Hierarchy Effects in Kiranti and Broader Algic

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0.1 Zusammenfassung

Many grammatical processes reflect prominence hierarchies of morphosyntactic categories, such as 1st $\succ$ 2nd $\succ$ 3rd person or animate $\succ$ inanimate. This project focusses on two especially striking hierarchy effects in polysynthetic multiargument agreement: Direction marking, i.e. affixal marking which indicates whether subject or object of a predicate are higher with respect to a specific hierarchy, and hierarchy-based competition (HBC), where similar hierarchies determine whether verb agreement is governed by the subject or the object for a specific combination of features. The main goal of the project is to broaden the empirical and theoretical understanding of these two phenomena by in-depth studies of two language families which show them in many different varieties: Algic and Kiranti. The project focusses on patterns which have been largely ignored in the literature and on the morphological details of microvariation in this domain. Following the basic tenets of Optimality Theory, it is assumed that a substantial part of this variation is due to different rankings of constraints which are themselves universal. Microvariation thus promises to provide us with crucial diagnostics for the formal nature of these effects. Since verbal inflectional paradigms are the major empirical basis of the project, a main methodological goal of the project is to develop methods of storing morphological paradigms in data bases which explicitly represent morphological and comparative relations inside and across paradigms and thus allows documentation of linguistic data which is maximally adapted for theoretical analysis.

Viele grammatische Prozesse spiegeln Prominenzhierarchien morphosyntaktischer Kategorien wider (z.B. 1. $\succ$ 2. $\succ$ 3. Person oder belebt $\succ$ unbelebt). Dieses Projekt behandelt zwei besonders bemerkenswerte Arten von Hierarchie-Effekten: Direktions-Markierung, d.h. verbale Affigierung-Prozesse, die anzeigen, ob Subjekt oder Objekt eines Prädikats höher auf einer spezifischen Hierarchie stehen, und hierarchie-basierter Wettbewerb (“Hierarchy-based competition”, HBC), bei dem ähnliche Prominenz-Hierarchien festglegen, ob Verbkongruenz für eine bestimmte Kombination von Merkmalen durch das Subjekt oder das Objekt gesteuert wird. Das Hauptziel des Projekts ist es, das empirische und theoretische Verständnis dieser Effekte substantiell zu vertiefen, indem zwei Sprachfamilien untersucht werden, die beide Phänomene in vielen verschiedenen Spielarten aufweisen: Algisch und Kiranti. Das Projekt fokussiert dabei auf Ausprägungen von Direktions-Markierung und hierarchie-basiertem Wettbewerb, die in der bisherigen Forschung nur eine periphere Rolle spielen. Ausgehend von den Grundprinzipien der Optimalitätstheorie wird dabei angenommen, dass ein Großteil der zwischensprachlichen Variation in diesem Bereich durch die sprachspezifische Anordnung von Beschränkungen zustandekommt, die selbst universell sind. Die Untersuchung von Mikrovari-

ation verspricht demzufolge wesentliche Einsichten in die formale Struktur von Hierarchie-Effekten. Da verbale Flexionsparadigmen die empirische Grundlage des Projekts darstellen, ist ein methodologisches Hauptziel des Projekts, Methoden zu entwickeln, um morphologische Paradigmen in Datenbanken in einer Weise zu speichern, die morphologische und zwischensprachliche Beziehungen innerhalb und zwischen Paradigmen explizit darstellt und so eine Dokumentation linguistischer Daten erlaubt, die die theoretische Analyse maximal unterstützt.

1 Stand der Forschung, eigene Vorarbeiten

1.1 Stand der Forschung

1.1.1 Direction Marking and Hierarchy-Based Competition

At a descriptive level, many grammatical processes reflect feature hierarchies, such as 1st $\succ$ 2nd $\succ$ 3rd person or animate $\succ$ inanimate. For example, in many languages coordinated noun phrases where the single constituents differ in person systematically inherit the higher-ranked person (e.g. 1st and 3rd person $\rightarrow$ 1st person), but there are no languages where coordinated noun phrases systematically inherit 3rd person over 1st and 2nd person (Corbett, 2000). Similarly, a number of languages allow pro-drop of 1st and 2nd person subjects, but not of 3rd person pronouns, while languages with the opposite pattern seem to be systematically excluded (Artstein, 1998). While the development of optimality-theoretic models of morphosyntax (see Müller, 2000, for an overview) has made it possible to formalize hierarchy effects in a straightforward and principled way, there are still few studies exploring in detail the empirical and theoretical consequences of this approach.

Hierarchy-based competition and direction marking are two interrelated phenomena which are especially striking manifestations of hierarchy effects. In hierarchy-based competition (HBC), verbal agreement is not tied to grammatical function (subject or object), but to relative prominence of the arguments. Thus in lCog-rtse rGya-roñ (Bickel, 1995), the verb shows always number agreement with a first person argument (subject or object). If there is no 1st person argument, number agreement is with a 2nd person argument if there is one. Only if there is neither a 1st or 2nd person argument, the verb can show agreement with a 3rd person subject. Hence whether the verb agrees with a given argument does not depend on its syntactic status, nor directly on its person value, but on the relative prominence of the argument with regard to the other argument. In direction marking, verbs have specific affixes which indicate whether the subject is higher on a specific prominence hierarchy (direct marking) or the object (inverse marking). Thus, in the Algonquian language Menominee (Bloomfield, 1962), transitive verbs with 1st person subjects and 3rd person animate objects have the direct suffix **-a**· just as forms with 3rd person animate subjects and 3rd person inanimate objects. On the other hand, forms with 3rd person animate subject and 1st person object or with 3rd inanimate subject and 3rd animate object have the inverse suffix **-eko**. Thus, not any specific linking of subject or object to morphosyntactic features leads to direct or inverse forms, but the linking of the subject-object configuration to a prominence hierarchy. Direction marking and HBC are closely linked: Both are related to agreement and seem to be strictly morphological in the sense that they do not alter grammatical relations (Dahlstrom, 1986). Finally there is also a typological link: Most attested languages with direction marking also have some form of HBC, and most languages with HBC also have direction marking (Siewierska, 2004). This makes functional sense since direction marking often allows to determine to which grammatical role agreement features governed by HBC are associated.

1.1.2 Descriptive and Typological Studies of Hierarchy Effects

As noted in Bickel (1995), the observation of direction-marking systems in Algonquian goes back at least as far as von Humboldt (1836). Hockett (1966) provides a well-articulated account of direction marking in the language family as marking the natural (direct) or unnatural (inverse) viewpoint in a transitive predication. A turning point in the typological treatment of hierarchy effects is Silverstein (1976). He shows that ergativity splits follow basically the same prominence hierarchies as direction marking, and provides for the first time a formally stringent formalization of possible systems governed by hierarchies. Comrie (1980b) shows that direction marking is not restricted to Algonquian, but also occurs in Paleosiberian. DeLancey (1981) introduces direction-marking data from Tibeto-Burman and further develops the concept of direction marking as expressing (un-) natural viewpoints.

A recurrent theme in the discussion of direction marking is the idea that it is a passive or inverse construction (Rhodes, 1976; Jolley, 1981) or a special voice besides active and passive (and possibly others such as middle, antipassive, cf. (Dahlstrom, 1986; Klaiman, 1991). This idea has become popular in the face of languages (e.g. most Salish and Tanoan languages) which have (or appear to have) obligatory passivization in contexts where Algonquian has inverse marking. However, Dahlstrom (1986) shows that inverse forms at least in Cree are syntactically in every respect transitive. Since the very concept of passive under most approaches implies creation of intransitive predicates this has discredited an analysis of inverse as passive for most of the field. While the concept of inverse as passive is largely discarded in present-days, Klaiman in her comprehensive monograph on voice (Klaiman, 1991) and several related articles (Klaiman, 1992, 1993), puts forth the idea that inverse is a distinct voice type. What is problematic about this view is that it does not account for the intimate linking of agreement morphology with direction marking.

The fact that direction-marking systems can be much less clearcut than previously assumed and that there is a tight connection between direction and agreement morphology has become a prominent theme in recent typological research on the subject. Thus, (Bickel, 1995) gives an analysis of the Kiranti language Belhare according to which inverse is marked indirectly by the presence of agreement prefixes, while intransitive and direct clauses tend to have exclusively suffixal agreement. Zúñiga (2002), a thorough and detailed study of direction marking in languages of North- and South-America stresses the close relation of direction-marking and agreement arguing that even in Algonquian some direction markers have developed into object agreement markers.

