**Title:** Hierarchy-based Competition and
Emergence of Two-Argument Agreement in Dumi

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# Hierarchy-based Competition and Emergence of Two-Argument Agreement in Dumi

## 1 Abstract

Aissen (1999; 2003) argues that prominence hierarchy effects in morphosyntax are governed by fixed rankings of markedness constraints related to the hierarchies themselves by harmonic alignment (Prince and Smolensky, 1993). In this paper, I analyze the effects of prominence hierarchies on agreement control in Dumi, an endangered Kiranti language spoken in Eastern Nepal (van Driem, 1993), and argue that the empirical facts can be captured best if hierarchy effects follow from freely rankable binary preference constraints, not from the fixed ranking of markedness constraints.

## 2 Introduction

In a number of genetically unrelated languages (e.g. Menominee, Bloomfield, 1962:Algonquian; Turkana, Dimmendaal, 1983:Nilotic; Nocte, Gupta, 1971:Tibeto-Burman), certain types of verbal agreement are not tied to specific grammatical roles such as subject and object. Agreement is instead with the argument which ranks higher on a prominence hierarchy. For example, in Dumi, an endangered Kiranti language spoken in Eastern Nepal (van Driem, 1993), intransitive verbs consistently show person and number agreement with the subject:[1]

(1) **Dumi Intransitive Verb Forms**

| | | |
|---|---|---|
| a. | *phɨkh-**ɨ*** | '**we (du., exc.)** got up' (p. 97) |
| | get:up-[+1-2+du] | |
| b. | *a-phɨkh-**i*** | '**you (du.)** got up' (p. 97) |
| | MS-get:up-[+du] | |
| c. | *phɨkh-**a*** | '**he** got up' (p. 97) |
| | get:up-[-du] | |

However, in transitive predications agreement is with the argument (subject or object) which is higher on the prominence hierarchy $1 > 2 > 3$. Thus, if one argument is 1st person we find the same agreement suffixes as in intransitive 1st person forms (2), and if a 2nd and a 3rd person argument coocur, 2nd person agreement is found ((3), 1→ 2 denotes 1st person subject and 2nd person object):[2]

[1] All Dumi data are from van Driem (1993). Page numbers with examples refer to this grammar. The "marked scenario affix" *a-*, glossed here MS, occurs in "all scenarios involving a 1st or 2nd person actant except those with a 1st person agent or subject (van Driem, 1993:123)." See Bynon (1998) and Trommer (2003c) for discussion. Other abbreviations used in the text and the glosses are: 1(st person), 2(nd person), 3(rd person), agr(eement), acc(usative), asp(ect), cl(itic), du(al), erg(ative), exc(lusive), inc(lusive), pl(ural), per(son), nom(inative), num(ber), O = object agreement, NPast = Non-Past, sg = singular, S = subject agreement. Boldface is used in examples and glosses to identify relevant agreement affixes and to indicate how arguments correspond to affixes.

[2] Note that the marked scenario affix disambiguates some ((2) and (3)), but not all of these forms (4).

(2) **Dumi Transitive 1→ 2, 2 → 1 Forms**

a. *duːkhuts-~~i~~* ‘**we (du.,exc.)** saw you (du.)’ (p. 107)
see-[+1-2+du]

b. *a-duːkhuts-~~i~~* ‘you (du.) saw **us (du.,exc.)**’ (p. 108)
MS-see-[+1+2+du]

(3) **Dumi Transitive 1→ 3, 3 → 1 Forms**

a. *duːkhuts-~~i~~* ‘**we (du.,exc.)** saw them (du.)’ (p. 107)
see-[+1-2+du]

b. *a-duːkhuts-~~i~~* ‘they (du.) saw **us (du.,exc.)**’ (p. 108)
MS-see-[+1+2+du]

(4) **Dumi Transitive 2 → 3, 3 → 2 Forms**

a. *a-duːkhust-**i*** ‘**you (du.)** saw them (du.)’ (p. 107)
MS-see-[+du]

b. *a-duːkhust-**i*** ‘they (du.) saw **you (du.)**’ (p. 108)
MS-see-[+du]

I call this phenomenon “hierarchy-based competition”(HBC) [3] since in these languages there is no general prohibition against agreement with specific types of arguments. Thus, Dumi verbs *do* agree with 3rd person arguments as long as the other argument is not a better competitor (i.e. 1st or 2nd person) or if there is no other argument, as in intransitive predications. But while each argument competes for agreement, only the one which is highest on the relevant hierarchy “wins”, i.e. is actually crossreferenced by agreement affixes.

While other languages with HBC such as Nocte (Gupta, 1971), can be almost exhaustively described by reference to the standard person hierarchy $1 > 2 > 3$, Dumi has actually a much more intricate competition system which will be the topic of this paper. Here is a short overview of the following sections: After a short introduction to general aspects of Dumi verbal inflection in section 3, I will show in section 4 that person-driven competition in the language interacts in a complex way with a similar system based on a number hierarchy. In section 5, I introduce the optimality-theoretic framework I will assume in the paper, and section 6 provides an analysis of the data based on constraints directly encoding binary preferences along markedness scales (Trommer, 2002a, 2003b,d,f). In section 7, I argue that this account allows to capture the the Dumi data much better than direct invoking of prominence hierarchies or an approach to prominence-hierarchy effects based on harmonic alignment (Aissen, 1999, 2003; Nagy, 1999; Ortmann, 2002). Finally, section 8 provides a short summary of the paper.

## 3 Agreement and Verbal Inflection in Dumi

Dumi belongs to the Kiranti Rai branch of Tibeto-Burman, spoken in Eastern Nepal. While all languages of this family have an ergative case system and highly complex inflectional verbal inflection with phonologically cognate affixes, the morphological systems differ to an astonishing degree. Dumi itself is exclusively documented through fieldwork by George van Driem published in different papers, but summarized in van Driem (1993). While the book contains

[3] See Comrie (1980) and Croft (1990) for discussion of similar phenomena under a functionalist perspective.

only marginal information on the syntax of the language, it gives a detailed description of the segmental phonology and the inflectional morphology.The language was reported to be almost extinct in van Driem's grammar (1993), but it seems that there have still been living speakers as late as 2001 (Dörte Borchers, p.c.).

