HISTORICAL ASPECTS OF COEUR D'ALENE HARMONY

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1.0 INTRODUCTION

Although the synchronic analysis of a language is often presented with little or no reference to the language's history, there are cases in which knowledge about the development of the language can provide valuable insight into its synchronic processes. The analysis of Coeur d'Alene harmony is such a case; the interaction of stressed vowels and faucal consonants can be better understood by the investigation of comparative data. In this paper, I discuss three aspects of Coeur d'Alene harmony which are of both synchronic and diachronic interest. A comparison of Coeur d'Alene with five other Interior Salish languages reveals at least partial answers to questions concerning Coeur d'Alene's synchronic harmony.

Because Reichard's (1939) transcription of Coeur d'Alene is not in a standard orthography, there has been debate over what the phoneme inventory of Coeur d'Alene is, especially with respect to vowels. Following Doak (1987:66, 1992:2), I assume the vowel inventory of Coeur d'Alene to be *i, ɛ, ɔ, u, o,* and *a*, where *ɛ* and *ɔ* represent *e* and *o* respectively.[2] Sloat (1968a) was used to convert Reichard's transcription of consonants to a more familiar system.

1.1 Regressive Harmony

Coeur d'Alene regressive (anticipatory) harmony is triggered by uvular and pharyngeal consonants (*q, q', qʷ, q'ʷ, χ, χʷ, ʕ, ʕ', ʕʷ, ʕ'ʷ*) and by *r* and *r'*; these are referred to collectively as "faucals" (Doak 1992:3). A faucal consonant causes a preceding stressed vowel to retract. In morphemes with */u/* and */ɛ/*, the assimilation process is straightforward as seen in (1) (the relevant vowels are underlined):

(1) a. *s-pu̲m* 'fur, feathers (on animal)': *spómalqs* 'fur coat' (Doak 1992:4)
b. *ʕɛ̲w* 'drop': *stʕa̲wʕəwpus* 'tears drop' (Doak 1992:29)

When followed by a faucal, *u* and *ɛ* retract to *o* and *a*, respectively.

If the root or suffix vowel is *i*, however, the situation is more complicated. Consider the examples in (2):

(2) a. *qʷɪ̲c* 'warm': *qʷácqɔn* 'hat' (Doak 1992:3)
b. *cɪ́st* 'it is long': *cɛ́salqʷ* 'he is tall' (Sloat 1968b:234, Doak 1992:3)

In (2a), the faucal causes *ɪ* to become *a*. As (2b) shows, however, in some morphemes, *ɪ* changes to *ɛ*. Although *ɪ* has two harmony variants, a given root or suffix has only one. There are no environmental criteria determining the choice of harmony variant. For example, both *kʷɪn* 'take, carry' and *kʷɪʔ* 'bite' take *a*, and both *t-kʷɪnc* 'how many' and *qɪʔ* 'stick to, wedge to' take *ɛ*, showing that neither the preceding nor the following consonant governs the harmony alternation.

All of the above examples involve root or suffix vowels assimilating to faucal consonants in suffixes. However, the distribution of vowels in roots which themselves contain faucals indicates that regressive harmony also occurs within roots. Thus, as shown in (3), we find the harmony vowels *ɛ, o,* and *a* occuring in roots with a following faucal:

(3) a. *leq'* 'to bury,' *č'eʕʷ* 'pray,' *p'ɛr* 'overflow, flood'
b. *c'or* 'sour,' *y'oqʷ* 'tell lie,' *ɬoq'* 'be bald, bare'
c. *caʕ* 'scream,' *kʷaχ* 'claw,' *naʔq'* 'rot, rotten'

But there are no roots of the shapes **CiF* or **CuF*, where *F* represents a faucal consonant. Because a regressive harmony rule is needed to account for the data in (1) and (2), roots containing faucals "can be postulated as having underlying *i u* (or underived *ɛ*)" (Doak 1992:5), even though these vowels never surface. The rule will cause the underlying vowels to retract.

1.2 Progressive Harmony

Although Coeur d'Alene progressive (lag) harmony is not obviously triggered by faucals, it is similar to regressive harmony. Certain roots containing */a/* or */o/* cause a stressed suffix vowel to retract; hence, these roots are called "retracting roots" (Doak 1992:4). The distribution of variants is the same as that in regressive harmony, except that since no suffix with */ɛ/* receives stress, the alternation of *ɛ* and *a* does not occur. Thus, *u* retracts to *o* (4a), and *i* retracts either to *a* (4b) or to *ɛ* (4c):

(4) a. *-us* 'eye, face; fire': *ceɬhəstp'əc'ósəm* 'I will squirt him in the eye' (Doak 1987:81)
b. *-ɪčt* 'hand, finger': *čyəc'yəc'amáčtəm*: 'hold on tight' (Doak 1987:85)
c. *-s-čɪnt* 'person': *t'apsčént* 'he shot people' (Doak 1992:4)

A given suffix will always have the same harmony vowel. Thus the *i* in *-ɪčt*, seen in (4b), consistently retracts to *a*:

(5) *-ɪčt*: *xʷɛmáčt* 'woodpecker' (Mattina 1979:23), *aməl'áčtmənčəlis* 'he is making us too warm' (Doak 1987:86)

Finally, not all roots with *a* or o trigger regressive harmony. Thus, it seems that harmony is not caused by the root vowel itself, but by some other property of the root.