Hierarchy-based Competition is often lumped together in the earlier typological literature with a slightly different phenomenon, the fact that agreement for hierarchically lower categories (e.g. 3rd person) is crosslinguistically much more often expressed by zero affixes (put another way, not expressed by affixal material at all) than hierarchically higher ones (e.g. 1st person). In the following, I will call this generalization the zero-unmarked correlation. Since zero expression is often restricted to specific contexts (e.g. certain tenses), HBC might be seen as a special case of the zero-unmarked generalization. Comrie (1980a) discusses such cases for the person hierarchy, Croft (1988) for definiteness and animacy (see Bickel, 2007, for a recent critical survey). However, subsuming HBC under this phenomenon obscures the fact that it is much more systematic than the zero-unmarked generalization (Trommer, 2003d), and that HBC is crucially governed by relative markedness (or prominence). HBC has also been treated as "hierarchical alignment", along with nominative-accusative and ergative alignment by Nichols (1992) and Siewierska (2004).

In typological discussions of both, HBC and direction marking, it becomes clear that different languages have quite different hierarchies, usually involving a person hierarchy and

some extensions such as animacy, obviation and number (Zúñiga, 2002). However, Kutenai, a language isolate spoken in parts of British Columbia, Idaho and Montana, seems to have direction marking referring only to the obviative/proximate contrast also found in Algonquian, but not to the person hierarchy (Dryer, 1994) .

It has also been acknowledged very early that languages can have opposite rankings of the same features. Thus Silverstein (1976) argues that languages can in principle rank 1st over 2nd or 2nd over 1st person. Similarly, for some direction marking languages a ranking of singular over plural has been assumed (e.g. Ebert, 1994) , and for others plural over singular (Macaulay, 1992; Conathan, 2002). Often it is implicitly or explicitly assumed that HBC and direction marking at least in a given language consistently refer to the same hierarchy. Thus Macaulay (1992) states that Karok, a Hokan language of Northern California which has both direction marking and HBC, is defective since HBC and direction marking are governed by slightly different hierarchies. However, Bickel (1995) and Zúñiga (2002) argue convincingly that slightly different rankings of features for both phenomena are also common in Algonquian languages (see also Trommer, 2003b).

1.1.3 Formal Approaches

There are currently three different types of approaches to integrate feature-hierarchy effects into formal grammar: First, typologically oriented approaches which treat hierarchies as a primitive of grammatical theory serving as a basis of specific grammatical processes. Second, reductionist approaches which either deny the existence of hierarchy effects or try to reduce them systematically to other grammatical primitives. Third, constraint-based approaches, where hierarchies do not directly govern grammatical processes, but constraints or constraint rankings systematically related to hierarchies mediate between concrete grammatical processes and the hierarchies themselves. I will discuss these three types of approaches in turn.

Approaches directly incorporating Hierarchies Noyer (1992) is the most comprehensive attempt to integrate prominence hierarchies into a formal theory. Noyer assumes the general framework of Distributed Morphology (Halle and Marantz, 1993), where morphology is a separate module of the grammar (MS, Morphological Structure) which assigns phonological shape to the output of syntactic computation by inserting underspecified vocabulary items into syntactic heads, but also modifies syntactic information in well-defined ways before vocabulary items are inserted. In Noyer's system, there are two processes which refer to feature hierarchies. First, if two vocabulary items compete for insertion into a syntactic head, apart from specificity (more specific VIs are generally preferred over less specific ones) prominence according to the feature hierarchy gets decisive. Thus assuming that we have a syntactic head specified as [+1 +2] (a first person inclusive) and two vocabulary items **ne:** [+1] and **ke:**[+2] which are both compatible with this head and equally specific, the universal hierarchy $1 \succ 2$ determines that **ne** is inserted, not **ke**. Second, Noyer assumes a universal inventory of morphosyntactic filters which might be switched on or off in a specific language. For example, *[part pl] [part pl] prohibits plural specification for two agreement heads corresponding to non-third person arguments. If now a filter is switched on in a given language, it is inviolable and must be satisfied by deletion of one of the involved features. Which one is actually deleted is computed deterministically by reference to the feature hierarchy. Features corresponding to lower elements on the hierarchy are deleted in favor of retaining features of elements higher on the hierarchy. Thus in a language where *[part pl] [part pl] in configuration [+1 +pl][+2 +pl] the plural feature of the 1st person head is retained and the plural feature of the 2 nd person

head is deleted.

A detailed critical discussion of Noyer's approach is provided in Trommer (2003b). Crucially, this framework seems to be too rigid to account for the variation in hierarchy effect in different languages. Thus languages differ to a large degree by which means they resolve the [part][part] filter partially favoring object or subject agreement or second person (cf. Trommer, 2003g). Noyer has to stipulate specific filters for all these languages to force the hierarchy to give the correct result. Moreover in a number of cases there is a preference for second person over 1st person and for number over person which seem to be categorically excluded in Noyer's framework. Referring to problems of this type, Noyer has abandoned this framework in recent work (Noyer, 1998) in favor of a more derivational version of DM without any reference to feature hierarchies.

While Noyer does not address direction marking at all, Wunderlich (1996) and Fabri (1996) provide analyses of the Algonquian direct/inverse morphology in the lexicalist framework of Minimalist Morphology (Wunderlich and Fabri, 1994) in a way which similarly to Noyer's account involves direct reference to prominence hierarchies (cf. also Wunderlich, 2005a). Thus, in Wunderlich (1996) the Potawatomi inverse marker **-uko** is specified as [ ][+ha] where [+ha] stands for "there is a higher argument". The interpretation of the features relevant for direction marking is only possible with reference to a specific prominence hierarchy. While this allows to implement straightforwardly the traditional understanding of direction marking, most current theories of grammar strive to minimize the number of features without direct semantic interpretation, and it seems that the only motivation for these type features is to account for hierarchy effects themselves. Moreover, Wunderlich in contrast to Noyer seems to assume that hierarchies are language-specific (e.g. Algonquian ranks 2nd over 1st person, other languages choose the opposite order). Recent work on Algonquian has shown (Zúñiga, 2002; Trommer, 2003b, see also Wunderlich, 2003) that the hierarchies manifested in direct-inverse marking often depart from the hierarchies one finds in other aspects of the grammar of the same language. Thus, in Turkana direction marking follows the hierarchy 1,2 $\succ$ 3 while HBC follows the hierarchy 1 $\succ$ 2 $\succ$ 3 Subject $\succ$ 3 Object (Dimmendaal, 1983). Similarly, in Menominee, different agreement positions follow different hierarchies than direction marking (Trommer, 2003b,a). Thus the hierarchy to which +ha refers would not only be language- but also construction-specific.

Approaches Denying Hierarchy Effects The logical antithesis to approaches directly implementing feature hierarchies as part of morphosyntax are approaches denying the existence of genuine hierarchy effects. An example for this line of argumentation is Stump (2001) (see Trommer, 2003b, for similar arguments) in his analysis of the Algonquian language Potawatomi. Based on the fact that clitic selection in Potawatomi follows the preference schema 2nd $\succ$ 1st person while plural marking follows the opposite preference, he excludes reference to feature hierarchies from his account of the language. Stumps approach to direction marking is stipulative and relies on assigning values of a diacritic feature "Major Reference" (MR) to direct ([MR:subject]) and inverse ([MR:object]) verb forms by arbitrary morphological rules, and then inserting **-a** for +MR and **-uk** (inverse) for MR forms.

What makes this type of approach problematic is that it predicts many kinds of unattested patterns. Thus, we expect HBC where 3rd person markers are favored over 1st person markers or systems for direct/inverse which are completely unrelated to standard prominence hierarchies. But this seems not to be attested. Similar criticism applies to approaches such as Anderson (1992) and (Steele, 1995) which do not address the question of prominence hierarchies explicitly. Trommer (2003b) gets similar effects as Stump by allowing arbitrary ranking of

specific realization constraints in an optimality-theoretic framework. Thus the ranking PARSE [+1 pl] $\gg$ PARSE [-1 pl] accounts for the fact that there is a preference for 1st person over second in plural marking while the ranking PARSE 2 $\gg$ PARSE 1 for clitics results in the opposite preference for clitics. An empirical argument for this type of approach can be found in Menominee person suffixes which specify a contrast between 3rd and non-third person. If one of the arguments is 3rd and the other non-3 rd person, contrary to what might be expected under a hierarchy account, third-person marking prevails. However, nothing in this approach excludes preference of 3rd over 1st person.

