

# The syntactic structure of Locations, Goals and Sources

Marina Pantcheva\*

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## Abstract

In this paper, I argue for a decomposition of the Path head in the syntactic structure for directional expressions. Based on cross-linguistic data showing that different types of paths are of different complexity and, crucially, are subject to a morphological containment relationship, I propose a more detailed structure for directionals.

I adopt the orthodox view that Goal paths are built on top of a locative Place projection. However, I suggest that Source paths are built on top of Goal paths. This is evidenced by the morphological make-up of Source-denoting elements in a variety of languages, where the Source marker morphologically contains the Goal marker. Further, I explore the lexicalization of the decomposed Path structure I defend and test the predictions against the empirical domain of syncretisms between the spatial roles Source, Goal, and Location. I show that the decomposed Path structure and the lexicalization theory I adopt capture syncretism patterns that are widely attested among languages and ban those syncretism patterns that are unattested.

## 1 Introduction: cross-linguistic patterns of Location-Goal-Source syncretisms

All languages have one way or another to express location, goal of motion, and source of motion. However, languages differ regarding the way they encode the

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distinction between these three notions by spatial case affixes or adpositions.<sup>1</sup> In principle, there are five logical permutations:

- (1) a. **Location=Goal=Source** (L=G=S) – a language with this pattern has one single marker (be it a case affix or adposition) to encode location, goal of motion and source of motion, thus drawing no distinction between the three functions in the domain of the spatial phrase (e.g., Yucatec Maya *ich le-kaaha-o* ‘in/into/out of the box’ (Bohnenmeyer and Báez 2008)).
- b. **Location=Goal≠Source** (L=G≠S) – in this case, there is one marker which is ambiguous between location and goal of motion, and a second marker which expresses source of motion (e.g., Breton *war an daol* ‘on/onto the table’, *diwar an daol* ‘from the table’ (Ternes 1992)).
- c. **Location≠Goal≠Source** (L≠G≠S) – this is the pattern of languages that have a separate marker for each of the three notions (e.g., Indonesian *di Australia* ‘in Australia’, *ke Johor* ‘to(wards) Johor’, *dari Malaysia* ‘from Malaysia’ (Mintz 1994)).
- d. **Location=Source≠Goal** (L=S≠G) – in such a language the notions of location and source of motion are expressed by the same means, to the exclusion of goal of motion, which is encoded separately.
- e. **Location≠Goal=Source** (L≠G=S) – such a language has one marker that encodes motion, regardless of whether it is goal oriented or source oriented. Location is expressed by a different marker.

Interestingly, these five possible patterns are not proportionally distributed among languages. As a matter of fact, there is a clear skewing in favor of the first three. This asymmetry has been stated most concisely in Andrews (1985:97).

A particularly interesting tendency [...] is for certain groups of notions but not others to be expressed by the same marker in many different languages. Thus sometimes one finds the same NP-marker coding the Locative, Goal and Source roles [...], sometimes one finds Locative and Goal expressed by the same marker, with a different one for Source [...], and sometimes, as in Warlpiri, different markers are used for all three locative roles. But one doesn’t seem to find one marker used for Locative and Source, with a second for Goal; or one for Source and Goal, with a different for Locative.

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<sup>1</sup>I adopt a unified view of spatial case markers and spatial adpositions, assuming that they are merged in the same position in the syntactic tree (cf. van Riemsdijk and Huybregts 2002, Asbury et al. 2007).

Thus, according to Andrews, languages world-wide exhibit an inclination towards the patterns  $L=G=S$  (1a),  $L=G\neq S$  (1b) and  $L\neq G\neq S$  (1c), while the patterns  $L=S\neq G$  (1d) and  $L\neq G=S$  (1e) are unattested.

Andrews' generalization gains support from statistical data. For instance, Blake (1977) examines the aforementioned syncretism tendencies against a sample of Australian languages. In Appendix I, Blake lists the case forms for 115 Australian languages. Of those, 85 languages are listed as having all three spatial cases: Locative (encoding location), Allative (encoding goal of motion), and Ablative (encoding source of motion). A survey of these 85 languages reveals that 91% (77 languages) have a special form for each spatial case, that is, follow the pattern  $L\neq G\neq S$ . Nine percent (8 languages) have one shared case affix for Locative and Allative and a separate one for Ablative, exemplifying the pattern  $L=G\neq S$ . No language from this sample exhibits the patterns  $L=G=S$ ,  $L\neq G=S$  or  $L=S\neq G$ . Blake (1977:60) concludes that a Locative-Allative syncretism is a common phenomenon, in line with Andrews' (1985) observation.

The tendency for languages to lexicalize location, goal and source of motion according to the patterns in (1a), (1b), and (1c) finds further support in the typological study conducted by Noonan (2008). He examines the overall patterns of syncretism in 76 Tibeto-Burman languages. The results again show a very robust Locative-Allative syncretism (44 languages) — 58% of the examined Tibeto-Burman languages pattern according to the type  $L=G\neq S$ . The pattern  $L\neq G\neq S$  is represented by 25 languages (33%). Four percent (3 languages) use the same marker for all three functions, thus exemplifying the type  $L=G=S$ . There are however two languages (2,5%) that exhibit the pattern  $L\neq G=S$  and two languages (2,5%) that follow the pattern  $L=S\neq G$ , which goes against Andrews' generalization. Unfortunately, Noonan (2008) does not reveal the names of the languages in question, which hinders further investigation of the syncretism patterns in these languages.

It should be noted that the fact that none of the Australian languages surveyed by Blake (1977) and only 4% of the Tibeto-Burman languages studied by Noonan (2008) follow the pattern  $L=G=S$  does not refute Andrews' (1985) claim. The pattern  $L=G=S$  is said to be attested among languages spoken in Subsaharan Africa, in particular languages from the Niger-Congo family (Creissels 2006). Other examples for such languages are *Yucatec Maya* (Mayan) (Bohnenmeyer and Stolz 2006), *Nahuatl* (Uto-Aztecan) (Launey 1979), *Mapudungun* (isolate, South America) (Wälchli and Zuñiga 2006), *Lahu* (Lolo-Burmese) (Matisoff 2003), and 'Ala'ala (Oceanic) (Ross 2002).

In order to test Andrews' generalization, I studied the grammars of 53 languages comprising 22 genera (which in their turn represent 14 language families), as well as two language isolates (for more information see the Appendix). The

results confirm Andrews' generalization. More specifically, 28 of the languages I examined follow the pattern  $L \neq G \neq S$ , which constitutes 53%. The pattern  $L = G \neq S$  is represented by 34% of the languages. Thirteen percent of the languages in the sample syncretise all three spatial roles (pattern  $L = G = S$ ). Finally, no language exhibits any of the patterns claimed by Andrews to be unattested.

