"
74.	//qatɨɣ̇-//	"to be white"
75.	//qitɨɣ̇-//	"to beat one's wife"
76.	//saɬɨɣ-//	"to scrape"
77.	//tukɨɣ̇-//	"to brace with one's foot"
78.	//tutɨɣ-//	"to be side by side with; to be parallel to"
79.	//uɬɨɣ̇-//	"to fall over"
80.	//umɨɣ-//	"to close"
81.	//uvɨɣ̇-//	"to keel over; to topple; to capsize"

1.2. Occurrence of Initial Vowel Doubling

The occurrence of initial vowel doubling depends on the kind of consonant in the C position in the sequence # (C_1)V.C_2ɨ.CV(V)(C)... in the derivational process. C is either stem-final, C_3 of $(C_1)VC_2$ɨC_3-, or suffix-initial (-C). Below, I discuss the conditions for the occurrence of initial vowel doubling according to the kind of consonant in the C position.

1.2.1. Stem-Final Velar Fricative in the C position

When velar fricatives ɣ, ɣ̇, x occur in the stem-final position in the sequence of # (C_1)V.C_2ɨCV(V)(C)..., initial vowel doubling occurs. There are two cases where a stem-final velar fricative is retained in that sequence. One is when a vowel-initial suffix is added to the stem $(C_1)VC_2$ɨC_3-.

(6) /uuvɣ̇axtuq/ "it capsized quickly"

< uvɨɣ̇axtuq < //uvɨɣ̇-axt(ɨ)-(ɣ)uɣ̇// (capsize-quickly-IND.3sg.)

When C_2 is voiceless, the stem-final voiced velar fricative becomes voiceless after the operation of initial vowel doubling as in (7).

(7) /aaɨxaχtuq/ "she swept something (floor) quickly"

< aɨɨɣaχtuq < //aɨɨɣ-aχt(ɨ)-(ɣ)uɣ// (sweep-quickly-IND.3sg.)

The other case is when a suffix that begins with a two-consonant cluster is added to the stem $(C_1)VC_2ɨC_3$-. Since SLI Yupik does not have three-consonant clusters on the phonemic level, an epenthetic vowel ɨ is inserted after the C_3 of the stem to break a three-consonant cluster on the morphophonemic level.

(8) /vuuvɣɨxka/ "my walrus skin covering"

< vuvɨɣɨxka < //vuvɨɣ-xka// (walrus.skin.covering-ABS.1sg.du.)

(9) /iitχɨsqaa/ "he wanted her to come in"

< itɨɣɨsqaa < //itɨɣ-sq(ɨ)-(ɣ)aa// (come/go.in-want.one.to.V-IND.3sg.3sg.)

1.2.2. Suffix-Initial Consonants in the C position

1.2.2.1. Velar Obstruents

When C is the suffix-initial consonant and also one of the velar consonants **k, q, ɣ, ɣ̇, χ, χ̇**, initial vowel doubling occurs.[10]

(10) /iiska/ "my eye"

< //iyɨ-ka// (eye-ABS.1sg.sg.)

(11) /iitqaa/ "please come in"

< itɨqaa < //itɨ(ɣ̇)-qa(ɣ̇)-(ɣ)i// (come/go.in-please-OPT.2sg.)

[10] All suffixes in the examples below delete stem-final fricatives. It should be noted that these suffix-initial velar consonants are assimilated with the stem-final velar fricatives, which are subsequently deleted as well as in Central Alaskan Yupik (Miyaoka 1996). When the stem-final consonant is a back velar fricative, a suffix-initial front velar consonant becomes back. In addition, when the stem-final consonant is a front velar fricative, a suffix-initial back velar consonant becomes front.

(12) /iipxalɨk/ "how sharp!" (ɣ → k / _#)

< ipɨxalɨk < //ipɨ(ɣ)-x̣alɨɣ// (be.sharp-how.V.it.is!)