The vowel alternations caused by Coeur d'Alene harmony are summarized in (6):

(6)

Non-Harmony Vowels	Harmony Vowels	
	Regressive	Progressive
u	*o*	*o*
ɛ	*a*	-
ɪ	*a*	*a*
i	*ɛ*	*ɛ*

1.3 Questions Raised by Coeur d'Alene Harmony

The synchronic vowel assimilation in Coeur d'Alene raises at least three questions of diachronic interest. First, is there evidence that would explain why some roots with *a* and *o* trigger progressive harmony while others do not? Second, is there any historical evidence that the vowels which surface in roots with faucals are the harmony variants of */ɪ/*, */ɛ/* and */u/*, rather than the regular surface representations of */a/* and */o/*? Finally, does comparative data reveal why *i* has two harmony variants? The answers to these questions also provide insight into Coeur d'Alene synchronic harmony.

2.0 RETRACTING ROOTS

In this section, I briefly discuss Coeur d'Alene retracting roots. Recall from section 1.2 that the effects of progressive harmony are the same as those of regressive harmony, although the roots involved do not contain faucals. As Mattina (1979) shows, the historical development of these roots provides an explanation for this phenomenon. Processes similar to Coeur d'Alene progressive harmony occur in other Interior Salish languages. In Colville, when a root with a pharyngeal occurs with a stressed suffix, the pharyngeal moves to the suffix and the stressed vowel is lowered. In Spokane, Kalispel and Shuswap, roots cognate to Coeur d'Alene retracting roots also cause suffix vowels to be lowered.[3]

Mattina constructs cognate sets with these roots, and finds that in most cases, the Colville root has the shape *CʕVC*. More recent Spokane data show that two of the Spokane cognates have alternate forms with a pharyngeal as C_2: *p'ac'(sta)* ~ *p'ʕac'(á)* 'loose bowels' (cognate with Mattina's set 13) and *p'at'(á)* ~ *p'ʕat'(á)* 'substance in gravy-like form' (cognate with Mattina's 16).

Mattina suggests that the retracting roots are reflexes of Proto-Interior Salish roots of the shape **CʕVC*, and that in Pre-Colville, "pharyngeal movement ... was at one time a regular morphophonemic process, and that, for reasons still unknown, the pharyngeal of the root was occasionally lost" (Mattina 1979:18 and 24). Perhaps Coeur d'Alene, Spokane, and Colville represent three stages of lexical diffusion (as defined by Wang (1969)),[4] in which a sound change affects only a number of words at a time, rather than applying to all eligible items at once. In Coeur d'Alene, the sound change is complete and all retracting roots have lost the pharyngeal; in Spokane, only a few pharyngeals remain; and in Colville, only a few roots have been affected by the change.

In all of these languages, the effects of the pharyngeals remain, even if the consonants themselves have been lost. In her synchronic analysis of Coeur d'Alene retracting roots, Doak (1992:20) posits a floating

pharyngeal feature which triggers vowel harmony. Thus, the slots which the pharyngeals occupied have been lost, but the features of the pharyngeals have not. The historical development of these roots clearly provides support for such an analysis.

3.0 ROOTS WITH FAUCAL CONSONANTS

As mentioned in section 1.1, Doak suggests that roots which have a faucal can be posited as having */i/*, */e/*, and */u/*, and the regressive harmony rule will cause *e*, *a*, and *o* to surface. However, she does not mention that since *a* and *o* can occur underlyingly, it is possible that these roots actually have */a/* and */o/*. This section addresses the question of whether roots with a faucal consonant following the vowel have developed differently from those without a faucal. For example, since *e* is the regular Coeur d'Alene reflex of Proto-Interior Salish **ə* (Kinkade and Sloat 1972:38), and *e* is also the harmony variant of *i*, are roots with *e* before a faucal reflexes of roots with **ə* or with **i*? If the historical development parallels the synchronic analysis, then we would expect that, before a faucal, Coeur d'Alene *o* reflects **u*, *e* reflects **i*, and *a* reflects either **i* or **ə*.

Many of the cognate sets in this and the following sections were constructed by using those found in Kinkade and Sloat (1972), Kinkade and Thompson (1974), Kinkade's unpublished cognate list, and Mattina (1979) as a starting point; appropriate references are given for these sets.[5] Additional members were added by searching the lexicons of Coeur d'Alene (Reichard 1939), Kalispel (Vogt 1940), Spokane (Carlson and Flett 1989), Okanagan (Mattina 1987, through Kinkade, p.c.) and Shuswap (Kuipers 1974).