There are a number of technically ambitious analyses of direction marking in current syntactic frameworks. The most simple and appealing one is by Brittain (2001), who assumes that Algonquian direction markers are simply object agreement markers. Using standard syntactic mechanisms from the minimalist program (in the version of Chomsky, 1995) and the additional stipulation that there is a default agreement head which compensates expression of agreement not provided by other syntactic heads, this allows to capture effects which are due to the hierarchy $2 \succ 1 \succ 3$. However, Brittain has to assume that 3rd person proximate arguments get "promoted" to speech act participants in the context of obviative arguments. Moreover she arbitrarily excludes forms with inanimate arguments from her discussion even if these show largely the same direction morphology as the other forms. Thus her analysis is both incomplete and based on two construction-specific stipulations without independent evidence. As shown in Trommer (2006a), the same is largely true for the analyses of Halle and Marantz (1993, for Potawatomi) and Bruening (2001, for Passamaquoddy). In these analyses, specific diacritic features are manipulated by morphosyntax to capture the contrast of direct and inverse. Again these accounts ignore parts of the hierarchy relevant at least for Menominee direction marking.

Reductionist Approaches to Hierarchy Effects While Stump and Trommer (2003b) claim that there are no genuine asymmetries between the categories encoded in feature hierarchies, another line of research maintains that hierarchy asymmetries exist, but that they do not result from hierarchies, but from structural differences. Thus Dechaine (1999) assumes that the asymmetry between 3rd person and 1st/2nd person is one of specificity: there are specific features (+1 and +2) characteristic for 1st and 2nd person while 3rd person is formally represented as the lack of person features. As a consequence, morphological operations which are sensitive to specificity choose 1st and 2nd person over 3rd person. Preference for 1st over 2nd person or vice versa is captured by different feature-geometric representations for these features in specific languages. If +1 is dependent on +2, +2 has preference. If +2 is dependent on +1, preference is vice versa. A similar account is developed in Béjar (2003), who adopts the privative-valued feature-geometry proposed by Harley and Ritter (2001) and implements hierarchy-based competition by a slightly modified version of the basic syntactic mechanisms proposed in Chomsky (2000, 2001). HBC is here a consequence of the fact that a functional head specified for phi-features attracts an argument (subject or object). If the functional head matches the features of the closest argument, it agrees with it, otherwise the search domain is expanded to check whether agreement with the other argument can be established. If none of the arguments matches the full feature specification of the functional head, the mechanism of default agreement successively removes the features of the geometric representation which allows agreement with arguments corresponding to hierarchically lower (i.e. less specified) categories. Preference for 1st over 2nd or vice versa in different languages is again assumed to be due to different structural representations of the features for 1st and 2nd person.

While Béjar provides a theoretically fascinating and technically elaborate approach to hierarchy effects, it is in principle unable to capture a number of phenomena. First, under her

approach there should be no combinations of person and number hierarchy effects since person (π) and number (#) correspond to different functional units. However in languages such as Dumi (van Driem, 1993; Trommer, 2006c) and Karok (Macaulay, 1992) the same morphological positions are governed by number and person prominence. Thus in Karok, 2pl is more prominent than 1st person (singular and plural), but 2sg is not. In Dumi, appearance of number agreement is governed by the number hierarchy plural $\succ$ dual $\succ$ singular for forms without SAP arguments. However in forms with two arguments with different person values the person hierarchy 1 $\succ$ 2 $\succ$ 3 gets decisive. Another phenomenon which remains unexplained is emergence of two-argument agreement (Trommer, 2003b,a, 2006c). Second, Béjar's account seems to be restricted to relatively simple hierarchies. Thus she can capture Algonquian inverse marking assuming the hierarchy 2nd $\succ$ 1st $\succ$ 3rd, but again not the full hierarchy relevant for Menominee. Third, specific effects such as the preference of [+3] over [–3] marking in Menominee are in principle excluded by her approach since [+3] cannot be represented in the assumed feature geometry (except by underspecification). Even if it would be built in, it is claimed to be generally less specific than SAP categories and hence to be outranked under competition.

Recently a number of more intricate proposals on the structure of person and number features have been developed which largely abandon geometric representations (Nevins, 2006; Harbour, 2003, 1994; Adger and Harbour, 2007). This line of research is potentially highly relevant to HBC and direction marking, but up to this point has not been applied to these phenomena.

Approaches Using Constraint Linking Constraint-based approaches make the assumption that hierarchy effects are ultimately governed by prominence hierarchies, but that this government is mediated by constraints. Thus prominence relations can be kept universal while crosslinguistic variation is captured by different ranking of constraints or constraint hierarchies related to them. An early instantiation of this approach is found in Lakämper and Wunderlich (1998), where effects of one specific constraint on hierarchies on argument linking in the agreement system of Quechuan dialects are explored. The most influential approach in this area however is the one by Aissen (1999). Aissen translates morphosyntactic hierarchies into OT-constraints by Harmonic Alignment (Prince and Smolensky, 1993) and Constraint Conjunction, which allows to capture a wide range of different hierarchy effects by a unified formal device, including direct-inverse marking in Nocte. Extensions and modifications of this approach using Minimalist Morphology can be found in Ortmann (2002) and Stiebels (2002). Unfortunately, this approach does not extend to direction marking in Algonquian (Trommer, 2003a, 2006a), which in contrast to Nocte does have a direct marker in addition to an inverse suffix, and it is unclear whether it can be applied to Hierarchy-based Competition. A more general problem is that the formal apparatus developed by Aissen can also be used to capture unattested and unintuitive hierarchy effects (Jäger and Zeevaat, 2002:4).

An elaborate approach to hierarchy effects in agreement, which will form the basis of the project, is developed in Trommer (2002a, 2003a,g, 2006a,b,c, 2005, 2008b) couched in the framework of Distributed Optimality (DO, Trommer, 2003b, 2002c, 2001, 2002b). With much of the literature DO uses underspecified vocabulary items spell out fully specified morphosyntactic features. With recent work in Minimalist Morphology (Wunderlich, 2003; Ortmann, 2002; Stiebels, 2002) it is assumed that the relation of morphosyntactic function and morphological spellout is mediated by optimality-theoretic constraints. With Distributed Morphology (Halle and Marantz, 1993), it is assumed that the input to morphology is the output of syntactic computation. Similarly to Aissen's approach, DO uses a linking schema to generate

constraints governing hierarchy effects. In contrast to Aissen's approach these constraints are not syntactic markedness constraints with a fixed ranking across languages, but morphological preference constraints for hierarchically higher categories which can be ranked differently in different languages. Linking of hierarchies and preference constraints follows the scheme in (1), where A, $A_1 \ldots A_n$ and $B_1 \ldots B_n$ are single features, and $S_1 \ldots S_n$ prominence scales over features:

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

Given the prominence scales in (2), the maximally simple instances of this schema in (3) result, which simply require realization of single higher ranked features:

(2) a. $\left\{ \begin{array}{l} \text{[+1]} \\ \text{[+2]} \end{array} \right\} >$ [+3]
b. plural $\succ$ dual $\succ$ singular
c. Nominative $\succ$ Accusative

(3) a. PARSE [PER]$^{[1]/[3]}$
b. PARSE [NUM]$^{[pl]/[sg]}$

However, (2) also licenses more complex constraints. Thus (4a) requires that the number feature of the head with the higher-ranked person feature is realized. Hence the hierarchy effect is not triggered by the surface features but by a distinct underlying feature of a different type (person instead of number). (4b) demands that the agreement features of an underlying 1pl head are realized in the context of a 3sg head. Here the constraint refers to two hierarchies at the same time (person and number). Finally, preference constraints can also implement preference for features which are unranked with respect to each other. This accounts for the fact that in some languages in some contexts 2nd person is ranked higher than 1st person while the opposite ranking seems to obtain in other contexts (4c,d):

(4) a. PARSE [NUM]$^{[1]/[3]}$
b. PARSE [AGR]$^{[1\ pl]/[3\ sg]}$
c. PARSE [PER]$^{[2]/[1]}$
d. PARSE [NUM]$^{[1]/[2]}$

Different rankings of features in specific contexts as in (4c,d) is a common trait of Algonquian languages where person clitics typically follow the preference 2nd $\succ$ 1st person while number agreement instantiates 1st $\succ$ 2nd person preference. (Trommer, 2003b,a; Wunderlich, 2003). Complex hierarchies as in (4b) are found in Yurok where 1pl is ranked over 2sg, but 2nd person is ranked above 1sg (Trommer, 2005) and Karok. Indirect effects of prominence hierarchies are attested in Dumi, where the person hierarchy partially governs realization of number features (Trommer, 2006c).

