

A correspondence-theoretic analysis of Dalabon transitive paradigms

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1. Introduction¹

In the preceding paper, Evans, Brown and Corbett (henceforth: EBC) presented the complex system of pronominal prefixation in Dalabon. They proposed an analysis that describes this system by a number of statements associated with the nodes of a Network Morphology. Some of these statements have the formal nature of referrals (Zwicky 1985, Stump 1993): certain category combinations are realized by the morphological exponent of other combinations. I find the notion of referral problematic for theoretical reasons (because it is too powerful a device), but especially in the context of language acquisition; it requires the child who tries to identify morphemes as the exponents of some category combinations to look also at other category combinations. It would be easier for the child to analyze word forms into minimal contrastive elements that bear information themselves. In the end, the child may have identified certain morphemes to be underspecified, covering more than one category combination, or more than one cell of a paradigm (Wunderlich 1996a, Noyer 1998).

The problem with Dalabon is that even if the child has found the minimal set of contrastive elements (the set of pronominal prefixes), associated with minimal specifications, and then combines them to find the morphological exponent for all the possible category combinations, in quite a number of cases the child will predict the wrong ones. So very early, the child will detect that there are certain constraints restricting category combinations from transparent expression. In order to maintain the intended meaning, the child may indeed inspect some alternative candidates. It is in this stage that a referral becomes implausible: why should just the exponent of another specific combination offer the best alternative? More plausible for circumventing the constraint is to choose in each instance a less specified morpheme, that is, a morpheme that does not express the undesired feature. If the 2nd person is blocked, one may look for a morpheme unspecified for person, if the plural is blocked, one may look for a morpheme unspecified for plural, and if the accusative is blocked, one may look for a morpheme unspecified for case. If there would be a general constraint for referrals demanding that only less specified morphemes can enter the cell under question, the referral analysis would be equivalent with the underspecification analysis. But such a constraint has never been proposed; in the contrary, Stump (1993) considers both directions: from the less marked to the more marked, and from the more marked to the less marked, and both Stump (1993) and Brown (forthcoming) deliberate the idea that in certain contexts the direction of a referral can be reversed, which is incompatible with the underspecification analysis.²

¹ I am grateful to Nicholas Evans for providing me with the data on Dalabon. I presented various stages of my analysis at conferences in Wuppertal, Malta, and Potsdam; it is due to the commentaries from the audiences, especially those from Birgit Gerlach and Barbara Stiebels, that the final version has been improved. I am also grateful to the comments of an anonymous reviewer. The research was supported by the German Science Foundation (DFG) in connection with the SFB 282 'Theorie des Lexikons'.

² The problem addressed by Brown (forthcoming) concerns the syncretism between genitive and prepositional case in Russian. I admit that in this case an underspecification analysis is not obvious, but it is also an open question whether this type of syncretism is systematic. Carstairs-McCarthy (1998) argues that

In this paper, I will propose an alternative analysis of the Dalabon data, which is based on the following assumptions:

- (i) The pronominal prefixes are exclusively specified by means of plus-valued features for person, number, and case. There is no value specified for 3rd person, singular, and nominative; prefixes that instantiate these categories are therefore underspecified.
- (ii) The selection of the pronominal prefixes that realize a certain category combination is regarded as a correspondence-theoretic problem. The intended information (the input) is represented by the theta structure of a verb, associated with person and number features, and the selection is made out of a set of alternatives formed by all sequences of pronominal prefixes attached to a verb (the output).
- (iii) There is a (partially) ordered set of violable constraints that determines for each intended feature complex which output candidate is the optimal one, that is, which pronominal prefix sequence wins the competition.

In order to set out this program, at least three steps must be performed: (a) the features by which the individual morphemes (the pronominal prefixes) are described have to be established; (b) every combination of prefixes has to be assumed a possible candidate in the competition; (c) a minimal set of constraints evaluating these candidates in a uniform ranking has to be motivated.

The fact that the form of some of the pronominal prefixes is predictable is ignored. EBC convincingly have shown that the form of dual and plural prefixes, among others, can be derived. I have nothing to add to this result. Furthermore, some other peculiarities of Dalabon are irrelevant for the problem to be considered here;³ since they can be fixed by postulating certain additional features, they do not enlarge the logical problem of why certain prefixes cannot combine transparently.