The typological study in Rice and Kabata (2007) takes a different perspective on the syncretism patterns, but still allows one to state some generalizations. Rice and Kabata take as a starting point the Allative marker (regardless of whether it is a case affix or an adposition) and examine what other functions it can have (for example, Locative, Ablative, Purposive, Benefactive, etc.). They examine the models of Allative syncretisms in 44 genealogically diverse languages. The upshot is that ten languages (23%) use the same marker for Allative and Locative (pattern  $L = G \neq S$  (1b)). Five languages (11%) use the same marker for the Allative, Locative and Ablative functions (pattern  $L = G = S$  (1c)).

The remaining 29 languages (66%) are the ones where the Allative marker is syncretic neither with Locative nor with Ablative. Since this study of syncretism patterns aims to answer the question which functions the Allative marker can express other than the Allative, no information can be retrieved as to whether Locative and Ablative can be syncretic to the exclusion of the Allative, that is,  $L = S \neq G$  (1d). Similarly, nothing can be said about languages in the sample that follow the pattern  $L \neq G \neq S$  (1c). Therefore, no conclusion can be drawn concerning the distribution of the 29 remaining languages between the patterns  $L \neq G \neq S$  and  $L = S \neq G$ .<sup>2</sup> Nevertheless, in the sample of Rice and Kabata (2007), there is not a single language that uses the Allative marker to express also the Ablative function, but has a separate Locative marker (i.e., the pattern  $L \neq G = S$  (1e)).

Table 2 summarizes the cross-linguistic lexicalization patterns, arranged according to their frequency. The numbers in the brackets show the actual number of languages: the first number is the number of languages that have the relevant pattern, the second number is the total number of languages included in the respective sample.

To conclude, from the five logically possible syncretism patterns in (1), only three seem to be widely attested, namely the ones in the shaded cells. This curious fact calls for an explanation. So far, the existing proposals regarding the syntactic structure of directional spatial expressions decompose them into a Path projection that dominates a Place projection. The Path head is the locus of various kinds of Path elements, for example Goal markers and Source markers. By dedicating the same syntactic position for both Goal and Source elements, these accounts

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<sup>2</sup>Following Andrews' generalization that the pattern  $L = S \neq G$  seems not to be found, I would guess that these 29 languages belong to the type  $L \neq G \neq S$ . However, this is a pure speculation and I am unwilling to take this as a reliable piece of data.

	Blake (1977)	Noonan (2008)	My sample	Rice and Kabata (2007)
L≠G≠S	91% (77/85)	33% (25/76)	53% (28/53)	—
L=G≠S	9% (8/85)	58% (44/76)	34% (18/53)	23% (10/44)
L=G=S	0% (0/85)	4% (3/76)	13% (7/53)	11% (5/44)
L=S≠G	0% (0/85)	2,5% (2/76)	0% (0/53)	—
L≠G=S	0% (0/85)	2,5% (2/76)	0% (0/53)	0% (0/44)

Table 1: Pattern of syncretism for the lexicalization of Location, Goal, and Source

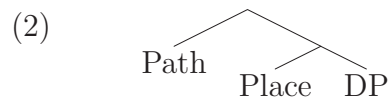
provide no insight as to why there should be such asymmetric syncretism patterns as already discussed. For instance, why would a locative Place marker tend to be syncretic exactly with a Goal element but not a Source element, when both directional elements are hosted by the Path head? It is the purpose of this paper to propose an answer to this question. I will argue for a decomposed Path projection and will show that such a syntactic structure is able to capture the cross-linguistic lexicalization patterns for Location, Goals, and Sources. In addition, I analyze the morphological composition of directional expressions in various languages and show how the structure I argue for accounts for the morphological make-up of spatial expressions across languages.

## 2 Decomposing directional expressions

### 2.1 Path versus Place

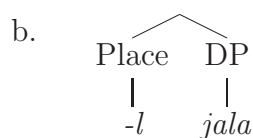
There have been numerous proposals concerning the syntactic decomposition of directional expressions into a Path head dominating a Place head. For instance, Koopman (2000) suggests that the structure underlying directional adpositional phrases in Dutch consists of a functional Path head combined with some projection of the Place head. Van Riemsdijk and Huybregts (2002) argue that the Path head (their *Dir*) and the Place head (their *Loc*) are syntactically diagnosable positions and have direct morphological counterparts in some languages. Den Dikken (to appear) and Svenonius (to appear), too, adopt the idea of two distinct heads in the syntactic structure of directional expressions: one for locative elements (Place) and one for directional elements (Path). All these accounts reflect Jackendoff’s (1983) conceptual structure for directional spatial expressions, where the function *PATH* dominates the function *PLACE*. Thus, there is a general consensus that the syntactic structure of directional expressions minimally consist of two heads: a Path head and a Place head. Abstracting away from other heads which have

been proposed to be part of the syntactic structure for spatial phrases, such as Koopman’s Deg<sub>Place</sub>, Den Dikken’s Deix head, or Svenonius’ AxPart head, the structure for directional expressions can be diagrammed as in (2).



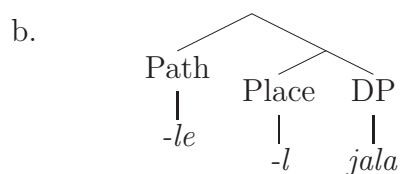
Direct evidence for such a structure comes from languages where directional markers morphologically contain locative markers. *Estonian* (Finnic) provides a clear example for such a superset-subset relationship between a directional expression and a locative expression. Consider the example in (3a) showing a noun marked by the Adessive case ending *-l* (glossed here as ‘on’) and the underlying syntactic structure in (3b) (data from Viitso 1998).

- (3) a. jala-l  
*foot-ON*  
 ‘on the foot’

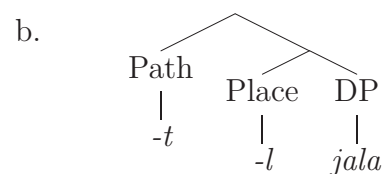


The corresponding Goal (Allative) and Source (Ablative) phrases in *Estonian* are derived by adding the case endings *-le* (glosses as ‘to’) and *-t* (glossed as ‘from’), respectively, to a noun marked by the Adessive ending *-l* (Viitso 1998).