The effect of preference constraints gets only visible in contexts where other constraints demand suppression of agreement features. The most important constraints of this type are constraints which forbid the realization of more than two morphemes of a specific type. Thus, Turkana allows only one person prefix, and Menominee allows only one number suffix. Different constraint formats to this end have been proposed in Trommer (2003b) and Wunderlich (2003). Here I assume that the constraints prohibiting cooccurrence of affixes are the COHERENCE constraints which also govern specific aspects of affix order (Trommer, 2008a) and follow the schema in (5):

(5) **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.

A high-ranked COHERENCE constraint as in (6) now has the effect that surface structures as in (7a,b) , where only one index associated to a person affix is present are favored over (7c) where two affixes correspond to distinct underlying heads and hence bear distinct indices:

(6) COHERENCE [PERSON]

(7) a. $[+1]_1$
b. $[+2]_2$
c. $[+1]_1[+2]_2$

Whether (7a) or (7b) becomes optimal depends now on the relative ranking of the preference constraints PARSE [PER]$^{[2]/[1]}$ and PARSE [PER]$^{[1]/[2]}$ (and other preference constraints targeting expression of person). Of course it is also possible that both preference constraints are ranked higher than (6). In this case we get emergence of two-argument agreement in a language which otherwise allows only agreement with one argument. See Trommer (2003a) for instances of this phenomenon.

As shown in Trommer (2003a, 2006a), the interplay of COHERENCE and preference constraints also allows a straightforward account of direction marking in Algonquian. In Menominee, where direction marking follows roughly the hierarchy in (8), the only constant linking of grammatical role and agreement features consists in the fact that in direct forms (marked by *-a·*) the subject is always animate while in inverse forms (marked by *-eko*) the object is always animate.

(8) 1st/2nd person $\succ$ indefinite actor $\succ$ proximate $\succ$ obviative $\succ$ inanimate

This allows for the minimal characterization of direction markers as portmanteau agreement markers as in (9) (nominative and accusative are used as abstract case features here since menominee does not show morphological case on noun):

(9)
-a· : [+Nom +an] [+Acc]
-eko : [+Nom] [+Acc +an]

Under this representation the distribution of direction markers follows directly from COHERENCE restricted to portmanteau agreement, and constraints according to the schema in (1) targeting the feature [+animate] and requiring preference along the hierarchy scales in (8). (10) illustrates this point with transitive forms involving 1st and 3rd person arguments:

(10) **Input:** $[+\text{Nom} +1 \textbf{+an}]_1$ $[+\text{Acc} +3 \text{ -obv } +\text{an}]_2$

		PARSE $[+\text{an}]^{[+1]/[+3]}$
a. ☞	*-a·*:$[+\text{Nom}\textbf{+an}]_1[+\text{Acc}]_2$	
b.	*-eko*:$[+\text{Nom}]_1[+\text{Acc}+\text{an}]_2$	*!

(11) **Input:** $[+\text{Nom} +3 \text{ -obv } +\text{an}]_1$ $[+\text{Acc} +1 \textbf{+an}]_2$

		PARSE $[+\text{an}]^{[+1]/[+3]}$
a.	*-a·*:$[+\text{Nom} +\text{an}]_1$ $[+\text{Acc}]_2$	*!
b. ☞	*-eko*:$[+\text{Nom}]_1[+\text{Acc}\textbf{+an}]_2$	

Wunderlich (2003) assumes a system which like Trommer (2003b) captures HBC by ranked PARSE constraints, while possible rankings are restricted by universal hierarchies. The formal details are still to be worked out.

1.2 Eigene Vorarbeiten

1.2.1 Theoretical Work

Trommer (2003g) discusses hierarchy effects, and explores the range of crosslinguistic variation in this area. The dissertation also develops the notion of 'spellout domains' as rough syntax-based equivalent of the traditional concept 'morphosyntactic word' which functions as the locality domain for hierarchy effects. Trommer (2002b) and Trommer (2003e) develop a general approach for linking hierarchies and spellout constraints. Trommer (2003c) explores the interaction of these constraints with a specific constraint on number neutralization crosslinguistically, and Trommer (2008b, 2006c) argues that constraints governing hierarchy effects can also apply in bigger domains which are equal or derived from syntactic chains. Different locality domains for morphologically conditioned allomorphy are developed in Trommer (1999) and Trommer (2002d). Trommer (2002a) applies the same formalism to case hierarchy effects in free relative constructions. The dissertation (Trommer, 2003g) further develops the idea that HBC is caused by specific constraints restricting agreement to a single argument. In Trommer (2003g, 2006c), these constraints are identified with COHERENCE constraints which are independently motivated by their impact for affix order restrictions. Trommer (2008b) provides empirical and conceptual counterevidence against the widespread claim that 3rd person must be formally represented as the lack of person features showing that approaches reducing hierarchy effects to structural factors are problematic.

1.2.2 Empirical Work (Algic and Kiranti)

Trommer (2003g) already treats in depth the hierarchy effects in one Kiranti language, Dumi, more principled discussions of Dumi can be found in Trommer (2006c) and Trommer (2003g). The dissertation and subsequent papers (Trommer, 2003a, 2006c, 2005) treat most aspects of hierarchy effects in the Algonquian language Menominee. Other Algic languages which are discussed in the thesis are Yurok, Ojibwa, Cree and Potawatomi. An exhaustive analysis of Yurok is given in Trommer (2008b) and Trommer (2002a) contains a short account of the Shasta data.

2 Ziele und Arbeitsprogramm

2.1 Ziele

2.1.1 Theoretical Goals

The major goal of this project is to explore in detail the possible range of hierarchy effects in agreement systems. Kiranti and Broader Algic exhibit extensive microvariation in this area across different dimensions:

- The same language invokes different hierarchies in different domains (e.g. Dumi shows evidence for a pure number hierarchy in inverse marking, but a mixed person/number hierarchy in HBC; Trommer, 2006c).
- Different related languages or dialects show different hierarchies in the same domain (e.g. one group of Cree dialects exhibits the ranking $1 \succ 2$ for number suffixes, while another group shows $2 \succ 1$; Anderson, 1992)
- The same dialects shows morphological variants according to different types of hierarchies (e.g. Camling suffix agreement in $2 \rightarrow 1$ clauses is either governed by the person hierarchy $1 \succ 2$ or the number hierarchy non-singular $\succ$ singular resulting in free variation of different forms; Ebert, 1997).
- The extent of hierarchy effects differs significantly. Thus Yamphu (Rutgers, 1998) and Arapaho (Salzmann, 1963) seem to show emergence of two argument-agreement in many places where other Kiranti and Algonquian languages obey a hierarchy-based restriction to agreement with one argument.

Main parameters of macro-variation lie in case marking on nominal arguments which is observable throughout Kiranti, but systematically absent in Algonquian, and the role of direction marking which is much more peripheral in Kiranti languages than in Algonquian.

The project focuses on four specific interrelated areas: Number hierarchies, the interaction of different hierarchies, non-canonical hierarchy effects, and morphosyntactic domains of hierarchy effects.

Number Hierarchies Bickel (1995) and Ebert (1994) claim that direct/inverse marking in Belhare and Camling obeys the hierarchy 1st/2nd Person $\succ$ 3rd Person Singular $\succ$ 3rd Person Non-Singular (see also Comrie, 1980b, on similar effects in Paleosiberian). In contrast to this position, Macaulay (1992) and Trommer (2008b) (based on Robins, 1958) describe agreement systems in Yurok and Karok where plural is more prominent than singular. Trommer (2006c) argues that in at least one Kiranti language, Dumi, plural and dual are ranked higher than singular in HBC.