Since the distribution of pronominal prefixes is considered from the perspective of correspondence theory, the relevant entities have to be specified with the same features at both the input and the output level. Let us assume that each transitive verb can be characterized by the schema in (1), where the λ -abstractors represent the theta roles, specified by the abstract case features [+hr] ('there is a higher role') and [+lr] ('there is a lower role'). Moreover, each theta role can be associated with additional features for person and number, abbreviated as ϕ -features. Such a configuration functions as input ('the intended information', see also Gerlach 1998):

$$(1) \quad \begin{array}{ccc} \lambda y^\phi & \lambda x^\phi & \text{VERB}(x,y) \\ +hr & +lr & \end{array}$$

This schema allows us to predict that the combination accusative-ergative is the optimal realization for a transitive verb if no restrictions take place (see below); however, with some restrictions it may well be the case that another combination is optimal. More specifically, every combination of pronominal prefixes attached to a verbal stem is considered a possible output candidate. Since each

some of the instances where a more marked exponent seems to appear in a less marked position can be handled by means of disjunctive lexical entries, though, as he admits, rules of referral may be needed in other instances. However, the cited phenomena, such as pluralia tantum (plural in form but singular in meaning) and deponent verbs in Latin and Greek (passive or middle in form but active in meaning), are often lexicalized rather than derived by a rule.

³ I disregard the disharmonic prefixes, as well as prefixes that mark the object to be equal or higher in animacy than the subject.

cell of the transitive paradigm is occupied by just one single form, the question is to determine which (partially) ordered set of constraints makes the actual forms the optimal ones. For readers who are unfamiliar with the application of correspondence theory in morphology, I will briefly indicate which types of constraints we have to expect. A first family of constraints, the faithfulness constraints, reflect preferences in the relation between the input, given by the schema in (1), and the actual realizations (the output):

- (2)
- a. MAX(f): Every feature f in the input has a correspondent in the output. ('Do not ignore features from the input')
 - b. DEP(f): Every feature f in the output has a correspondent in the input. ('Do not introduce features in the output')
 - c. MAX(ϕ)/role α : Every ϕ -feature associated with the role α in the input has a correspondent in the output. (Contextualized MAX-constraint)
 - d. MAX(f,g): Every feature combination (f,g) in the input has a correspondent in the output. (Conjunctive MAX-constraint)

The DEP-constraints are generally high-ranked because of monotonicity: if a '+'-valued feature is introduced in the output, it would override some '-'-valued feature assigned to the input by default. This should never happen in morphology; to my knowledge, no real instance of this type has ever been observed.⁴ Therefore, all candidates with DEP-violations are ignored in the following. By contrast, both the contextualized MAX-constraints and the conjunctive MAX-constraints will play an essential role; they preserve the identity of ϕ -features associated with theta roles.

Another relevant family of constraints concerns properties of the output: markedness constraints block certain features (or feature combinations), while alignment constraints regulate the order of affixes:

- (3)
- a. *(f): Do not realize the feature f in the output.
 - b. ALIGN(f,R, μ): Realize the feature f to the right of the morphological category μ .
 - c. *ALIGN(f,L, μ): Do not realize the feature f to the left of the morphological category μ .

The feature values assumed in this study are the following:

- Person: [+1] for first person, [+2] for second person, [+1,+2] for first inclusive, and [] for third person.
- Number: [+dl] for dual, [+pl] for plural, and [] for singular.
- Morphological case: [+hr]=O for accusative (realizing the lower argument of transitive verbs, the object O), [+lr]=A for ergative (realizing the higher argument of transitive verbs, the subject or Actor A), and []=N for nominative (realizing the subject of intransitive verbs).⁵

It is in the spirit of correspondence theory that input and output are characterized by the same features. In morphology, mostly only the '+' values are relevant; so MAX(person) is violated if

⁴ Clitic substitutions in Italian (**si si* → *ci si*) or Spanish (**le lo* → *se lo*), discussed in Gerlach (1998:68,75), are phonologically motivated: in order to avoid a violation of ANTIHOMOPHONY or *ALLITERATION, a locative *ci* or a reflexive *se* is used, which is phonologically similar and does not introduce undesired features of person, number or case.

⁵ I use the notions O and A to avoid any confusion with the examples presented in the article by EBC.

either [+1] or [+2] from the input do not appear in the output, and MAX(number) is violated if either [+dl] or [+pl] from the input do not appear in the output. This account thus deviates from the standard version of correspondence theory (McCarthy and Prince 1995), which does not assume underspecification.⁶

For describing the input demands, I will use notions such as ‘3sg’; but note that in such a case a MAX(person) or a MAX(number) violation can never occur - it can only happen that the 3sg argument role itself does not find a correspondent. However, for describing the output information, I will only use notions correlating to positive values; 3sg nominative is then abbreviated as N. The notions O and A help to abbreviate both the input case features and the morphological case features. It may happen that a 2sgA input is mapped to a 3sg nominative (=N) form; in such a case, many linguists tend to use the intended features for the interlinear gloss, but here only the realized features are considered.