- (4) a. jala-l-le<sup>3</sup>  
*foot-on-to*  
 ‘onto the foot’



- (5) a. jala-l-t  
*foot-on-from*  
 ‘off the foot’



A comparison between the syntactic structures in (3b), on the one hand, and (4b) and (5b), on the other hand, reveals that directional expressions are built on top of locative expression by adding to the locative structure the directional head

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<sup>3</sup>According to the orthographical conventions in *Estonian*, the double *ll* of the Allative ending is written as a single *l* leading to *jalale* ‘on the foot.’ Nevertheless, the Allative marker is morphologically decomposed as shown in (4) (Anna Tamm, p.c.).

Path. In a language like *Estonian* this is morphologically transparent, as there are dedicated morphemes (*-le* and *-t*) that lexicalize the Path head. This phenomenon is not limited to *Estonian* in particular. It is fairly common cross-linguistically and exhibited by genealogically diverse languages, as can be seen from Table 2 below.<sup>4</sup>

Language	Genus	Location	Goal	Source	Reference
<i>Garó</i>	Tibeto-Burman	<i>-o</i>	<i>-o-na</i>	<i>-o-ni</i>	Burling (2003)
<i>Lezgian</i>	Daghestanian	<i>-q<sup>h</sup></i>	<i>-q<sup>h</sup>-di</i>	<i>-q<sup>h</sup>-aj</i>	Haspelmath (1993)
<i>Mwotlab</i>	Oceanic	<i>l(V)-</i>	<i>a l(V)</i>	<i>m<sup>w</sup>ε l(V)</i>	Crowley (2002)
<i>Yanesha</i>	Arawakan	<i>-o</i>	<i>-o-net</i>	<i>-o-t<sup>y</sup></i>	Duff-Tripp (1997)

Table 2: Morphological containment of locative expressions inside directional expressions

To sum up, the fact that in many languages Goal and Source directional expressions morphologically contain locative expressions substantiates syntactic accounts which argue for a structure where a Path projection embeds a Place projection.

On the semantic side, one can find the same concept developed in the work by Zwarts (2005; 2006). Zwarts proposes a semantics for directional preposition which relates paths to locations. More specifically, Source prepositions are the ones that include the starting point of a path, termed  $p(0)$ , which can be either IN the reference object (for *out of*), ON the reference object (*off*), or AT the reference object (*from*). What all Source prepositions share is the property that they include the location in the starting point  $p(0)$ . Goal prepositions, on the other hand, include the end point of the path,  $p(1)$ , which is IN, ON, or AT the reference object (resulting in *into*, *onto* and *to*, respectively). The table below, which has been adapted from Zwarts (2005:759), gives a more perspicuous overview of the decomposability of the prepositions discussed in this paragraph.

The table can be summarized by saying that Source prepositions impose a locative condition on the initial part of the path, while Goal prepositions impose a locative condition on the final part of the path. In addition, Zwarts includes in the definition of Source and Goal prepositions a single transition from one

<sup>4</sup>There are, however, cases that seem to go against such a syntactic decomposition. As Sander Lestrade (p.c.) pointed out to me, the Hungarian Inessive case marker (*-ban/-ben*), encoding interior location, appears to be built on top of the goal-oriented Illative case (*-ba/-be*) by the affixation of *-n*. The same phenomenon of a locative expression morphologically containing a goal-directional expression is found with Hungarian spatial particles, e.g., *be* ‘into’ versus *be-nt* ‘in’ (Éva Dékány, p.c.), and also with Norwegian spatial particles, e.g., *inn* ‘into’ versus *inn-e* ‘in.’ These cases could be handled by the G-head proposed by Svenonius (to appear). The G-head is a syntactic manifestation of Cresswell’s (1978) G-function which turns a directional expression into a locative expression. I will, however, not go into details here, as the main contribution of this paper lies elsewhere.



		IN	ON	AT
Source Ps	p(0)	out of	off	from
Goal Ps	p(1)	into	onto	to

Table 3: Relation between Goal/Source paths and locations

spatial domain to a complementary spatial domain, following the intuition that they actually refer to a two-stage path structure, namely a negative and a positive phase (see also Fong’s 1997 treatment of directional expression, which are argued to encode a unique transition from a positive phase  $p$  to a negative phase  $\neg p$ , or vice versa).

Thus, a Goal path like *into the house* is visualized by Zwarts (2005) as in (6), where the plusses indicate locations in the house, and the minuses represent locations not in the house, that is, outside the house.

$$(6) \quad \begin{array}{cccccccc} - & - & - & - & - & + & + & + & + \\ 0 & & & & & & & & 1 \end{array}$$

With Source prepositions, we get the opposite pattern, where a negative phase follows a positive phase, (7). Hence, Source paths can be seen as reversed Goal paths (Zwarts 2006).

$$(7) \quad \begin{array}{cccccccc} + & + & + & + & + & - & - & - & - \\ 0 & & & & & & & & 1 \end{array}$$

The semantics proposed by Zwarts is clearly compositional and in line with the syntactic structures proposed by Koopman (2000), van Riemsdijk and Huybregts (2002), Svenonius (to appear), and den Dikken (to appear), where there is a Path head that takes as a complement a Place projection. Thus, if we are to make the syntactic and semantic analyses converge, it will be fairly obvious to state that the Path head encodes Goal or Source, while the Place head below it expresses an IN, ON or AT relationship between the Figure and the Ground. Put in other words, the IN/ON/AT bit is the semantic contribution of the Place head, while the semantic content of the Path head specifies whether the locative condition encoded by the Place head holds of the starting point  $p(0)$  or of the end point  $p(1)$  of the path.

## 2.2 Zooming in on Path: Goal versus Source

As can be seen from the data presented in the previous subsection, the morphological containment relationship observed to hold between directional expressions and locative expressions supports analyses arguing for a Path head dominating a



Place head. At first glance, there seems to be no such relationship between Goal expressions and Source expressions. For instance, there is no evident containment relationship between the *Estonian* Goal marker *-le* and the Source marker *-t*, as there is between the Adessive *-l* and the Ablative *-l-t*. In fact, in the majority of languages, Goal markers and Source markers appear to be equally complex (or simple), which implies the presence of a unique Path head in the directional structure accommodating both types of elements.

Importantly, there are some languages that suggest a different view. One such language is *Quechua* (Adelaar 2004, Faller 2007, Schmidt-Riese 2005), as illustrated in the example below.<sup>5</sup>

- (8) a. Kay nʸan-ga ayakučo-**man** ri-n.  
           *this road-TOP Ayacucho-ALL go-3SG*  
           ‘This road goes to Ayacucho’ (Adelaar 2004)  
       b. May-**manta-s** chay runa ka-n-man?  
           *where-ABL-REP this man be-3SG-COND*  
           ‘Where could this man be from?’ (Faller 2007)

In *Quechua*, the Allative (Goal) marker is the simple morpheme *-man*, while the Ablative (Source) marker is morphologically complex and consists of the Allative morpheme *-man* and the morpheme *-ta*. The same pattern is observed for a number of other unrelated languages. Those are presented in Table 4.