Verb inflection in Dumi encodes agreement with subjects and direct objects for three persons (1st, 2nd and 3rd person) and numbers (singular, dual and plural). In addition, there are different inclusive and exclusive forms for the 1st person dual and plural. Agreement markers occur roughly in three positions: Prefixed to the verb, immediately after the verb stem, or after the non-past aspect marker *-t*. (5) shows some representative forms of the verb *phɨkh*, 'get up' and (6) a schematic overview of the affixes occurring in intransitive forms ("V" stands for the verb stem) which mostly overlap with the affixes used in transitive forms.[4]

(5) **Representative Intransitive Forms**

a. *phɨkh-**ɨ***
get:up-[+1-2+du]
**'we (du., exc.)** got up' (p. 97)

b. *a-phɨkh-**i***
MS-get:up-[+du]
'**you (du.)** got up' (p. 97)

c. *phɨkh-**a***
get:up-[-du]
**'he** got up' (p. 97)

(6) **All Intransitive Forms**

| person | number | | Past | Non-Past |
|---|---|---|---|---|
| **1** | **sg** | | V-ə | V-t-ə |
| | **du** | **incl** | V-i | V-t-i |
| | | **excl** | V-ɨ | V-t-ɨ |
| | **pl** | **incl** | V-k-i | V-ki-t-i |
| | | **excl** | V-k-a | V-kɨ-t-a |
| **2** | **sg** | | a-V-a | a-V-t-a |
| | **du** | | a-V-i | a-V-t-i |
| | **pl** | | a-V-ini | a-V-t-ini |
| **3** | **sg** | | V-a | V-t-a |
| | **du** | | V-i | V-t-i |
| | **pl** | | ham-V-a | ham-V-t-a |

The most pervasive contrast here is between dual (marked by *-i*) and non-dual (i.e., singular and plural) forms (marked by *-a*). Assuming that number in Dumi is decomposed in the binary features [+/-pl(ural)] and [+/-du(al)] as in (7), these affixes can be simply characterized as [+dual] and [-dual].

[4]van Driem assumes a further 1st person suffix -ŋ which is however deleted in many contexts and probably a part of stem allomorphy (van Driem, 1993:133). There are also negation and reflexive affixes which are irrelevant for the discussion here.

(7) **Feature System for Dumi Number Agreement**

| | | |
|---|---|---|
| singular | = | [-plural -dual] |
| dual | = | [-plural +dual] |
| plural | = | [+plural -dual] |

While the system in (7) departs from more common feature systems for number, (e.g. Noyer, 1998; Harley and Ritter, 2002), it allows the simplest description of Dumi affixes. However, nothing crucial in the following analysis of Dumi depends on the specific representation of number features. (8) shows the feature representations I assume for the affixes in (6). Assume for the time being that affixes which convey at least some non-overlapping information can coocur (e.g. -k(ɨ) [+1 +pl] and -i [+1 +2 -du], since the first one provides the feature +pl, not present in -i, and the latter adds the information [+2 -du] missing in -k(ɨ)), while affixes whose content properly subsumes the content of less specific affixes block the latter ones (e.g. -*ə* [+1 -pl -du] blocks -*a* [-du] since -du is already specified in -*ə*, and -*a* does not specify any other features). In section 5, I will provide a more formal account of these facts in Optimality Theory.

(8) **Simple Agreement Affixes (Suffixes)**

| | | | |
|---|---|---|---|
| -ə | [+1 -pl -du] | **blocks** | -a [-du] |
| -ɨ | [+1 -2 +du] | **blocks** | -i [+du] |
| -i | [+1 +2 -du] | **blocks** | -a [-du] |
| -i | [+du] | | |
| -a | [−du] | | |
| -k(ɨ) | [+1 +pl] | | |
| -ini | [-1 -du +pl] | **blocks** | -a [-du] |

I will restrict my analysis of Dumi here to the affixes listed in (8) which occur in transitive as well as in intransitive forms. The 3pl marker *ham*- appears only in intransitive forms, while the portmanteau affixes in (9) are only found in transitive forms.

(9) **Portmanteau Agreement Affixes**

| | | | |
|---|---|---|---|
| -u | transitive portmanteau | subject: 1sg<br>object 3sg, past | |
| -N | transitive portmanteau | subject: 1sg<br>object 2 | |
| -s | number inverse | subject: du<br>object: sg | |
| a- | marked scenario | subject: non-1$^{st}$<br>and non-3$^{rd}$ arg | |

Since the distribution of these markers is rather complex and largely independent from simple agreement marking, I will not analyze them in this paper.

## 4 The Interaction of Person and Number Hierarchies in Dumi

In this section, I summarize briefly the data which are relevant for an analysis of HBC in Dumi. While I informally assume here that competition is driven directly by feature hierarchies, it will become clear that this assumption is highly problematic. A more formal, constraint-based analysis of the data avoiding these problems will then be provided in section 6.

Obviously, the hierarchy 1 > 2 > 3 cannot determine with which argument a transitive verb will agree in a language with HBC if both arguments have the same person value. Cases where both arguments would be 1st or both 2nd person are obligatorily expressed in Dumi by intransitive reflexive forms, which are irrelevant for the discussion of HBC. However, for predications where both arguments are 3rd person, there exist in all cases distinct non-reflexive forms. In these forms, Dumi maintains the restriction of agreement to one argument (henceforth: One-Argument Restriction, OAR) by applying a number hierarchy. Agreement is with the plural argument if there is one (10a,b), otherwise with the dual argument if there is one (10c), and agreement with a singular argument only occurs if there are no dual or plural arguments, i.e. in forms with two singular 3rd person arguments or intransitive forms (10d):

(10) **Effects of the Number Hierarchy in Dumi 3rd Person Forms**

| | | |
|---|---|---|
| a. | *doːkhot-t-**ini*** <br> see-NPast-[-1 +pl] | '**they (pl.)** see them (du.)/they (du.) see **them (pl.)**' |
| b. | *doːkhot-t-**ini*** <br> see-NPast-[-1 +pl] | 'he sees **them (pl.)/they (pl.)** see him' (p. 108) |
| c. | *doːkhos-t-**i*** <br> see-NPast-[+du] | 'he sees **them (du.)/they (du.)** see him' (p. 107) |
| d. | *phɨkh-**a*** <br> get:up-[-du] | '**he** got up' (p. 97) |

Thus, we can assume that besides the person hierarchy, Dumi agreement also instantiates the number hierarchy pl > du > sg. Presupposing now the two hierarchies for person and number, all the data we have seen so far show minimal contrasts. The forms in (2-4) differ only in person, while number is kept constant, and the forms in (10) differ only in number, with the same value for person. The same lack of interaction between the two hierarchies is found in forms where the same argument is higher in both hierarchies, such as forms with a 2nd person plural subject with a 3rd person dual object as in (11a). In these cases, we get exclusive agreement with the hierarchically higher argument, as expected:

(11) **Convergence of pl > du and 1 > 2 > 3**

| | | |
|---|---|---|
| a. | *doːkhoʔ-**k**-t-**a*** <br> see-[+1]-NPast-[-du] | '**we (pl.,exc.)** see them/you (du.)' (p. 107) |
| b. | *a-doːkhoʔ-**k**-t-**a*** <br> MS-see-[+1]-NPast-[-du] | 'they/you (du.) see **us (pl.,exc.)**' (p. 108) |

(12) **Convergence of du > sg and 1 > 2 > 3**

| | | |
|---|---|---|
| a. | *duːkhus-t-**ɨ*** <br> see-NPast-[-du] | '**we (du.,exc.)** see him/you (sg.)' (p. 107) |
| b. | *a-duːkhus-t-**ɨ*** <br> MS-see-NPast-[-du] | 'he/you (sg.) see(s) **us (du.,exc.)** ' (p. 108) |

More interesting are cases where one argument outranks the other on the person hierarchy while the other one is higher on the number hierarchy. I will call this configuration "hierarchy crossing". Intuitively, we would expect that either the number hierarchy outranks the person hierarchy, or vice versa. Interestingly, the distribution of agreement in these cases is quite quirky and the truth is somewhere in between. If the subject is 2sg, and the object 3rd person dual or plural, agreement is with the non-singular argument, hence in this case the number hierarchy prevails:

(13) **pl > sg and pl > du outrank 2 > 3**

a. *a-doːkhot-t-**ini***
MS-see-NPast-[-1+pl]
'you (sg.) see **them (pl.)**' (p. 107)

b. *a-doːkhos-t-**i***
MS-see-NPast-[+du]
'you (sg.) **see them (du.)**' (p. 107)

On the other hand, if one argument is 2du and the other one 3pl, person becomes the decisive hierarchy, and agreement is with the 2du argument:

(14) **2 > 3 outranks pl > du**

a. *a-duːkhus-t-**i***
MS-see-NPast-[-1+pl]
'**you (du.)** see them (pl.)' (p. 107)

b. *a-duːkhus-t-**i***
MS-see-NPast-[-1+pl]
'they (pl.) see **you** (du.)' (p. 108)

Finally, there is one configuration where the restriction of agreement to one argument is violated, namely in forms with a 1sg and a 3du/2du or 3pl/2pl argument:

(15) **Violations of the One-Argument Restriction**

a. *doːkhot-t-**ə-~~n~~i***
see-NPast-[+1-pl]-[-1+pl]
'**I** see **them (pl.)**' (p. 107)

b. *a-duːkhus-t-**ə-~~n~~i***
D-see-NPast-[+1-pl]-[-1+pl]
'**they (pl.)** see **me**' (p. 108)

Crucially, this violation of the One-Argument Restriction occurs in a hierarchy-crossing configuration: the 1sg argument is higher on the person hierarchy, while the 2/3pl/du arguments are higher for number. At this point, it should be clear that the assumption of two strictly separate hierarchies for person and number is generally problematic for hierarchy-crossing configurations in Dumi. It leads to a type of ranking paradox for the data in (12) and (13) under the assumption that both hierarchies are strictly ordered with respect to each other. An alternative would be to stipulate a refined hierarchy which "mixes" person and number, as in (16):

(16) $1 > \left\{ \begin{array}{c} \text{2pl} \\ \text{2du} \end{array} \right\} > \text{3pl} > \text{3du} > \text{3sg} > \text{2sg}$

However, the status of this hierarchy in relation to universal markedness hierarchies is dubious at best. Moreover, a hierarchy such as (16) effectively eliminates the phenomenon of hierarchy crossing which seems to be crucial for an understanding of why Dumi violates the OAR in the forms in (14). No further refinement of the hierarchy would predict this violation. In the next two sections, I will propose an approach to HBC based not on hierarchies themselves, but on binary preference constraints linked to hierarchies by a general constraint schema, an account

which derives apparent ranking paradoxes and violations of the OAR as a natural consequence of the constraint system.

## 5 The Theoretical Framework

The theoretical framework I will assume in the following is Distributed Optimality (DO; Trommer, 2002a,b, 2003c,e), a constraint-based approach to postsyntactic spellout merging concepts from Optimality Theory (OT, Prince and Smolensky, 1993; McCarthy and Prince, 1993, 1994, 1995) and Distributed Morphology (DM, Halle and Marantz, 1993). However, most of the arguments should carry over to any OT-based approach to spellout, where morphology has crucial access to syntactic structure (as e.g. in Noyer, 1993; Grimshaw, 1997, 2000). DO shares with Distributed Morphology (DM, Halle and Marantz, 1993) the assumption that morphology is a separate module of the grammar interpreting the outputs of syntax, where the latter operates on abstract feature bundles (= heads = Lexical Items) without phonological content. Morphology assigns phonological content to syntactic structures by pairing word-like syntactic units (spell-out domains) with strings of vocabulary items (VIs) which combine (underspecified) morphosyntactic features with phonological content. Here is an illustrative example with the Dumi verb form *phɨk-k-a*, 'we (exc.) got up':

(17) **Syntax-Morphology Mapping for *phɨk-k-a***

| | | | |
|---|---|---|---|
| **Input:** | $[+V]_1$ | $[+Tense\ +past]_2$ | $[+Agr\ +Abs\ +1\ -2\ +pl\ -du]_3$ |
| **Output:** | $phɨk{:}[+V]_1$ | | $k{:}[+1]_3$ $a{:}[-du]_3$ |

The input consists of a list of abstract heads, the output of a list of VIs. Both representations are linked by coindexing according to the principles of Correspondence Theory (McCarthy and Prince, 1994, 1995).[5] Note that not all underlying heads and features are necessarily expressed in the output (e.g. [+Tense +past] and -2 in (17) are not), and some heads can be expressed by more than one VI (such as [+Agr +Abs +1 -2 +pl -du] in (17) which corresponds to k:[+1] and a:[-du]).

Since the output of syntax serves in DO as the input to morphological computation, the grammar generates, as usual in OT, an infinite candidate set of output candidates which contains here all strings which consist exclusively of VIs compatible with input heads.[6] Which heads are actually realized by VIs and the order of VIs in a given language depends on the language-specific ranking of universal constraints on markedness, faithfulness and morpheme order. This is illustrated with the example from (17) and one very basic constraint PARSE F in (18):[7]

[5] Note however that not the VIs themselves are coindexed with lexical items, but the feature structures associated with VIs. Thus a portmanteau VI can contain two distinct feature structures with different indices. See Trommer (2003c) for more details. Trommer (2003c:ch. 4.2) discusses the differences in the basic constraint types of Standard Correspondence Theory and DO.