3.1 Roots with *o*

Synchronically, Coeur d'Alene *o* can be the surface realization either of */u/* or of */o/*. Because *u* never occurs in roots with a following faucal, it is possible for a root with the shape *CoF* to have either *u* or *o* as its underlying vowel. Since *o* is the harmony variant of *u*, and *u* is the regular reflex of PIS **u*, we might expect that *o* before a faucal consonant also reflects **u*. Consider the cognate sets in (7):

(7) a. Cr *s-xʷəl-ótqən* 'jackrabbit;' Cm *sxʷəl'ú̲tqs* 'cottontail;' Ka *sxʷəl'óqs* 'prairie rabbit;' Sp *s-x̣ʷl'=ót=qs* 'cottontail rabbit' (KS 330)

b. Cr *y'o̲qʷ* 'tell lie;' Ka *yo̲qʷ* 'to tell lies;' Sp *yo̲qʷ* (s) 'to lie'

c. Cr *do̲q'ʷ* 'wood is rotten;' Sp *yo̲q'ʷ* ~ *yóq'ʷiʔ* 'general term for decayed wood;' Sh *yʔu̲q'ʷ* 'rotting, rotten'

d. Cr *nóx̣no̲x̣* 'spouse;' Cm *nú̲x̣ʷnux̣ʷ*, Ka *nóx̣ʷənx̣ʷ*, Sp *nóx̣ʷno̲x̣ʷ* (s) 'wife;' Sh *nu̲x̣ʷ-ux̣ʷ* 'female.' Residue: Ok *nú̲x̣ʷnəx̣ʷ* 'wife' (KS 232)

e. Cr *c'ó̲r* 'sour;' Ka *c'o̲l* 'salt, sour.' Residue: Cm *c'ə̲́r* 'sour, salty;' Sp *c'u̲r* (s) 'salty, sour;' Sh *c'a̲lt* 'bitter, sour, salty' (KS 589, KT 1 (PIS **c'úr*), Ku I and II 40)

The sound correspondences seen in these sets are summarized in (8). Vowels from forms that are included as full members of the sets are shown in bold type, and those from residue forms are given in regular type:

(8)

Faucal	Cr	Cm	Ka	Sp	Ok	Sh	Examples
q	**o**	**u**	**o**	**o**			7a
qʷ	**o**		**o**	**o**			7b
q'ʷ	**o**			**o**		**u**	7c
x̣	**o**	**u**	**o**	**o**	a	**u**	7d
r	**o**	ə	**o**	u		a	7e

Kalispel is the only language with completely regular correspondences to Coeur d'Alene *o*. The Columbian and Shuswap residue forms in (7e) may represent a *ə*-grade variant, although there is no independent evidence for this. Note that the only irregular Spokane reflex occurs before *r* (7e); further evidence that *r* is not treated the same as the other faucals in Spokane is seen in section 3.3 (this was also noted by Kinkade and Thompson (1974:24)).

The following table shows the reflexes of **u* preceding a faucal consonant given by Kinkade and Sloat (1972:35), Kinkade and Thompson (1974:24) and Kuipers (1970:51):[6]

(9)

	Cr	Cm	Ka	Sp	Ok	Sh
KS	o	u				
KT	o	u	o	o	[ɔ]	u
Ku	o		o			u

All of the regular correpsondences in (8) agree with the above reflexes. With the exception of the residue forms, then, we can say that the forms in (7) go back to roots with **u*.

3.2 Roots with *ɛ*

A Coeur d'Alene root with *ɛ* before a faucal can have only *i* as its underlying vowel. If */ɛ/* were posited, the regressive harmony rule would cause *a* to surface. The historical development of *ɛ* in such roots parallels the synchronic analysis. Cognate sets are given in (10):[7]

(10) a. Cr *pɛ́q*, Cm *pɨ́q-*, Ka *pɨq*, Sp *pɨq* (v), Sh *pɨq* 'white' (KS 236, Ku II 3.3)

b. Cr *lɛ́q'*, Cm *lɨ́q'-*, Ok *lɨ́q'-*, Sh *lɨq'-m* 'bury.' Residue: Ka *láq'*, Sp *láq'* 'bury' (KS 238)

c. Cr *t'ɛ́qʷ*, Cm *t'ɨ́qʷ-* 'explode, shoot, go off;' Sp *t'ɨqʷ-* 'small, bursting sound;' Ok *t'ɨ́qʷ-* 'burst, explode.' Residue: Sh *t'qʷ-up-t* 'explode (tire, firecracker), go off (firearm)' (KS 239, Ku II 25.1)

d. Cr *ʔɛ́tɨxʷɛʔ* 'camas;' Cm *ʔɨ́tɨxʷaʔ* 'black camas;' Ka *ʔɨ́tɨxʷɛʔ* 'cooked camas;' Sp *ʔɨ́tɨxʷɛʔ* 'camas (black, blue, or brown) after baking;' Ok *ʔɨ́tɨxʷaʔ* 'camas' (KS 245)

e. Cr *tə-pɛ́xʷ*, Cm *ptɨ́xʷ*, Ka *pɨtáxʷ*, *pɨtxʷ-*, Ok *sptɨ́xʷ*, Sh *ptɨxʷ-m* 'to spit.' Residue: Sp *ptaxʷ* (s) 'to spit' (KS 243, Ku I 1)

A summary of the sound correspondences is presented in (11):

(11)

Faucal	Cr	Cm	Ka	Sp	Ok	Sh	Examples
q	e	i	i	i		i	10a
q'	e	i	a	a	i	i	10b
q^w	e	i		i	i	∅	10c
x^w	e	i	i	i	i		10d
x^w	e	i	i	a	i	i	10e

There is more irregularity in this group than in that reflecting **u*. Kalispel and Spokane have *a* in (10b), and Spokane also has *a* in (10e). Other sets show Okanagan zero and Shuswap *ɛ* and *a* possibly corresponding to Coeur d'Alene *ɛ*. For the most part, however, Coeur d'Alene *ɛ* corresponds to *i* in the other languages.