	<i>Jingulu</i> , Australian Blake (1977)	<i>Ingush</i> , Nakh Nichols (1994)	<i>Uchumataqu</i> , Andic Vellard (1967)	<i>Mansi</i> , Uralic Keresztes (1998)
Locative	<i>-mpili</i>	<i>-ǵ</i>	<i>-tá</i>	<i>-t</i>
Allative	<i>-ŋka</i>	<i>-ga</i>	<i>-ki</i>	<i>-n</i>
Ablative	<i>-ŋka-mi</i>	<i>-ga-ra</i>	<i>-ki-stani</i>	<i>-n-əl</i>

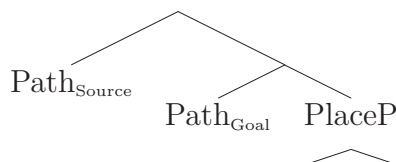
Table 4: Languages where the Ablative marker morphologically contains the Allative marker

So far, I haven’t encountered a language where the reversed relationships obtains, that is, a language where the Goal marker morphologically contains the Source marker. Thus, the data indicates that Source expressions are more complex than Goal expressions in that the former morphologically contain the latter, and not the other way around. Assuming that morphological complexity is indicative of syntactic structure, I suggest that the syntactic structure underlying

<sup>5</sup>Abbreviations in glosses are: 3 – third person or noun class; ABL – Ablative; ALL – Allative; COND – Conditional; LOC – Locative; PERF – Perfective; PL – Plural; REP – Reported speech; SG – Singular; TOP – Topic marker.

Source expressions embeds the syntactic structure for Goal expressions. This is represented by the tree diagrams in (9).

(9) a. Source phrase:



b. Goal phrase:



To phrase it in a different way, the fact that in a variety of languages Source expressions are built by adding a morpheme to an already constructed Goal expression provides evidence in favor of a hierarchical structure where Source paths are built on top of Goal paths.

### 3 Proposal

The conclusion from the last section is the gist of the proposal in this paper. Thus, I argue against the claim that, in the functional sequence for directional expressions, there is a unique Path head hosting directional elements, regardless of whether these elements have a Source-directional or a Goal-directional semantics. The claim I defend is that Source paths and Goal paths are structurally different. Specifically, Source paths are built out of Goal paths by merging an additional syntactic head. The syntactic structures for Locations, Goal paths and Source paths, which I propose, are then the following:

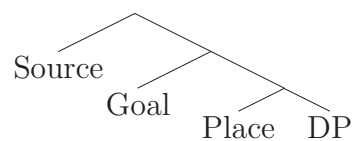
(10) a. Locations



b. Goal paths



c. Source paths



Under this analysis, the syntactic structure for Locations remains unaltered compared to other accounts (albeit simplified to a maximal extent for ease of exposition). Goal paths are built on top of Locations, which also complies with the dominant view. The innovation is that Source paths are built not from Locations, but from another path — a Goal path. I take this structure to be part of the invariant hierarchical total ordering of heads underlying all languages (the *functional sequence*, see Cinque 1999). Thus, Source paths are universally built on top

of Goal paths. In languages like English, this is obscured by the fact that the number of heads in the syntactic tree exceeds the number of morphemes lexicalizing it. That is, the Source preposition *from* in *from the house* is mono-morphemic, still it spells out the three heads Place, Goal and Source. I discuss the lexicalization of the structure in Section 4.1.

The question I turn to now is what role in the syntax each of the heads I have postulated has and how they can be motivated from the point of view of compositional semantics. In what follows, I lay out my proposal concerning the functions of the three heads.

Let us start from the simplest structure, namely a locative expression constituting a Place phrase. I make the orthodox assumption that the Place head encodes a spatial domain (in Zwart’s 2005, 2006 terminology).

Turning to Goal paths, I suggest that the role of the Goal head is to encode *transition* from one spatial domain to a complementary spatial domain (or from one phase, say,  $\neg p$ , to another phase  $p$ , in Fong’s 1997 terms). Given that the Goal head selects a PlaceP, the transition has to be a transition *to* the spatial domain encoded by the Place head. This, however, does not follow from the transitional semantics of the Goal head, so, a more detailed discussion is in order.

Under the assumption that the Goal head introduces the transition from one spatial domain to a complementary spatial domain (or  $\neg p \rightarrow p$ ), at first glance, it seems necessary to postulate that the second domain is the positive phase. This is needed in order to obtain a Goal path represented by Zwarts as  $- - - + + +$ . Thus, we have to ensure that the Goal head encodes a transition from  $\neg$ Place to Place. Without this additional restriction on the transition provided by Goal, the transition could be from Place to  $\neg$ Place. This, however, represents a Source path, visualized as  $+ + + - - -$ , and goes against the proposal that Source paths embed a Goal path.

It is very likely that this restriction falls out from universal cognitive grounds and hence, need not be stated separately. There has been established a natural bias to encode end-points (Goals) over starting points (Sources) in non-linguistic motion event representations (see Lakusta 2005, Assadollahi et al. 2006, and references therein). This perceptual and attentional asymmetry is reflected in language acquisition and adult language (Lakusta and Landau 2005). Thus, it is possible that the Goal path interpretation of a structure like [Transition [Place]] is due to this asymmetry in the cognitive system and not to the syntax-semantics itself. In other words, I suggest that the reason for the transitional head dominating PlaceP to be interpreted as Goal-oriented lies in the general extra-linguistic bias for goals.

There is enough linguistic evidence confirming the Goal bias. For instance, when a stative projection is embedded under a dynamic head, the former is interpreted as the result, or the end-point, of the latter. It seems to never be the

case that an embedded stative projection can be interpreted as the initiation, or starting point, of the dynamic head. A clear illustration is provided by resultative predications. As discussed by Hoekstra (1988), when a non-stative verb selects a small clause complement, the latter is interpreted as the consequence of the activity or process denoted by the verb. Thus, in *They painted the door green* the activity of painting the door leads to the door being green. Crucially, the small clause cannot be interpreted as the cause for the activity or process denoted by the verb. In other words, the sentence above cannot describe a situation where the door is green in some initial state and then changes its color to, say, red as the result of painting.

The same causal semantic relationship can be found in Ramchand’s (2008) semantic approach to event structure. Ramchand decomposes the verbal phrase into three subevents: an initiation head (*init*), a dynamic process head (*proc*), and a stative result head (*res*).