[6] See Trommer (2003c) for technical details

[7] With Halle and Marantz (1993), I assume that agreement heads inherit case features from the DPs with which they agree. Since Dumi is an ergative language, these features are +Abs(olutive) and +Erg(ative).

(18) **Input:** $[+V]_1$ $[+\text{Tense } +\text{past}]_2$ $[+\text{Agr } +\text{Abs } +1 \text{ } -2 \text{ } +\text{pl } -\text{du}]_3$

| | PARSE F |
|---|---|
| ☞ a. phɨk:$[+V]_1$ k:$[+1]_3$ a:$[+1]_3$ | ****** |
| b. phɨk:$[+V]_1$ k:$[+1]_3$ | *******! |
| c. phɨk:$[+V]_1$ a:$[+1]_3$ | *******! |
| d. phɨk:$[+V]_1$ | *******!* |

PARSE F induces one constraint violation for each input feature which is not realized by a coindexed VI (e.g. +Tense -past, +Agr, +Abs,-2, +pl for (18a)). Since there are no appropriate VIs in the lexicon of Dumi to express the tense features of a [+past] head or the absolutive feature of 1pl agreement, violations of PARSE F are unavoidable. However, they are minimized to guarantee maximal expression of features by VIs. Blocking of less specific VIs is achieved by independently motivated alignment constraints, such as NUM ➪ R which aligns all number agreement VIs to the right edge of the spellout domain (roughly the morphological word), and L ➪ PER which aligns person agreement to the left edge of the spellout domain.[8] (19) shows how PARSE F and alignment constraints conspire to suppress the less specific VI -a:[-du] for the form *phɨkhə*, 'I got up' with the more specific VI ə:[+1]:

(19) **Input:** $[+V]_1$ $[+\text{Tense } +\text{past}]_2$ $[+\text{Agr } +\text{Abs } +1 \text{ } -2 \text{ } -\text{pl } -\text{du}]_3$

| | PARSE F | NUM ➪ R | L ➪ PER |
|---|---|---|---|
| ☞ a. phɨkh:$[+V]_1$ ə:$[+1$ $-\text{pl}$ $-\text{du}]_3$ | ***** | | * |
| b. phɨkh:$[+V]_1$ ə:$[+1$ $-\text{pl}$ $-\text{du}]_3$ a:$[-\text{du}]_3$ | ***** | *! | * |
| c. phɨkh:$[+V]_1$ a:$[-\text{du}]_3$ ə:$[+1$ $-\text{pl}$ $-\text{du}]_3$ | ***** | *! | ** |

Crucially, candidates like (19b) and (19c) with an additional affix expressing features already present in a more specific VI are harmonically bounded by candidates which have only the more specific affix (19a) since they do not improve feature realization for PARSE F, but lead inevitably to more violations of the alignment constraints. Hence suppression of the less specific affix is independent of the actual ranking of these constraints.

## 6 A Constraint-Based Analysis of HBC in Dumi

In this section, I will propose a DO-analysis of HBC in Dumi which models the OAR as an independently motivated violable constraint, and hierarchy effects by binary preference constraints. That this analysis is superior to conceivable alternatives in terms of markedness constraints will be shown in section 7.

### *6.1 Deriving the One-Argument Restriction from Coherence*

In Trommer (2003a), it is argued that the one-argument restriction for agreement can be derived from COHERENCE, a parameterized constraint mainly motivated by facts in the domain of affix order. (20) gives the definition of COHERENCE from Trommer (2003a:8):

(20) **COHERENCE** $F$ **:** Count a constraint violation for each VI $V$ matched by $F$ and containing index $i$ preceded by another VI matched by $F$ $V'$ containing index $j$ such that $i \neq j$ and there is no matching VI $V''$ between $V'$ and $V$.

[8] The idea that alignment constraints can be used to suppress "superfluous" structure was independently developed in Trommer (2001) and Grimshaw (2001). See Trommer (2003c) for detailed discussion.

COHERENCE captures the fact that agreement affixes crossreferencing the same syntactic head tend to coocur. Thus, the plural marker *-rr* in Wardaman always occurs right-adjacent to the corresponding person marker as in *wu-rr-yanggi*, 3-PL-go:PAST, 'they went' (Merlan, 1994:77,125). Alignment constraints alone (cf. (19)) would incorrectly predict that *wu-* occurs leftmost and *rr-* rightmost in the spell-out domain (☛ marks the empirically correct candidate which is suboptimal under the given ranking):

(21) **Input:** [+V] [+Tense] [+3+pl]

| | | L ⇦ PER | NUM ⇨ R |
|---|---|---|---|
| ☛ | a. wu-rr-V-Tense | | *!* |
| | b. wu-V-rr-Tense | | *! |
| ☞ | c. wu-V-Tense-rr | | |

COH [ ], where "[ ]" is the empty feature structure matching all possible VIs, counts now more index changes and hence constraint violations if *wu-* and *rr-* are not string-adjacent:

(22) **Index Changes and Violations**

| | **Relevant Indices** | **Violations of COH [ ] (Index Changes)** |
|---|---|---|
| a. $wu_2$ $rr_2$ $V_1$ | 2-2-1 | * |
| b. $V_1$ $wu_2$ $rr_2$ | 1-2-2 | * |
| c. $wu_2$ $V_1$ $rr_2$ | 2-1-2 | ** |
| d. $rr_2$ $V_1$ $wu_2$ | 2-1-2 | ** |

By ranking COH [ ] above L ⇦ PER ≫ NUM ⇨ R we get just the right ordering patterns for Wardaman (Trommer, 2003a:7):

(23) **Input:** $[+V]_1$ $[+Tense]_2$ $[+3+pl]_3$

| | | COH [ ] | L ⇦ PER | NUM ⇨ R |
|---|---|---|---|---|
| ☞ | a. $wu_3$-$rr_3$-$V_1$-$Tense_2$ | ** | | ** |
| | b. $wu_3$-$V_1$-$rr_3$-$Tense_2$ | ***! | | * |
| | c. $wu_3$-$V_1$-$Tense_2$-$rr_3$ | ***! | | |

Now, if we restrict COHERENCE to agreement, an interesting result emerges for languages with subject and object agreement. Agreement with only one argument is favored (24d,e,f) over two-argument agreement (24a,b,c) since it involves less index changes, even if agreement with the relevant argument is by more than one affix (24f).