(13) /uumɣak/ "box with a lid"

< umɨɣak < //umɨ(ɣ)-ɣ̇a(ɣ̇)-ɣ// (lid-thing.like.N-du.)

(14) /kuumɣaqaa/ "occasionally she scratched it"

< kumɨɣaqaa < //kumɨ(ɣ)-ɣaq(ɨ)-(ɣ)aa// (scratch-HAB-IND.1sg.3sg.)

1.2.2.2. Velar Nasals

There are two morphophonemically different velar nasals **ŋ** and **ŋ*** in SLI Yupik. The former, i.e., the non-asterisked velar nasal, is deleted after stem-final velar fricatives. Initial vowel doubling occurs when a suffix that begins with **ŋ** is added to the stem $(C_1)VC_2ɨC_3$-. On the other hand, the latter, i.e., the asterisked velar nasal, deletes stem-final velar fricatives, and initial vowel doubling does not occur with **ŋ***. Examples below illustrate the difference between **ŋ** (15), (16) and **ŋ*** (17), (18).

(15) /aatx̣isuxtuq/ "he needs a name"

< atɨɣ̇isuxtuq < //atɨɣ̇-ŋisux-tuɣ̇// (name-need-IND.3sg.)

(16) /saayŋiitaq/ "armor"

//sayɨ-ŋiitaɣ̇// (front.of.body-protective.device.for.N)

(17) /atɨŋuq/ "he gets a name"

//atɨɣ̇-ŋ*ɨ-ɣuɣ̇// (name-acquire-IND.3sg.)

(18) /sayɨŋistaa/ "its small front part of the body"

//sayɨ-ŋ*ɨstaɣ̇-ŋa// (front.of.body-small-ABS.3sg.sg.)

1.2.2.3. Other Consonants

When a consonant other than velars occurs in the C̲ position of $(C_1)VC_2ɨ$C̲V... , initial

vowel doubling hardly ever occurs, with a few exceptions. Consonants that can be in the C position, besides the velars already described in the above subsection, are as follows: **p, s, y, t, l, ɬ, r, ɣ, v, m, n.**

Suffixes that begin with **p, s, y, t, l, ɬ, r,** or **ɣ** do not cause initial vowel doubling in most cases.[11] Below are examples:

(19) /xatɨpɨrɨɣʷaaẏmɨŋ tuunaaŋa/ "she gave me nothing but blouses"
//xatɨ-pɨrɨɣʷaaẏ-mɨŋ tuun(ɨ)-(ɣ)aaŋa// (blouse-nothing.but-ABM.sg. give-IND.3sg.1sg.)

(20) /qitɨsiẏʷaaẏaa/ "he pretended to beat her (his wife)"
//qitɨ(ẏ)-siẏʷaaẏ-(ɣ)aa// (beat.one's.wife-pretend.to-IND.3sg.3sg.)

(21) /aɬɨyiituq/ "she did not sweep the floor sufficiently"
//aɬɨ(ɣ)-yiit(ɨ)-(ɣ)uẏ// (sweep-poorly-IND.3sg.)

(22) /tumɨtɨn/ "your footprints"
//tumɨ-tɨn// (footprint-ABS.2sg.pl.)

(23) /aẏnaq sayɨliixtuq/ "the woman cooked the breast part of a seal"
//aẏnaq sayɨ-liiẏ-tuẏ// (woman.ABS.sg. front.part-cook-IND.3sg.)

(24) /apɨɬɨq xʷatɨtuq/ "this is how it was told"
//apɨ(ẏ)-ɬɨq xʷatɨt(ɨ)-(ɣ)uẏ// (tell-one.that.has.been.V-ed be.like.this-IND. 3sg.)

(25) /uvɨraxkiixtuq/ "it capsized fast"
//uvɨ(ẏ)-raxkiiẏ-tuẏ// (capsize-quickly-IND.3sg.)