The reflexes of **i* before a faucal consonant posited by Kinkade and Sloat (1972:31), Kinkade and Thompson (1974:24) and Kuipers (1970:51) are shown in (12):

(12)

	Cr	Cm	Ka	Sp	Ok	Sh
KS	e	i				
KT	[e^]	[e]	i/a	[e]	i/a	i
Ku	e		e			i

My data show both *i* and *a* in Kalispel, as well as in Spokane, although there is no obvious environment in which each reflex appears. There is no evidence in my data for Kalispel *ɛ*. In addition, my data contain no examples of Okanagan *a*. For those roots in which Coeur d'Alene *ɛ* corresponds to *i* in the other languages, we can reconstruct **i*. Further work is needed to clarify the status of the seemingly irregular correspondences.

3.3 Roots with *a*

Roots with surface *a* before a faucal can be posited as having either */i/*, */ɛ/*, or */a/*, as *a* is a harmony variant of both */i/* and */ɛ/*, and */a/* does not undergo harmony. In Doak's analysis, *ɛ* is the underlying vowel. It is therefore interesting to examine the comparative data to determine whether these roots are reflexes of PIS roots with **i*, **ə* (> *e* in Coeur d'Alene), or **a*.

The relevant cognate sets can be divided into two groups. First, (13) presents those sets in which Coeur d'Alene *a* corresponds to Columbian *a*:[8]

(13) a. Cr *s-pá̲pq-ɬc'e?* 'ermine;' Cm *spá̲pq-ɬc'a?*, Ka *pá̲pqɬc'e?* 'weasel;' Sp *pá̲pq=ɬc'e?* 'weasel (short-tailed)' (KS 4)

b. Cr *x̣á̲q'*, Cm *x̣á̲q'-* 'pay, reward;' Ka *x̣á̲q'* 'to pay for work or favors received;' Sp *x̣a̲q'* (s), Ok *x̣á̲q'-* 'pay;' Sh *x̣e̲q'-n-s* 'to pay for a cure' (KS 7)

c. Cr *ʔá̲c'x̣*, Cm *ʔá̲c'x̣* 'to look at, watch;' Ka *ʔá̲c'əx̣* 'look;' Sp *ʔa̲c'x̣* (s) 'watch, look at.' Residue: Ok *ʕá̲c'x̣-* 'look at' (KS 11)

d. Cr *pá̲x̣* 'rub on rough surface;' Cm *pá̲x̣-* 'scratch, scrape;' Sp *pa̲x̣* (w) 'scratch;' Ok *pá̲x̣-* 'scrape, shave;' Sh *pe̲x̣-m* 'to whittle, plane' (KS 14)

e. Cr *ca̲r-t* 'cold weather;' Ka *c'a̲l* 'ache, hurt, cold;' Ok *c'á̲ɬt* 'cold (of weather).' Residue: Cm *c'əɬt* 'cold;' Sp *c'e̲r* (w) 'ache, hurt, cold' (M 29, Ku I and II 40)

The table in (14) gives a summary of the sound correspondences seen in the above sets:

(14)

Faucal	Cr	Cm	Ka	Sp	Ok	Sh	Examples
q	**a**	**a**	**a**	**a**			13a
q'	**a**	**a**	**a**	**a**	**a**	e	13b
x̣	**a**	**a**	**a**	**a**	**a**		13c
x̣	**a**	**a**		**a**	**a**	e	13d
r	**a**	ə	**a**	e	**a**		13e

Columbian has *ə* corresponding to Coeur d'Alene *a* in (13e). Given that Okanagan has *á* in its form, it is likely that this set belongs here rather than in the group believed to have descended from roots with **ə* (see below). The Kalispel correspondents to Coeur d'Alene *a* seen here are completely regular, although additional data include one form with zero (13d); Okanagan has zero for this form as well. The single Spokane irregularity is found before *r* (13e). Okanagan has *a* in all forms seen here. The Shuswap correspondents are also regular; one form not shown here has zero corresponding to Coeur d'Alene *a*.

Kinkade and Sloat (1972:30), Kinkade and Thompson (1974:24) and Kuipers (1970:51) agree as to the reflexes of **a* preceding a faucal:

(15)

	Cr	Cm	Ka	Sp	Ok	Sh
KS	a	a				
KT	a	a	a	a	a	e
Ku	a		a			e

Aside from the residue forms, my data show the same reflexes. Thus, the members of this group of roots can all be considered to reflect roots with **a*.

The second group of cognate sets are those in which Coeur d'Alene *a* corresponds to Columbian *ə*:

(16) a. Cr *t'á̲q* 'bushy stuff lies;' Cm *t'ə̲́q-* 'pile;' Ka *t'á̲q* 'lay down something;' Sp *t'a̲q* ~ *t'a̲q*^{w} (w) 'piled, bushy;' Ok *t'á̲q-*, *t'q-* 'lay, put' (KS 439)

b. Cr *ɬá̲q'*, Cm *ɬə̲́q'-*, Ka *ɬa̲q'* 'wide;' Sp *ɬa̲q'* (w) 'wide, flat;' Ok *ɬá̲q'-*, *ɬq'-* 'wide, flat.' Residue: Sh *ɬe̲q'-m* 'to spread or stretch a hide' (KS 443)