In this verbal decomposition we have a dynamic head (*proc*) dominating a stative projection (*res*). The two heads are semantically related to each other by means of a “leads-to” relationship and the stative head dominated by the process head is interpreted as the result of the process or change denoted by the *proc*, hence its name. I propose that we see the same mechanism in action in PPs. Thus, one can think of the Goal head as the spatial counterpart of the verbal *proc* head, denoting change. The PlaceP corresponds to the stative *res* head.

To sum up, the semantic content of the Goal head is that of a transition and due to the cognitive bias towards the encoding of Goals (end-points) over Sources (starting points), the location denoted by the Place head holds of the end-point of the path  $p(1)$ .

Let us now turn to the semantics of the Source head. Unlike the Goal head, the Source head does not apply to a stative location, but takes as a complement an already constructed path, namely a Goal path. A Goal path contains one transition (provided by the Goal head), hence it cannot be the case that the semantics of the Source head is transitional, as this would lead to a path with two transitions, and this is not a Source path.<sup>6</sup> What is, then, the semantic information that the Source head brings into the structure? A comparison between Goal paths

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<sup>6</sup>There exist paths with two transitions and these are the so called Route paths, e.g., *past the house*, represented by Zwarts (2005) as  $- - - + + + - - -$ . For a discussion of the syntactic structure of Route paths under the current framework, as well as other paths like unbounded paths, see Pantcheva (2008).

and Source paths shows that they are constructed in the same way, but are the mirror images of each other. In other words, Source paths can be seen as the opposite of Goal paths (as also discussed in Zwarts 2005; 2006). Therefore, I suggest that the Source head is the locus of a semantic reversal operation. Thus, the Source head just reverses the orientation of the path provided by the [Goal [Place]] configuration. More precisely, the Source heads assigns to each point  $i$  in the interval  $[0,1]$  the position that is assigned to  $1-i$  in the denotation of the Goal path, where 0 and 1 represent the starting point and the end-point of the path, respectively. In this way, the spatial domain encoded by the Place head (i.e., the positive phase) gets interpreted as the *starting point* of the path, leading to a path of the type  $+++--$ .

The reversal encoded by the Source heads resembles a negation function. In this sense, my proposal is similar to Arsenjević's (2006) treatment of Source phrases who analyses the so called Source modifiers (for instance Slavic spatial prefixes like *iz-* 'from') as being more complex than Goal modifiers and crucially involving negation of Goals. In the same line, Svenonius (2009) suggest that English Source particles like *out* and *off* are endowed by the feature *neg*, accounting for the observation that they license NPIs (which otherwise occur in the scope of negation).

To wrap up the discussion in this section, I proposed to decompose the Path head in the structure for directional expressions into two heads: a lower Goal head and a higher Source head. The semantics of the Goal head is dynamic and it expresses the transition *to* the spatial domain encoded by the Place projection. The semantic role of the Source head is to reverse the path expressed by the Goal phrase, thus resulting in a transition *from* the spatial domain encoded by the Place phrase.

## 4 Explaining the syncretisms

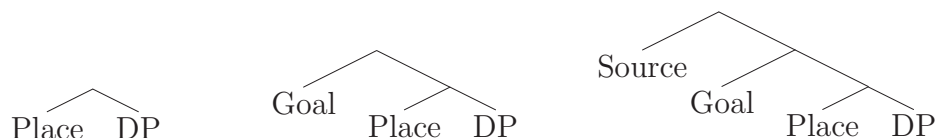
Let us now turn back to the syncretism patterns discussed in Section 1. Recall that from the five logically possible syncretism patterns, only three are attested, while the remaining two seem not to be found in languages. The patterns are repeated below from (1), re-ordered according to their frequency.

- (12)
- a. Location $\neq$ Goal $\neq$ Source ( $L\neq G\neq S$ )
  - b. Location=Goal $\neq$ Source ( $L=G\neq S$ )
  - c. Location=Goal=Source ( $L=G=S$ )
  - d. \*Location=Source $\neq$ Goal ( $L=S\neq G$ )
  - e. \*Location $\neq$ Goal=Source ( $L\neq G=S$ )

Given that these patterns have cross-linguistic validity, they should be derivable from the universal syntactic representation underlying each of the three spatial

roles, for which I presented evidence in the preceding sections.

- (13)    a.   Locations                    b.   Goal paths                    c.   Source paths



The current section is devoted to testing the predictions made by the structures in (13), in that I examine the possible ways for languages to exhibit each of the syncretism pattern in (12). Specifically, I show that if a particular view on lexicalization is adopted, the syntactic trees in (13) predict the syncretism patterns in (12) in that they allow for (12a-c) and ban (12d-e)

## 4.1 Lexicalizing the structure

Before proceeding to the detailed analysis of each syncretism pattern, it is important to state clearly the assumptions concerning the spell-out of the structures in (13) and, in general, the lexicalization of syntactic structure.

### 4.1.1 The Superset Principle and spell-out of non-terminals

First, I adopt the view that lexical items are inserted into the syntactic structure once its derivation has been completed. In other words, lexicalization of the structure is a post-syntactic operation, where the hierarchical structure built by syntax is supplied by the phonological features provided by the lexical item (Halle and Marantz 1993; 1994).

Further, I assume that lexical items (free and bound morphemes) are stored in the lexicon as a pairing of a phonemic string (phonological exponent) and a set of grammatical features (Halle 1997). The grammatical feature specification of a given lexical item determines which heads in the syntactic structure it can lexicalize. Thus, syntax is concerned only with the grammatical features of a lexical item and the phonological form of the item is irrelevant.

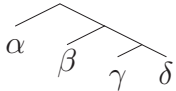
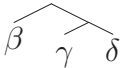

In addition, I assume that a single lexical item can lexicalize more than one terminal in the syntactic structure (Starke 2007, Neeleman and Szendrői 2007, Caha 2008; 2009, Ramchand 2008, Abels and Muriungi 2008, Taraldsen 2009). Thus, there is no one-to-one correspondence between lexical items and heads in the syntactic structure, as a single lexical item can lexicalize a larger chunk of structure. This can be achieved in various ways: by multi-attachment of a single lexical item to multiple terminals (Ramchand 2008), by “spanning” where one

lexical item lexicalizes a whole stretch of syntactic structure (Svenonius 2009, Taraldsen 2009), or by phrasal spell-out which lets lexical items spell out non-terminal nodes (Starke 2007, Neeleman and Szendrői 2007, Caha 2008; 2009). In this paper, I will employ phrasal spell-out, but the data discussed here are consistent with any of these options.

