

Cross-modularity in active to passive alternations

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1. Introduction

Alternations from active to passive are often characterized as an *optional* process driven by discourse considerations such as agent demotion or agent focus. In the Coast Salish languages spoken on the Northwest coast of North America we find, aside from this optional alternation, an obligatory alternation to passive when the corresponding active construction is ungrammatical. In Lummi, for instance, active constructions with a 3rd person subject and a 1st person object are ungrammatical, irrespective of the order in which the agreement suffixes occur (cf. (1a) vs. (1b)). Instead, a passive construction as in (2) has to be used.¹

- (1) Lummi (Jelinek 1993)
a. *Leŋ-t-oŋəs-əs
 see-TR-1/2SG.OBJ-3SG.SU
 ‘He saw you/me.’
b. *Leŋ-t-əs-oŋəs
- (2) Lummi (Jelinek 1993)
 Leŋ-t-ŋ=sən
 see-TR-PASS=1SG.SU
 ‘I was seen (by someone).’

In this paper I will focus on the ungrammaticality of some active constructions in these languages — the so-called *paradigm gaps* — and the obligatory voice alternation resulting from them. Most authors (Jelinek and Demers 1983, Jelinek 1993, 1994, Aissen 1999) have argued in favour of a so-called person hierarchy in order to account for this alternation. In this view the ungrammaticalities in the active are the result of a violation of a constraint which states that “the element highest in rank in the agent hierarchy in a sentence should be the

subject of that sentence” (Jelinek and Demers 1983:169). In Section 3, I argue (following Wiltschko and Burton 2004) in favour of a morphological account of the data. Using Optimality Theory, I propose that the obligatory alternation can be best viewed as the result of a conflict between four constraints coming from different modules of the grammar. But before we come to this analysis let us first have a look at the exact data in Section 2.

2. Three types of paradigm gaps

The Coast Salish languages are so-called radical head-marking languages (Davis 1995). This means that all grammatical functions are marked on the predicate by means of affixes and clitics. The agreement pattern found in the languages under discussion is shown in Table 1.

Table 1. Agreement markers in Coast Salish

Person	Subject	Object
1	clitic	suffix
2	clitic	suffix
3	suffix	zero

As we can see, 1st and person subjects are represented by clitics and the other agreement markers are suffixes with 3rd person object agreement being zero.² In the remainder of this section I discuss the three types of languages we can distinguish with respect to paradigm gaps. The reader should bear in mind when examining the three types that the main point of the analysis outlined in Section 3 is the observation that the ungrammaticality of these constructions is the result of the existence of only one position for agreement suffixes on the verb. Consequently, we will see that most constructions with two suffixes are ruled out.

2.1 Type 1: Excluding both 3–1 and 3–2 sentences³

Lummi falls within the first type under discussion. Its agreement markers are given in Table 2, showing that Lummi follows the general pattern of agreement markers given in Table 1 above.

As we have seen in (1) above, the combinations 3–1 and 3–2 are the paradigm gaps found in Type 1. Well-formed expressions are any combination of clitic and suffix (1–2, 2–3, etc.) or suffix and zero agreement (3–3). In

Table 2. Agreement markers in Lummi (Type 1; Jelinek 1993, 1996)

Person	Subject	Object	Person	Subject	Object
1sg	=sən	-oŋəs	1pl	=lh	-oŋəlɥ
2sg	=sx ^w	-oŋəs	2pl	=sx ^w helə	-oŋəs
3sg	-əs	-Ø	3pl	-əs	-Ø

subordinate clauses all combinations are grammatical. Interestingly, 3rd person subject agreement is zero in subordinate clauses, and under these circumstances the restrictions on direct objects found in main clauses are lifted. This means that even 3–1 and 3–2 sentences are well-formed as can be seen from (3).

- (3) Lummi (Jelinek 1993)
 Ye'-Ø [cə [leŋ-t-oŋəs-Ø]]
 go-3SG.SU DET see-TR-1/2SG.OBJ-3SG.SU
 'He left, the (one that) saw you/me.'

2.2 Type 2: Excluding only 3–2 sentences

Table 3 shows that the agreement markers used in Squamish, a Type 2 language, again follow the general pattern. A difference with Lummi is that Squamish has different forms for 1st and 2nd person objects.