2. The transitive inventory and paradigm

With the above features in mind, the relevant set of Dalabon pronominal prefixes can be specified as follows:

(4) The inventory of pronominal prefixes in Dalabon

	Forms that appear with intransitive verbs N=nominative	Forms that only appear with transitive verbs	
		A=ergative	O=accusative
Singular	ngah [+1] djah [+2] kah []	dah [+lr,+2]	
Dual	yah [+1,+2] yarrah [+1,+dl] narrah [+2,+dl] barrah [+dl]	yirrah [+lr,+1,+dl] nurrah [+lr,+2,+dl] burrah [+lr,+dl]	njeh [+hr,+1,+2] njerr [+hr,+1,+dl] norr [+hr,+2,+dl] bunu [+hr,+dl]
Plural	ngarrah [+1,+2,+pl] yalah [+1,+pl] nalah [+2,+pl] balah [+pl]	ngurrah [+lr,+1,+2,+pl] yilah [+lr,+1,+pl] nulah [+lr,+2,+pl] bulah [+lr,+pl]	ngorr [+hr,+1,+2,+pl] njel [+hr,+1,+pl] nol [+hr,+2,+pl] bulu [+hr,+pl]
		referring to both object person and subject number djirrah [<+hr,+2>,+dl] djilah [<+hr,+2>,+pl]	

This inventory shows a tripartite system in the dual and plural, whereas all singulars are expressed with the same prefixes as those used with intransitive verbs (with the only exception *dah*). Such an

⁶ As Inkelas (1994) has argued, underspecification is however justified if it allows the better account of a phenomenon such as vowel harmony. Paradigmatic syncretism is just another example in which an underspecification analysis gives the better results (see also Blevins 2000).

inventory is rather unusual because it displays more differentiation in the marked categories (dual or plural) than in the unmarked one (singular). Number thus seems to play a much more important role in Dalabon grammar than in other languages.⁷

CT offers us the possibility to describe this unusual inventory as induced by a particular type of constraint ranking.

- (5) a. $\text{Max}(+\text{hr}, \text{number}) \gg *(\text{+hr}) \gg \text{Max}(+\text{hr})$

Do not realize accusative unless it is combined with a number feature.

- b. $\text{Max}(+\text{lr}, \text{number}) \gg *(\text{+lr}) \gg \text{Max}(+\text{lr})$

Do not realize ergative unless it is combined with a number feature.

In the analysis below, the markedness constraints $*(\text{+hr})$ and $*(\text{+lr})$ will be replaced by more specific constraints that infer the blocking of singular forms. There is, however, a slight difference between accusative and ergative in this respect. It will be evident that $\text{MAX}(+\text{hr}, \text{number})$ is indeed necessary, whereas $\text{MAX}(+\text{lr}, \text{number})$ might be too strong a requirement; what actually is needed is the requirement that the number of subject is preserved in every case. Note that there exists one singular ergative morpheme, *dah-*, a fact that is not compatible with (5b) as it stands.

Another unusual feature is the emergence of just two fused morphemes referring to both subject and object features⁸; there must be some pressure in the grammar of Dalabon that lets these inventions survive.

Given the inventory in (4), one is tempted to combine these affixes in order to derive the transparent realizations of transitive settings. Since dual and first inclusive affixes behave in most respects like the plural ones, they are neglected in the following for the sake of brevity. Nearly nothing had to be changed in the analysis presented here if one accounts for this additional complexity. The singular and plural forms that are predicted on the basis of the inventory are listed in (6). However, many of these predictions are wrong. All the forms included in the field surrounded by bold lines do not exist.

- (6) The transitive paradigm of pronominal prefixes as predicted on the basis of the affix inventory; first inclusive and dual neglected.

⁷ EBC have given evidence that the original number system was of the augmented type, which may have prompted this preference.

⁸ The onset /dj/ refers to second person, while the rest of the morpheme refers to 1dIA or 1pIA.

Object (O)	Subject (A)					
	1	2	3	1pl	2pl	3pl
1		ngah dah 1N 2A	ngah kah 1N N		ngah nulah 1N 2plA	ngah bulah 1N plA
2	djah ngah 2N 1N		djah kah 2N N	djah yilah 2N 1plA		djah bulah 2N plA
3	kah ngah N 1N	kah dah N 2A	kah kah N N	kah yilah N 1plA	kah nulah N 2plA	kah bulah N plA
1pl		njel dah 1plO 2A	njel kah 1plO N		njel nulah 1plO 2plA	njel bulah 1plO plA
2pl	nol ngah 2plO 1N		nol kah 2plO N	nol yilah 2plO 1plA		nol bulah 2plO plA
3pl	bulu ngah plO 1N	bulu dah plO 2A	bulu kah plO N	bulu yilah plO 1plA	bulu nulah plO 2plA	bulu bulah plO plA

The forms that actually occur are given in (7).

(7) The actual transitive paradigm of pronominal prefixes.

Object (O)	Subject (A)					
	1	2	3	1pl	2pl	3pl
1		kah N			bulah plA	
2	djah 2N		djah 2N	djilah pl/2O		djilah pl/2O
3	ngah 1N	dah 2A	kah N	yilah 1plA	nulah 2plA	bulah plA
1pl		njel kah 1plO N			njel bulah 1plO plA	
2pl	nol ngah 2plO 1N		nol kah 2plO N	nol yilah 2plO 1plA		nol bulah 2plO plA
3pl	bulu ngah plO 1N	bulu dah plO 2A	bulu kah plO N	bulu yilah plO 1plA	bulu nulah plO 2plA	bulu bulah plO plA

Regarding the differences between the actual and the predicted combinations, some preliminary observations can be made.