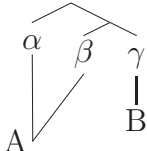
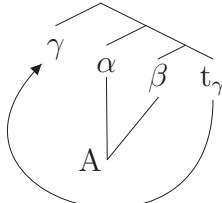
Finally, I assume that lexicalization is governed by the so-called *Superset Principle*, stated below:

- (14) *Superset Principle* (originally proposed by Michal Starke in unpublished work, formulation of Caha 2009):  
A phonological exponent is inserted into a node if its lexical entry has a (sub-)constituent which matches that node.

Matching a node means that the lexical entry is identical to it. Thus, a lexical item A with the features  $\langle \alpha, \beta, \gamma, \delta \rangle$  can spell out all the structures below, as they are all (sub-)constituent of the structure A is specified for.

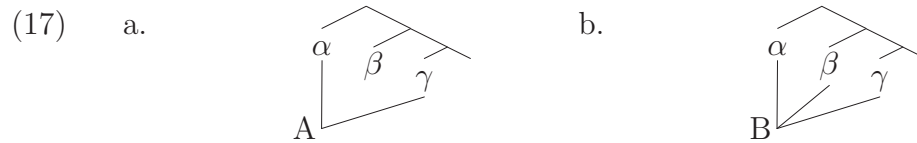
- (15) a.  c.  e.   
b.  $\alpha$  d.  $\beta$  f.  $\gamma$   
g.  $\delta$

Matching ignores traces and spelled out constituents (Caha 2009). A node can thus be rendered invisible for the matching procedure if it gets lexicalized by a matching lexical item, or moved. For illustration, a lexical item A specified with the features  $\langle \alpha, \beta, \gamma \rangle$  can lexicalize the syntactic structure in (16) only if  $\gamma$  has been spelled out, for instance, by B with the feature  $\langle \gamma \rangle$ , (16a), or if  $\gamma$  has moved out, (16b).

- (16) a.  b. 

Since, under the Superset view, lexical items are seen as a pairing between phonological information and a chunk of syntactic structure, it follows that a lexical item cannot “straddle” syntactic heads. That is, the structure in (17) cannot be lexicalized by an item A with the features  $\langle \alpha, \gamma \rangle$ , but it can be legitimately spelled out by an item B with the features  $\langle \alpha, \beta, \gamma \rangle$ , as B covers all the terminals in-between the lowest and the highest one.





At first glance, the *Superset Principle* seems to be similar to the *Subset Principle* of Distributed Morphology, so it is important to highlight the differences between them.

(18)    *Subset Principle* (Halle 1997):

The phonological exponent of a Vocabulary item is inserted into a morpheme in the terminal string if the item matches all or a subset of the grammatical features specified in the terminal morpheme. Insertion does not take place if the Vocabulary item contains features not present in the morpheme.

The two principles are different in a crucial way. In a lexicalization governed by the Superset Principle, insertion of a lexical item into a node takes place if the lexical item is specified for a *superset* of the features expressed in the node, while under the Subset principle insertion takes place if the lexical item is specified for a *subset* of the features expressed in the node. Further, under the Superset Principle, insertion does not take place if the node contains features that the lexical item is not specified for, while the Subset Principle says that insertion doesn't take place if the lexical item is specified for features that are not contained in the node.

This means that, under the Subset view of lexicalization, a lexical item need not be specified for all the grammatical information contained in the node it spells out. The Superset-driven lexicalization, however, takes a different stand on the matter. Under the Superset view, underspecification of lexical items is disallowed. That is, each feature contained in a node must be spelled out. This is also the hunch behind the *Exhaustive Lexicalisation Principle* of Ramchand (2007) and Fábregas (2007), stating that each feature in the syntactic structure has to be lexicalized, otherwise the structure is ill-formed.

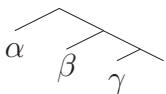
#### 4.1.2 Fine-tuning insertion

In this subsection, I discuss some additional restrictions on lexical insertion and discuss how the competition between lexical items is regulated.

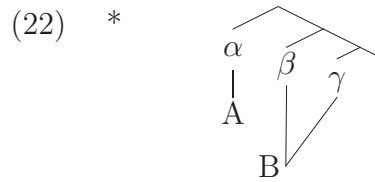
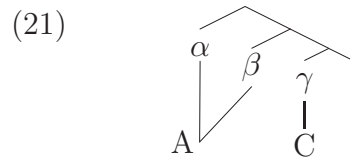
##### 4.1.2.1 The Anchor Condition

An important restriction on the spell-out of non-terminals is the condition that a lexical entry can replace only syntactic structures that include its lowest feature,

as defined by the functional sequence (Abels and Muriungi 2008). In other words, lexical entries are “anchored” at the bottom to a particular node in the syntactic structure. To illustrate how this *Anchor Condition* regulates lexicalization, consider the syntactic structure in (19) and the lexical items in (20), where A and B overlap in that they share a common feature  $\beta$  (for a more detailed discussion of the *Anchor Condition*, I refer the reader to Caha 2009).

- (19)  (20) a.  $A < \alpha, \beta >$   
b.  $B < \beta, \gamma >$   
c.  $C < \gamma >$

There are two possible ways for the structure in (19) to be spelled out by the given lexical items.



The lexicalization in (22) is, however, banned by the *Anchor Condition* because the lowest feature of the lexical item A is not matched against the syntactic structure. Thus, the structure in (19) is spelled out as A+C and not as A+B.

#### 4.1.2.2 Minimize junk

The *Superset Principle* allows for there to be more than one lexical item that match a given syntactic structure and therefore can lexicalize it. The rule to regulate such cases is stated in (23).

(23) **Minimize Junk:**

When two lexical items meet the conditions for insertion in a given node, the item with the fewest features not contained in the node gets inserted.

In other words, this rule says that when two lexical items are in competition to spell out a given syntactic structure, the one which wins is the one which contains fewest superfluous features (i.e., junk). The *Minimize Junk* rule is, in fact, derivable from an independent principle, namely the *Elsewhere Condition* as formulated in Kiparsky (1973).

(24) *Elsewhere Condition* (Kiparsky 1973:94)

Two adjacent rules of the form

$A \longrightarrow B / P\_ \_ Q$

$C \longrightarrow D / R\_ \_ S$

are disjunctively ordered if and only if:

- a. the set of strings that fit  $PAQ$  is a subset of the set of strings that fit  $RCS$ , and
- b. the structural changes of the two rules are either identical or incompatible.

Put informally, the *Elsewhere Condition* says that whenever we have two rules — one which applies in a more *general* case, and another one which applies in a more *specific* case — the specific rule blocks the general rule from application (unless, of course, the two rules have nothing to do with each other, and this is what (24b) is about).

An alternative way to formulate the same principle is provided by Neeleman

and Szendrői (2007).

