Aspectual /-*x'id*/ in Modern Kwak̓wala*

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Abstract: One of the most frequent and important suffixes in Kwak̓wala is /-*x'id*/, an aspectual suffix with ten allomorphs in the modern language: {-*x'id*, -*'id*, -*x'i*, -*'i*, -*nd*, -*ud*, -*d*, -*n*, -*u*, -∅}. In this paper I summarize research concerning this suffix's history, syntax, and semantics, and provide an updated rule-based analysis of the morphophonology of /-*x'id*/ in modern Kwak̓wala. I also comment on issues related to teaching and learning /-*x'id*/.

Keywords: morphology, phonology, aspect, Kwak̓wala, Wakashan

1 Introduction

The suffix /-*x'id*/ is one of the most frequent suffixes encountered in the Kwak̓wala language.[1] In terms of its morphophonology, it is also one of the most complex: in modern Kwak̓wala, /-*x'id*/ has the ten allomorphs, listed in (1).

(1) Allomorphs of /-*x'id*/ in modern Kwak̓wala:

{-*x'id*, -*'id*, -*x'i*, -*'i*, -*nd*, -*ud*, -*d*, -*n*, -*u*, -∅}

One purpose of this paper is to describe the morphophonology of /-*x'id*/ in modern Kwak̓wala. While the distribution of five allomorphs, {-*x'id*, -*'id*, -*nd*, -*ud*, -*d*}, is unchanged since the language was described at the turn of the 20th century (Boas 1911, 1947), five new allomorphs {-*x'i*, -*'i*, -*n*, -*u*, -∅} have arisen due to an optional rule in the modern language, the deletion of *d* in syllable-final position. This change has had the effect of making the morphophonology of /-*x'id*/ more complicated than it was over a century ago.

Because of its high frequency and grammatical importance, /-*x'id*/ is a central part of the language for consideration by both linguists and language learners. A second purpose of this paper is to bring together what is currently known about /-*x'id*/. Several recent studies have described the semantics of /-*x'id*/ (Greene 2013, Sardinha 2018), adding to the detailed descriptions of /-*x'id*/ provided in Boas' grammars (Boas 1911, 1947). Novel observations presented below come from field research focused primarily on the central dialect of the language, commonly referred to as Kwak̓wala, as spoken by four language consultants from Tsax̱is and Gwa̓yi. I have also worked to a lesser extent with two language consultants speaking the Nak̓wala dialect from Tsulquate, and am not aware of any differences across the two dialects in the grammar of /-*x'id*/.

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[1] Kwak̓wala is an endangered Northern Wakashan language spoken in British Columbia on the central coast, adjacent mainland, and intervening islands, as well as in Victoria and the Fraser Valley. The Kwakwaka'wakw population is estimated to consist of 2.2% fluent speakers, 5.9% semi-speakers, and 12.3% active learners (First Peoples' Cultural Council 2018).

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I begin with an overview of how /*-x'id*/ is described in the historical literature (Section 2), followed by an overview of its syntax and semantics (Section 3). Then, I proceed to an analysis of the morphophonology of /*-x'id*/ in the modern language (Section 4). Following this, I comment on some of the issues facing L2 teachers, L2 students, and toddlers acquiring /*-x'id*/ (Section 5). Section 6 summarizes and concludes.

2 Descriptions of /*-x'id*/ in the early 20th century

Boas (1911) and Boas (1947) constitute the earliest comprehensive descriptions of Kwakʼwala grammar. The focus of these grammars is on the central dialect, especially as it was spoken in and around Tsax̲is (Fort Rupert) around the turn of the 20th century.

At this time and place in the language's history, there were five allomorphs of /*-x'id*/: {*-x'id*, *-'id*, *-nd*, *-ud*, *-d*}. In Boas (1911), the forms *-d* and *-(x)'id* are provided separate entries in the list of suffixes (456–457 and 486–488, respectively). However, by the time Boas (1947) is written, these forms are identified as allomorphs of the same morpheme. The description in (2) is reproduced from the annotated glossary of suffixes in Boas (1947).

(2) *-(x)'id*[2], *-nd*, *-ud*, *-d*

"These forms express a momentary aspect, generally an inchoative." (Boas 1947:365)

In Boas (1947), there are in fact two distinct morphemes reported with [*–(x)'id*] as their phonological shape. These include the morpheme in (2) which expresses aspectual information and attaches closer to the root, and the /*-x'id*/ described below in (3) which attaches further from the root and expresses tense information. Several examples that are identified in Boas (1947) as involving tense /*-x'id/* are provided in (4).[3]

(3) *-(x)'id*:

"This suffix does not occur often in the texts although it is quite common in conversation. It refers to recent past, a few hours, day [sic.] or even weeks ago." (Boas 1947:289)

"[tense *-(x)'id*] Retains *x* except in nouns." (Boas 1947:366)

(4) Examples with tense */-x'id/*:

a. ga̲lx'id
ga̲l =x'id
first =REC.PAST
'he had been first' (Boas 1947:366)

b. lax'id
la =x'id
go =REC.PAST
'he went' (Boas 1947:366)

[2] Brackets around the initial segment indicate that this segment is lost in certain phonological environments, making *-(x)'id* shorthand for {*-x'id*, *-'id*}.
[3] Glossing conventions and abbreviations are provided at the end of the paper, following References.

c. a̲x̲’as’ide
a̲x̲ -’as =x’id =i’
do -LOC.PASS =REC.PAST =NMZ
‘place where he had been before’ (Boas 1947:366)

From a semantic perspective, it is not obvious why the examples of alleged tense */-x’id/* in (4) could not be analyzed as instances of aspectual */–x’id/*. The motivation for positing two distinct morphemes seems to derive, rather, from the existence of alternations such as those in (5), where we see [*-(x)’id*] attaching either closer to (5a) or further from (5b) the root relative to the suffix *-a*, and where we see it is possible for two morphemes with the shape [*-(x)’id*] to be present on the same stem (5c).

(5) Aspectual /*-x’id*/, tense /*-x’id*/, and their combination:

a. k̲as’id
k̲as -x’id
walk -BEC
‘to go’ (Boas 1947:365)

b. k̲asax’id
k̲as -a =x’id
walk -A =REC.PST
‘he went (about a week or month ago)’ (Boas 1947:366)

c. k̲as’ida̲x’id[4]
k̲as -x’id =x’id
walk -BEC =REC.PST
‘he took a walk’ (Boas 1947:366)

Greene (2013) investigates [*-(x)’id*] forms in modern Kwak̓wala and finds that contemporary speakers no longer allow this form in the outer tense slot (6).[5] In its place, they volunteer forms with the simple past tense enclitic, *=xd* (7).[6]

(6) *k̲asa**x’id**ox̲da ga̲nana̲m la**x̲**a skul
k̲as -a **-x’id** =ox̲ =da ga̲nana̲m la =x̲ =a skul
walk -A **-REC.PST** =D2 =DET child PREP =ACC =D4 school
Intended: The child walked to school (about a week/month ago).’ (Greene 2013:80)

[4] Schwa (*a̲*) is epenthetic here, and more generally in any example where it is omitted from the parse and gloss lines in the morpheme analysis. It is debatable whether schwa is ever phonemic in Kwak̓wala.
[5] Greene’s research also focuses on the central dialect and was carried out with many of the same speakers as my own.
[6] The morpheme analysis of these examples has been changed slightly from the source to make them align with the glossing conventions adopted here.

(7) k̲asa**xd**o̲x̲da g̲a̲nana̲m la̲x̲a skul
k̲as -a **=xd** =o̲x̲ =da g̲a̲nana̲m la =x̲ =a skul
walk -A **=REC.PST** =D2 =DET child PREP =ACC =D4 school
'The child was walking to school.' (Greene 2013:80)

In the modern language, aspectual /*-x'id*/ can co-occur with the simple past tense enclitic *=xd*, which is realized in the same outer position as tense /*-x'id*/ was historically (8). This is the position of tense clitics generally, as shown in (9) where the future tense clitic *=tł* follows aspectual /*-x'id*/.