(24) **Schematic Example for COHERENCE [+Agr]**

| | **Relevant Indices** | **Violations of COH [+Agr) (Index Changes)** |
|---|---|---|
| a. **$Agr_2$** $V_1$ **$Agr_3$** | 2-3 | * |
| b. **$Agr_3$** $V_1$ **$Agr_2$** | 3-2 | * |
| c. $V_1$ **$Agr_3$ $Agr_2$** | 3-2 | * |
| d. $V_1$ **$Agr_3$** | 3 | |
| e. $V_1$ **$Agr_2$** | 2 | |
| f. $V_1$ **$Agr_2$ $Agr_2$** | 2-2 | |

Note that V ([+V]) is invisible to COH [+Agr] since verbs are not subsumed by [+Agr]. Therefore, the relative order of V and the agreement markers is irrelevant. Of course, this effect

becomes only visible if COHERENCE [+Agr] is ranked above PARSE F as in (25) since the latter otherwise enforces agreement with both arguments (26):

(25) **Input:** $[+V]_1\ [+Agr]_2\ [+Agr]_3$

| | | COH [+Agr] | PARSE F |
|---|---|---|---|
| | a. $[+V]_1\ [+Agr]_2\ [+Agr]_3$ | *! | |
| ☞ | b. $[+V]_1\ [+Agr]_2$ | | * |
| ☞ | c. $[+V]_1\ [+Agr]_2$ | | * |

(26) **Input:** $[+V]_1\ [+Agr]_2\ [+Agr]_3$

| | | PARSE F | COH [+Agr] |
|---|---|---|---|
| ☞ | a. $[+V]_1\ [+Agr]_2\ [+Agr]_3$ | | * |
| | b. $[+V]_1\ [+Agr]_2$ | *! | |
| | c. $[+V]_1\ [+Agr]_2$ | *! | |

For Dumi, COH [+Agr] is slightly to general since simple agreement markers can in principle coocur with portmanteau agreement referring to the other argument. Thus *-N* (spelled out as *-n* in (27)) which crossreferences the 1st person subject coocurs with *-ini* referring to a 3pl object in (27a). The marked scenario prefix *a-* indicating a [-1] subject (and a [-3] argument) occurs with *-i* crossreferencing a 1st person object in (27b):

(27) **Coocurrence of Simple and Portmanteau Agreement**

a. *doːkhot-**n**-t-**ini*** — '**I** see **you (pl.)**' (p. 107)
see-S1sg:O2-NPast-[-1+pl]

b. ***a**-duːkhus-t-**i*** — '**he** sees **us (du.,incl.)**' (p. 108)
MS-see-NPast-[+1-pl]-[-1+pl]

Moreover, the OAR seems to be obtained less rigidly if one of the arguments is 1st person, where in some cases even simple agreement markers for different arguments might coocur while this is never the case if both arguments are 2nd or 3rd person.

Therefore, I assume that Dumi has two related COHERENCE constraints. The more general one is COH $[+Agr]_{simple}$, where $[+Agr]_{simple}$ matches only feature structures in VIs containing a single feature structure. In other words, portmanteau agreement is invisible for this constraint, and the examples in (27) do not induce any constraint violations for it. Note that COH $[+Agr]_{simple}$ is not equivalent to the statement that a verb form can only contain one simple agreement affix. Discontinuous expression of agreement with 1 argument is in principle possible in Dumi, as in the examples in (28):[9]

(28) **Discontinuous Agreement with 1 Argument**

a. *phɨ̀k-**k**-**a*** — '**we (pl.,exc.)** got up' (p. 97)
get:up-[+pl]-[-du]

b. ***ham**-dzeː-t-**a*** — '**they (pl.)** speak' (p. 97)
3PL-speak-NPast-[-du]

Such forms do not induce any index changes for [+Agr] VIs, and are hence optimal. This is illustrated in (29) for the example in (28b):

[9] Recall from section 5 that discontinuous agreement is excluded by alignment constraints in cases where one affix specifies a subset of the features of the other.

(29) **Input:** $V_1$ [-Past] $_2$ [+Abs +3+pl -du]$_3$

| | | COH [+Agr]$_{simple}$ | PARSE F |
|---|---|---|---|
| ☞ | a. **ham:[+Abs+3+pl]$_3$** $V_1$ t:[-Past]$_2$ **a:[-du]$_3$** | | |
| | b. **ham:[+Abs+3+pl]$_3$** $V_1$ t:[-Past]$_2$ | | *! |
| | c. $V_1$ t:[-Past]$_2$ **a:[-du]$_3$** | | *!** |
| | d. $V_1$ t:[-Past]$_2$ | | *!*** |

The second COHERENCE constraint I assume for Dumi is COH $[+Agr]^{[-1]}_{simple}$ It is identical to COH [+Agr]$_{simple}$ apart from the fact that it is restricted to simple VIs which are coindexed with a [-1] (hence 2nd or 3rd) person argument. This constraint will only become relevant in subsection 6.3. In the following, I will abbreviate COH [+Agr]$_{simple}$ as COH [+Agr] and COH $[+Agr]^{[-1]}_{simple}$ as COH [-1].

*6.2 Hierarchies and Constraints*

While COH [+Agr] correctly derives the One-Argument Restriction for all relevant forms in Dumi, it does not predict whether the verb will agree with the subject or the object in specific cases. Thus for the form in (30), we get a tie between the candidates in (31b) and (31c):

(30) *du:khuts-**i*** ‘**we (du.,inc.)** saw them (du.)’ (p. 107)
see-[+du]

(31) **Input:** [+V]$_1$ [+Erg +1+2 +du]$_2$ [+Abs-1-2-du]$_3$

| | | COH [+Agr] | PARSE F |
|---|---|---|---|
| | a. du:khuts:[+V]$_1$ **i:[+du]$_2$ a:[-du]$_3$** | *! | ****** |
| ☞ | b. du:khuts:[+V]$_1$ **i:[+du]$_2$** | | ******* |
| ☞ | c. du:khuts:[+V]$_1$ **a:[-du]$_3$** | | ******* |

The constraint type I will use to implement the effects of person and number prominence on agreement in Dumi are *Relativized PARSE Constraints*. Relativized PARSE constraints have proven useful in different domains such as direct-inverse marking (Trommer, 2003b), number neutralization crosslinguistically (Trommer, 2003f), and case conflict in free relative constructions (Trommer, 2002b). They have the general format in (32a), where $F_{1\text{-}3}$ are agreement features. (32a) and (32b) are concrete instantiations of this format:

(32) a. PARSE $[F_1]^{[F_2]/[F_3]}$
b. PARSE $[+Agr]^{[+1]/[+3]}$
c. PARSE $[+Per]^{[+an]/[-an]}$