c. Cr *sá̲q'* 'gape, split in two;' Cm *sə̲́q'*, Ka *sá̲q'-* 'split;' Sp *sa̲q'(é)* (w) 'cracked, split;' Ok *sq'-*, Sh *sə̲q'-*, *sq'-* 'split' (KS 443, Ku I 50)

d. Cr *t'á̲x̣*, Cm *x̌'ə̲́x̣-* 'fast, swift;' Ka *x̌'á̲x̣(t)*, Sp *x̌'a̲x̣* (w), Ok *x̌'á̲x̣(t)* 'fast' (KS 453)

e. Cr *x^{w}á̲r*, Cm *x^{w}ə̲́rp* 'shake, tremble;' Ka *x^{w}a̲l(í)-* 'shake;' Ok *x^{w}a̲r-*, *x^{w}r(á)* 'shake, shiver;' Sh *x^{w}ə̲lɛ́* 'spin around.' Residue: Sp *x^{w}e̲r(í)-* (w) 'shake' (KS 436, KT 5 (PIS **x^{w}ərə-*))

As seen in table (17), these sets show more irregularities than do those involving other vowels:

(17)

Faucal	Cr	Cm	Ka	Sp	Ok	Sh	Examples
q	**a**	ə	**a**	**a**	**∅, a**		16a
q̓	**a**	ə	**a**	**a**	**∅, a**	e	16b
qˀ	**a**	ə	**a**	**a...(é)**	**∅**	**∅, ə**	16c
x̣	**a**	ə	**a**	**a**	**a**		16d
r	**a**	ə	**a...(í)**	e...(i)	**∅...(á), a**	**ə...é**	16e

Kalispel *a* corresponds to Coeur d'Alene *a* in these data. Spokane again has different vowels before *r* than before the other faucals (16e and additional data). All of the Okanagan forms shown here have either zero (with or without a following *a*) or *a* corresponding to Coeur d'Alene *a*. The most common Shuswap correspondents are zero and *ə*.

Kinkade and Sloat (1972:37), Kinkade and Thompson (1974:24) and Kuipers (1970:51) give the following reflexes for **ə* before a faucal consonant:

(18)

	Cr	Cm	Ka	Sp	Ok	Sh
KS	a	ə				
KT	a	ə	a	a	a	ə/e/a
Ku	e		ə			ə

There is no evidence that Coeur d'Alene *ɛ* corresponds to Columbian *ə*. Nor is there evidence for Kalispel *ɔ*. My data shows only one example of Shuswap *a* corresponding to Columbian *ə* (not given here), and two examples with Shuswap *e* (16b and additional data). Given the regularity of the correspondences between Coeur d'Alene and Columbian, the forms in (16) seem to go back to roots with **ə*.

It is interesting to note that none of the Coeur d'Alene roots with *a* preceding a faucal are reflexes of PEIS roots with **i*, even though *a* is a harmony variant of *i*. All roots from **i* have *ɛ*. Although **a* is reflected in Coeur d'Alene by non-harmony *i*, in roots with a following faucal the surface vowel is always *a*. The development of vowels in roots with faucals can thus be summarized as follows:

(19) a. PIS **u* becomes Coeur d'Alene *u*, which becomes *o* before a faucal;
b. PIS **i* becomes Coeur d'Alene *i*, which becomes *ɛ* before a faucal;
c. PIS **a* becomes Coeur d'Alene *i*, which becomes *a* before a faucal; and
d. PIS **ə* becomes Coeur d'Alene *ɛ*, which becomes *a* before a faucal.

Thus, when the vowel and the faucal occur in the same root, the harmony variant of *i* can be determined by the proto-vowel.

Regarding the synchronic analysis of these roots, positing */i/* for those reflecting **i* (which have the harmony variant *ɛ*) and for those reflecting **a* (which have the harmony variant *a*) requires that we stipulate which roots have which harmony vowel. A simpler solution may be to posit */i/* for those roots which reflect **i*, and */a/* for those which reflect **a*. The regressive harmony rule will change */i/* to *ɛ* and leave */a/* unaffected.

4.0 HARMONY ACROSS MORPHEME BOUNDARIES

In this section I discuss the historical development of Coeur d'Alene stressed vowels which participate in harmony across morpheme boundaries. The data given in this section include cognate sets for only those Coeur d'Alene morphemes which have been specified by Doak (1992), Reichard (1939), or Mattina (1979) as undergoing harmony, in order to avoid false statements about roots which do not participate in harmony.

4.1 Non-Harmony Vowels *u* and *ɛ*

The behaviour of morphemes with *u* with respect to faucal harmony is uncomplicated; they have only one harmony variant, *o*. We would thus expect the historical development to be straightforward as well. Due to space limitations, I do not give cognate sets involving such morphemes; however, my data indicate that their proto-forms can all be reconstructed with **u*.

Kinkade and Sloat (1972:36), Kinkade and Thompson (1974:24) and Kuipers (1970:51) all state that the languages in their studies retain **u* when it precedes a non-faucal consonant:

(20)

	Cr	Cm	Ka	Sp	Ok	Sh
KS	u	u				
KT	u	u	u	u	u	u
Ku	u		u			u

Except for a single irregularity in Kalispel and Spokane, my data agree with their predictions.