(8) k̲as**'ida̲xd**o̲x̲da g̲a̲nana̲m la̲x̲a skul
k̲as **-x'id** **=xd** =o̲x̲ =da g̲a̲nana̲m la =x̲ =a skul
walk **-BEC** **=REC.PST** =D2 =DET child PREP =ACC =D4 school
'The child started to walk to school.' (Greene 2013:80)

(9) latła̲n tłi̲x̲w**'id**tł la̲x̲ Tsa̲x̲is
la =tł =a̲n tłi̲x̲w **-x'id** =tł la =x̲ Tsa̲x̲is
go =FUT =1 relocate **-BEC** =FUT PREP =ACC Fort.Rupert
k̲a'a̲n xwa̲nukw
k̲a =a̲n xwa̲nukw
PREP =1.POSS child
'I'm going to move to Tsax̲is for my child.' (20160720 VF)

Examples such as (8–9) indicate that tense /*-x'id*/ is not used by contemporary Kwak̓wala speakers. The rest of this paper will only be concerned with aspectual /*-x'id*/.

3 Syntax and semantics

The suffix /*-x'id*/ is one of the most frequently encountered morphemes in Kwak̓wala, in part because its occurrence on lexical roots is not restricted by syntactic category. The examples in (10) show that /*-x'id*/ can occur on verbs, nouns, adjectives, and adverbs (see Littell 2016:51–93 for discussion of syntactic categories).

(10) */-x'id/* on lexical roots*:*

a. ma̲x'id verb + */-x'id/*
ma̲x -x'id
punch -BEC
'to punch, hit with fist'

b. ba̲gwana̲mx'id noun + */-x'id/*
ba̲gwana̲m -x'id
man -BEC
'to become a man'

c. t̓suł'id adjective + */-x'id/*
t̓suł -x'id
black -BEC
'to get black, to blacken'

d. olax'id — adverb + */-x'id/*
ola -x'id
really -BEC
'really'

Regarding its morphosyntax, the suffix */-x'id/* attaches exclusively to the stem which it semantically modifies. In this way, */-x'id/* patterns as a suffix and not as a clitic (see Littell 2016:545–583).

Greene (2013) investigates the semantics of */-x'id/* in modern Kwak̓wala and describes the suffix as a non-canonical perfective. One way */-x'id/* resembles a canonical perfective is that it advances event time in narratives: in stories consisting of multiple sequenced events, */-x'id/* is often used to mark a transition from one event to the next (Greene 2013:82–85). Another way */-x'id/* resembles a perfective is shown by its interpretation in the vicinity of when-clauses, which are known to make the reference time of the event explicit. In (11), the reference time is the moment when the speaker ("I") enters in a room where Marion is, thereby scaring Marion. The verb *dzg̲alkw'id* ('run-*x'id*') in this sentence indicates that Marion's running began within the reference time, which in this example is the moment I entered the room. This can be contrasted with (12), where the reference time is once again the moment the speaker enters a room where Marion is, this time interrupting Marion's workout. In (12), the verb *dzg̲alkwg̲la* with the continuative suffix *-la* is used to indicate that Marion's running was ongoing at the reference time.[7]

(11) *Context: Marion was scared of me as soon as she saw me walk into the room.*

le'gan				le'etła	dzalkw**'id**i			Marion
la	=i'	=(i)k	=an	le'etła	dzalkw	**-x'id**	=i	Marion
AUX	=NMZ	=V1	=1	arrive	run	**-BEC**	=D3	Marion

'When I arrived, Marion ran.' (Greene 2013:87)

(12) *Context: I interrupted Marion's daily workout when I came into the room.*

le'gan				le'etła	dzalkwa**l**i			Marion
la	=i'	=(i)k	=an	le'etła	dzalkw	**-la**	=i	Marion
AUX	=NMZ	=V1	=1	arrive	run	**-CONT**	=D3	Marion

'When I arrived, Marion was running.' (Greene 2013:88)

Greene (2013) makes two conclusions from this type of data. Firstly, */-x'id/* minimally requires the beginning of an event to be included within the reference time of an utterance. Secondly, */-x'id/* does not require the completion of an event within reference time — that is, */-x'id/* does not express telicity. If */-x'id/* were telic, we would expect (11) to receive the interpretation whereby the running was completed within reference time ('When I arrived, Marion had ran.'). Aspectual */-x'id/* is thus unlike canonical perfectives, because canonical perfectives require event completion within reference time. These two conclusions about */-x'id/* are captured by Greene's denotation in (13).

[7] I have modified the morpheme analysis of (11) and (12) from the source to reflect an update in our knowledge about the structure of when-clauses (Littell 2016:604–606).

(13) Denotation of */-x'id/*:[8]

$[\![x'id]\!] = \lambda P_{<v,<s,t>>}.\lambda t_i.\lambda w_s.\ \exists e.(\text{BECOME}(P))(e)(w)\ \&\ \text{time}(e) \subseteq t$ (Greene 2013:88)

Another important finding in Greene (2013) is that Kwak̓wala has three basic event types, or aktionsart classes, which are referred to as *states*, *processes*, and *transitions*. States are non-telic and non-dynamic; processes are non-telic and dynamic, or composed of stages; and transitions are telic, but are not dynamic; rather, they are momentaneous events. A summary of these properties is provided in Table 1.

Table 1: Lexical aspect classes in Kwak̓wala (from Greene 2013)

Verb class	Template	Semantic features
a. States	λe.P(e)	[-telic, -stages/-dynamic]
b. Processes	λe.(DO(P))(e)	[-telic, +stages/+dynamic]
c. Transitions	λe.(BECOME(P))(e)	[+telic, -stages/-dynamic]

One way of understanding the semantics of /*-x'id*/ is to look at how it interacts with verbs from each aktionsart class. Greene (2013) shows that on states /*-x'id*/ receives an inchoative interpretation (14), while on processes /*-x'id*/ receives either a simple past or inchoative interpretation depending on context (15). Lexical transitions, on the other hand, are ungrammatical with /*-x'id*/ (16).

(14) States and */-x'id/*:

a. k̓a̲na'isa̲n
k̓a̲na'is =a̲n
feel.cold =1
'I'm cold.' (Greene 2013:90)

b. k̓a̲na'is**'ida̲**n
k̓a̲na'is **-x'id** =a̲n
feel.cold **-BEC** =1
'I got cold.' (Greene 2013:90)

[8] The BECOME operator in (13) is defined in Dowty (1979:139f.) as follows:

> *Interval*: Let *T* be the set of real numbers. Let ≺ be the standard dense linear ordering of *T*. *I* is an interval iff $I \subset T$ and for all moments t_1, t_2, t_3, if $t_1 \prec t_2 \prec t_3$, then $t_2 \in I$.
>
> *Initial and final bound*: *t* is an initial bound for *I* iff *t* is the latest moment just before *I*. Final bound is defined similarly.
>
> [BECOME ϕ] is true at *I* iff there is an interval *J* containing the initial bound of *I* such that $\neg\phi$ is true at *J* and there is an interval *K* containing the final bound of *I* such that ϕ is true at *K*.

(15) Processes and */-x'id/*:

a. k̲asa̲n
k̲as =a̲n
walk =1
'I walk (habitually)' or 'I am walking'. (Greene 2013:37)

b. k̲as**'id**ox̲da ga̲nana̲m la x̲a skul
k̲as **-x'id** =ox̲ =da ga̲nana̲m la =x̲ =a skul
walk **-BEC** =D2 =DET child PREP =ACC =D4 school
(i) 'The boy started to walk to school.'
(ii) 'The boy walked to school.' (Greene 2013:93)

(16) Transitions and */-x'id/*:

a. dulowa̲n
dulo =a̲n
win =1
'I won.' (Greene 2013:97)

b. * dulo**x'id**a̲n
dulo **-x'id** =a̲n
win **-BEC** =1 (Greene 2013:97)

The incompatibility of /*-x'id*/ and lexical transitions arises from the fact that the denotation of /*-x'id*/ and the template of lexical transitions (Table 1, c) both contain the BECOME operator. Their combination would derive a non-sensical event type consisting of an initial transition into an instantaneous transition.