[11] I have so far obtained one suffix //-liqɨ// "have trouble with N," which is exceptional in causing initial vowel doubling. For example:
/xuusiquq/ "she has a toothache"
//xutɨ-liq(ɨ)-(ɣ)uẏ// (tooth-have.trouble.with.N-IND.3sg.)

(26) /kamɨr̥aaq/ "ragged boot"
//kamɨ(ɣ)-r̥aaɣ̇// (boot-ragged N)

When a suffix that begins with **v, m,** or **n** is added to the stem $(C_1)VC_2ɨ(C_3)$-, initial vowel doubling occurs in some cases. Its tendency to occur varies widely.

There are only two suffixes that begin with **v** and can make the sequence of $(C_1)VC_2ɨCV$... with the stem $(C_1)VC_2ɨ(C_3)$-: //-vaɣ// "V in a big way; big N," and //-vaɣ̇// "go toward.N; put something toward.N." When the former suffix is added to the stem $(C_1)VC_2ɨ(C_3)$-, initial vowel doubling does not always occur. Both the doubled form and the non-doubled one are used with some of the stems. My language consultant prefers the doubled form in (27), while she prefers the non-doubled form in (28).

(27) /xaatfaɣa/ and /xatɨvaɣa/ "his large back"
//xatɨ-vaɣ-ŋa// (back-big-ABS.3sg.sg.)

(28) /xuutfak/ and /xutɨvak/ "large tooth"
//xutɨ-vaɣ// (tooth-big)

However, only the non-doubled form is acceptable with other stems.

(29) /kamɨvak/ but */kaamvak/ "large boot"
//kamɨ(ɣ)-vaɣ// (boot-big.ABS.sg.)

(30) /mayɨvak/ but */maayvak/ "big winnings"
//mayɨ-vaɣ// (winnings.in.game-big)

It is difficult to determine the condition of initial vowel doubling with this suffix. At least, both the doubled and non-doubled forms seem to be used with the stems that mean body parts.

The second suffix //-vaɣ̇// always causes initial vowel doubling. This suffix is added only to positional bases that usually denote the positions of some particular things and mostly have the shape of CVCV, including CVCɨ. Furthermore, the words with the suffix are rather lexicalized.

(31) /quulvaχtuq/ "it moved upward"
//qulɨ-vaɣ̇-tuɣ̇// (area.above-go.toward.N-IND.3sg.)

(32) /quuŋvaq/ "wind from the midst of a mountain"
//quŋɨ-vaɣ̇// (the.midst-go.toward.N)

(33) /quutfaq/ "wind from north"
//qutɨ-vaɣ̇// (land-go.toward.N)

Suffix-initial **m** causes initial vowel doubling in general. However, some words have both doubled and non-doubled forms. In most cases, doubled forms are preferable as in (34) according to my language consultant. However, both doubled and non-doubled forms for frequently used stems, such as the ones that mean body parts, are often treated equally, as in (35), though some words show deviation.[12] Initial vowel doubling does not occur in obsolete words as in (36) and (37). Those stems are no longer used in daily conversation.

(34) /xaatmi/ (preferable) and /xatɨmi/ "her own blouse(s)"
//xatɨ-mi// (upper.part.of.body-REL.3Rsg.sg/pl.)

(35) /iiyma/ and /iyɨma/ "my eye REL.1sg.sg."
//iyɨ-ma// (eye-REL.1sg.sg.)

(36) /mayɨmi/ but */maaymi/ "his own winning(s) REL.3Rsg.sg/pl."
//mayɨ-mi// (winnings.in.game-REL.3Rsg.sg/pl.)

(37) /payɨmi/ but */paaymi/ "its own area near exit REL.3Rsg.sg/pl."
//payɨ-mi// (area.near.exit-REL.3Rsg.sg/pl.)