As with *u*, *ɛ* has only one harmony variant, *a*. Relevant cognate sets are given in (21):

(21) a. Cr *čɛ́ɬ* 'separate, divorce, part;' Cm *kə̱ɬ-* 'part, divide;' Sp *čɬ* (w) 'separate;' Sh *kɬ-* 'come off, come apart,' *kə̱ɬ-* 'divorce;' Ok *kɬ(á)-* 'split in two.' Residue: Sh *kɨ́ɬ* 'come off, come apart, be released' (KS 549)

b. Cr *lɛ̱ǰ*, Cm *lɨ̱y-* 'stab, poke, sting;' Ok *lγ* 'put in, poke;' Sh *lγ(é)-* 'put, stick into'

c. Cr *p'ɛ̱́n*, Cm *p'ə̱́n-*, Ka *p'ɨ̱́n* 'long object lies (pl.);' Sp *p'ɨ̱n* (v) 'long objects lying on the ground;' Ok *p'n-* 'put down several long objects' (KS 520)

d. Cr *šɛ̱́lč* 'move in a circle;' Cm *xə̱́lk-* 'spin, turn;' Sp *šl(í)č* (w) 'to turn;' Ok *xlák-*, *xlk-* 'whirl, roam.' Residue: Ka *šə̱lč* 'turn around' (KS 532)

e. Cr *t'ɛ̱́l'*, Cm *t'ə̱́l'-*, Ka *tɨ̱́l* 'tear, rip;' Sp *t'l'(í)* (w) 'to break, to tear;' Ok *t'l(á)-* 'tear open.' Residue: Sh *t'ɨ̱lxʷ-m* 'to rip something at the seam' (KS 542)

The correspondences seen in the cognate sets are summarized in (22):

(22)

Cr	Cm	Ka	Sp	Ok	Sh	Examples
e	ə		∅	∅...(á)	∅, ə	21a
e	i			∅	∅...(é)	21b
e	ə	i	i	∅		21c
e	ə	ə	(í)	∅, ∅...(á)		21d
e	ə	i	∅...(í)	∅...(á)	i	21e

The correspondence between Coeur d'Alene *ɛ* and Columbian *i* seen in (21b) is a regular one, occurring before *y*, *y'*, *d*, or *ǰ*. Kalispel has *ə* instead of *i* in (21d). All of the Spokane forms have zero or *ɨ*, except for two not shown here, which have *ɛ*. Most of the Okanagan forms have zero, which is sometimes followed by *a*. As before faucals, the most common Shuswap correspondents to Columbian *ə* are zero and *ə*.

The following table gives posited reflexes of **ə* when it does not precede a faucal (Kinkade and Sloat 1972:38, Kinkade and Thompson 1974:24, Kuipers 1970:51):

(23)

	Cr	Cm	Ka	Sp	Ok	Sh
KS	e	ə				
KT	e	ə	i	i	a	ə/a
Ku	e		ə			ə

Although Kalispel has one form with *ə*, its regular reflex seems to be *ɨ*. My data contain only one example of Shuswap *a*. Aside from a few irregularities, it appears that the forms in (21) reflect etyma with **ə*.

4.2 Non-Harmony Vowel *i*

The most interesting case of harmony across morpheme boundaries involves those morphemes in which the non-harmony vowel is *i*.[10] since it has two harmony variants, *a* and *ɛ*. Given that before tautomorphemic faucals it is possible to predict the harmony variant based on the proto-vowel, we would hope to find that those morphemes with the harmony vowel *a* are reflexes of PIS morphemes with **a*, and those with *ɛ* reflect etyma with PIS **i*. This, however, is not the case.

First, consider those morphemes for which the harmony vowel is *a*:

(24) a. Cr *kʷɨ̱́ʔ*, Cm *kʷə̱́ʔ-*, Ka *kʷɛ̱́ʔ*, Sp *kʷɛ̱ʔ(é)* (w) 'bite;' Sh *kʷɛ̱ʔ(é)-* 'chew.' Residue: Ok *kʷa̱ʔ(á)-* 'bite' (KS 197)

b. Cr *kʷɨ̱́n*, Cm *kʷə̱́n-* 'take, carry (sg. obj.);' Ka *kʷɛ̱́n-* 'take (sg.);' Sp *kʷɛ̱n ~ kʷɛn(é)* (v) 'to take;' Ok *kʷɨ̱́n* 'take;' Sh *kʷɛ̱n* 'to go and get, take (hold of)' (KS 156, Ku II 79.1)

c. Cr *qʷɨ̱́c-t*, Cm *qʷə̱́ʔc* 'warm;' Ka *qʷɛ̱́c* '(comfortably) warm;' Sp *qʷɛ̱c* (s), Sh *qʷɛ̱c* 'warm.' Residue: Ok *qʷə̱́c-* 'warm' (KS 150)

d. Cr *tɨ̱́ʔ* 'pound, hit;' Cm *tə̱́ʔ-* 'mash;' Ka *tɛ̱ʔ*, Sp *tɛ̱ʔ(é)* (w) 'pound;' Sh **tɛ̱ʔ* 'to pound.' Residue:

Ok *ta̲ʔ-*, *tʔá-* 'crush' (KS 196)

e. Cr *-í̲tkʷeʔ*, Cm *-á̲tkʷ*, Ka *-e̲tkʷ*, Sp *-e̲tkʷ*, Sh *-e̲t-kʷe* 'water.' Residue: Ok *-ʔí̲tkʷ* (KS 206)

The following table gives the correpsondences for these sets:

(25)

Cr	Cm	Ka	Sp	Ok	Sh	Examples
i	**a**	**e**	**e...(é)**	**(a)...(á)**	**e...(é)**	24a
i	**a**	**e**	**e, e...(é)**	**i**	**e**	24b
i	**a**	**e**	**e**	**a**	**e**	24c
i	**a**	**e**	**e...(é)**	**∅...(á),a**	**e**	24d
i	**a**	**e**	**e**	**i**	**e**	24e

The correspondences between Coeur d'Alene, Columbian, Kalispel and Shuswap are completely regular. So too are the Spokane correspondents: *ɛ...(é)* occurs with weak roots, *ɛ* and *ɛ...(é)* with the one variable root, and *ɛ* with strong roots and suffixes. Okanagan has *i* in (24b) and (24e), but has forms with *a* as either the first or second vowel in most of the other sets in my data.

For Coeur d'Alene, Columbian, Kalispel, Spokane and Shuswap, my data agree with the following proposed reflexes of **a* (Kinkade and Sloat 1972:30, Kinkade and Thompson 1974:51, Kuipers 1970:51):

(26)

	Cr	Cm	Ka	Sp	Ok	Sh
KS	i	a				
KT	i	a	e	ɛ	i	e
Ku	i		e			e

My data suggest that *a* may also be an Okanagan reflex of **a*. It may be significant that Okanagan forms with *a* as the second vowel correspond to weak roots in Spokane. It seems reasonable to reconstruct roots with **a* for the sets in (24).

We can predict, then, that if the non-harmony vowel is *i* and the harmony vowel is *a*, the proto-vowel was **a*. Unfortunately, the converse of this statement does not hold; a morpheme reflecting **a* may have *ɛ* in the harmony environment.

The sets which contain Coeur d'Alene morphemes for which the harmony vowel is *ɛ* can be divided into two groups. First, the sets in which Coeur d'Alene *i* corresponds to Columbian *a* are given in (27):

(27) a. Cr *dík'ʷ*, Cm *yák'ʷ-* 'cross.' Residue: Ok *yak'ʷ* 'cross over water' (KS 191)

b. Cr *q'íʔ* 'stick to, wedge into;' Cm *q'áʔ-* 'stick in, push in;' Ka *q'ɛʔ* 'put, stick;' Sh *q'ɛʔ* 'put, stick into; add.' Residue: Ok *q'əʔáʔ, q'aʔ-* 'get stuck' (KS 198)

c. Cr *q'íy'*, Cm *q'áy'* 'cleft, angle;' Sp *q'ey* (s) 'split, forked' (KS 179)

d. Cr *síg'ʷ* 'ask for;' Cm *sáw-* 'ask;' Ka *séu* 'ask for information;' Sp *sew* (s), Ok *siw-*, Sh *sew-n-s* 'to ask.' (KS 147)

e. Cr *ʕíd* 'glow, become red hot;' Cm *ḥáʔi* 'hot;' Sh *ʕéy-*, *ʕy-* 'stinging, hot' (KS 177)

These sets exhibit the same types of correspondences seen in (25):

(28)

Cr	Cm	Ka	Sp	Ok	Sh	Examples
i	**a**			**a**		27a
i	**a**	**e**		**a/ə...(á)**	**e**	27b
i	**a**		**e**			27c
i	**a**	**e**	**e**	**i**	**e**	27d
i	**a**				**e/∅**	27e

Although the Coeur d'Alene harmony variant for these roots is *ɛ*, the proto-vowel appears to have been **a*.

The second group contains those sets in which Coeur d'Alene *ɛ* corresponds to Columbian *i*:

(29) a. Cr *cí̲l*, Cm *cí̲lkst*, Ka *cí̲l*, Sp *ci̲l* (w), Ok *cí̲l(ə)kst*, Sh *ci̲l-kst* 'five' (KS 285, Ku I 30)

b. Cr *t-k'ʷi̲nc*, Cm *k'ʷí̲nx*, Ka *k'ʷí̲nš* 'how many;' Sp *k'ʷi̲nš* (w) 'several;' Ok *k'ʷí̲nx* 'how much, how

many;' Sh *k'ʷi̲nx* 'how many (objects), several.' Residue: Ok *k'ʷnx-* 'how much, how many' (Ku I 84)

c. Cr *ni̲c'*, Cm *n'i̲k'-*, Ka *ni̲c'* 'cut with blade;' Sp *ni̲c'* (s) 'to cut;' Ok *ni̲k'-* 'cut with a knife;' Sh *ni̲k'-m* 'to cut, saw' (KS 295, Ku II 53.1)

d. Cr *-ci̲n*, Cm *-ci̲n* 'mouth;' Ka *-ci̲n*, Sp *-ci̲n* 'mouth, lips, tongue; speech; food;' Sh *-ci̲n* 'mouth, voice' (KS 312)

e. Cr *-i̲c'ɛʔ* 'all around, all over;' Cm *-i̲c'aʔ* 'blanket, skin, hide;' Ka *-i̲c'ɛʔ* 'all around;' Sp *-i̲c'ɛʔ* 'blanket, outside covering of something;' Sh *-i̲c'ɛʔ* 'surface, hide' (KS 94, 311, Ku I 146)

The correspondences in the above sets are almost completely regular, as shown in (30).