Sa̓rdinha (2018) extends Greene's system by proposing that three frequent suffixes in Kwak̓wala have the function of deriving Greene's three event types: *-ała* 'stative' derives states, *-la* 'continuative' derives processes, and *-(x)'id* 'become' derives transitions. These suffixes form a paradigm with *-a*, an unmarked default, to specify the event type of every event expressed in the language. Some verb roots, such as *duk̲w-* 'to see', can be used to express all three event types through derivation with these suffixes (17).

(17) *duk̲w-* 'to see' with *-ała* (a), *-la* (b), *-x'id* (c), and default *-a* (d):

a. *Context: Mabel thinks she heard something in the bushes. She keeps her eye on the bushes to see if it'll move again.*

la̓mis **duk̲wała** x̲ada k̓wax̲mis
la̲ ='m =(w)is **duk̲w** **-ała** =x̲ =a =da k̲wax̲mis
AUX =VER =and.so **see** **-STAT** =ACC =D4 =DET bush
k̓a̲yosida yaẇixa
k̓a̲yos =i =da yaẇix -a
NEG.EXIST =D3 =DET move -A
'She **watched** the bushes, but nothing moved.' (20160712 VF)

b. *Context: Vicky drew a complicated picture of a garden. In it there was a butterfly. She asked Eddie if he could find the butterfly.*

duk̲wa̲lux̲			Eddiya̲x̲		x̲ada			k̓ata̲makw
duk̲w	**-la**	**=ux̲**	Eddie	=(a̲)x̲	=x̲	=a	=da	k̓ata̲makw
see	**-CONT**	**=D2**	Eddie	=V2	=ACC	=D4	=DET	picture

k̓i'stłux̲			**duk̲wa̲la**		x̲ida			ha̲mumu
k̓i's	=tł	=ux	**duk̲w**	**-la**	=x̲	=i	=da	ha̲mumu
NEG	=FUT	=D2	**see**	**-CONT**	=ACC	=D3	=DET	butterfly

'Eddie **looked over** the picture, but he didn't **see** the butterfly.' (20160712 VF)

c. *Context: The speaker is telling a story about paying her hydro bill at the bank. The bill was for an absurdly small sum.*

la̲m̓ida				t̓sa̲dak̲	**dux̲w'i**		x̲a̲n	
la̲	='m	=i	=da	t̓sa̲dak̲	**dux̲w**	**-x'id**	=x̲	=a̲n
AUX	=VER	=D3	=DET	woman	**see**	**-BEC**	=ACC	=1.POSS

bill	la̲'a̲m		da̲'ł'i	
bill	la̲	='m	da̲'ł	-x'id
bill	AUX	=VER	laugh	-BEC

'Then the woman **saw/looked at** my bill, and laughed.' (20150527 VF)

d. *Context: Mabel heard a noise behind her, so she turned around to look at it.*

la̲m̓isi				ma̲ls'i'lela	**duk̲wax̲**		
la̲	='m	=(w)is	=i	ma̲lsi'lela	**duk̲w**	**-a**	**=x̲**
AUX	=VER	=and.so	=D3	turning.around	**see**	**-A**	**=ACC**

'She turned around to **look** at it.'
Speaker: "She looked around." (20160712 VF)

The existence of a system of event type marking explains why /*-x'id*/ is so frequent, and why the other suffixes in its paradigm, *-ała* and *-la*, are similarly frequent.[9] In contrast with tense, which is only obligatory in the future, the specification of event type is obligatory.

On nouns, /*-x'id*/ derives an inchoative with the meaning 'to become *N*' (18). Semantically, this involves the coercion of a predicate of individuals into a predicate of events defined over an interval of time (see (13) and footnote 8).

(18) a.

ba̲gwana̲mux̲		Connor
ba̲gwana̲m	=ux̲	Connor
man	=D2	Connor

'Connor is a man.' (20100129-Abel VF)

b.

ba̲gwana̲m**x'id**ida			kwa̲nkwa̲nxwa̲lige'
ba̲gwana̲m	**-x'id**	=i	=da	kwa̲nkwa̲nxwa̲lige'
man	**-BEC**	=D3	=DET	Thunderbird

'Thunderbird became a man.' (20130710 VF)

[9] The story is more complicated with respect to *-a*, as there appears to be multiple suffixes and clitics with this shape.

While /*-x'id*/ is in principle possible on any noun, such examples are rare for pragmatic reasons.

In summary, /*-x'id*/ patterns morphosyntactically as a suffix and attaches to every category of lexical root. Semantically, /*-x'id*/ marks a category of event type known as transitions, and its use requires that the event in question began, but was not necessarily completed, during the reference time of the utterance.

4 Morphophonology of /*-x'id*/

In modern Kwak̓wala, there are ten allomorphs of /*-x'id*/ which fall into three sets. The set of allomorphs in (19a) and the set of allomorphs in (19b) are differentiated by the morphological environment they appear in, while the allomorphs in (19c) appear in either morphological environment and arise due to an optional phonological rule.

(19) Allomorphs of */-x'id/* in modern Kwak̓wala:

a.	*-nd, -ud, -d*	After lexical suffixes
b.	*-x'id, -'id*	On stems without lexical suffixes
c.	*-x'i, -'i, -n, -u, -∅*	Arises due to optional *d* loss syllable-finally

In Section 4.1, I discuss the morphological conditioning of the sets of allomorphs in (19a) and (19b), as well as the phonological conditioning of allomorphs within these sets. Then in Section 4.2, I discuss the allomorphs in (19c), which arise due to the occasional omission of *d* at the end of syllables in connected speech. Section 4.3 presents the full set of rules for the morphophonology of /*-x'id*/.

The phonological inventory of Kwak̓wala is summarized in Appendix A.

4.1 {*-nd, -ud, -d*} and {*-x'id, -'id*}

Two sets of allomorphs were attested in the Kwak̓wala spoken around the turn of the 20th century: {*-nd, -ud, -d*} and {*-x'id, -'id*}. These allomorphs are analyzed here as instances of the same abstract morpheme, /*-x'id*/. This unified analysis is motivated by the fact that these sets are identical in meaning and are in complementary distribution (exceptions are discussed below). The conditions underlying the distribution of these sets is morphological in nature.

Of these two sets of allomorphs, {*-nd, -ud, -d*} is more restricted. These allomorphs occur exclusively on stems which already contain one or more "primary suffixes" (Boas 1911:455), a set which includes nearly all suffixes in the language. Suffixes which are specifically listed as not being primary suffixes include terminal completive *-a* (Boas 1911:456), *-la* 'continuative', *-ała* 'stative', and *-!iq* 'in mind' (Boas 1947:365). The reciprocal suffix *-ap̓* 'each other' may be added to this list. What Boas calls primary suffixes are referred to in the literature on Northwest Coast languages as *lexical suffixes*, a term which refers to suffixes with meanings resembling independent lexical items in familiar European languages. Some examples of lexical suffixes in Kwak̓wala include *-(g)g̲am* 'face', *-(x)tła* 'on the fire', and *-'sta* 'in(to) water'. As 'lexical suffix' is the more familiar term, I adopt it below. Clitics are naturally excluded from this set, and in any case always attach to the right of /*-x'id*/ within the word.