The goal of this project part is to re-examine both claims on the basis of a richer data base and to establish clear generalizations on prominence effects based on number. This area is of crucial relevance for a general theory of hierarchy effects, since there are arguments for both views. Thus Bickel (1995:84) claims that the hierarchy relevant for Belhare verb agreement rests on "referential closeness to the speaker or empathy" in the sense of Kuno (1987) which is supposed to motivate that 1st person (the speaker) is more prominent than 2nd and 3rd person (non-speakers). Similarly, it is argued that singular is "closer" to the speaker (as a single individuum) than plural and dual (denoting groups, cf. also the concept of an "indexability"

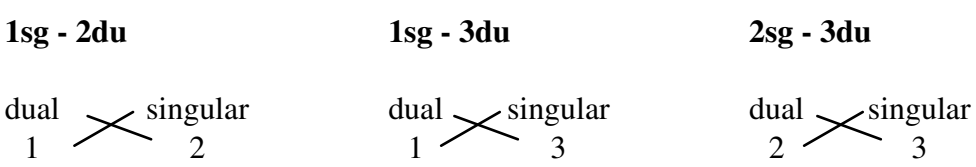
hierarchy (Bickel and Nichols, 2007) which makes the same prediction). However, the general typology of morphosyntactic markedness points into the opposite direction: Plural and dual are generally more marked (e.g. expressed by affixes in contrast to zero in singular, or expressed by phonologically more complex affixes than singular). This reflects the asymmetry of 1st and 2nd person which are usually marked by affixes in contrast to shorter or zero affixes for 3rd person. If morphosyntactic markedness is a criterion for prominence and 1st person is more prominent than 3rd person, we would expect that non-singular is more prominent than singular. The study of Kiranti and Algic seems especially promising to determine whether the universal ranking Singular $\succ$ Non-Singular, the opposite ranking or no universal ranking at all can be established, since both language groups show extensive evidence for effects of number (cf. the languages cited above), and claims for both hierarchies in some of these languages can be found in the literature.

A further open question is the position of dual in a number hierarchy. While this question has been hardly addressed in the literature, the results reported in Cowper (2003) and Trommer (2006c, based on Dumi) suggest that dual is in-between singular and plural in prominence. Again, this question has important consequences for the general theory of markedness and its relation to hierarchy effects since dual marking occurs only in languages which also have plural marking, which has been taken as evidence by Harley and Ritter (2002) that dual is more marked than singular (hence in the terms adopted here: should be more prominent). While Algic does not have dual marking, dual is a pervasive feature in Kiranti and hence this subproject promises to convey substantial new evidence in this area. An open question which has to be explored is the range of formal hierarchy effects triggered by number hierarchies. As noted above, both HBC and direction marking related to number have been reported. Since inverse morphology is usually interpreted as marking the fact that two prominence hierarchies do not align (e.g. the person hierarchy and the hierarchy of grammatical roles or case relations), one might speculate that the non-alignment of person and number could also be expressed morphologically. For example, if in a transitive clause the subject or object is 1st person singular and the other argument 3rd person plural, the first argument is higher for person and the second one for number (assuming the prominence hierarchy plural $\succ$ singular). Thus we might expect that languages mark scenarios of this type while they leave a constellation unmarked (or mark it with a different marker) where one argument is 1pl and the other one 3sg, hence the same argument is more prominent for both hierarchies.

A marker of this type seems to exist in the Kiranti language Dumi: The suffix **-si** is used when one argument is 1st person singular and the other one is 2nd or third person dual, or if the subject is 2nd person singular and the object is 3rd person dual. Assuming that Dumi roughly follows the hierarchies in (12), all of these contexts are person-number inverses:

(12) a. $1 \succ 2 \succ 3$
b. $\text{pl} \succ \text{du} \succ \text{sg}$

(13) **Number Inverse**



-si is also used in two other contexts where both arguments have obviously equal person prominence: a) if both arguments are 3rd person and dual b) if both arguments are 3rd person, one

is singular and the other one is dual.

However, it is also common in standard direction marking systems that transitive configurations with two equally prominent arguments are treated as inverse. For example in Turkana (Dimmendaal, 1983; Trommer, 2003f) inverse marking applies also if both arguments of a transitive clause are SAPs. Similar number markers as in Dumi are also present in most Kiranti languages and at least in one language in Broader Algic (Kutenai). While the distribution of these markers differs widely in detail, they all share the property that they only occur in transitive forms and can not be easily analyzed as expressing features of a single argument, hence like direction markers they express in some way the relation of the arguments. The project will shed more light on the relation of these markers to number hierarchies.

The Interaction of Different Hierarchy Types Non-formal descriptions of hierarchy effects often state complex hierarchies such as in (1) (Macaulay, 1992 for Karok) which mix features of different types, hence of the person hierarchy in (14b) and the number hierarchy in (14c):

(14) a. 2pl $\succ$ 1st 2sg $\succ$ 3
b. 2/1 $\succ$ 3
c. pl $\succ$ sg

A major goal of the project is to determine the empirical extent of such hierarchy merging and its formal nature. The working hypothesis is that it derives mainly from the constraint schema cited in (1) which is generalized over different hierarchies. Notice that hierarchy merging seems to be in principle excluded in non-optimality-theoretic approaches to hierarchy effects. In Noyer (1992) it is claimed that person always outranks number even though both are present in the same overall hierarchy. In Béjar (2003) person and number are distinct feature bundles not interacting with each other. Both, broader Algic and Kiranti seem to provide a rich wealth of effects evidencing such hierarchies. In Yurok 1pl seems to outrank all other categories for HBC and inverse marking, resulting in roughly the hierarchy in (15):

(15) 1pl $\succ$ 2 $\succ$ 1sg $\succ$ 3

While here plural is conjoined with 1, not with 2, the same type of hierarchy conjunction takes place. A similar effect as in Karok obtains in the Northwest II dialect of Camling (Ebert, 1997), where 2pl and 2du subjects outrank 1sg objects, while otherwise agreement is strictly with the object. This can be stated by the hierarchy in (16):

(16) 1pl/du $\succ$ 2pl/du $\succ$ 1sg $\succ$ Objects

Note that it is unclear whether the preference for 2pl over 1sg is restricted to the case that the subject is 2nd person since preference for agreement with 2nd person objects is already independently predicted by the general preference for object agreement in the language. The mechanism of hierarchy conjunction predicts that all pairs and triples of the following simple hierarchies should conjoin:

(17) a. Person Hierarchy
b. Number Hierarchy
c. Case Hierarchy (Absolutive/Nominative $\succ$ Ergative/Accusative)
d. Role Hierarchy (higher argument $\succ$ lower argument)

Indeed, in Dumi and Athpare there is a prominence effect for 2nd person largely restricted to 2nd person objects indicating conjunction with the case hierarchy. In Tanoan, person is conjoined with role a constraint against the expression of number marking in contexts with two SAP arguments is overridden by prominence relations conjoining first or second person with either case (absolutive/nominative) or grammatical role (subject) (Trommer, 2003e).

A second type of interaction between different hierarchies which is naturally predicted by an optimality-theoretic grammar is the conflict between preference constraints related to different hierarchies. Thus, assuming the constraint ranking in (18) it is predicted that agreement with first person is always preferred over agreement with third person. However, agreement with a plural over a singular argument has precedence if both arguments are third person or one is third and the other 2nd person.

(18) PARSE 1/3 $\gg$ PARSE PL/SG $\gg$ PARSE 2/3

This pattern is in fact attested in Dumi (Trommer, 2006c) and provides strong evidence for expressing the effects of hierarchies by atomic binary constraints. However, this approach predicts a great range of variability in this area and a main goal of the project is to explore whether this variation space is indeed realized in single languages.