Table 3. Agreement markers in Squamish (Type 2; Jacobs 1994)

Person	Subject	Object	Person	Subject	Object
1sg	=chen	-s	1pl	=chet	-umulɥ
2sg	=chexw	-umi	2pl	=chap	-umi
3sg	-as	-Ø	3pl	-as	-Ø

Type 2 languages are less restrictive as they only exclude the 3–2 combination. 3–1, on the other hand, is well-formed as can be seen from the contrast between (4a) and (4b).

- (4) Squamish (Jacobs 1994)
 a. Ch'áw-at-s-as
 help-TR-1SG.OBJ-3SG.SU
 'He helped me.'
 b. *Ch'áw-at-umi-as
 help-TR-2SG.OBJ-3SG.SU
 'He helped you.'

Again combinations of clitic and suffix and of suffix and zero agreement are well-formed. Furthermore, as Kuipers (1967) reports, 3–2 sentences are ruled out only in three of the four verbal paradigms. That is, we do not find 3–2 sentences in the finite, factual, and hypothetical paradigm, but such sentences are present in the nominal paradigm, which lacks a 3rd person marker. Consider the example in (5) and compare it to (3) from Lummi in which the 3rd person subject is also zero.

- (5) Squamish (Kuipers 1967)
 Na ch'áw-at-umi-Ø
 RL help-TR-2SG.OBJ-3SG.SU
 'the one who helped you.'

2.3 Type 3: No exclusion of any sentence with pronominal arguments

The third type of language is exemplified by Lushootseed. Let us first consider the various subject and object markers of this language listed in Table 4.

Table 4. Agreement markers in Lushootseed (Type 3; Hukari 1976)

Person	Subject	Object	Person	Subject	Object
1sg	=chad	-s	1pl	=chalh	-ubulh
2sg	=chax ^w	-sid	2pl	=chaləp	-ubulhəd
3sg	-Ø	-Ø	3pl	-Ø	-Ø

In contrast with the two types discussed so far, in this language both the 3rd person subject and object marker are zero. Interestingly, in the absence of a 3rd person subject marker this language puts no restrictions on any combination of arguments (see Hukari (1976) for examples).

3. Suffix competition as constraint interaction

As stated in the introduction, most authors account for the data discussed in the previous section by means of a person hierarchy. However, as Brown et al. (2003) and Wiltschko and Burton (2004) have shown, in order to account for the facts described in Section 2, different person hierarchies have to be stipulated both within and across the different languages.⁴ Instead of referring to a person hierarchy, Wiltschko and Burton (2004) argue at length for an account based on a morphological co-occurrence restriction: the ungrammaticalities

follow from the co-occurrence of two agreement morphemes in one position (an insight already implicit in the work of Jelinek 1993, 1994). In this section, I develop an account that shares this main idea but is different in many respects, especially in the way in which it is implemented.

The account developed in this section is couched in the framework of Optimality Theory (OT). In line with earlier work on voice alternations in OT (Aissen 1999; Bresnan et al. 2001), I assume active and passive constructions to be elements of the same candidate set. In this view, both active and passive constructions are considered to be equal alternatives, the choice for which is dependent on what the discourse status of the participants asks for. Thus, on the account developed in this section a given input can be realized both by an active and a passive construction. The actual choice for one construction above the other is dependent on the evaluation of the output candidates against the constraints involved. The input is considered to be a simple predicate-argument structure in which the semantic roles and the number features of the arguments are specified.

Now let us turn to the constraints involved. In the proposed analysis I make use of three types of constraints. The starting point of this account is the constraint on argument linking formulated in (6).

- (6) SUBAG: the agent argument is assigned the function of subject.

The linking of the agent argument to the subject function is not specific to the Salish language family but seems to be a universal tendency (Zaenen et al. 1985, Jelinek 1993, Aissen 1999). The constraint SUBAG is satisfied when the agent in the input is linked to the subject function. It is violated when the agent is linked to any non-subject function in the clause, e.g., direct object or oblique phrase. It thus favours active constructions over passive ones. As we develop the account we will see that this constraint may be frustrated by two other types of constraints to be proposed.