With stems containing one or more lexical suffixes, one of the allomorphs in the set {*-nd, -ud, -d*} is chosen according to three phonological rules (Boas 1947:365). After stem-final *m* and *n*, the allomorph *-d* is realized. After stem-final rounded vowels and semi-vowels, *-o, -u*, or *-g̲w*, the allomorph *-ud* is realized, with *o* and *g̲w* being converted to *u*. Elsewhere, the allomorph *-nd* is

realized, in which case up to three additional phonological rules apply: one, if the stem ends in a consonant, *ạ* (schwa) is inserted before *-nd*; two, if the stem ends in the vowel *a*, this vowel is shortened to *ạ*; and three, if the stem ends in an obstruent, it undergoes softening (lenition). These rules for realizing {*-nd, -ud, -d*} are summarized in (20) along with examples.

(20) *Phonological conditioning of the allomorphs {-nd, -ud, -d)*:

A. Realize [***-d***] when the rightmost lexical suffix ends in *m* or *n.*

i. /kus-/ + /-(g)ạm/ + /-x'id/ → [kusạm**d**]
kus- 'to shave', -(g)ạm 'face', kusạmd 'to shave face'

ii. /lus-/ + /(-k)'ạn/ + /-x'id/ → [lusạn**d**]
lus- 'to uncover', -(k)'ạn 'body', lusạnd 'to get naked, undress'

B. Realize [***-ud***] when the rightmost lexical suffix ends in a rounded vowel or semi-vowel (*u, o,* or *ạw*), and convert the vowel or semi-vowel to *u*.[10]

i. /dạy-/ + /-'stu/ + /-x'id/ → [di'st**ud**]
dạy- 'wipe', -'stu 'round opening', di'stud 'to wipe eyes'

ii. /nix̱-/ + /-ẇạk̲o/ + /-x'id/ → [nix̱ẇạk̲**ud**]
nix̱- 'to pull', -ẇạk̲o 'out of hole', nix̱ẇạk̲ud 'to pull out of hole'

iii. /k̲ux̱-/ + /-ṫsạw/ + /-x'id/ → [k̲ux̱wṫs**ud**]
k̲ux̱- 'to dress', -ṫsạw 'in', k̲ux̱t'sud 'to get dressed'

C. Realize [***-nd***] elsewhere after lexical suffixes, and apply the following three additional rules:

a. If the stem ends in a consonant (other than *m* or *n*), insert *ạ* (schwa) before *-nd.*

i. /ṫsạṁ-/ + /-(ạ)nx̱/ + /-x'id/ → [ṫsạṁạnx̱**ạnd**]
ṫsạṁ- 'melt', -(ạ)nx̱ 'season', ṫsạṁạnx̱ạnd 'season of melting (ice)'
(Boas 1947:305)

b. If the stem ends in a non-rounded vowel (*a, i,* or *e*)[11], shorten this vowel to *ạ.*

i. /ạx̱-/ + /-ba/ + /-x'id/ → [ạx̱b**ạnd**]
ạx̱- 'empty root, do', -ba 'end of long horizontal object', ạx̱bạnd 'to put at end' (Boas 1947:365)

[10] The Uṁista letter *o* used here corresponds to the letters *â* and *ô* in Boas (1947), while the Uṁista letter *u* here corresponds to *u, ū, o,* and *ō* in Boas (ibid.). Note that the sequence *ạw* is phonetically identical to *o* when it makes up the rhyme of a syllable. Phonologically, however, the sequence *ạw* can be distinguished from *o* in a variety of ways (see Littell 2016:444–448).

[11] I have generalized this rule to include *e*, though I have not found any examples with this vowel in this position. The only lexical suffix in Boas (1947) which ends in this vowel is *-°x̱tłe* 'on top of head, name' (pg. 274), and the only relevant example provided takes the allomorph [*-x'id*]: *nił'x̱tłex'id* 'to begin to show head'.

ii. /dza̲m-/ + /-(k)a̲ẏi/ + /-x'id/ → [dza̲mka̲ẏ**a̲nd**]
dza̲m- 'to bury in soil', -(k)a̲ẏi 'on top (of a surface)', dza̲mka̲ya̲nd 'to cover with dirt' (Boas 1947:355)

c. If the stem ends in an obstruent, soften the obstruent (e.g. *s* → *dz*, *k* → *g*, *k̲* → *g̲*).

i. /la-/ + /-°x̲s/ + /-x'id/ → [lax̲**dz**a̲nd]
la- 'to go', -°x̲s 'in canoe', lax̲dza̲nd 'to shift from one side to other in canoe' (Boas 1947:365)

ii. /ga̲l-/ + /-°ik/ + /-x'id/ → [ga̲li**g**a̲nd]
ga̲l- 'to crawl', -°ik 'on back', ga̲liga̲nd 'to climb on back' (Boas 1947:365)

iii. /p̓a̲tɬ-/ + /-p̓ik̲/ + /-x'id/ → [p̓a̲ɬp̓i**g̲**a̲nd]
p̓a̲tɬ- 'to fly', -p̓ik̲ 'stick, tree', p̓a̲ɬp̓iga̲nd 'to fly to pole' (Boas 1947:338)

In some cases, more than one of the above rules apply. The example in (c-iii), for instance, undergoes both *a̲* insertion (C-a) and softening of *k̲* to *g̲* (C-c).

The rules in (20) are motivated to varying degrees on phonological grounds. The split between the consonants *m* and *n* in Rule 20A and all other consonants in Rule 20C-a may be a form of dissimilation, with the allomorph *-d* being realized instead of *-nd* in order to prevent sequences of nearly adjacent nasal consonants (**...na̲nd, *...ma̲nd*). Note that the glottalized nasals, *m̓* and *n̓*, pattern along with obstruents rather than nasals in failing to trigger Rule A. While Rule 20C-c has been generalized to make reference to all obstruents, the inventory of obstruents which actually appear at the right edge of lexical suffixes is quite small. In fact, the consonants *s*, *k*, and *k̲* are the only obstruents which occur at the right edge of lexical suffixes and trigger this rule. I know of only one exception to this generalization, which is that the final consonant of the suffix *-(k)'ut* 'opposite' hardens to *t̓* before the *-nd* allomorph of */-x'id/*, giving rise to forms such as *lak̓ut̓a̲nd* 'to go to other side' (from *la-* 'to go', *-(k)'ut* 'opposite') (Boas 1947:358).[12]

Rule 20B, on the other hand, has numerous exceptions. Boas (1947:365) lists a set of suffixes which do not end in rounded vowels or semi-vowels, but which nevertheless invariably condition the *-ud* form of */-x'id/*. These are reported in Boas (1947:365) as including *-a̲x̲a* 'down' (21a), *-°tłe'* 'on water' (21b), *-tɬa̲la* 'above' (21c), *-(x̲)t'a* 'seaward' (21d), and *-!a* 'ear' (21e).

(21) *Exceptional lexical suffixes which condition the use of* -ud:

a. /a̲x̲-/ + /-a̲x̲a/ + /-x'id/ → [a̲x̲a̲x̲**ud**]
a̲x̲- 'empty root, do', -a̲x̲a 'down', a̲x̲a̲x̲ud 'to take down' (Boas 1947:321)

b. /a̲x̲-/ + /-(g)a'ɬ/ + /-°tłaẏ/ + /-x'id/ → [a̲x̲'atłaẏ**ud**]
a̲x̲- 'empty root, do', -(g)a'ɬ 'telic directional',[13] -°tłaẏ 'moving on water, at sea', a̲x̲'atłaẏud 'to put on water' (Boas 1947:377)

[12] It is ironic that the final consonant of a suffix meaning 'opposite' undergoes hardening — the opposite of softening — after the *-nd* form of */-x'id/*. This should make it an easy exception to remember!
[13] This and other directional suffixes are analyzed in Rosenblum (2015:88–93 and 294–312).

c. /mans-/ + /-(g)a'ɬ/ + /-tɬala/ + /-x'id/ → [mans'atɬal**ud**]
mans- 'to measure', -(g)a'ɬ 'telic directional', /-tɬala/ 'above ground', mans'atɬalud 'to measure, to try on' (Boas 1947:350)

d. /hantɬ-/ + /-(x)ta/ + /-x'id/ → [hantɬat**ud**]
hantɬ- 'to hunt with rifle', -(x)ta 'seaward', hantɬatud 'to shoot seaward' (Boas 1947:373)

e. /day-/ + /-!a/[14] + /-x'id/ → [disday**ud**]
day- 'to wipe', /-!a/ 'ear', disdayud 'to wipe ear' (Boas 1947:309)

I have not checked with contemporary speakers to verify whether the same pattern of exceptions holds in the modern language.