- In all 2A/1O settings, subject person is unexpressed, instead the unspecified (3rd person) form appears.
- 1sg objects are always unexpressed.
- In all settings with 2sg object and plural subject, a fused morpheme appears.

Moreover, all forms with plural object have two prefixes, the first one being accusative, whereas all forms with singular object only show one prefix. This distribution can be seen more clearly from the schematic paradigm in (8).

(8) Schematic distribution of forms

Object (O)	Subject (A)					
	1	2	3	1pl	2pl	3pl
1		nom			erg	
2	nom			fused		fused
3		erg		erg		
1pl		acc - nom			acc - erg	
2pl	acc - nom					
3pl		acc - erg				

We can infer the following morphological facts from this schematic overview: (i) An accusative prefix is necessary in order to express a dual or plural object. (ii) The accusative prefix must not be adjacent to the stem, so two prefixes have to appear in such a case. (iii) Otherwise only one prefix appears, even if some information is suppressed; it is due to further analysis to specify which one.

The following analysis attempts to capture all the observations made. I will first list the relevant constraints, followed by more intuitive considerations, and then demonstrate the evaluation of competing candidates in detail, thereby also giving evidence for the assumed constraint ranking.

3. The constraints

Three kinds of constraints are assumed: in addition to the above-mentioned faithfulness and markedness/alignment constraints there are also morphological taboos, which play a special role in the morphological expression of speaker-addressee relations.⁹ (Recall also that O=[+hr], and A=[+lr].)

⁹ In their formal nature, these taboos, which are well-known from many languages (Heath 1998), can be compared with the impoverishment rules of syntax-based accounts (Bonet 1991, Halle and Marantz 1993, Noyer 1998). However, they are restricted to 1st and 2nd person, and it is assumed that they originate from politeness strategies or face constraints in the sense of Brown and Levinson (1978) and Bickel et al. (1999). Being extralinguistic, these taboos play in fact only a periphrastic role in the grammar.

a. Faithfulness constraints:

- MAX(numO): Every combination of a [+hr] role with a positive number value in the input has a correspondent in the output. (This constraint would be violated if a plural object is realized with nominative plural.)
- MAX(num)/A: Each positive value of number associated with a [+lr] role in the input has a correspondent in the output. (This constraint only requires that the number of subject is realized; it is not violated if the plural subject is realized with nominative plural.)
- MAX(per)/O: Each positive value of person associated with a [+hr] role in the input has a correspondent in the output.
- MAX(per)/A: Each positive value of person associated with a [+lr] role in the input has a correspondent in the output.
- MAX(arg): Every argument position is realized by a pronominal prefix.
- MAX(+hr): Every feature [+hr] in the input has a correspondent in the output.
- MAX(+lr): Every feature [+lr] has a correspondent in the output.

b. Alignment and markedness constraints:

- *ALIGN(+hr): No [+hr] morpheme is realized adjacent to the verbal stem.
- SINGLE LINKER: Only one pronominal prefix appears.

c. Morphological taboos restricting faithfulness:

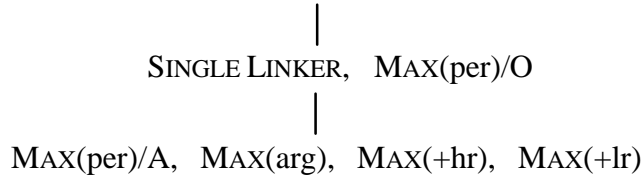
- *MAX(2A)/1O: [+lr,+2] in the context of [+hr,+1] in the input has no correspondent [+2] in the output (for short: *2/1).
- *MAX(1sgO): [+hr,+1,-pl] in the input has no correspondent in the output.

It is in the nature of a taboo that it forbids an intended meaning to be expressed; a surface markedness constraint usually would not be sufficient.¹⁰

¹⁰ This does not exclude that a taboo is so much grammaticalized that only a surface markedness constraint is left. This is what has happened in Yimas (Wunderlich 2000). - One reviewer asks whether it is possible to state that *Max(2A)/1O is a possible taboo, but *Max(1A)/2O is not. One can easily imagine a society in which the speaker's face is more important than the addressee's face, which also may depend on the social relationship of speaker and addressee. In fact, the languages widely differ with respect to the kind of taboos (whether the expression of the speaker or the addressee is suppressed, and whether this holds for the subject or the object). It is important to recognize that *MAX constraints undermine expressivity, hence, they must be seriously restricted for each individual grammar. Even if one would know the relevant politeness strategies one cannot predict whether a violation results in ungrammaticality. Therefore, one can detect these taboos only by scrutinizing the data.