The status of non-canonical person prominence A core tenet in research on person hierarchies is the assumption that SAPs are more prominent than 3rd person. Most authors also claim that 1st person is generally ranked above 2nd (Noyer, 1992) or that 2 $\succ$ 1 while in principle possible is at least the more marked variant of prominence among SAPs. Thus, the canonical instances of person prominence according to the literature are the ones in (19):

(19) Canonical: 1 $\succ$ 3 Canonical: 2 $\succ$ 3 Canonical: 1 $\succ$ 2

The topic of this project part are the non-canonical prominence relations in (20):

(20) a. Non-Canonical: 2 $\succ$ 1
b. Non-Canonical: 3 $\succ$ non-3

As already discussed above, both types of non-canonical prominence can be observed in Algonquian. (20a) is the pattern found in the clitic system of all Algonquian languages, (20b) is present at least in a number of them (Menominee, Trommer, 2003a; Cree, Dahlstrom, 1986). Recall that non-3 does not stand for 1st and 2nd person markers, but for affixes marking SAPs, but not the 1st/2nd person distinction. Thus, I assume that the relations in (20) are non-canonical only in the sense of being currently less documented while the following relations are genuinely impossible:

(21) a. Impossible: 3 $\succ$ 1
b. Impossible: 3 $\succ$ 2
c. Impossible: non-3 $\succ$ 3

The goal of this project part is the documentation and analysis of the non-canonical patterns in (20). Trommer (2003g) shows that the prominence of 2 over 1 plays a crucial role in participant reduction of some Tanoan languages, where number of 2nd person, but not of 1st person arguments is retained. Thus 2 $\succ$ 1 is not restricted to Algonquian. In Shasta, an extinct Hokan language of Northern California (Conathan, 2002; Trommer, 2002b), agreement is usually with the suffix. However, if the subject is 3rd and the object 2nd person, 2nd person agreement prevails. While this does not directly show that 2nd person is more prominent in the language,

the prominence relation 3 $\succ$ 2 seems to be more important than 3 $\succ$ 1 which is incompatible with a strict hierarchy 1 $\succ$ 2 $\succ$ 3. Similar evidence can be found in the other South-Californian languages: In Yurok, 3 $\succ$ 2 forms take always inverse marking and object agreement while for 3 $\succ$ 1 both phenomena only obtain under specific conditions (plural subject or object). In Karok, the highest-ranked category for inverse and HBC seems to be 2nd person plural (cf. the discussion of prominence conjunction in section 4.2) over 1sg and 1pl.but strong evidence for prominence ofd 2nd person over 1st can also be found in Kiranti languages, most clearly in the Southeast dialect of Camling (Ebert, 1997). In this dialect verbal number agreement is always with a second person argument if one is present (and additionally with a 3rd person object in some cases). 1st person agreement only outranks 3rd person agreement.

Preference for 2nd person is also found in one variety of the Northwest dialect of Camling, where there is a general preference for object agreement. However in 2 du $\succ$ 1sg and 2pl $\succ$ 1sg forms subject agreement prevails. Here person preference for 2 is linked to number preference for non-singular over singular, but the phenomenon is restricted to 2nd person. Thus there is no comparable reversal of agreement for 3 $\succ$ 1 forms.

In Athpare 2nd person prominence emerges with objects. While preference for ergative agreement outranks agreement with 1st person objects, 2nd person object agreement is maintained. Interestingly 2nd person agreement is suspended for singular subjects which suggests again an interaction of number and person hierarchy effects: Taken together, Kiranti seems to provide an overwhelmingly rich testing ground for the prominence of 2nd over 1st person which is often regarded as a strange idiosyncrasy of Algonquian. The very fact that this language family seems to provide so many structurally different instances of this effect, is evidence that ranking of 2nd over 1 st person is not due to single historical accidents in the development of inflectional systems. If these effects can be verified in detailed analyses of the cited and other language, this would mean a major step forward in the understanding of the symmetry between 1st and 2nd person in hierarchy effects.

Morphosyntactic Domains of Hierarchy Effects The most local interpretation of hierarchy effects to be found in the literature is the claim that they apply at single heads at vocabulary insertion (Noyer, 1992). The most global interpretation found is that these effects are of strictly syntactic nature and hence only restricted by general restrictions on syntactic locality (Béjar, 2003). The goal of this project part is to evaluate new morphological and syntactic evidence for the relevant locality domains under the working assumption that local and non-local domains of hierarchy effects are not necesarily mutually exclusive, but may coexist and interact with each other.

A major question to be adderessd in the project is to which degree HBC and direction marking correlate with syntactic factors. Thus Bruening (2001) shows that specific inverse marking configurations in Passamaquoddy (clauses with a 3rd person obviative subject and a 3rd person proximate object) correspond to syntactic movement of the object above the subject as evidenced by variable binding and provides tentative statistic results consistent with a correlation of inverse marking and word order. However it is unclear whether these observations are due to the obviation system of the language which is restricted to 3rd person arguments or inherently related to the inverse because other constellations (e.g. clauses with two SAP arguments) cannot be subjected to the same syntactic tests. Similar problems hold for most of the empirical arguments in favor of a syntactic account of inverse marking in Algonquian (e.g. Rhodes, 1976; Jolley, 1981). An important empirical goal of the project is to examine syntactic correlates of inverseness in Kiranti, a language family which exhibits similar morphological structure as Algonquian, but much less clear-cut direct-inverse marking and no grammatical-

ized obviation system. Specifically the project will investigate whether there are significant correlations between different types of inverseness and HBC to basic syntactic properties such as word order, case marking and quantification. Since documentation of syntactic patterns for Kiranti is very scarse this goal can only be achieved through retrieving data by additional fieldwork.

Typologically, Wunderlich (2005a) argues that direct/inverse morphology correlates with the absence of well-known diagnostics for subject-object asymmetries. Wunderlich shows that Cree lacks many of the typical morphosyntactic reflexes of this asymmetry such as overt case marking and weak crossover. In turn the lack of case marking on nominal arguments seems to correspond to the lack of case distinctions in agreement affixes closely linked to HBC in Algonquian languages (cf. also the disussion of related facts in Quechuan dialects; Wunderlich, 2005b). Again the project promises a better understanding of the extent of these correlations from lesser studied such as Arapaho where many of the original direction markers seem to have evolved into case-specific agreement affixes (Salzmann, 1963) and the Kiranti languages with an elaborate case marking on nouns, but a HBC similar to the one of the Algonquian type.

Even at a purely morphological level there is evidence that hierarchy effects appear partially in strictly local contexts, and partially in larger contexts roughly equivalent to the clause. Thus Trommer (2006b) shows that while most coccurence restrictions and preference constraints in the HBC system of Menominee hold for local clusters of string-adjacent clitics or agreement affixes, the constraint against multiple instances of the feature [+/–3] and the preference of 2nd over 3rd person systematically apply across clitics and agreement even though these are separated by different grammatical words. Similar observations hold for Yurok (Trommer, 2005). Since these patterns in Yurok and Menominee become only visible once different paradigms are studied in detail, it is to be expected that comparable effects can be found in other Algic languages which shed further light on the nature and interaction of the relevant domains.

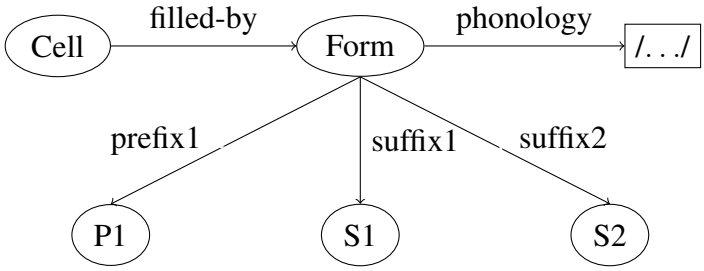
In addition to strictly syntactically defined domains abstract morphological features might also play a crucial role to determine domains of HBC. While it is by now firmly established that restrictions against multiple identical elements play a crucial role for establishing competition domains (Grimshaw, 1997; Nevins, 2006), it is argued in Trommer (2008a) that specific HBC effects in Dumi are restricted to affixes which are not related to case by syntactic case assignment or morphological specification. The study of closely related systems in the project promises a better understanding of the extent to which this and similar generalizations extend beyond the morphology of a single language.

2.1.2 Methodological Goals

At an abstract level hierarchy effects are cases of systematic partial syncretism (Stump, 2001), i.e. non-identical word forms which share one or more affixes: Direction marking implies that different transitive forms bear the same marker, and as far as agreement markers do not encode grammatical role or case, HBC manifests itself by transitive forms sharing markers with intransitive forms. Hence most instances of hierarchy effects under investigation in the project can be seen as a special instance of paradigmatic identity relations. The main methodological goal of the project is to develop an explicit representation of paradigms for typological data which allows to retrieve partial syncretism (and hence hierarchy effects) inside a single paradigm as directly as possible, and permits to evaluate structural commonalities and differences across paradigms of the same language or in different languages. This type of representation and storage of the typological data under investigation is a precondition for systematic and partially automatic access to the morphological patterns which are the basis for the theoretical investigation the project, but is also of more general interest for linguistic research linking morphological databases to theoretical research.