If a stem does not contain a lexical suffix, one of the allomorphs in the set {*-x'id*, *-'id*} is realized instead. These allomorphs also follow *-la* 'continuative', *-ała* 'stative', and *-!iq* 'in mind' (Boas 1947:365), as well as *-ap̓* 'each other' (see 22C-i). The choice between allomorphs {*-x'id*, *-'id*} is conditioned by a complex set of phonological rules governing the loss of initial *x*, as well as changes to the final consonant of the stem. These rules, based closely off of the ones stated in Boas (1947:365), are provided alongside examples in (22). In a few places, these rules have been generalized over phonological classes to make predictions about segments for which there is no data; round brackets '( )' are used to indicate these segments.

(22) *Phonological conditioning of the allomorphs {-x'id, -'id}*:

A. Realize [***-x'id***] when the stem ends in a vowel {***a, e, i, (o) u, (a)***}, or one of the following consonants: {***m, n, l, m̓, n̓, l̓***}.

i.	/d**a**-/ + /x'id/ → [dax'id]	da- 'to take in hand'
ii.	/al**e**-/ + /-x'id/ → [alex'id]	ale- 'to search'
iii.	/m̓aɬ̓**i**-/ + /-x'id/ → [m̓aɬ̓ix'id]	m̓aɬ̓i- 'to recognize'
iv.	/gay̓**u**-/ + /-x'id/ → [gay̓uxw'id][15]	gay̓u- 'to ask in marriage'
v.	/t̓sa**m**-/ + /-x'id/ → [t̓samx'id]	t̓sam- 'to point'
vi.	/w̓a**n**-/ + /-x'id/ → [w̓anx'id]	wan- 'to hide'
vii.	/t̓sa**l**-/ + /-x'id/ → [t̓salx'id]	t̓sal- 'to spawn'
viii.	/ha**m̓**-/ + /x'id/ → [ham̓x'id]	ham̓- 'to eat'
ix.	/dza**n̓**-/ + /-x'id/ → [dzan̓x'id]	dzan̓- 'to be loyal'
x.	/w̓a**l̓**-/ + /-x'id/ → [w̓al̓x'id]	w̓al̓- 'to stop'

B. Realize [***-x'id***] when the stem ends in {***y, w, y̓, w̓***} and change these semi-vowels to a corresponding vowel: ***y → i, w → o, y̓ → i, w̓ → u***.

i.	/da**y**-/ + /-x'id/ → [dix'id]	day- 'to wipe'
ii.	/ta**w**-/ + /-x'id/ → [toxw'id]	taw- 'to go forward, get closer'

[14] This suffix triggers reduplication of the root CV and insertion of *s* into the coda of the reduplicant.
[15] Velar and uvular segments neutralize to rounded after rounded vowels and semivowels.

iii. /t̓a**y̓**-/ + /-x'id/ → [t̓ex'id] t̓ay̓- 'to be sheltered'[16]
iv. /ga**w̓**-/ + /-x'id/ → [gu'xw'id] gaẇ- 'to help'

C. Insert ***a*** after the stem and realize [***-x'id***] when the stem ends in a glottalized plosive {***p̓, (t̓), k̓, kw̓, k̲, (k̲w̓), ts̓, tł̓, '***} or voiced plosive{***(b), d, (g), gw, (g̲), (g̲w), dz, (dł)***}.

i. /gal̓a**p̓**-/ + /-x'id/ → [gal̓ap̓ax'id] galap̓- 'to reproach each other'[17]
ii. /yan**k̓**-/ + /-x'id/ → [yank̓ax'id] y̓ank- 'to throw with sling'
iii. /kwa**kw̓**-/ + /-x'id/ → [kwak̓wax'id] kwak̓w- 'to peel off'
iv. /t̓łi**k̓**-/ + /-x'id/ → [t̓łik̓ax'id] t̓łik̲- 'to be jealous'
v. /max̲**ts̓**-/ + /-x'id/ → [max̲t̓sax'id] max̲t̓s- 'to be ashamed'
vi. /x̲a**tł̓**-/ + /-x'id/ → [x̲at̓łax'id] x̲at̓ł- 'small amount'
vii. /t̓a**ł'**-/ + /-x'id/ → [t̓ał'ax'id] t̓ał'- 'to have blanket pinned on left shoulder'[18]

viii. /ẇa**d**-/ + /-x'id/ → [ẇadax'id] ẇad- 'to be cold'
ix. /y̓u**gw**-/ + /-x'id/ → [y̓ugwax'id] y̓ugw- 'to rain'
x. /u**dz**-/ + /-x'id/ → [udzax'id] udz- 'wrong, not working'

D. Elsewhere, initial ***x*** is lost and [***-'id***] is realized, along with the following additional changes to the final stem consonant:

a. The glottal stop in [***-'id***] fuses with stem-final ***p*** and ***t*** (***p → p̓, t → t̓***).

i. /da**p**-/ + /x'id/ → [dap̓id] dap- 'to tow with rope'
ii. /sa**t**-/ + /x'id/ → [sat̓id] sat- 'to be silent, quiet, calm'

b. Stem final velars, uvulars, and the unvoiced lateral affricate undergo spirantization (***k → x, kw → xw, k̲ → x̲, k̲w → x̲w, tł → ɬ***).[19]

i. /n̓i**k**-/ + /-x'id/ → [n̓ix'id] n̓ik- 'to say'
ii. /m̓a**kw**-/ + /-x'id/ → [m̓axw'id] m̓akw- 'to iron'
iii. /p̓a**k̲**-/ + /-x'id/ → [p̓ax̲'id] p̓ak̲- 'to taste'
iv. /du**k̲w**-/ + /-x'id/ → [dux̲w'id] duk̲w- 'to see'
v. /g̲anu**tł**-/ + /-x'id/ → [g̲anuɬ'id] g̲anutł- 'night'

[16] The vowel change is specific to this stem: *t̓ay̓*- 'to be out of sight, protected by an intervening shelter against sight, heat, light, against being seen, to keep secret' (Boas 1948:174).
[17] *g̲al*- 'to reproach', *-ap̓* 'reciprocal' (Boas 1948:318).
[18] This example is from Boas (1948:178).
[19] In the case of velars and uvulars, I have also encountered increased aspiration as an alternative to spirantization (*k → k^h, kw → kw^h, k̲ → k̲^{h}, k̲w → k̲w^h*). Hypothetically, this would produce the following alternative set of examples: [*n̓ik^h'id*], [*m̓ak̲w^h'id*], [*p̓a k̲^{h}'id*], and [*duk̲w^h'id*]. Boas (1911:231) also mentions aspiration as a reflex of */-x'id/* suffixation, though he only provides examples involving spirantization.

c. There is no change to the final stem consonant when it is a fricative {***s, x, xw, x̲, x̲w, ɬ***}.

i.	/k̲a**s**-/ + /-x'id/ → [k̲as'id]	k̲as- 'to walk'
ii.	/da**x**-/ + /-x'id/ → [dax'id]	dax- 'to open eyes'
iii.	/da̲**xw**-/ + /-x'id/ → [da̲xw'id]	da̲xw- 'to jump'
iv.	/da̲n**x̲**-/ + /-x'id/ → [da̲nx̲'id]	da̲nx̲- 'to sing'
v.	/ya̲**x̲w**-/ + /-x'id/ → [ya̲x̲w'id]	ya̲x̲w- 'to dance'
vi.	/ka̲**ɬ**-/ + /-x'id/ → [ka̲ɬ'id]	ka̲ɬ- 'to be scared'

I am not aware of any roots ending in phonemic *a̲* (schwa) or *o*, though we predict these segments to be followed by [*-x'id*] as with other vowels. The only roots I am aware of which end in *ts* are phonologized loanwords (*labits* 'rabbit', *kalits* 'carrot'), and I have not observed these words with */-x'id/*. In theory, we might expect root-final *ts* to undergo spirantization (*ts* → *s*) by analogy with the other plain plosives. As indicated by square brackets above, there are a number of glottalized plosives and voiced plosives for which I lack data; in general, these segments are rarely encountered in the coda of lexical roots. The last remaining unmentioned segment, *h*, only occurs word-initially, and therefore never interacts phonologically with /*-x'id*/.