(30)

Cr	Cm	Ka	Sp	Ok	Sh	Examples
i	i	i	i	i	i	29a, 29c
i	i	i	i	i/∅	i	29b
i	i	i	i		i	29d,29e

The only exception is the Okanagan form with zero in (29b).

As would be expected from the correspondences in (30), Kinkade and Sloat (1972:34), Kinkade and Thompson (1974:24) and Kuipers (1970:51) state that all of the languages retain **i* when it precedes a non-faucal consonant:

(31)

	Cr	Cm	Ka	Sp	Ok	Sh
KS	i	i				
KT	i	i	i	i	i	i
Ku	i		i			i

The proto-forms for the sets in (29) can thus be posited as having **i*.

In my data, five of the Coeur d'Alene forms with non-harmony *ɪ* and harmony *ɛ* reflect etyma with **a*, while seven descend from forms with **i*. Within each group, the sound changes are regular. An interesting point revealed by this comparison is that all *suffixes* with *ɪ* < **a* have *a* as their harmony vowel, while those with *ɪ* < **i* have *ɛ*. This may be a coincidence of the data, and should be investigated further. For roots, at least, it is not possible to explain the two harmony variants of *ɪ* by referring to the proto-vowels. It is plausible that at one time the harmony pattern across morphemes was the same as that seen in tautomorphemic harmony environments. That is, it may have been the case that *ɪ* < **a* always had the harmony variant *a*, and *ɪ* < **i* always became *ɛ* in a harmony environment, as shown schematically in (32):

(32) a. **a* > *ɪ* — *a*/___F
b. **i* > *ɪ* — *ɛ*/___F

Perhaps, for some instances of (32a), the harmony vowel has changed to *e* by analogy with the (32b) cases:

(33) **a* > *ɪ* — *e*/___F

This would be less likely to occur in roots which contain a faucal, since *i* is never realized on the surface and analogy between roots which always have the shapes *CaF* and *CɛF* would not be obvious. This would provide a further indication that those roots with a faucal preceded by *i* < **a* should not be posited as having */ɪ/*, even though *i* is the regular Coeur d'Alene reflex of **a*. If *CaF* roots are underlyingly *CaF*, and *CɛF* roots are underlyingly *CiF*, then the two types would differ in both underlying and surface representations, and no analogy would be made.

4.3 Conclusion

The case of Coeur d'Alene harmony is clearly one in which an investigation of comparative data leads to a better understanding of the modern language. Such data provide valuable insight into the reasons behind the behaviour of retracting roots, and suggest that the loss of pharyngeals in Interior Salish languages is an example of lexical diffusion. With respect to forms containing a faucal consonant after the vowel, it is possible to predict the harmony vowel based on the proto-vowel. Although this is not true when the vowel and faucal are not in the same morpheme, it may be that prediction was possible at one time, but has been rendered impossible by analogy.

This study has also highlighted the need for further investigation into the behaviour of Spokane vowels before **r*, into developments of **ə*, especially in Okanagan and Shuswap, and into the reflexes of **i* in roots with faucals in Kalispel and Spokane. In addition, much of the Coeur d'Alene data used in this paper is based on Reichard (1939), which does not always agree with Reichard (1938) with regard to vowel alternations (Kinkade, p.c.) Therefore, it would be worthwhile to verify the harmony vowels reported in Reichard (1939), and to re-examine the comparative evidence in light of any new information.

NOTES

[1]Many thanks to Dale Kinkade and Barry Carlson, who provided numerous comments on earlier versions of this paper. This work was supported in part by a Social Sciences and Humanities Council of Canada Doctoral Fellowship.

[2]For alternative analyses, see Sloat (1968b, 1980), Kinkade and Sloat (1972), and Bessell (1990).

[3]For detailed discussions of these processes, see Vogt (1940), Kuipers (1974), and Mattina (1979).

[4]For an overview of the theory of lexical diffusion, see Labov (1981).

[5]Throughout this paper, the number of cognate sets given to illustrate each of the correspondence types has been limited to five. In most cases, my data contain additional examples. The following abbreviations are used: Cr - Coeur d'Alene, Cm - Columbian, Cv - Colville, Ka - Kalispel, Sp - Spokane, Ok - Okanagan, Sh - Shuswap, PEIS - Proto-Eastern Interior Salish, PIS - Proto-Interior Salish, and PS - Proto-Salish; Kn - Kinkade's cognate list, KS - Kinkade and Sloat (1972), KT - Kinkade and Thompson (1974), M - Mattina (1979), Ku I - Kuipers (1970), and Ku II - Kuipers (1982). Numbers given in the references are from the original sources.

[6]Vowels given in brackets by Kinkade and Thompson (1974) "are lower allophonic variants of higher vowels." Kinkade and Sloat reflexes are for PEIS proto-vowels, Kinkade and Thompson for PIS, and Kuipers for PS.

[7]For the Spokane data in this and the following sections, "w," "v" and "s" are used to specify whether a root is weak, variable or strong (see Carlson and Flett (1989)).

[8]See Kinkade and Sloat (1972:31) for further examples.

[9]See Kinkade and Sloat (1972:37) for further examples.

[10]I hesitate to refer to this as "underlying *i*," given the debate over the synchronic analysis of Coeur d'Alene harmony. Hence I will refer to the vowel that occurs in non-harmony environments as the "non-harmony" vowel.

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