In the previous section we have seen that if two agreement suffixes co-occur the resulting active construction is deemed ungrammatical. The question arises why this should be the case. As said above, I assume that the two agreement suffixes are competing for one single position (as also noted by Jelinek 1994, 1996 and Wiltschko and Burton 2004), i.e., they both want to go in the position immediately following the transitivizer. This observation is captured by the two constraints formulated in (7).

- (7) a. ALIGN-P: align the left edge of an object suffix to the right edge of the stem.⁵

- b. ALIGN-A: align the left edge of a subject suffix to the right edge of the stem.

These constraints are so-called alignment constraints (McCarthy and Prince 1993), which state the placement preference for a morphological category. In our case, a suffix violates one of these constraints if it is not placed immediately after the stem. Thus, in a construction with two suffixes, one of them will always violate either of the constraints in (7). In case the object suffix immediately follows the stem, the subject suffix violates its alignment constraint and if the subject suffix is positioned immediately after the stem the object suffix violates its alignment constraint. In case we have only one agreement suffix and either a clitic or zero agreement, the alignment constraint is not violated and the corresponding active construction is grammatical.⁶

As Tableaux 1 and 2 show, the three constraints formulated so far can describe Type 1 and Type 2 languages by means of the constraint ranking stated in (8).

- (8) *Constraint Ranking for Type 1 and Type 3 languages:*
ALIGN-P >> ALIGN-A >> SUBAG

Tableau 1. Evaluation of a 3–2 sentence in Lummi (Type 1).

	V(Ag/3-Pat/2)	AL-P	AL-A	SUBAG
a.	Act(Su/3/suf-Obj/2/suf) V-TR- <i>as-ohas</i>	*!		
b.	Act(Obj/2/suf-Su/3/suf) V-TR- <i>ohas-as</i>		*!	
c.	Pass(Su/2-Obl/3) Su/2 V-TR-PASS Obl/3			*

Tableau 2. Evaluation of a 3–2 sentence in Lushootseed (Type 3).

	V(Ag/3-Pat/2)	AL-P	AL-A	SUBAG
a.	Act(Su/2/suf-Obj/3/suf) V-TR- <i>sid-Ø</i>			
b.	Pass(Su/2-Obl/3) Su/2 V-TR-PASS Obl/3			*!

Tableau 1 shows the evaluation of a 3–2 sentence in Lummi. In accordance with the examples in (1) and (2) above, in this language such combinations are only possible as a passive construction. The active construction would contain two agreement suffixes and therefore always violate one of the highranked alignment constraints. The passive construction only violates the lowest ranked

constraint on argument linking and is considered the optimal expression for this input. In case of the Type 3 language Lushootseed, the active comes out as the optimal candidate. In this language, 3rd person subject agreement is zero and therefore competition between suffixes will never take place. Consequently, the active does not violate a single constraint. The passive, on the other hand, violates the argument linking constraint and is deemed suboptimal.⁷

The account developed so far cannot account for the languages of Type 2. In these languages 3–2 constructions are ruled out, but 3–1 constructions are perfectly grammatical even though both constructions contain two overt agreement suffixes (cf. (4) above). This means that we have to add something to our system, if we want to account for this type of languages as well. But what addition should we make? Let us first consider the approach taken in Brown et al. (2003, following Wiltschko 2003) and Wiltschko and Burton (2004), who develop a morphological account for Halkomelem, a Type 2 language, based on suffix competition. Wiltschko and Burton (2004:53) state that in this language the following *3/2 constraint holds: “3rd person [subject] morphology cannot co-occur with person object agreement morphology.” This constraint is the result of the fact that both types of agreement are in complementary distribution, which follows from the fact that they both occupy the head position of *vP* (Brown et al. 2003:12). The immediate question, which arises, is why we only find a *3/2 constraint and not a *3/1 constraint, since 1st person object agreement is also assumed to hold the same position as 3rd person subject agreement.⁸ The answer is given in Brown et al. (2003:12): “We argue [for Halkomelem] (again following Wiltschko 2003) that the 3/1 combination is well-formed because it is “lexicalized” as a single agreement morpheme (-*òxes*; -*òxwes*);⁹ i.e. it constitutes a kind of “portmanteau” morpheme. In contrast, the 3/2 combination is ruled out because it is not lexicalized and thus the agreement endings compete for the same position.” This subsequently raises the question why the 3–1 combination is lexicalized and the 3–2 not.