(25) *Elsewhere Principle* (Neeleman and Szendrői 2007):

Let  $R_1$  and  $R_2$  be competing rules that have  $D_1$  and  $D_2$  as their respective domains of application. If  $D_1$  is a proper subset of  $D_2$ , then  $R_1$  blocks the application of  $R_2$  in  $D_1$ .

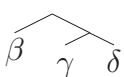

The *Minimize Junk* rule is simply an implication of this principle. Consider, for an illustration, the following lexical items with the respective feature specifications:

- (26) a.  $A: \langle \beta, \gamma, \delta \rangle (R_1)$   
 b.  $B: \langle \alpha, \beta, \gamma, \delta \rangle (R_2)$

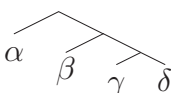
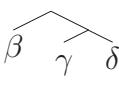

And the syntactic structure in (27):



As the feature specification of the two lexical items is a superset of the features contained in the structure in (27), they are both eligible to spell it out (according to the *Superset Principle*) and are thus competitors. Let us then turn to their domains of application. A can lexicalize the following structures in (28). First, because they are all (sub-)constituents of the structure A is specified for. And second, because they include A's lowest feature and consequently obey the *Anchor Condition*.

- (28) a.  b.  c.  $\delta$

B can lexicalize all the structures which A can lexicalize plus also the structures in (29a), which A cannot spell out for lack of the feature  $\alpha$ .

- (29) a.  b.  c.  d.  $\delta$

Another way to describe the situation is to say that the domain of application of A is a proper subset of the domain of application of B. Hence, lexicalization by A represents a more specific case than lexicalization by B. For that reason A is favored over B to lexicalize the structure in (27). Put in other words,  $R_1$  applies in (27), thus blocking  $R_2$  from applying. As a result, for the lexicalization of the structure in question we have chosen the lexical item which leaves us with the smallest number of “superfluous” features.

This leads us to another difference between the *Superset* and the *Subset Principles*. Namely, under a *Superset*-driven lexicalization, when two items compete for insertion in a node, the one with fewest features not contained in the node wins. Under a *Subset*-driven lexicalization, the one which wins is the one with the greatest number of features contained in the node. I will not elaborate here on how this follows from the *Elsewhere Condition*, as the reasoning is parallel to the one described above for the *Superset Principle*.

#### 4.1.2.3 Maximize Span

The last rule regulating competition between possible lexicalizations of a given syntactic structure says that syntactic structure should be lexicalized by using as few lexical items as possible.

- (30) **Maximize Span:** When a given syntactic node could be spelled out by one bigger lexical item or two or more smaller lexical items, the bigger one wins.

To illustrate, imagine, we have the lexical items in (31a-c) and the structure in (31d).

- (31) a. A:  $\langle \alpha \rangle$   
 b. B:  $\langle \beta \rangle$   
 c. C:  $\langle \alpha, \beta \rangle$
- d. 

With the given lexical items, (31d) can be spelled out in two ways: either as A+B, or as C.

- (32) a.  b. 

According to the rule in (30), the lexicalization in (32b) is the preferred one, because it make use of the fewest lexical items possible. Therefore, the structure in (31d) will be spelled out by C.

This rule is not inherent of the particular view on lexical insertion advocated in this paper. For instance, a similar principle is Emonds' (1994) *Economy of Derivation* saying that, of two equivalent deep structures, the derivation with the insertion of the smallest number of free morphemes is to be preferred.

Another way to approach the same phenomenon is from the point of view of *blocking* (for instance, Andrews' 1990 *Morphological Blocking Principle*, Posers'

1992 *Phrasal blocking*, and Kiparsky’s 2005 blocking mechanism). The term *blocking*, in general, alludes to cases when the existence of one (usually irregular) form prevents the creation of another (usually regular) form that is expected to be available. For example, the existence of the English irregular past tense form *went* prevents the formation of the regular form *\*go-ed* thus producing a blocking effect.

### 4.1.3 Summing up

To conclude the discussion in this subsection, I would like to repeat the rules and principles which I assume to govern the lexicalization of syntactic structure:

- *Superset Principle* (proposed by Michal Starke, formulation of Caha 2009):  
A phonological exponent is inserted into a node if its lexical entry has a (sub-)constituent which matches that node.
- *The Anchor Condition* (Abels and Muriungi 2008, Caha 2009):  
In a lexical entry, the feature which is lowest in the functional sequence must be matched against the syntactic structure.
- *Minimize Junk*:  
When two lexical items meet the conditions for insertion in a given node, the item with the fewest features not contained in the node gets inserted.
- *Maximize Span*:  
When a given syntactic node could be spelled out by one bigger lexical item or two or more smaller lexical items, the bigger one wins.
- *Exhaustive Lexicalization Principle* (Ramchand 2007, Fábregas 2007):  
Every syntactic feature must be lexicalised.

In the following subsections, I show how the attested and unattested patterns of syncretism are derived from the interaction of the structures I have proposed and the mechanism of lexicalization.

## 4.2 The attested syncretism patterns

### 4.2.1 Location≠Goal≠Source

Languages exhibiting the syncretism pattern  $L \neq G \neq S$  have a separate marker for each of the three notions, each of which notions corresponds to a particular syntactic structure. In the light of the lexicalization theory presented in the preceding subsection, there are several ways for a language to exhibit this pattern.

**Type 1 languages**

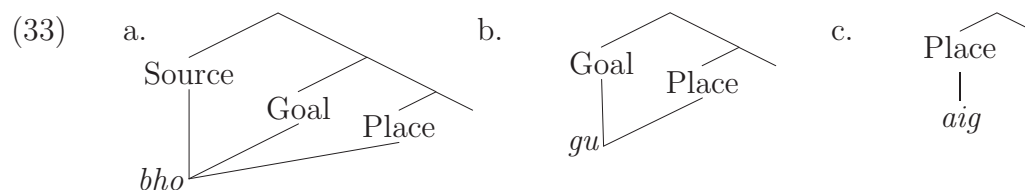
Feature specification of lexical items	Lexicalization of spatial roles	<i>Scottish Gaelic</i> , Celtic (MacAulay 1992)
C: <Source, Goal, Place>	Source: C	C = <i>bho</i>
B: <Goal, Place>	Goal: B	B = <i>gu</i>
A: <Place>	Location: A	A = <i>aig</i>

Table 5

A language can have Locative, Goal and Source markers that are specified to lexicalize the entire stretch of the corresponding structures, as shown in the leftmost column of Table 5.