A constraint of the form (32a) induces a constraint violation for each input head subsumed by $[F_1]$ and $[F_2]$ in the context of an input head subsumed by $[F_3]$ for which $[F_1]$ is not realized by a VI in the output. Thus, given a [+1] and a [+3] head in the input, (32b) requires that the number feature of the [+1] head is expressed by an output VI. (33) shows how this constraint derives the correct agreement with the 1st over the 3rd person argument for the form in (30):

(33) **Input:** $[+V]_1$ $[+Erg\ +1+2\ +du]_2$ $[+Abs\text{-}1\text{-}2\text{-}du]_3$

| | | COH [+Agr] | PARSE $[+Agr]^{[+2]/[+3]}$ | PARSE F |
|---|---|---|---|---|
| | a. du:khuts:$[+V]_1$ **i:$[+du]_2$ a:$[-du]_3$** | *! | | ****** |
| ☞ | b. du:khuts:$[+V]_1$ **i:$[+du]_2$** | | | ******* |
| | c. du:khuts:$[+V]_1$ **a:$[-du]_3$** | | *! | ******* |

Relativized PARSE constraints are linked to universal prominence hierarchies by the schema in (34):

(34) If A is distinct from B, and A $\geq$ B on a prominence scale $S$
then there is a PARSE constraint PARSE $[P]^{A/B}$

Given the prominence scales in (35), this licenses the PARSE constraints in (36), which will be crucial for the account of HBC in Dumi ([pl] abbreviates in the following [+plural-dual], [du] [-plural+dual], and [sg] [-plural-dual]):[10]

(35) a. $\left\{ \begin{array}{l} [+1] \\ [+2] \end{array} \right\} > [+3]$

b. plural $>$ dual $>$ singular

(36)
a. PARSE $[+Agr]^{[+1]/[+3]}$
b. PARSE $[+Agr]^{[+2]/[+3]}$
c. PARSE $[+Agr]^{[+1]/[+2]}$
e. PARSE $[+Agr]^{[pl]/[sg]}$
f. PARSE $[+Agr]^{[pl]/[du]}$
g. PARSE $[+Agr]^{[du]/[sg]}$

Since the effects of the person and the number hierarchy are now effectively "split into pieces", we can model the fact that in some cases number prominence is more important, and in others person prominence. Recall from (13a) that in 2sg $\rightarrow$ 3du/3pl forms the object instantiating the more prominent number outranks the subject which is higher for person for agreement. This follows if PARSE $[+Agr]^{[pl]/[sg]}$ is ranked above PARSE $[+Agr]^{[+2]/[+3]}$.

(37) $[+Erg\ +2\ sg]_1[+Abs\ +3\ pl]_2$

| | | PARSE $[+Agr]^{[pl]/[sg]}$ | COH [+Agr] | PARSE $[+Agr]^{[+2]/[+3]}$ |
|---|---|---|---|---|
| ☞ | a. a-do:khot:$[+V]$-ini:$[-1\text{-}du\text{-}pl]_2$ | | | * |
| | b. a-do:khot:$[+V]$-a:$[-du]_1$ | *! | | |
| | c. a-do:khot:$[+V]$-a:$[-du]_1$-ini:$[-1\text{-}du\text{-}pl]_2$ | | *! | |

The relative ranking of PARSE $[+Agr]^{[+2]/[+3]}$ and COH [+Agr] is irrelevant for this case, but will become crucial for other forms I will discuss below. In contrast to the 2sg $\rightarrow$ 3du/3pl forms, person becomes the decisive factor in forms with one 2du and one 3pl form (cf. (14a)). This follows straightforwardly if PARSE $[+Agr]^{[pl]/[+du]}$ is ranked below PARSE $[+Agr]^{[+2]/[+3]}$ (38). Relativized PARSE constraints will be abbreviated in the following by the exponents referring to hierarchies. Thus [+2]/[+3] stands for PARSE $[+Agr]^{[+2]/[+3]}$:

[10] A further constraint licensed is PARSE $[+Agr]^{[+2]/[+1]}$ which is crucial for prefi xes in Algonquian (Trommer, 2002a), and different number preference patterns in Tanoan languages (Trommer, 2003f). I assume that this constraint is ranked below PARSE $[+Agr]^{[+1]/[+2]}$ in Dumi and hence becomes invisible in this language.

(38) [+Erg +2 +du]$_1$[+Abs +3 pl]$_2$

| | | [pl]/ [sg] | COH [+Agr] | [+2]/ [+3] | [pl]/ [du] |
|---|---|---|---|---|---|
| | a. du:khus:[+V]-ini:[-1-du-pl]$_2$ | | | *! | |
| ☞ | b. du:khus:[+V]-i:[+du]$_1$ | | | | * |
| | c. du:khus:[+V]-i:[+du]$_1$-ini:[-1-du-pl]$_2$ | | *! | | |

Up to this point, it might seem that the interplay of COHERENCE allows only for a refined statement of hierarchy effects under the OAR, but indeed the violations of the OAR for forms with a 1sg and a 2/3 dual/plural argument illustrated in (15) are a natural consequence of this constraint system. If [+1]/[+3] and [pl]/[sg] are both ranked above COH [+Agr], the effect of the latter is suppressed and we get eventually double agreement ([pl]/[+du] is irrelevant here and omitted to enhance readability):

(39) [+Erg +1 sg]$_1$[+Abs +3 pl]$_2$

| | | [+1]/ [+3] | [pl]/ [sg] | COH [+Agr] | [+2]/ [+3] |
|---|---|---|---|---|---|
| | a. do:khot:[+V]-t-n̈:[-1 pl]$_2$ | *! | | | |
| | b. do:khot:[+V]-t-ə:[+1 sg]$_1$ | | *! | | |
| ☞ | c. do:khot:[+V]-t-ə:[+1 sg]$_1$-n̈:[-1 pl]$_2$ | | | * | |

(40) shows the complete constraint ranking so far:

(40) $[+1]/[+3] \gg \left\{ \begin{array}{c} [pl]/[sg] \\ [du]/[sg] \end{array} \right\} \gg \text{COH} \gg \left\{ \begin{array}{c} [+2]/[+3] \\ [+1]/[+2] \end{array} \right\} \gg \left\{ \begin{array}{c} [pl]/[du] \\ [+2]/[+1] \end{array} \right\}$

Generally, exceptional two-argument agreement is limited to the case that agreement for both arguments is favored by different relativized PARSE constraints, which are both ranked higher than COH [+Agr]. Thus, we still get agreement with a single argument if both PARSE constraints above COH [+Agr] favor agreement for the same argument (41), or if one of the relevant PARSE constraints is ranked below it (40):