Instead of stipulating that only 3–2 morphemes are conflicting by assuming a lexicalization of the 3–1 combination, I argue that the difference in well-formedness between 3–1 and 3–2 in Type 2 languages is due to a third type of constraint, well-known from phonology (Kager 1999).

- (9) ONSET[*VV]: avoid sequences of two adjacent vowels.

If we look at Table 5, we see that this constraint correctly rules out the combination 3–2 because the 2nd person object suffix ends in a vowel and the 3rd person subject suffix starts with a vowel as well. By contrast, the 3–1 combination

Table 5.

		*vv
3-1	V-TR-s-as	
3-2	V-TR-umi-as	*

is perfectly well-formed with respect to this constraint because the 1st person object suffix ends in a consonant, cf. (4) above. The table only shows the order in which the object suffix preceeds the subject suffix. In Tableaux 3 and 4 I also discuss the reverse order.

The fact that phonology is partly responsible for a voice alternation may come as quite a surprise. There are however two pieces of evidence in favour of this analysis. First, there exists historical evidence for the fact that vowel sequences are not preferred when combining agreement suffixes. In Table 3 we have seen that Jacobs (1994) analyzes the 1st and 2nd person subject clitics as *chen* and *chexw* respectively. Kuipers (1967) notes in his grammar written almost thirty years earlier that these clitics are actually composed of the clitic *ch* meaning ‘to be, to act as’ and the subject suffixes *-an* and *-axw*. He states that the language at the time of writing still had free occurrences of these subject markers, which are absent today due to the merging with *ch*. Interestingly, the 1st person subject markers *-an*, *-at* were never combined with the 2nd person object suffix *-umi* in the same word. Instead speakers would either attach the markers to the clitic *ch* or take recourse to possessive affixes. The 2nd person subject markers *-axw*, *-ap* were nevertheless used as free forms and could be attached to the 1st person object markers *-s* and *-umulh* which both end in a consonant. This clearly shows that the language avoids sequences of vowels in its agreement paradigms.

Secondly, there is cross-linguistic evidence within the Coast Salish branch. Consider the overview presented in Table 6.¹⁰ As we can see all languages that have a restriction only on 3-2 sentences have a 1st person object suffix ending in a consonant, a 2nd person object suffix ending in a vowel, and a 3rd person subject suffix starting with a vowel. This neatly shows the correlation between the phonological shape of the suffixes and the exclusion of certain suffix combinations. The other two languages listed in the table for comparison do not show this pattern and more importantly show different paradigm gaps.

We already have seen above that Type 1 and 3 languages can be captured by means of the two constraint types on argument linking and suffix alignment. Now with this third constraint type on syllable shape we can also model the last type of languages. Consider the constraint ranking in (10).

Table 6. Agreement inventory and paradigm gaps

Language	Type	Object		Subject	Gaps
		1st	2nd	3rd	
Squamish	2	-s	-umi	-as	3–2
Sechelt	2	-ts	-tsi	-as	3–2
Saanich	2	-s/-aŋəs	-sə/-aŋə	-əs	3–2
Halkomelem	2	-òx	-òme	-əs	3–2
Lummi	1	-oŋəs	-oŋəs	-əs	3–1, 3–2
Lushootseed	3	-s	-sid	-Ø	–

(10) *Constraint Ranking for Type 2 languages:*

*VV >> ALIGN-P >> SUBAG >> ALIGN-A

With this constraint ranking we correctly predict that in this language type only 3–2 active constructions are ruled out whereas 3–1 is ruled in. This can be seen by comparing Tableaux 3 and 4.

Tableau 3. Evaluation of a 3–1 sentence in Squamish (Type 2).

V(Ag/3-Pat/1)	*VV	AL-P	SUBAG	AL-A
a. Act(Su/3/suf-Obj/1/suf) V-TR- <i>as-s</i>		*!		
b. Act(Obj/1/suf-Su/3/suf) V-TR- <i>s-as</i>				*
c. Pass(Su/2-Obl/3) Su/1 V-TR-PASS Obl/3			*!	

Tableau 4. Evaluation of a 3–2 sentence in Squamish (Type 2).