These constraints are partially ordered as follows:

- (9) *ALIGN(+hr), *MAX(2A)/1O, *MAX(1sgO), MAX(numO), MAX(num)/A



It is in the spirit of CT morphology that there are constraints working in opposite direction, but since they are ordered, the higher-ranked constraints can outperform the lower ones. One of these crucial rankings is the following:

- (10) MAX(numO), MAX(num)/A >> SINGLE LINKER >> MAX(arg)

Despite the requirement that all arguments have to be realized, only one argument can be realized by a prefix, except that both subject and object are nonsingular.

Since both *ALIGN(+hr) and MAX(numO) are undominated constraints, a violation of SINGLE LINKER is inevitable in all sgA/plO settings, too, that is, an accusative morpheme must appear, but not adjacent to the verbal stem. No such constraint effects the realization of plA/sgO settings, therefore, these cases always follow SINGLE LINKER, that is, only one prefix appears. However, since MAX(per)/O ranks relatively high (and therefore should be observed), it is in these (and only these) contexts that a fused subject/object morpheme has developed, thereby circumventing SINGLE LINKER.

In the sgA/sgO settings there is nothing that prevents the suppression of information due to SINGLE LINKER; the only requirement is that the person information in the object is more relevant than that in the subject. However, *ALIGN(+hr) excludes any sgO-morpheme to appear; therefore, there is no chance that such an morpheme will ever develop.

This already very restricted scenario is then additionally affected by the influence of morphological taboos, which function as politeness strategies in speaker-addressee settings. These taboos are peripheric to the grammatical system as such, nevertheless, they are inviolable and therefore force the grammatical system to react to them. The particular ways in which they enter the grammar of a language may vary considerably. In Dalabon it is the expression of 2A/1O settings that is avoided, a prohibition that in fact is split into two constraints: 1sgO is totally gapped in all contexts (including 3A/1sgO contexts), whereas the expression of 2nd person is disallowed in the context of 1O. This latter constraint then forces a replacement of 2nd by 3rd person.

4. Evaluation of transitive forms

In this section, I will show how the proposed constraint ranking is able to account for all the restrictions in the transitive paradigm of Dalabon. I will proceed along the route illustrated in (11); these results can then be generalized to the other cells.

(11) Overview of the selected paradigm cells

	Subject (A)					
Object (O)	1	2	3	1pl	2pl	3pl
1		tableau 5	tableau 4		tableau 6	
2	tableau 3			tableau 13		tableau 12
3	tableau 2			tableau 1		
1pl		tableau 7			tableau 8	
2pl	tableau 10			tableau 9		
3pl		tableau 11				

To make the procedure more transparent, the tableaus are always presented with the complete set of constraints, even though some of them are irrelevant for the setting under discussion. The following signs are used:

- ‘★’ for the transparent combination, which is expected on the basis of the inventory,
- ‘☞’ for the optimal combination (based on the constraint ranking), which is identical with the actually found combination.

The first tableau shows that one argument must be dropped, so SINGLE LINKER ranks above MAX(arg). As expected, the less informative prefix is omitted. Any other form than *yilah* would yield more violations.

Tableau 1

Input: 1plA/3sgO	*AL (+hr)	*2/1	*MAX 1sgO	MAX numO	MAX num/A	SINGL LINK	MAX per/O	MAX per/A	MAX (arg)	MAX (+hr)	MAX (+lr)
★ kah yilah N 1plA						*!				*	
☞ yilah 1plA									*	*	
yalah 1plN									*	*	*!
kah N					*!			*	*	*	*

A similar constellation is seen in tableau 2; here, only the nominative form *ngah* is available.

Tableau 2

Input: 1sgA/3sgO	*AL (+hr)	*2/1	*MAX 1sgO	MAX numO	MAX num/A	SINGL LINK	MAX per/O	MAX per/A	MAX (arg)	MAX (+hr)	MAX (+lr)
☛ kah ngah N 1N						*!				*	*
kah N								*!	*	*	*
☞ ngah 1N									*	*	*

Tableau 3 shows that in the setting 1sgA/2sgO also person information must be dropped in order to satisfy SINGLE LINKER. It is better to preserve object person than subject person, so MAX(pers)/O ranks above MAX(pers)/A. This interaction of constraints thus forces a subject gap.

Tableau 3

Input: 1sgA/2sgO	*AL (+hr)	*2/1	*MAX 1sgO	MAX numO	MAX num/A	SINGL LINK	MAX per/O	MAX per/A	MAX (arg)	MAX (+hr)	MAX (+lr)
☛ djah ngah 2N 1N						*!				*	*
☞ djah 2N								*	*	*	*
ngah 1N							*!		*	*	*
kah N							*!	*	*	*	*

In the setting 3sgA/1sgO, however, we find an object gap. There cannot be a MAX constraint that forces the omission of the more informative argument, neither would a surface markedness constraint work; it would either have to ban *ngah* (which, however, was optimal in tableau 2) or to accept *ngah* (which is the wrong form here). Therefore an additional constraint dominating MAX(pers)/O is necessary. It is the taboo *MAX(1sgO) that excludes any expression of 1sgO. As a consequence, *ngah* can only appear for subjects; furthermore, the reverse settings 1sgA/3sgO and 3sgA/1sgO are marked differently.