(41) [+Erg +1 pl]$_1$[+Abs +3 sg]$_2$

| | | [+1]/ [+3] | [pl]/ [sg] | COH [+Agr] | [+2]/ [+3] |
|---|---|---|---|---|---|
| | a. do:kho?-a:[-du]$_2$ | *! | * | | |
| ☞ | b. do:kho?-k:[+1+pl]$_1$ | | | | |
| | c. do:kho?-k:[+1+pl]$_1$-a:[-du]$_2$ | | | *! | |

(42) [+Erg +3 pl]$_1$[+Abs +1 -2 +du]$_2$

| | | [+1]/ [+3] | COH [+Agr] | [+2]/ [+3] | [pl]/ [sg] |
|---|---|---|---|---|---|
| ☞ | a. adu:khuts-ï:[+1-2+du]$_2$ | | | | * |
| | b. adu:khuts-ini:[-1 pl]$_1$ | *! | | | |
| | c. adu:khuts-ï:[+1-2+du]$_2$-ini:[-1 pl]$_1$ | | *! | | |

*6.3 3du/pl → 2sg Forms*

The ranking in (40) accounts for all transitive forms in Dumi except for forms with a 2sg object and a 3rd person dual or plural object. Recall that for the converse configuration (2sg → 3du/pl forms), agreement with the higher number agreement prevails (43a). Since none of the constraints in (40) refers to specific grammatical role, we would expect that the same holds for 3du/pl → 2sg forms, but this turns out to be incorrect (43b).

(43)

a. *a-doːkhot-t-**ini*** 'you (sg.) see **them (pl.)**' (p. 107)
MS-see-NPast-[-1pl]

b. *a-duːkhus-t-**a*** 'they (pl.) see **you (sg.)** ' (p. 108)
MS-see-NPast-[+du]

Note that this is the only place in the whole transitive paradigm where simple agreement is sensitive to grammatical role. In all other cases, forms of the type X → Y have the same agreement as Y → X forms. There are two ways to interpret the preference for object agreement here. as preference for 2nd person over 3rd, and as preference for agreement with the absolutive argument over the ergative one. Preference for agreement with the absolutive argument is instantiated in a number of languages, e.g. Hindi (cf. Woolford, 2000) and especially languages with HBC effects (e.g. Tangut, Kepping, 1979, LaPolla, 1992, Trommer, 2002a and several Tanoan languages, Noyer, 1992, Trommer, 2003f).[11] However, the preference for 2nd person over 3rd person agreement has systematical exceptions for cases like (43b), while no other place in the paradigm shows systematic preference for absolutive agreement. To solve this problem, I propose to conjoin both preferences following the generalized version of the constraint schema in (34) formulated in (44) (Trommer, 2003f:2):

(44) If $A_1 \ldots A_n$ are distinct from $B_1 \ldots B_n$,
and $A_i \geq B_i, 1 \leq i \leq n$ on prominence scales $S_1 \ldots S_n$
then there is a PARSE constraint PARSE [AGR]$^{[A_1 \ldots A_n] \,/\, [B_1 \ldots B_n]}$

Now, given the scales in (45a) and (45b), this licenses the relativized PARSE constraint in (45c):

(45) a. [+Abs] > [+Erg]
b. [+2] > [+3]
c. PARSE [AGR]$^{[+\text{Abs}+2]/[+\text{Erg}+3]}$

If [+Abs+2]/[+Erg+3] is ranked above the other PARSE constraints, we correctly derive object agreement in 3pl/du → 2sg forms such as (43)-b. COH [-1] excludes (46c) which would otherwise become optimal since both [+Abs+2]/[+Erg+3] and [pl]/[sg] dominate COH [+Agr]:

(46) [+Erg +3 pl]$_1$ **[+Abs +2 sg]$_2$**

| | COH [-1] | [+Abs+2]/ [+Erg+3] | [pl]/ [sg] | COH [+Agr] | [+2]/ [+3] |
|---|---|---|---|---|---|
| ☞ a. a-duːkuts-a:[-du]$_2$ | | | * | | |
| b. a-duːkuts-ini:[-1 pl]$_1$ | | *! | | | * |
| c. a-duːkuts-a:[-du]$_2$-ini:[-1 pl]$_1$ | *! | | | * | |

[11] If absolutive is interpreted as nominative, this can be reduced to the preference for agreement with nominative arguments which also holds in nominative-accusative languages (cf. Woolford, 2000).

For 3pl/du → 2sg forms such as (43)-a, [+Abs+2]/[+Erg+3] is irrelevant and [pl]/[sg] ensures agreement with the 3pl argument:

(47) [+Erg +2 sg]$_1$**[+Abs +3 pl]$_2$**

| | COH [-1] | [+Abs+2]/ [+Erg+3] | [pl]/[sg] | COH [+Agr] | [+2]/ [+3] |
|---|---|---|---|---|---|
| ☞ a. a-doːkot-t-ini:[-1 pl]$_2$ | | | | | * |
| b. a-doːkot-t-a:[-du]$_1$ | | | *! | | |
| c. a-doːkot-t-a:[-du]$_1$-ini:[-1 pl]$_2$ | *! | | | * | |

## 7 Other Approaches to Hierarchy-Based Competition

Hierarchy-based Competition has received few attention in the generative literature. Perhaps, the most detailed approach to phenomena of this type in a pre-OT framework is presented in Noyer (1992). Noyer assumes in an elaborate version of Distributed Morphology that suppression of agreement affixes is triggered by universal filters categorically excluding the coocurrence of certain feature values. (e.g. *1 + dual). If such a filter is active in a given language, universal feature hierarchies determine which affix is spelled out. For example, the hierarchy 1 > dual ensures that for an input containing the features [1] and [dual] only [1] is realized by an affix.

While this approach has many desirable consequences, it is problematic for the Dumi data discussed here. Assuming that coocurrence of subject and object agreement is generally suppressed by a surface filter in the language, we would expect that person always outranks number since Noyer assumes that number features are universally lower than person features. Moreover, Noyer's approach cannot explain why the surface filter can be violated in cases of hierarchy crossing, since the role of hierarchies is restricted to determining the way in which the filter is satisfied. In other words, no hierarchy configuration can ever lead to overriding the filter which is otherwise active in a language. Similar problems result with other approaches to hierarchy effects which try to reduce it to specificity effects in a feature-geometric representation of pronominal (agreement) features, as for example Dechaine (1999)

In the OT-literature on morphosyntax, effects of prominence hierarchies play a crucial role (e.g. Aissen, 1999, 2003), but again there exists no systematic account of HBC. The standard tool to derive asymmetries in the realization of agreement for other cases is basically to assume a fixed ranking of markedness constraints interacting with faithfulness constraints (e.g. Nagy, 1999; Morimoto, 2002; Ortmann, 2002). Schematically, a prominence hierarchy of the form More_Marked > Less_Marked allows to derive via Harmonic Alignment (Prince and Smolensky, 1993) the fixed constraint ranking *More_Marked ≫ *Less_Marked.