Suffixes that begin with **n** generally do not cause initial vowel doubling. Above all,

[12] The stem //tuyɨ-// "shoulder" is used very frequently in daily conversation. When the ablative-modalis singular case ending //-mɨŋ// is added to it, both /tuuymɨŋ/ and /tuyɨmɨŋ/ are used, while when the relative case ending //-ma// is added to it, only the non-doubled form /tuyɨma/ is accepted.

derivational suffixes do not cause it as in (38).[13] However, inflectional suffixes do not always cause initial vowel doubling as in (39) and (40) below:

(38) /aŋɨnasiiɣaa/ */aaŋnasiiɣaa/ "he is hesitating to agree with her"
//aŋɨɣ-nasiiɣ-ɣaa// (agree-hesitate.to-IND.3sg.3sg.)

(39) /xutɨni (xuutni) ukmaŋiɣii/ "he cleaned his teeth"
//xutɨ-ni ukma-ŋiɣ-(ɣ)ii// (tooth-ABS.3R.sg.pl. dirtiness-remove.IND. 3sg.3pl.)

(40) /qulɨni uɣvuχqaa/ */quulni/ "he washed the upper part of his body"
//qulɨ-ni uɣvuχqɨ-ɣaa// (upper.part-ABS.3R.sg.sg. wash-IND.3sg.3sg.)

1.3. Phonotactic Constraints

On the taxonomic phonemic level, two identical consonants cannot constitute a consonant cluster in SLI Yupik (Krauss 1975). Initial vowel doubling does not occur when it would cause a cluster of two identical consonants. For example, when the suffix //-qaq// is added to //tuŋɨ//, initial vowel doubling changes the sequence //tuŋɨ-qaq// into /tuuŋqaq/ as in (41a). On the other hand, when the suffix //-ŋa// is added to //tuŋɨ//, initial vowel doubling cannot change the sequence //tuŋɨ-ŋa// into */tuuŋŋa/ because sequences of two identical consonants are not allowed on the taxonomic phonemic level. Therefore it does not occur as in (41b).

[13] I obtained one example that has the doubled form with a derivational suffix //-niiɣ// "work with N" as below:
/xuutniiχta/ */xutɨniiχta/ "dentist"
//xutɨ-niiɣ-tɨ// (tooth-work.with.N-Ver)
In this case, the non-doubled form is not used. It might be possible to say that this word is lexicalized.

(41a) /tuuŋqaq/ //tuŋi-qaq// "relative, kin"

(41b) /tuŋiŋa/ //tuŋi-ŋa// "its vicinity ABS.3sg.sg."[14]

(42a) and (42b) are another similar pair:

(42a) /quuŋkutaŋa/ //quŋi-kuta-ŋa// "the source of it ABS.3sg.sg."

(42b) /quŋiŋinaq/ //quŋi-ŋinaq// "only the midst"

1.4. Constraints on stems

I examined when initial vowel doubling occurs with the above mentioned 81 stems. Some of the 81 stems I examined are quite productive. However, others are not. There are two tendencies of initial vowel doubling concerning stems. First, a word that consists of the stem used frequently in daily conversation tends to be lexicalized in either doubled form or non-doubled form. The other tendency is that obsolete stems as in (43) below, which are no longer used in daily conversation but are still used in some folklore, tend to take non-doubled forms rather than the doubled ones that they are supposed to take.

(43) /mayiŋiɣaa/ */maayŋiɣaa/ "s/he lost her/his winning."
//mayi-ŋiɣ-(ɣ)aa// (winnings.in.game-lose-IND.3sg.3sg.)

According to one of my language consultants, younger speakers prefer using non-doubled forms when the words have both doubled and non-doubled forms.

1.5. Factor of Initial Vowel Doubling

What causes initial vowel doubling as seen above? It seems to have something to do with the prosody of SLI Yupik. We will take a brief look at it in the following subsection.