Tableau 4

Input: 3sgA/1sgO	*AL (+hr)	*2/1	*MAX 1sgO	MAX numO	MAX num/A	SINGL LINK	MAX per/O	MAX per/A	MAX (arg)	MAX (+hr)	MAX (+lr)
☛ ngah kah 1N N			*!			*				*	*
☞ kah N							*		*	*	*
ngah 1N			*!						*	*	*

In the setting 2sgA/1sgO not only *ngah* is excluded but also any expression of 2nd person. Obviously, a further taboo is needed to block the 2nd person of a 2/1 setting. The resulting form *kah* violates five constraints, all of them ranked low with regard to the taboos. Note, by the way, that the reverse settings 1sgA/2sgO and 2sgA/1sgO again are expressed differently. Thus, the taboos are in a way also functional for the grammar of Dalabon in that they help to ensure that reverse settings are never expressed in the same way.

Tableau 5: Both *MAX(1sgO) and *MAX(2A)/1O (abbreviated as *2/1) are necessary

Input: 2sgA/1sgO	*AL (+hr)	*2/1	*MAX 1sgO	MAX numO	MAX num/A	SINGL LINK	MAX per/O	MAX per/A	MAX (arg)	MAX (+hr)	MAX (+lr)
☛ ngah dah 1N 2A		*!	*			*				*	
ngah 1N			*!					*	*	*	*
☞ kah N							*	*	*	*	*
dah 2A		*!					*		*	*	
ngah kah 1N N			*!			*		*		*	*

Turning now to the setting 2plA/1sgO, we find that both the expression of object and the expression of 2A is blocked. The optimal form is *bulah*, which preserves the plural information.

Tableau 6

Input: 2plA/1sgO	*AL (+hr)	*2/1	*MAX 1sgO	MAX numO	MAX num/A	SINGL LINK	MAX per/O	MAX per/A	MAX (arg)	MAX (+hr)	MAX (+lr)
☛ ngah nulah 1N 2plA		*!	*			*				*	
nulah 2plA		*!					*		*	*	
ngah 1N			*!		*			*	*	*	*
☞ bulah plA							*	*	*	*	
ngah bulah 1N plA			*!			*		*		*	

With the reverse distribution of plural, that is, in the setting 2sgA/1plO, the expression of plural object becomes important. In this case, even SINGLE LINKER is violated because *ALIGN(+hr) functions as an undominated constraint. This result can easily be generalized to other cells of the sgA/plO subfield (such as 3sgA/1plO), in which the single occurrence of an accusative morpheme is excluded. As in the preceding tableau, the taboo *MAX(2A)/1O (abbreviated as *2/1) forces a 3rd person morpheme to appear as substitute for a 2nd person.

Tableau 7

Input: 2sgA/1plO	*AL (+hr)	*2/1	*MAX 1sgO	MAX numO	MAX num/A	SINGL LINK	MAX per/O	MAX per/A	MAX (arg)	MAX (+hr)	MAX (+lr)
☛ njel dah 1plO 2A		*!				*					
njel djah 1plO 2N		*!				*					*
☞ njel kah 1plO N						*		*			*
njel 1plO	*!							*	*		*

A similar situation holds for 2plA/1plO settings, shown in tableau 8. Since the number constraints are high-ranked, here a 3plA form replaces 2plA in order to avoid the expression of 2A in the context of a 1st person object.

Tableau 8.

Input: 2plA/1plO	*AL (+hr)	*2/1	*MAX 1sgO	MAX numO	MAX num/A	SINGL LINK	MAX per/O	MAX per/A	MAX (arg)	MAX (+hr)	MAX (+lr)
☛ njel nulah 1plO 2plA		*!				*					
☞ njel bulah 1plO plA						*		*			
bulu nulah plO 2plA		*!				*	*				
njel dah 1plO 2A		*!			*	*					
bulah njel plA 1plO	*!					*		*			
njel nalah 1plO 2plN		*!				*					*
njel kah 1plO N					*!	*		*			*
njel 1plO	*!				*			*	*		*

The realization of the reverse setting is more faithful to the input, only violating SINGLE LINKER; in this case, the selected form coincides with what one expects on the basis of the inventory of affixes. This result can easily be generalized to other cells of the plA/plO subfield.

Tableau 9

Input: 1plA/2plO	*AL (+hr)	*2/1	*MAX 1sgO	MAX numO	MAX num/A	SINGL LINK	MAX per/O	MAX per/A	MAX (arg)	MAX (+hr)	MAX (+lr)
yilah nol 1plA 2plO	*!					*					
yilah nalah 1plA 2plN				*!		*				*	
☛☞ nol yilah 2plO 1plA						*					
nol yalah 2plO 1plN						*					*!
nol 2plO	*!				*			*	*		*

The next tableau shows that the conjunctive constraint MAX(numO) is necessary; only this higher-ranked constraint can exclude *nalah*, which marks number but not accusative.