Paradigmatic data will be implemented by the Resource Description Framework (RDF; Manola and Miller, 2004), an XML-based representation language for the Semantic Web (Daconta et al., 2003; Antoniou and van Harmelen, 2004). In RDF, resources are linked through statements, i.e. triples of a subject resource, a property and an object resource. Paradigms can be represented as resources (subjects) linked to paradigm cells (objects) where specific location of cells (e.g. 1sg intransitive) is expressed as a property. Single Cells are linked to phonological and morphological structure as schematized in (22) (each arrow corresponds to an RDF statement, where the subject is the origin node of the arrow the object the goal node, and the property the arrow label). Cells are linked to forms which are independent resources specifying a full phonological form, but are also linked by a position class sequence to affixes, again represented as separate resources:

(22) **RDF-Representation of a Paradigm Cell**



Under this representation full syncretism (identity of full word forms) means that different cells are linked by the filled-by predicate to the same Form, while partial syncretism is a relation of Forms (and indirectly of cells) linked to identical affixes through the same position class predicate.

The use of RDF for the representation of paradigms promises maximal perspicuity of the representations, reusability of the data and compatibility with major initiatives for language documentation such as OLAC (http://linguistlist.org/olac/olac.html; Bird and Simons, 2003) and ROSETTA (http://www.rosettaproject.org/; Good and Hendryx-Parker, 2006)

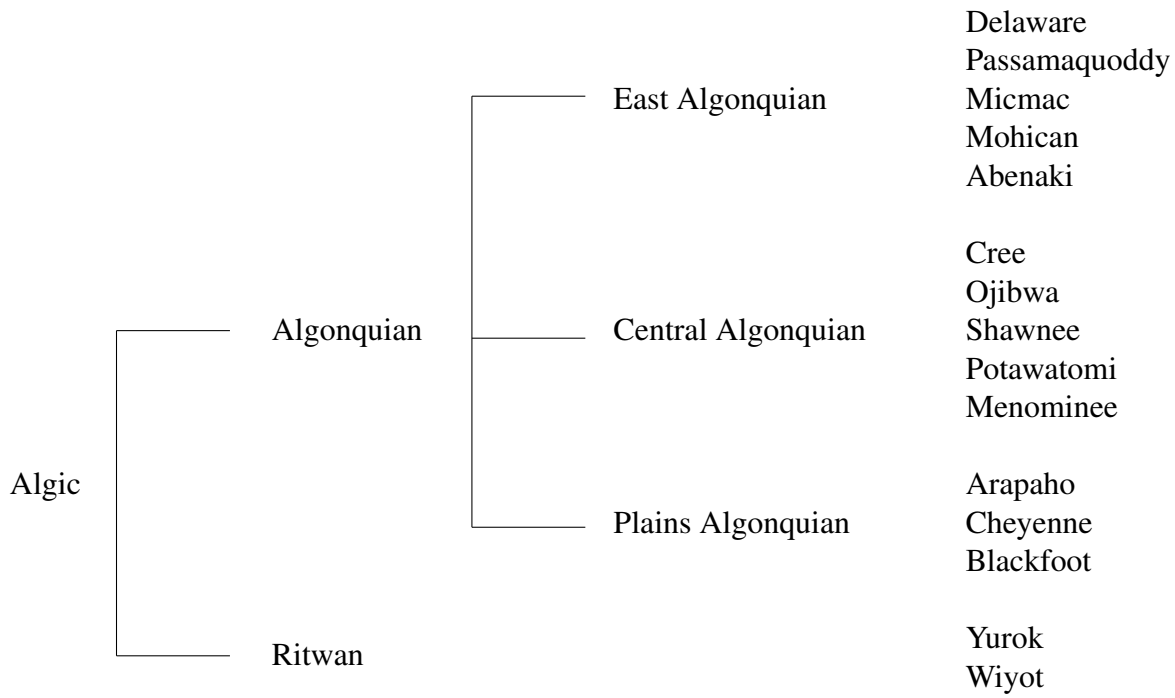
2.2 Arbeitsprogramm

The central aim of the project is to come to a deeper understanding of the phenomena discussed in section 2.1.1 by investigating agreement hierarchy effects in two unrelated language families, Kiranti and broader Algic. Thus, the project has two dimensions in that it investigates on the one hand microvariation inside these two families, and on the other hand large scale differences and commonalities between these families. In section 2.2.1, I will introduce these two language families, while section 2.2.2 describes the methods of data collection. Section 2.2.3 lays out the methods of data documentation, and section 2.2.4 provides a time line for the project.

2.2.1 The Empirical Domain

Broader Algic The Algic language family comprises besides Yurok and Wiyot the Algonqian languages which are among the most widely spoken Amerindian language families and which are (or were) spread over most of Northern America. (23) shows the standard grouping of Algic languages found in the literature Note that besides Algic itself, only the Algonquian languages as a whole, Ritwan and Eastern Algonquian have been shown to constitute genetic units, while the differentiation between the Plains and the central Algonquian languages is exclusively motivated geographically:

(23) **Algic languages**



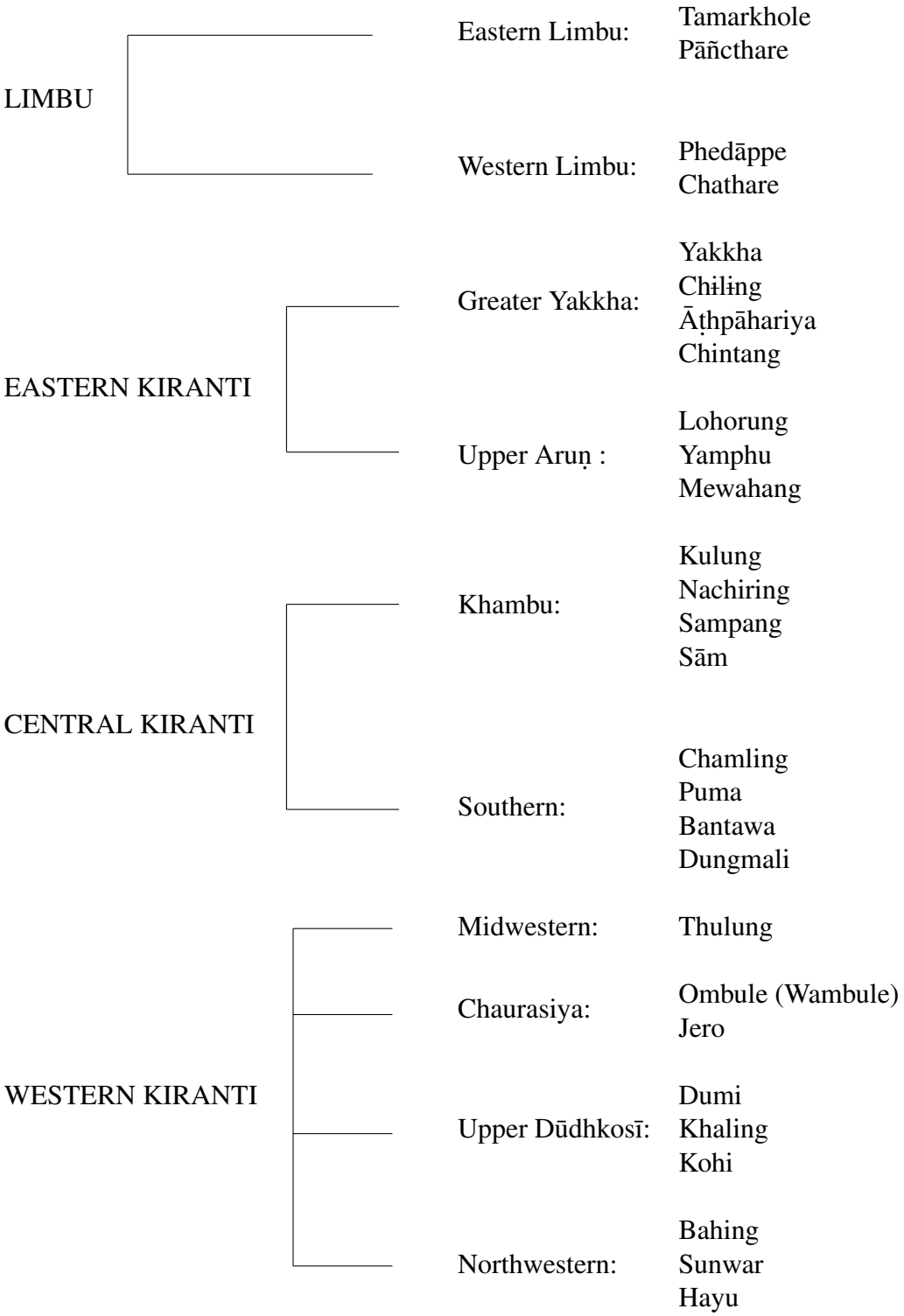
By the term "Broader Algic" I will informally refer to Algic plus a number of languages which are not genetically related to this family, but seem to be loosely areally related to it and to share basic hierarchy patterns with most Algic languages, namely Kutenai (a languages isolate spoken in parts of British Columbia, Montana and Idaho) as well as the Hokan languages Karok, Chimariko and Shasta (Northern California) which according to Conathan (2002) form