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[14] /tuŋiŋa/ can be replaced by /tuŋaŋa/. This form also avoids having /i/ in the head position of the foot ˈ(C)V.Cˈl. The //CVCi-// stems often alternate to //CVCa-//. This alternation is observed not only with the younger generation of speakers but also with those of the older generation. The selection below is from a text told by Lincoln Blassi (1894-1980) and recorded between 1978-84:

/ɣaami taɣ"ani ɣaaɣaqɬutiŋ, qulaŋi riɣilŋuut. aziɣutiiɣaqluki amiɣim tuŋaŋaniŋ taaxkin inkaam aɣipsut qulɨɣɬuɣinaɣmun ligan piiqilɣiit/ "Inside the front entrance, to the side, was the hearth. Here people built their fire and cooked their meals. There was an opening in the roof of the summer home for the smoke to escape. A windbreak was put up by the entrance so that the smoke would go straight up through the hole." (Apassingok et al. 1985: 82-83)

The underlined words would be realized as /quulŋi/ and /tuŋiŋaniŋ/ respectively, if the stems were //CVCi-//.

1.5.1. Syllable Structures

SLI Yupik syllables have the structure (C)V(V)(C). Syllables containing a single vowel are called light syllables ((C)V, (C)VC), and those containing two vowels, heavy syllables ((C)VV, (C)VVC). Those lacking a final consonant are called open ((C)V, (C)VV), and those having a final consonant, closed((C)VC, (C)VVC).

1.5.2. Iambic foot

SLI Yupik is an iambic stress language where a foot[15] consists of either an unstressed syllable followed by a stressed one or a heavy stressed syllable itself (Krauss 1975, 1985; Jacobson 1985).

For example, the following word consisting of open light syllables shows a sequence of rhythmic feet.[16] The head of a foot, that is, a stressed syllable, is lengthened to form an iambic rhythmic pattern. The final syllable is extrametrical.[17]

(44) na.ɣalsi.malka.ŋa [naɣá:simá:kaŋa] "he heard it"

When the head of a foot is a closed light syllable CVC, it is stressed without iambic lengthening. The light closed syllable **χaɣ**, is simply stressed, while the light open syllable **ɣi** of the second foot is lengthened to make an iamb.

(45) qɨp.χaɣlyun.ɣiltu.ŋa [qəpχáɣyunˀɣé:tuŋa] "I did not want to work"

It should be noted that a stressed open light syllable whose nucleus is /ɨ/ is not lengthened as seen in (46).

(46) i.tɨlmuq [itɨ́m:oq] "it came undone"

A heavy syllable can either be the head of a foot or constitute a monosyllabic foot by itself. In the example (47), the heavy syllable **ŋaaɣ** forms the head of the third foot, while in the examples (48) and (49), the heavy syllables **ŋaa** and **maal** form monosyllabic feet by

[15] I use the term foot as Trask (1996) defines: the fundamental unit of rhythm in phonology, most typically consisting of a sequence of syllables, one of which bears a stress or other prosodic element.
[16] Hereafter syllable boundaries and foot boundaries are marked by periods (.) and vertical lines (|), respectively.
[17] The prosodic rules apply to forms produced by prior application of morphophonemic rules.

themselves:

(47) qɨp.x̣aɣ̌lyun.ɣ̌ilt̪ɨɣ̌.ŋaaɣ̌lma [qəpx̣áɣ̌yunᵃɣ̌é:təɣ̌ŋá:ɣ̌ma]

"though I did not want to work"

(48) ki.nalŋaalɣʷa [kiná:ŋá:ɣʷa] "who is it?"

(49) maallɣ̌u.ɣɨylnɨŋ [má:lɣ̌oɣɨ́ynɨŋ] "from two"

In short, the second syllable of a word is always stressed unless the initial syllable of the word is a stressed heavy syllable.