Tableau 10

Input: 1sgA/2pIO	*AL (+hr)	*2/1	*MAX 1sgO	MAX numO	MAX num/A	SINGL LINK	MAX per/O	MAX per/A	MAX (arg)	MAX (+hr)	MAX (+lr)
ngah nalah 1N 2pIN				*!		*				*	*
nalah 2pIN				*!				*	*	*	*
☛ nol ngah 2pIO 1N						*					*
ngah 1N				*!			*		*	*	*

Tableau 11 shows that the emergence of singular ergative morphemes is possible;¹¹ the form with *dah* is slightly better than the alternative with *djah*. Moreover, this form allows the reverse settings in the singular, 2sgA/3sgO and 3sgA/2sgO, to be expressed differently (*dah* vs. *djah*). I consider this asymmetry to be a side-effect of the vocabulary emerged; it is not possible to state in our framework a global principle that requires reverse settings to be realized differently. (I will come back to this problem in the conclusion.)

Tableau 11

Input: 2sgA/3pIO	*AL (+hr)	*2/1	*MAX 1sgO	MAX numO	MAX num/A	SINGL LINK	MAX per/O	MAX per/A	MAX (arg)	MAX (+hr)	MAX (+lr)
dah balah 2A pIN				*!		*				*	
balah pIN				*!				*	*	*	*
☛ bulu dah pIO 2A						*					
bulu djah pIO 2N						*					*!

Recall that all settings with pIO require two prefixes because accusative must not be realized adjacent to the verbal stem; therefore violation of SINGLE LINKER is inevitable. Since there is no such reason for pIA settings, here violation of SINGLE LINKER should rather be avoided. Tableau 12 now shows that in the setting 3pIA/2sgO the form *bulah* would in no way be better than *djah bulah* because it violates MAX(per)/O, which is co-ranked with SINGLE LINKER. This is a situation in which the emergence of a fused morpheme such as *djilah* is provoked. Note that this form is the only one of the whole paradigm that does not violate any of the constraints assumed.

¹¹ In contrast, singular accusative morphemes cannot emerge because of the interaction of *ALIGN(+hr) and SINGLE LINKER.

Tableau 12

Input: 3plA/2sgO	*AL (+hr)	*2/1	*MAX 1sgO	MAX numO	MAX num/A	SING L LINK	MAX per/O	MAX per/A	MAX (arg)	MAX (+hr)	MAX (+lr)
✱ djah bulah 2N plA						*!				*	
☞ djilah plA/2O											
djilah bulah plA/2O plA						*!					
bulah plA							*!		*	*	
djah 2N					*!				*	*	*

If we finally turn to the 1plA/2sgO setting, we see that the same fused morpheme *djilah* improves its realization as well, even though the 1st person remains unexpressed.

Tableau 13

Input: 1plA/2sgO	*AL (+hr)	*2/1	*MAX 1sgO	MAX numO	MAX num/A	SINGL LINK	MAX per/O	MAX per/A	MAX (arg)	MAX (+hr)	MAX (+lr)
✱ djah yilah 2N 1plA						*!				*	
☞ djilah plA/2O								*			
djilah yilah plA/2O 1plA						*!					
yilah 1plA							*!		*	*	

5. Conclusions

This study has shown that even in a rather complex paradigmatic system like that of Dalabon transitive verbs a number of fairly general constraints (of which only a few are really language-specific) is sufficient to characterize all of the existing transitive forms. Once the lexical entries of the pronominal prefixes have been found, all realizations of transitive settings are fully determined by the constraint ranking. It is a particular feature of these constraints that they only register positive feature values of case, number, and person, therefore an underspecification analysis is adequate. Moreover, none of the constraints compares alternatives directly; whether a transitive form violates a constraint can fully be determined on the basis of its own features. Comparison between possible

candidates only comes into play when the form with the fewest violations of high-ranked constraints is selected.

Correspondence-theoretic morphology is minimal in its assumptions. There are no rules, and no exceptions to rules - this is possible because the constraints are viewed as conflicting with each other, hence violable.

Dalabon shows a number of interesting properties. But when one tries to generalize just one of these properties, it soon becomes obvious that the generalization doesn't work. All these properties are side-effects, they are induced by the constraint ranking.