a type of Sprachbund with (Algic) Yurok. Algonquian languages have very simple segmental inventories, but a great wealth of morphophonological changes which make morphological analysis often intricate. They are generally characterized by features of typically polysynthetic languages (Jelinek and Demers, 1984; Baker, 1996): subject and object are cross-referenced on the verb, pronouns can be freely dropped, and word order is very free. Algonqian languages do not have any overt case marking, but an obviation system which marks arguments morphologically according to their topic status (Bloomfield, 1962; Hockett, 1966; Dahlstrom, 1986; Bruening, 2001). All Algonquian languages have basically the same inflectional structure: pronominal clitics usually prefixed to the verb, direction markers immediately following the verb, and several additional person- and number affix classes following direction marking (if present). Algonquian languages are well understood from a genetic and historical point of view. Single Algonqian languages and dialects differ highly with respect to the number of speakers and the status of language documentation: besides many completely extinct languages, there are languages which are spoken by thousands of speakers and documented in accurate detail (especially Ojibwa and Cree), while others are on the verge of extinction (e.g. Menominee and Abenaki) and without any up-to-date documentation. While Kutenai is still actively spoken by roughly a dozen elder speakers, all Northern Californian languages from Broader Algic are close to extinction.

Although Algonqian pronominal inflection plays a prominent role in current theoretical discussions (Anderson, 1992; Halle and Marantz, 1993; Dechaine, 1999; Bruening, 2001; Stump, 2001; Béjar, 2003; Bianchi, 2003), most analyses do not discuss the considerable differences between the single languages. In fact, treatments of Algonquian often give the impression that if an analyses applies to one language it extends automatically to all other Algonquian languages. Moreover, most theoretical analyses undersegment. Thus conjunct order data are mostly discarded as largely irregular portmanteau inflection without any connection to the independent order forms even if it has been shown that a largely parallel segmentation can be obtained (Bloomfield, 1962; Trommer, 2003g) .

Kiranti Kiranti languages are a subfamily of the Tibeto-Burman family and are spoken in the Eastern Himalayas (mainly in Nepal, but also in India and Bhutan). All Kiranti languages except Limbu (with 250 000 speakers) and Bantawa (roughly 35000 speakers) are spoken in small communities and are highly endangered albeit to different degrees. Of the roughly 30 Kiranti languages few are well-documented by grammars. The picture in (24) shows a tentative genetic grouping of some of the Kiranti languages following van Driem (2001) :

(24) **Kiranti**



Like Algonquian, Kiranti morphosyntax has the typical traits of polysynthesis with up to three prefix slots and up to five suffix slots. While case marking is complex in detail, it seems to follow a general ergative/absolutive pattern. It is hard to understand that the elaborate hierarchy-based system of Kiranti plays hardly any role in formal approaches to this topic. A possible reason might be that most monographs on Kiranti are completely restricted to morphology,

with few phonological information and hardly any treatment of syntax.

2.2.2 Data Collection

To obtain a representative sample of languages, the project will collect representative data from published and unpublished sources for around 12 languages from each language family (Kiranti and Broader Algic) equally distributed over the respective genetic subgroups (the "broad sample"). For a small number of languages from each family we will retrieve more detailed information to allow a more in-depth analysis ("the narrow sample").

Broad Sample Especially for Kiranti a major criterion for the choice of languages for the broad sample is whether there is substantial written language documentation material available. In addition to the published sources we will collect unpublished material (especially additional paradigms) from field researchers working on the respective languages. (25) contains the languages from Broader Algic which will be investigated (languages which are also in the narrow sample are in boldface). The Ritwan family contains only Yurok and Wiyot. Wiyot is not included because it seems to have completely eliminated all traces of hierarchy effects in inflection it has inherited from Proto-Algic:

(25) **Sample of Broader Algic**

Eastern Algonquian	**Passamaquoddy** Abenaki Micmac
Central Algonquian	**Menominee** Ojibwa Shawnee
Plains Algonquian	Arapaho **Blackfoot**
Ritwan	**Yurok**
Areally Related Languages	Kutenai Shasta Karok

(26) contains in the same format the Kiranti languages which will be investigated:

(26) **Sample of Kiranti Languages**

LIMBU	Eastern:	**Tamarkhole**
	Western:	Phedāppe
EASTERN KIRANTI	Greater Yakkha:	**Chintang**
	Upper Aruṇ:	Yamphu
		Mewahang
CENTRAL KIRANTI	Khambu:	Kulung
	Southern:	Chamling
		Puma
WESTERN KIRANTI	Chaurasiya:	Wambule
	Upper Dūdhkosī:	**Dumi**
	Midwestern:	Thulung
	Northwestern:	**Hayu**

For all languages in the sample, the following data will be retrieved:

- full paradigms of verbs as far as available
- (morpho-)phonological processes relevant for the proper segmentation of paradigms
- basic information on non-verbal inflection identical or related to pronominal agreement with verbs (e.g. nominal plural marking, pronouns, etc.)
- basic syntactic data which are (potentially) relevant for the agreement system (case marking, agreement with DPs which are not arguments of the agreeing verb, basic word order, extent of pro-drop)

The first point addresses the central data relevant for the project. Collecting different paradigms and phonological information (point 2) is important because in both language families it occurs that specific affixes become virtually invisible in specific verb classes or other environments due to morphophonological processes. Thus the Menominee 3rd person marker **-w** merges in many contexts with the **o** in the theme marker **-eko**. The 1st person marker **-ŋ** in Dumi only occurs overtly after vowel-final stems and is otherwise suppressed. The third point is crucial because especially in Algonquian nominal and verbal inflection are so closely related that a proper understanding of the morphology is only possible if both subsystems are taken into account (Hockett, 1966; Dechaine, 1999; Trommer, 2008b). Finally, point 4 is indispensable for evaluating the interaction of morphology and syntax in the observed hierarchy effects which is especially important for analyzing the morphosyntactic domains of the effects (cf. section 2.1.1).

Narrow Sample For the languages of the narrow sample (printed in boldface in (26) and (25)), we will collect more detailed data on syntax and phonology, and especially in a systematic way full paradigms for members of all morphologically relevant subclasses of verbs, i.e. transitive and intransitive verbs, verbs of different morphological classes and of different phonological stem shapes.

The relevant material for the Algic languages seems to be in principle available through published sources and field-notes of researchers currently working on these languages, but the documentation status for Kiranti is much worse. While there is an extensive current research project (http://www.uni-leipzig.de/~ff/cpdp/index.html) which can provide all necessary information on Puma and Chintang, the written sources on Tamarkhole Limbu, Dumi and Hayu are very restricted. For these language no current fieldwork is carried out, relatively few paradigms are documented and there is fragmentary or no information on their syntax.

To fill this gap the project will conduct fieldwork on these three languages in close cooperation with Balthasar Bickel and the Department of Linguistics at Tribhuvan University (Nepal). The fieldwork will focus on the collection of additional paradigms, and necessary syntactic and phonological details, and will be carried out by research assistants trained at Tribhuvan University in fieldwork on Kiranti languages.

2.2.3 Data Documentation

To document the retrieved data the project will develop an RDF ontology for paradigms and – building on this ontology – an electronic database which contains the raw data (in IPA notation), the detailed phonological and syntactic information necessary for a proper analysis and possible morphological segmentations and annotations. Extraction from the sources and integration of the data in the database includes the following steps

- Extraction of basic morphological, syntactic and phonological information
- Standardization of transcriptions for raw data
- Morphemic segmentation and identification of syncretisms
- Digitalization of the results

These steps which will require a substantial part of the practical workload in the documentation part of the project will be carried out by student assistants.

The database will allow easy comparison of different analyses for the same language, but also of related morphological data in different languages, and will be published online after the completion of the project. Documenting data and segmentation together follows and extends recent practice in typological databases which also include raw data (e.g. the Surrey Agreement database, http://www.smg.surrey.ac.uk/ and the Autotype database; Bickel and Nichols, 2002)). Including different possible segmentations addresses the problem which is common in the inflection of polysynthetic languages that different possible segmentations which are a priori ignored by the analyst, but are important for the theoretical analysis which make it difficult to evaluate such analyses.

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