1.5.3. Avoiding Stressed Cɨ

However, SLI Yupik is not as typically iambic as has been claimed. As far as the vowel /ɨ/ is concerned, SLI Yupik shows deviations from typical iambic stress. As previous works stated (Krauss 1975, Hayes 1995), /ɨ/ of a light syllable Cɨ is stressable in the head position of a foot, although it cannot be lengthened like other vowels as we have already seen in (46) above.[18] However, there is a tendency to avoid stress on /ɨ/ of a light syllable Cɨ.[19] The reason may be that the foot |(C)V(C).Cɨ| is not ideal for forming an iambic foot. Other light open syllables CV in the head position of a foot can be lengthened to form a canonical iambic foot. However, Cɨ in the head position of the foot |(C)V(C).Cɨ| cannot be lengthened, and the foot cannot form a canonical iambic foot.

[18] Stressed vowels in open syllables obtain higher pitch and longer duration than unstressed ones. As mentioned above, a stressed vowel of an open syllable is lengthened. As far as the stressed /ɨ/ of an open light syllable is concerned, it is pronounced with high pitch like other vowels but it is not lengthened as such. The syllable-initial consonant following the syllable Cɨ is notably tense, that is, pronounced with longer duration. It should be noted that this does not mean consonant gemination as heard in other Yupik languages like Central Alaskan Yupik, though some speakers pronounce the stressed /ɨ/ of an open light syllable with the following consonant completely geminated. Below are examples of open light syllable Cɨ followed by a tense consonant:

atɨpik [atɨ́p:ik] "real name; Yupik name"

ɨ̨pɨt̪ɨk [ɨ̨ɨ́pɨt:ɨk] "you (du.)"

Stressed /ɨ/ in a light closed syllable CIC behaves similarly to other vowels in light closed syllables CVC; they are stressed but not lengthened, unlike the vowels (except /ɨ/) of open light syllables CV.

[19] There is also a tendency to avoid the foot |(C)V(C).Cɨ| also in Central Alaskan Yupik. The foot |CVC.CV| is always avoided in the language. In this case, the foot division is to be put between the closed syllable CVC and the open light syllable CV. A closed syllable CVC can constitute a monosyllabic foot in Central Alaskan Yupik. The foot |CV.Cɨ| is also to be avoided in it. In this case, the vowel /ɨ/ is syncopated to make a closed syllable CVC. Even when it is not syncopated for some reason, the initial consonant of the following syllable is to be geminated to change the syllable Cɨ into C:C. An open light stressed syllable Cɨ́ never occurs. See Miyaoka (1985) for further details.

Mostly when a foot has the shape of |(C)V(C).Cɨ|, /ɨ/ is stressed as in (50) and (51) below:

(50) i.nɨ|qɨ.rɨ|ɣʷaaq [inə́q:əɹɨ́ɣʷ·a:q] "armpit"

(51) qɨl.mɨ|siit|m̥un [qəlmɨ́sɨ́:tm̥un] "into the cooking pot"

However, when an open light syllable Cɨ in the head position of the predictable penultimate foot of a word is followed by a closed light syllable FVC that starts with a voiced velar fricative (F), that is, the word has the shape of (#)(C)VC.CI.FVC.(CV(V)(C))#, the vowel /I/ is not stressed. In this case, the preceding close light syllable is stressed and forms a foot by itself. In turn, the syllable Cɨ and the following FVC form an iambic foot as in (52) and (53).

(52) a.lɨχ|qum|sɨ.ɣaχ|tuq [alə́χqómsəɣ́áχtoq] "he whispered"

(53) nu.nɨ|vax|sɨ.ɣaq [nuní:váxsɨɣ́áq] "tundra vegetations"

Now we are back to initial vowel doubling. The words that start with the stems $(C_1)VC_2ɨ(C_3)$- are stressed on the second syllable $C_2ɨ(C)$ as mentioned above. When this second syllable of the words is open $C_2ɨ$ and the following syllable starts with a velar consonant, initial vowel doubling occurs. While the second syllable of the words is closed $C_2ɨC$, initial vowel doubling does not occur. It can be assumed that initial vowel doubling is similar to the phenomenon with unstressed Cɨ followed by FVC as we have just seen above in (51) and (52). In both cases, Cɨ in question is followed by a velar consonant although the conditions are slightly different. Initial vowel doubling occurs with any velar consonant in the C̲ position of $(C_1)VC_2ɨ$C̲V..., while only voiced velar fricatives are involved in the case of |(C)VC|Cɨ.FVC|(CV(V)(C))#.