V(Ag/3-Pat/2)	*VV	AL-P	SUBAG	AL-A
a. Act(Su/3/suf-Obj/1/suf) V-TR- <i>as-umi</i>		*!		
b. Act(Obj/2/suf-Su/3/suf) V-TR- <i>umi-as</i>	*!			*
c. Pass(Su/2-Obl/3) Su/2 V-TR-PASS Obl/3				*

In Tableau 3 we see that in the case of a 3–1 input the active with the subject suffix following the object suffix correctly comes out as the optimal output (cf. example (4a)). The active with the reverse order is ruled out because it violates the constraint on object alignment and the passive is ruled out because it links the agent to a non-subject function. In the case of a 3–2 input both active

constructions are ruled out (Tableau 4). The subject-object order because it violates the constraint on object alignment and the object-subject order because it violates the highest ranked constraint on vowel sequences. The passive therefore comes out as the winning candidate since it only violates the lower ranked constraint on argument linking.

In this section I have shown that the obligatory voice alternation found in Coast Salish languages can be accounted for by a cross-modular model in which three types of constraints are in conflict with one another. In this approach the different paradigm gaps observed in different languages do not fall out from constraints stipulated for each language only in relation to this single phenomenon (see note 8), but rather fall out from the conflict between constraints that are present in the grammar for independent reasons, that is, to account for other facts such as suffix placement and syllable shape.

4. Conclusion

In this paper I have discussed the obligatory voice alternation found in some Coast Salish languages. In these languages some person combinations can only be expressed as passive constructions due to the ungrammaticality of the corresponding active. I hope to have shown that this alternation can be best captured as a conflict between four potentially conflicting constraints coming from different modules of the grammar. Instead of stipulating constraints only needed to handle the paradigm gaps, this analysis makes use of constraints independently needed in the grammar.

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Notes

1. The abbreviations used in this paper are: 1=first person, 2=second person, 3=third person, ACT=active, AG=agent, DET=determiner, OBJ=object, OBL=oblique, PASS=passive, PAT=patient, RL=realis, SG=singular, SU=subject, SUF=suffix, TR=transitive, V=verb.
2. In intransitive sentences 3rd person subject is also zero.
3. In the remainder of this paper I refer to paradigm gaps by using the number features of the subject followed by the number feature of the object argument. Thus, 3–1 indicates a combination of a 3rd person subject and a 1st person object.
4. I refer to the authors cited for further discussion.
5. I use the term *stem* to refer to the combination of verb root and transitivizer.
6. As illustrated by Jelinek (1996), the agreement clitics come in second position right after the first predicate of the clause following agreement suffixes and TAM markers. They thus do not compete with the suffixes for a position.
7. In fact, since both active and passive are grammatical options we find an optional voice alternation in this language not dealt with in this paper (the data are more complicated though). This optionality can be easily fitted into the analysis developed here by integrating discourse constraints, e.g. link the most discourse prominent argument to the subject function, which are as strong or stronger than the argument linking constraint (see Aissen 1999 for such an approach).
8. Interestingly, in discussing variation across Coast Salish, Wiltschko and Burton (2004) argue that although Type 2 Halkomelem has no *3/1 constraint we do find it in Type 1 Lummi. Following the authors, the “crucial” reason for this is that in Lummi 1st and 2nd person are homophonous and thus share the same paradigmatic cell. Therefore, the *3/1 and the *3/2 constraint affect the combination of the same morphemes. This homophony, however, only exists in the singular but not in the plural as can be seen from Table 2 and thus cannot be taken as a reason for the existence of the *3/1 constraint in Lummi. In order to account for different language types they thus have to stipulate different constraints for each language type: Type 1 has both *3/1 and *3/2, Type 2 has only *3/2 (plus lexicalization of 3–1) and Type 3 has no such constraint.
9. These morphemes are composed of the 3rd person subject suffix *-es* and the 1st person object suffix *-òx* or the 2nd person object suffix *-òxw* respectively.
10. For reasons of space this table only shows the singular markers. The plural markers follow the same pattern as (or are identical to) the singular ones: if the singular marker ends in a vowel/consonant the plural will also end in a vowel/consonant. The third subject person marker is identical in singular and plural.

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