- Dalabon has a multiple split system: accusative-ergative in plA/plO settings, mostly accusative-nominative in sgA/plO settings, mostly ergative in plA/sgO settings, and mostly nominative in sgA/sgO settings. It should be clear that such a multiple split is not a constructional property by itself.
- Dalabon seems to have a balanced ergative-accusative system: it has the same number of ergative and accusative morphemes, and also the same number of ergative and accusative realizations in the transitive paradigm. However, this impression is delusive. The constraints show that accusative (in connection with number and person) is more important than ergative.
- Dalabon shows some person asymmetries, for instance, the setting 1/2 is transparently expressed, while the reverse setting 2/1 is not. One might think that 2nd person ranks above 1st person, because there are three 2nd person exponents in the set of sgA/sgO settings, compared with only 1st person exponent. However, no assumption of a person hierarchy, a concept that is well-known from other languages, proves successful.
- Most remarkably, Dalabon shows properties that are typical for direct-inverse systems: all settings x/y (where x and y are person-number features for subject vs. object) are distinctively marked from the reverse settings y/x . While a direct-inverse system implements this asymmetry by means of particular morphemes (see Anderson 1992, Halle and Marantz 1993, Steele 1995, and Wunderlich 1996 on Potawatomi), Dalabon realizes this kind of global asymmetry only indirectly: if the form α allows the interpretation x/y , it blocks the interpretation y/x .

The Dalabon transitive paradigm exhibits both gaps and substitutions. One type of gap is induced by a hard constraint, namely the taboo *MAX(1sgO); it is this type of gap that could as well be described by an impoverishment rule (in the sense of Bonet 1991, Halle and Marantz 1993). There are other gaps, for instance the subject gap in the 1sg/2sg setting (see tableau 2 above), which follow from the interaction of constraints; there is no need to stipulate impoverishment rules in these instances.¹² Regarding substitutions, one can see that all 2nd person subjects are replaced by 3rd person forms in the context of 1st person objects. Exactly this can be stated by a referral rule; the analysis presented here does not need such a rule. The second taboo, *MAX(2A)/1O, only states that 2nd person cannot be expressed in such a context; it follows then from the constraint ranking which form functions as a substitute. As I have mentioned before, the taboos are in a way external to

¹² The insight that paradigmatic gaps can be forced by conflicting constraints rather than by special rules is one of the major progresses of constraint-based morphology. In other cases discussed in the literature it is the conflict between two co-ranked alignment constraints that forces a gap (see Gerlach 1998 on gaps in the clitic sequences of Romance, Donohue 1998 and Curnow 1999 on gaps in the pronominal prefix patterns of Maung (Australian), and Wunderlich 2000 on gaps in the pronominal prefix patterns of Yimas (New Guinea)).

Dalabon's grammar because they originate from politeness strategies. If Dalabon dispenses with these taboos, all other things being equal, there would still be gaps, only the need for substitutions would disappear. The Dalabon transitive paradigm would remain a very interesting system because all the asymmetries shown in (8) would still exist.

Correspondence-theoretic morphology assumes two levels: the input level constituted by the intended readings (the input settings), and the output level constituted by the morphological surface forms. Such a scenario, in principle, allows two complementary perspectives under the same constraint ranking, deliberating the following questions: (i) Which surface form is the optimal realization of a given input setting? (ii) Which reading is optimal for a given morpheme combination?¹³ In this paper, I only considered perspective (i). This choice is adequate for Dalabon because the interpretation of all transitive forms is unique (modulo underspecification); so, for instance, there never arises the question of which of the two arguments is marked for plural.¹⁴

However, in a language such as Quechua, in which a plural morpheme can be associated with either argument (Lakämper and Wunderlich 1998), perspective (ii) becomes important as well. This study thus shows only a fragment of the explanatory force of correspondence-theoretic morphology. For instance, the global asymmetry observed above, namely that x/y settings are always differently expressed from y/x settings, might be explained in the perspective (ii). Let us assume the following constraints: UNIQUE INTERPRETATION requires a form α to have only one interpretation (which is obviously violated for *kah* and *bulah* with the interpretations 2/1, 3/1, and 3/3 - which do not form a natural class), and ASYMMETRY requires a form α to not have both x/y and y/x interpretations. If the latter constraint ranks above the former, the case of Dalabon may then be captured adequately.

Needless to say that Dalabon displays just one (very particular) way in which the faithfulness constraints can be ranked; as we have seen, faith to number is more important than faith to person. One can easily envisage a system in which the opposite ranking is relevant, in fact, number is for many languages a less salient category than person. The interplay of case, number and person opens a large number of possible systems; the systematic study of these systems is only in the beginning. Therefore, empirical contributions extending our knowledge are highly welcomed. In this respect, I admire the careful exposition in the preceding paper of Evans, Brown and Corbett.

¹³ The importance of this second perspective has been explicated by Blutner (1999) and Jäger (1999), among others.

¹⁴ However, this property changes if one takes into account the disharmonic feature, which I neglected here. EBC show in section 4.1 that disharmonicity in the dual object is realized on the subject because it is impossible to realize it on the object-expression itself. One can capture this fact by the constraint ranking MAX(dis)/O » IDENT(num)/A, where IDENT requires the identity of features in the input and output. A similar proposal has been made by Curnow (1999) for Maung, a non-Pama Nyungan language of the north of Australia. In this language, the plural in the subject is expressed on the object in case the subject is gapped (MAX(num)/A » IDENT(num)/O).

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