Thus, Ortmann (2002:161) captures the fact that subject agreement is restricted to animate subjects in certain varieties of Georgian by the markedness constraints *AgrPl/[-an] ≫ *AgrPl/[+an],[12] and a faithfulness constraint ranked between the two markedness constraints:

(48) **Input:** [Agr +Nom + pl +an]$_1$

| | *AgrPl/[-an] | Faith | *AgrPl/[+an] |
|---|---|---|---|
| a. Ø | | *! | |
| ☞ b. [Agr+pl]$_1$ | | | * |

[12] I have slightly adapted Ortmann's constraint names and other details to the convention applied in this paper.

(49) **Input:** [Agr +Nom + pl -an]$_1$

| | *AgrPl/[-an] | Faith | *AgrPl/[+an] |
|---|---|---|---|
| ☞ a. Ø | | * | |
| b. [Agr+pl]$_1$ | *! | | |

It should be easy to see how this can be transferred to a system where there is agreement with 1st and 2nd subjects and objects, but not with 3rd person arguments. If the hierarchy effect is captured by the ranking *Agr/[+3] ≫ *Agr/[+1], and a corresponding Faithfulness constraint is interspersed, we get subject agreement for 1 → 3 (50), and object agreement for 3 → 1 clauses (51):

(50) **Input:** [Agr +Nom +1]$_1$ [Agr +Nom +3]$_2$

| | *Agr/[+3] | Faith | *Agr/[+1] |
|---|---|---|---|
| a. Ø | | **! | |
| ☞ b. [Agr]$_1$ | | * | * |
| c. [Agr]$_2$ | *! | * | |
| d. [Agr]$_1$ [Agr]$_2$ | *! | | * |

(51) **Input:** [Agr +Nom +3]$_1$ [Agr +Nom +1]$_2$

| | *Agr/[+3] | Faith | *Agr/[+1] |
|---|---|---|---|
| a. Ø | | **! | |
| b. [Agr]$_1$ | *! | * | |
| ☞ c. [Agr]$_2$ | | * | * |
| d. [Agr]$_1$ [Agr]$_2$ | *! | | * |

However, the resulting system leads not to hierarchy-based competition as in Dumi. For intransitive forms with 3rd person subjects or if both arguments of a transitive form are 3rd person, we get complete suppression of agreement:

(52) **Input:** [Agr +Nom +3]$_1$ [Agr +Nom +3]$_2$

| | *Agr/[+3] | Faith | *Agr/[+1] |
|---|---|---|---|
| ☞ a. Ø | | ** | |
| b. [Agr]$_1$ | *! | * | |
| c. [Agr]$_2$ | *! | * | |
| d. [Agr]$_1$ [Agr]$_2$ | *!* | | |

No addition of simple markedness constraints will lead to agreement in this case since markedness constraints of this type penalize the presence, not the absence of structure.[13] This general problem could be solved by introducing an additional constraint, say "Agree!" which requires that each clause contains at least one agreement affix:[14]

[13] Aissen (1999, 2003) assumes markedness constraints against zero affixes expressing certain morphosyntactic categories. Markedness constraints of this type might be able to enforce agreement, but probably such constraints are also able to emulate a much bigger class of faithfulness constraints, and blur the distinction of faithfulness and markedness constraints in morphosyntax altogether.

[14] A similar constraint is assumed in Woolford (2003), but restricted to subject agreement.

(53) **Input:** [Agr +Nom +3]$_1$ [Agr +Nom +3]$_2$

| | Agree! | *Agr/[+3] | Faith | *Agr/[+1] |
|---|---|---|---|---|
| a. Ø | *! | | ** | |
| ☞ b. [Agr]$_1$ | | * | * | |
| ☞ c. [Agr]$_2$ | | * | * | |
| d. [Agr]$_1$ [Agr]$_2$ | | **! | | |

However, this would not resolve a further problem for markedness constraints, namely the dissociation of preferences which can be observed in Dumi, i.e., the fact that agreement for certain features is disfavored in one part of the paradigm, but not in others. For example, agreement with a singular argument is almost always suppressed in Dumi which would suggest a high-ranked markedness constraint *Agr/[sg]. But agreement with the singular argument becomes obligatory if it is 1st person, and the object dual or plural, as in (15). In this case, Agree! would be already satisfied by agreement with the non-singular argument, and *Agr/[sg] should lead to suppression of agreement with the 1$^{st}$ person argument. Other markedness constraints such as *Agr/[+3] by themselves would not favor realization of 1$^{st}$ person agreement.

More generally, an approach using markedness constraints seems to be unable to account for emergence of two-argument agreement. Markedness constraints offer no suitable formal mechanism to enforce agreement here. Even under the assumption of something like Agree!, they predict not cumulativity of agreement, but cumulativity of non-agreement, resulting eventually in complete zero agreement under appropriate ranking, as in (54)

(54) **Input:** [Agr +Nom +3]$_1$ [Agr +Nom +1]$_2$

| | *Agr/[+3] | *Agr/[+1] | Agree! | Faith |
|---|---|---|---|---|
| ☞ a. Ø | | | * | ** |
| b. [Agr]$_1$ | *! | | | * |
| c. [Agr]$_2$ | | *! | | * |
| d. [Agr]$_1$ [Agr]$_2$ | *! | * | | |

Crucially, even if markedness constraints for number are interspersed with those for person, they can never accumulate to enforce two-argument agreement. Thus, the problems for this approach are basically analogous to the problems with Noyer (1992). Hierarchies cannot influence the restriction to one-argument agreement in an adequate way. This is only possible by integrating hierarchy effects with constraints *requiring* feature realization, such as relativized PARSE constraints.

Note finally that relating prominence hierarchies to PARSE constraints instead of applying markedness constraints obviates the need for fixed constraint-ranking in this area, which is in a line with the general claim in the OT-literature that constraints are universal, but ranking is free (cf. also de Lacy, 2002).

## 8 Summary

In this paper, I have shown that Dumi shows intricate effects of person and number hierarchies which are problematic for an analysis which directly invokes hierarchies themselves. I have proposed an analysis based on COHERENCE constraints modeling the restriction to agreement with one argument, and binary PARSE preference constraints implementing hierarchy effects. Finally I have argued that an analysis in terms of relativized PARSE constraints is

superior to alternative conceivable alternatives in other approaches to prominence hierarchies in morphosyntax.

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