The number of exceptions to the rules in (22) appears to be quite small. One notable exception is the root *ts̓a̲k-* 'to be awake', which together with /*-x'id*/ results in *ts̓a̲ka̲x'id* 'to awaken', though we would expect to see spirantization of root-final *k* (**ts̓a̲x'id*). It is likely that *ts̓a̲ka̲x'id* arises and has been conventionalized in order to avoid homonymy with *ts̓a̲x-* 'to hurt, be in pain', which together with /*-x'id*/ forms *ts̓a̲x'id* 'to become in pain'. Without schwa epenthesis in the former example, the /*-x'id*/ forms of *ts̓a̲k-* and *ts̓a̲x-* would be identical. This exception to the rules in (22) thus appears to be motivated by a need to maintain a contrast in the language between the /*-x'id*/ forms of two lexical verb roots.

Up to this point we have been assuming that {*-nd, -ud, -d*} and {*-x'id, -'id*} always occur in different morphological environments. In fact, when we look at large amounts of data, we see that this morphological conditioning is not always obeyed and that the {*-x'id, -'id*} allomorphs are often acceptable following lexical suffixes. Boas (1947:365) even remarks that "probably all the other [lexical] suffixes may also take *-x'id...*". Boas' grammar lists numerous examples where one or more lexical suffixes are present on the stem — that is, where we would expect {*-nd, -ud, -d*} — but where allomorphs from {*-x'id, -'id*} can also occur. Two such examples are given in (22–23).

(23) *-ba* 'end of long horizontal object':

a. dza̲xba**n̲d**
dza̲k -ba **-x'id**
rub -END.OF.LONG.OBJECT **-BEC**
'to rub end' (Boas 1947:336)

b. hiłba**x'id**
hił -ba **-x'id**
right -END.OF.LONG.OBJECT **-BEC**
'to turn the right way' (Boas 1947:336)

(24) *-(s)i'sta* 'around':

a. hiłtsi'sta**nd**
hił -(s)i'sta **-x'id**
right -around **-BEC**
'to go right around' (Boas 1947:341–342)

b. le'sta**x'id**
la -(s)i'sta **-x'id**
go -around **-BEC**
'to start to go around, to set right' (Boas 1947:341–342)

Similar sets of examples exist for stems containing at least the following lexical suffixes: *-iłba* 'outside of nose, point of land' (Boas 1947:330), *-'stu* 'round opening' (343), *-s(g)ąm* 'round surface, round thing' (343–344), *-dzu* 'on a flat thing' (345), *-ts̓aw* 'in, inside' (356), *-kas* 'to eat' (357), *-(k)'an* 'body' (357), *-(g)am* 'face, head, in front, ahead' (360), *-(x)ts̓ana* 'hand' (372), *-xto* 'on top of long object' (373), and *-ʰxdła* 'hind end, stern of canoe' (374).

In the course of my research on modern Kwak̓wala, I have also occasionally run into particular stems with lexical suffixes that take either {*-nd, ud, -d*} or {*-x'id, -'id*}, with no apparent difference in meaning. An example from my own data is given in (25) with the verb *k̓uxts̓aw-* 'to dress'.

(25) *-ud* and *-x'id* on the same stem (modern Kwak̓wala):

a. la̓muxʷ lamxw'iduxʷ Monica, la̓muxʷ
la ='m =uxʷ lamxw -x'id =uxʷ Monica la ='m =uxʷ
AUX =VER =D2 dry -BEC =D2 Monica AUX =VER =D2
k̓uxts̓**ud**a
k̓uxʷ -ts̓aw **-x'id** -a
dress -in **-BEC** -A
'Monica got dry, then she got dressed.' (20181127 VF)

b. la̓muxʷ Shelliyaxʷ k̓uxts̓o**x'id**a
la ='m =uxʷ Shelly =(a)xʷ k̓uxʷ -ts̓aw **-x'id** -a
AUX =VER =D2 Shelly =V2 dress -in **-BEC** -A
'Shelly got dressed.' (20191205 VF)

In contrast, I am not aware of any examples where {*-nd, -ud, -d*} allomorphs are present on stems lacking lexical suffixes where we would expect to see {*-x'id, -'id*}.

I am aware of only a few examples where a difference in meaning has been conventionalized between stems containing allomorphs from {*-nd, -ud, -d*} and stems containing allomorphs from the set {*-x'id, -'id*}. One such example is given in (26), where the difference between a stem with *-ud* (26a) and one with *-x'id* (26b) corresponds to a semantic difference in the configuration and attachment of objects in a caused motion event (this difference is productive; see Boas 1947:361 for additional examples). Another example is given in (27) between a stem with *-nd* (27a) and a stem with *-x'id* (27b). Modern speakers use *la'staxʷ'id* to refer to bathing the whole body in water.

(26) a. kaka̲t**ud**
Ca~ ka̲t -(g)u **-x'id**
RED~ long.horizontal -between/together **-BEC**
'to put a long thing between' (Boas 1947:361)

b. kaka̲tu**xw'id**
Ca~ ka̲t -(g)u **-x'id**
RED~ long.horizontal -between/together **-BEC**
'to put long things together' (Boas 1947:361)

(27) a. la'sta̲**nd**
la -'sta **-x'id**
go -in.water **-BEC**
'to put into water' (Boas 1947:365)

b. la'sta̲**x'id**
la -'sta **-x'id**
go -in.water **-BEC**
'to begin to go into water' (Boas 1947:365)

Altogether, the overlap in distribution of these two sets of allomorphs suggests that since the turn of the 20th century, and extending into the present day, the forms {*-nd*, *-ud*, *-d*} have lost some of their productivity while {*-x'id*, *-'id*} forms have been expanding into these other forms' morphological domain. Thus, researchers and students of Kwak̓wala should not be surprised to encounter the occasional use of {*-x'id*, *-'id*} forms in contexts where {*-nd*, *-ud*, *-d*} forms are expected. Note that since these are all allomorphs of the same morpheme, /*-x'id*/, alternations of this sort should have no effect on the expressive potential of the language.

4.2 {*-x'i, -'i, -n, -u, -∅*}

The remaining five allomorphs of /*-x'id*/ are innovations in the modern language. They arise due to an ongoing phonological change, whereby speakers occasionally do not pronounce *d* in syllable-final position. This pattern can be modeled using an optional phonological rule of *d* deletion (28), which gives rise to the five allomorphs in (29)

(28) *d* deletion:

$d \rightarrow \varnothing / [_{\sigma}\ C\ V\ (C)\ \_\_\ ]$ (*d* is deleted syllable-finally)

(29) {*-x'i*, *-'i*, *-n*, *-u*, *-∅*}

Examples of *d* deletion from the speech of modern speakers are provided in (30). In all of the (a) examples below, the *d* in /*-x'id*/ is syllabified in the onset and is retained; in all of the (b) examples, the *d* in /*-x'id*/ is syllable-final and is not pronounced. Were *d* to be added back into these (b) sentences, they would still be judged as grammatical.