Because an open light syllable Cɨ in the head position of an iambic foot is not preferable as mentioned above, there is a tendency to avoid stressed Cɨ́. An unstressed Cɨ is followed by a stressed syllable to form an iambic foot. Also the preceding syllable needs to be stressed. When a stem having the shape of $(C_1)VC_2ɨ(C_3)$- is followed by a suffix and made

into the sequence $(C_1)VC_2\dot{\imath}CV...$, $C_2\dot{\imath}$ is supposed to be the head of a foot. But this is not preferable for the head of an iambic foot. Therefore, it can be assumed that unstressed $C_2\dot{\imath}$ causes the preceding syllable stressed. When the first syllable is stressed, it needs to be a heavy syllable. Furthermore, unstressed vowel /ɨ/ tends to be deleted. It is possible to say that maintaining the iambic prosody causes the loss of the unstressed vowel /ɨ/ and induces compensatory lengthening to make the initial stressed syllable heavy. Why velar consonants are involved in initial vowel doubling remains to be done. It needs to be studied further.

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On Initial Vowel Doubling in St. Lawrence Island Yupik

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St. Lawrence Island Yupik has a peculiar phonological process which I call initial vowel doubling in this paper: when a stem having the shape of $(C_1)VC_2$ ɨ(C_3)- (C_3=velar fricative) is followed by a suffix and made into the sequence $(C_1)VC_2$ɨ$\underline{C}$V... in the derivational process, the initial vowel of the stem is lengthened, doubled, to be precise, with the deletion of ɨ into the shape $(C_1)V_iV_iC_2\underline{C}$V .... The purpose of this paper is to examine this process and its conditioning factors from the data that I have obtained through my fieldwork and to explain it as a prosodic process.

When initial vowel doubling occurs, the underlined consonant of the sequence $(C_1)V_iV_iC_2\underline{C}$V... is velar consonants: **k, q, ɣ, ġ, x, χ, ŋ.**

SLI Yupik is an iambic stress language where a foot consists of either an unstressed syllable followed by a stressed one or a heavy stressed syllable itself. However, SLI Yupik is not as typically iambic as has been claimed. As far as the vowel /ɨ/ is concerned, SLI Yupik shows deviations from typical iambic stress. There is a tendency to avoid stress on /ɨ/ of a light syllable Cɨ. The reason may be that the foot |(C)V(C).Cɨ| is not ideal for forming an iambic foot. The words that start with the stems $(C_1)VC_2$ ɨ(C_3)- are stressed on the second syllable C_2ɨ(C). When this second syllable of the words is open C_2ɨ and the following syllable starts with a velar consonant, initial vowel doubling occurs. Because an open light syllable Cɨ in the head position of an iambic foot is not preferable, there is a tendency to avoid stressed Cɨ. An unstressed Cɨ is followed by a stressed syllable to form an iambic foot. Also the preceding syllable needs to be stressed. When a stem having the shape of $(C_1)VC_2$ ɨ(C_3)- is followed by a suffix and made into the sequence $(C_1)VC_2$ɨCV..., C_2ɨ is supposed to be the head of a foot. But this is not preferable for the head of an iambic foot. Therefore, it can be assumed that unstressed C_2ɨ causes the preceding syllable stressed. When the first syllable is stressed, it needs to be a heavy syllable. Furthermore, unstressed vowel /ɨ/ tends to be deleted. It is possible to say that maintaining the iambic prosody causes the loss of the unstressed vowel /ɨ/ and induces compensatory lengthening to make the initial stressed syllable heavy.