(30) Retention (a) and deletion (b) of syllable-final *d* in modern Kwak̓wala:

A. ***-x'id → -x'i***

a.

l̲a̓mu**x̲**			da**x'id**u**x̲**			Katieya**x̲**		
l(a̲)	='m	=u**x̲**	da	**-x'id**	=u**x̲**	Katie	=(a̲)**x̲**	
AUX	=VER	=D2	take.in.hand	**-BEC**	=D2	Katie	=V2	

x̲a		tłat̲amła**x̲**		la**x̲**wa				
=**x̲**	=a	tłat̲aml	=(a̲)**x̲**	la	=**x̲**	=u**x̲**	=a	
=ACC	=D4	hat	=V2	PREP	=ACC	=D2	=D4	

k̓waxda̓miła**x̲**	
k̓waxda̓mił	=(a̲)**x̲**
chair	=V2

'Katie picked the hat up from off of the chair.' (20160707 VF)

b.

l**a̲**'mu**x̲**			waxu**x̲**		Mabel**x̲**		da**x'i**		
l(a̲)	='m	=u**x̲**	wax	=u**x̲**	Mabel	=**x̲**	da		**-x'id**
AUX	=VER	=D2	try	=D2	Mabel	=V2	take.in.hand		**-BEC**

x̲ada			k̓**x̲**wa**x̲**	
=**x̲**	=a	=da	k̓wa**x̲**	
=ACC	=D4	=DET	tree	

'Mabel tried to grab the log.' (20160714 VF)

B. ***-'id → 'i***

a.

ła**x̲'id**a̲n			gugwa̓yu
ła**x̲**	**-x'id**	=a̲n	gugwa̓yu
itchy	**-BEC**	=1.POSS	leg/foot

'My leg got itchy.' (20150621 JF)

b.

w̓alasu**x̲**		Simon**x̲**		ła**x̲'i**		sis		
w̓alas	=u**x̲**	Simon	=**x̲**	ła**x̲**	**-x'id**	=s	=i(')s	
big/very	=D2	Simon	=V2	itchy	**-BEC**	=INST	=3.REFL.POSS	

alumas	g̲wiłg̲wela							
alumas	g̲wiłg̲wela							
new	clothing							

'Simon got really itchy from his new clothes.' (20160714 VF)

C. ***-nd → -n***

a.

l̲a̓mu**x̲**			Simon**x̲**		t̓ipsidza̲**nd**a			
l(a̲)	='m	=u**x̲**	Simon	=**x̲**	t̓ip	-(x)sis	**-x'id**	-a
AUX	=VER	=D2	Simon	=V2	step	-leg/foot	**-BEC**	-A

'Simon is putting on his shoes.' (20160718 VF)

b. kał̲al̲an̲ k̲utł̲an̲ t̓ipsidza̲**n**
kał̲ -la =a̲n k̲u =tł =a̲n t̓ip -(x)sis **-x'id**
afraid -CONT =1 if =FUT =1 step -leg/foot **-BEC**
x̲a a̲mabidu *geese*-a'
=x̲ =a a̲ma =bidu *geese* =a'
=ACC =D4 small =DIM *geese* =I3
'I was afraid I would step on the tiny geese.' (20181205 VF)

D. ***-ud → -u***[20]

a. la̲'a̲m ma'ɬp̓a̲na a̲x̲st**ud**i
l(a̲) ='m ma'ɬ -p̓a̲na a̲x̲ -(')stu **-x'id** =i
AUX =VER two -time do -round.opening **-BEC** =D3
Eddie x̲a t̓a̲x̲a̲la
Eddie =x̲ =a t̓a̲x̲a̲la
Eddie =ACC =D4 door
'Eddie has opened the door twice now.' (20160721 VF)

b. la̲m̓isa̲n a̲x̲st**u** x̲a t̓a̲x̲a̲la
l(a̲) ='m =(w)is =a̲n a̲x̲ -'stu **-x'id** =x̲ =a t̓a̲x̲a̲la
AUX =VER =and.so =1 do -round.opening **-BEC** =ACC =D4 door
'I opened the door.' (20160715 VF)

E. ***-d → -∅***

a. lux̲ Monicax̲ k̲̓wa̲lis'a̲m
l(a̲) =ux̲ Monica =(a̲)x̲ k̲̓wa̲lis ='m
AUX =D2 Monica =V2 do.oneself =VER
t̓sut̓sa̲x̲wa̲m**d**a
Ci~ t̓sux̲w -(g̲)a̲m **-x'id** -a
RED~ wash -face **-BEC** -A
'Monica washed her own face.' (20181127 VF)

b. lux̲ Shelliya̲x̲
l(a̲) =ux̲ Shelly =(a̲)x̲
AUX =D2 Shelly =V2
t̓sut̓sa̲x̲wa̲mbidu x̲ux̲ Simonx̲
Ci~ t̓sux̲w -(g̲)a̲m **-x'id** =bidu =x̲ =ux̲ Simon =x̲
RED~ wash -face **-BEC** =DIM =ACC =D2 Simon =V2
'Shelly washed little Simon's face.' (20181127 VF)

The rule of *d* deletion is a post-lexical rule which tends to apply in connected, conversational speech. In citation speech, which is slow and deliberate, *d* is more reliably retained. This kind of speech occurs during more formal elicitation and teaching contexts, and is more common with some speakers than with others. According to my own observation, it seems that *d* deletion is most

[20] Technically, it is ambiguous whether the *u* remaining in examples of this sort belongs to the suffix or to /*-x'id*/. In any case, I have bolded this segment for expository purposes.

common when *d* is word-final, and is slightly less common when *d* is word-medial. However, I have not done the quantitative work necessary to verify whether these impressions are correct.

4.3 Summary: The morphophonology of /-*x'id*/

The morphophonology of /-*x'id*/ in modern Kwak̓wala is presented below for easy reference.

If a stem contains one or more lexical suffixes:

A. Realize [-***d***] when the rightmost lexical suffix ends in *m* or *n.*

B. Realize [-***ud***] when the rightmost lexical suffix ends in a rounded vowel or semi-vowel (*u*, *o*, or *a̲w*), and convert the rounded vowel or semi-vowel to *u*.

C. Realize [-***nd***] elsewhere after lexical suffixes, and apply the following three additional rules:

   a. If the stem ends in a consonant (other than *m* or *n*), insert *a̲* before -*nd.*
   b. If the stem ends in a non-rounded vowel (*a*, *i*, or *e*), shorten this vowel to *a̲*.
   c. If the stem ends in an obstruent, soften the obstruent (e.g. *s* → *dz*, *k* → *g*, *k̲* → *g̲*).

If the stem does not contain any lexical suffixes:

A. Realize [-***x'id***] when the stem ends in a vowel {***a, e, i, o u, a̲***}, or one of the following consonants: {***m, n, l, m̓, n̓, l̓***}.

B. Realize [-***x'id***] when the stem ends in {***y, w, y̓, w̓***} and change these semi-vowels to a corresponding vowel: ***y*** → ***i, w*** → ***o, y̓*** → ***i, w̓*** → ***u***.

C. Insert ***a̲*** after the stem and realize [-***x'id***] when the stem ends in a glottalized plosive {***p̓, t̓, k̓, kw̓, k̲̓, k̲w̓, ts̓, tl̓, ʼ***} or voiced plosive {***b, d, g, gw, g̲, g̲w, dz, dɬ***}.

D. Elsewhere, initial ***x*** is lost and [-***'id***] is realized, along with the following additional changes to the final stem consonant:

   a. The glottal stop in [-***'id***] fuses with stem-final ***p*** and ***t*** (***p*** → ***p̓, t*** → ***t̓***).
   b. Stem final velars, uvulars, and the unvoiced lateral affricate undergo spirantization (***k*** → ***x, kw*** → ***xw, k̲*** → ***x̲, k̲w*** → ***x̲w, tɬ*** → ***ɬ***).[21]
   c. There is no change to the final stem consonant when it is a fricative {***s, x, xw, x̲, x̲w, ɬ***}

When a stem with /-*x'id*/ is used in a sentence, the rule of *d* deletion is optionally applied:

***d* deletion**: d → ∅ / [$_{\sigma}$ C V (C) __] (*d* is deleted syllable-finally)

[21] Or, perhaps, aspiration (*k* → *k*^{h}, *kw* → *kw*^{h}, *k̲* → *k̲*^{h}, *k̲w* → *k̲w*^{h}).

5 Teaching and learning /-*x'id*/

Throughout this paper, we have come to see that the suffix /-*x'id*/ is a complex and vital component within the grammar of Kwak̓wala. This means that every second language learner of Kwak̓wala will at some point need to study and master the use of this suffix in order to become a competent speaker. Luckily for learners, though the grammar of /-*x'id*/ is complex, it is also highly regular and is therefore something that can be precisely taught and studied. It will take effort and patience to learn /-*x'id*/, but because the rules governing its use have few exceptions, it should be learnable with practice.

There are at least two questions that Kwak̓wala teachers will have to grapple with in the course of teaching /-*x'id*/. One is the question of what attitude to take regarding the use of the allomorphs {-*x'id*, -*'id*} in morphological contexts where the allomorphs {-*nd*, -*ud*, -*d*} were used historically. As mentioned near the end of Section 4.1, the occasional use of {-*x'id*, -*'id*} even after lexical suffixes has been occurring since the turn of the 20th century. Since generalization of {-*x'id*, -*'id*} would have the effect of making the grammar simpler without any loss of meaning, it is conceivable that some teachers and students could adopt an accepting attitude towards using the {-*x'id*, -*'id*} forms in all morphological environments. On the other hand, teachers and students may prefer to learn the language as it was traditionally described, even if this means the grammar is more complicated. Such teachers and students may opt to preserve a distinction between {-*nd*, -*ud*, -*d*} and {-*x'id*, -*'id*}, possibly making the distinction more rigid than it currently is. There may end up being disagreement in the community of teachers and students about what to do. Ultimately, it will be up to the next generation of speakers to decide what is best.

The second question Kwak̓wala teachers will have to grapple with in order to teach /-*x'id*/ is how to teach the rule of *d* deletion, as this rule is optional in the modern language. Here too, the next generation of speakers will need to decide how to make use of this rule in their language.

Children who are learning Kwak̓wala as a first language are faced with a fairly difficult task when it comes to acquiring /-*x'id*/. In addition to having to learn a distinction between {-*nd*, -*ud*, -*d*} and {-*x'id*, -*'id*} forms, which is complicated enough, modern Kwakwaka'wakw toddlers also must connect these allomorphs with their counterparts lacking *d* in certain environments, {-*n*, -*u*, -∅, -*x'i*, -*'i*}, in order to form a coherent grammar of this suffix. Fortunately, there are a few Kwakwaka'wakw children currently learning the language through immersion (Sara Child, p.c.). It will be interesting to see what the grammar of /-*x'id*/ looks like to them someday.

6 Conclusion

The aspectual suffix /-*x'id*/ is a very complex morpheme from a morphophonological perspective, and one that is central within Kwak̓wala grammar, making it a vital part of the language for linguists and language learners to understand. This paper has laid out a rule-based analysis of the morphophonology of /-*x'id*/ for the modern language. The morphological conditioning of {-*nd*, -*ud*, -*d*} versus {-*x'id*, -*'id*} allomorphs, as well as the phonological conditioning of allomorphs within these sets, has remained essentially unchanged from the language described at the turn of the 20th century. In the modern language, there are five additional allomorphs of /-*x'id*/ which arise due to an optional rule of *d* deletion syllable-finally. Luckily, even though the grammar of /-*x'id*/ is complex, it is also highly regular, making it a suffix which can be precisely taught and studied. In addition to discussing the morphophonology of /-*x'id*/, this paper has summarized what is known about /-*x'id*/ from recent research, most notably regarding its semantics as a non-canonical

perfective (Greene 2013) and its role within a paradigm of aspectual suffixes that mark event type in the language (Sardinha 2018).

The study here is limited in a number of ways. First, the grammar of /*-x'id*/ described above is derived from speakers of two dialects, Kwak̓wala and to a lesser extent, Nak̓wala. It is not known whether the generalizations here hold for other dialects of the language, or even for other speakers of these same dialects. There has also not yet been any quantitative analysis of corpora to understand the frequency of *d* deletion syllable-finally, or to understand the degree to which {*-x'id*, *-'id*} forms are replacing {*-nd*, *-ud*, *-d*} forms following lexical suffixes. Quantitative analysis of this sort would help to establish the extent of these processes, which otherwise can only be guessed at.

My hope in writing this paper is that the complexity of /*-x'id*/ will cease to be a barrier for students and researchers who are striving to master the language.

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Glossing Abbreviations

Gloss	Morphs	Notes
-		affix boundary
=		clitic boundary
~		reduplicant boundary
!		hardening mutation
˚		softening mutation
1		first person singular
1.POSS	=a̲n	possessed by first person
3.POSS	=s	possessed by third person
3.REFL.POSS	=i(')s	possessed by third person who is coreferent with the sentential subject or topic
A	-a	Terminal completive *-a*; in at least some instances, *-a* functions as a default aspectual suffix (Greene 2013:8), though *-a* also may correspond to more than one morpheme
ACC	=x̲	accusative case
AUX	l(a̲)	auxiliary verb
BEC	-x'id, -'id, -x'i, -'i, -nd, -ud, -d, -n, u, -∅	become operator, momentaneous aspect, inchoative; marks transition predicates (Greene 2013, Sardinha 2018)
C	(various)	consonant
CONT	-la	continuative aspect; marks process predicates (Sardinha 2018)
D2	=ux̲, =w	third person medial deictic determiner ("this, close by") (Nicholsen & Werle 2009). The =w morph is realized in some third person medial DPs in the accusative case

D3	=i	third person distal deictic determiner (“that, over there”) (Nicholsen & Werle 2009)
D4	=a	existential deictic determiner (Black 2011)
DIM	=bidu	diminutive
EMB	=a	embedding *a* (Littell 2016: 604–606)
FUT	=tɬ	future
I3	=a’	third person distal invisible
INST	=s	instrumental case
JF		judged form
NEG	(ḵ)i’s	negation
NEG.EXIST	ḵa̲yos	negative existential (“there is no”, “there are no”)
NMZ	=i’	nominalizer
PREP	la, k̲(a̲)	preposition
REC.PST	=xd, =(x)’id	recent past tense; *-(x)’id* is not used in modern Kwakʼwala
STAT	-ała	stativizer (Sardinha 2018)
VER	=’m	verum focus (Littell 2016)
V1	=(i)k	third person proximal visible
V2	=(a̲)x̲	third person medial visible
VF		volunteered form

Appendix A: Phonological Inventory

Table 2: Kwak̓wala Consonants

plain plosives	p	t	tɬ	ts	k	kw	k̲	k̲w	
glottalized plosives	p̓	t̓	t̓ɬ	t̓s	k̓	k̓w	k̲̓	k̲̓w	ʼ
voiced plosives	b	d	dɬ	dz	g	gw	g̲	g̲w	
fricatives			ɬ	s	x	xw	x̲	x̲w	h
plain resonants	m	n	l		y	w			
glottalized resonants	m̓	n̓	l̓		y̓	w̓			

Table 3: Kwak̓wala Vowels

	Front	Central	Back
High	i		u
Mid	e	a̲	o
Low		a	