Thus, the Source-encoding syntactic structure [Source [Goal [Place ]]] can be lexicalized only by the lexical item C, since it is the only item specified for all the features in the tree. The Goal structure [Goal [Place ]] can, according to the *Superset Principle*, be spelled out by both C and B, since they both possess the relevant features. However, C has one additional feature that it will not make use of when lexicalizing a Goal structure, namely <Source>. Therefore it loses the competition in favor of B by the *Minimize Junk* rule. Finally, A lexicalizes the locative structure, since it wins the competition with C and B, again by virtue of having fewest superfluous features.

The scenario depicted above applies to languages where there is no morphological containment relationship between the three markers. An example for such a language is *Scottish Gaelic* with its monomorphemic prepositions *bho* ‘from,’ *gu* ‘to,’ and *aig* ‘at.’ On the face of it, they appear to be equally complex, or simplex for that matter, but in fact the Source preposition is the one with the richest feature specification, while the Place preposition is specified for just one feature. The tree diagrams below show how the lexicalization of Location, Goal and Source works in *Scottish Gaelic*.



This, however, is not the only way to have a language with the pattern  $L \neq G \neq S$ . Instead of lexicalizing the entire stretch of the structure, the spatial morphemes can be specified for just one of the relevant features.

In this case all three lexical items are equally complex in their feature specification. Nevertheless, the three spatial roles will be spelled out in three distinct

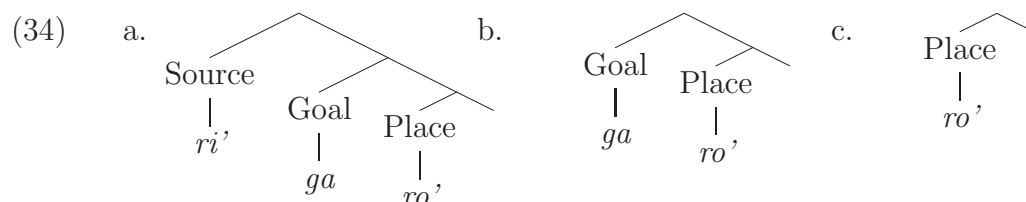


### Type 2 languages

Feature specification of lexical items (LIs)	Lexicalization of spatial roles	<i>Hua</i> , Papuan (Kibrik 2002) LIs	Lexicalization
C: <Source>	Source: A+B+C	C = <i>-ri'</i>	Source: <i>-ro-ga-ri'</i>
B: <Goal>	Goal: A+B	B = <i>-ga</i>	Goal: <i>-ro-ga</i>
A: <Place>	Location: A	A = <i>-ro'</i>	Location: <i>-ro'</i>

Table 6

ways, thus giving rise to a Location≠Goal≠Source pattern. Specifically, Location will be lexicalized by A, Goal will be lexicalized by the morphologically complex marker A+B, and Source will be spelled out by the even more complex marker A+B+C. An example for such a language is *Hua*, as described by Kibrik (2002).<sup>7</sup>



There are also hybrid cases between a language of Type 1, where spatial markers that are higher on the hierarchy lexicalize larger chunks of structure, and a language of Type 2, where the lexical entries for two (or more) of the spatial markers have the same number of grammatical features, with these features, of course, being different. We have already encountered such a hybrid, when discussing the lexicalization of Goal and Source paths in *Quechua*. The features of the relevant *Quechuan* spatial case endings are given in Table 7.

### Type 3 languages

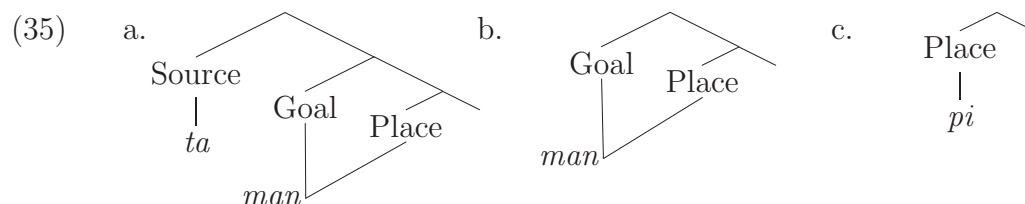
Feature specification of lexical items	Lexicalization of spatial roles	<i>Quechua</i> , Andic (Adelaar 2004) LIs	Lexicalization
C: <Source>	Source: B+C	C = <i>-ta</i>	Source: <i>-man-ta</i>
B: <Goal, Place>	Goal: B	B = <i>-man</i>	Goal: <i>-man</i>
A: <Place>	Location: A	A = <i>-pi</i>	Location: <i>-pi</i>

Table 7

In *Quechua*, the Place and the Source morphemes are endowed by one feature each, while the Goal morpheme has two. The tree diagrams below illustrate how

<sup>7</sup>Note that Haiman (1980) presents a different description of these case markers in *Hua*.

the syntactic structures are spelled out. This lexicalization type encompasses all the languages in Table 4.



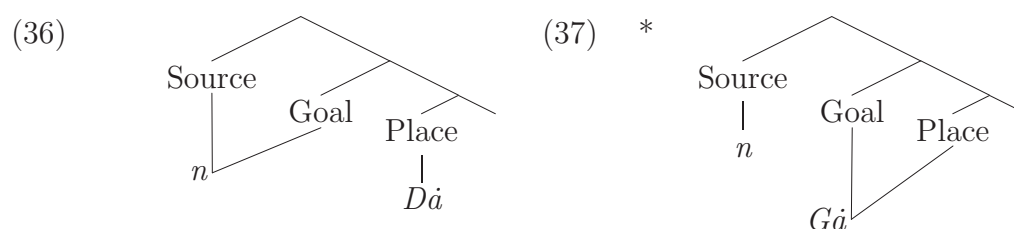
Another instantiation of a “hybrid” lexicalization type is provided by cases where the Goal and the Source morphemes are endowed by two features each, while the Place morpheme has just one. The Turkic language *Uzbek* exhibits this pattern (see Table 8).

**Type 4 languages**

Feature specification of lexical items	Lexicalization of spatial roles	<i>Uzbek</i> , Turkic (Boeschoten 1998)	
		LIs	Lexicalization
C: <Source, Goal>	Source: A+C	C = - <i>n</i>	Source: - <i>Dā-n</i>
B: <Goal, Place>	Goal: B	B = - <i>Gā</i>	Goal: - <i>Gā</i>
A: <Place>	Location: A	A = - <i>Dā</i>	Location: - <i>Dā</i>

Table 8

This lexicalization type is a real language illustration of how the *Anchor Condition* regulates lexical insertion. With the feature specification of the Goal and the Source morphemes in *Uzbek*, there are two possible ways to spell out a Source structure: either as A+C (-*Dā-n*) or as B+C (-*Gā-n*). The latter is however ungrammatical, as the Source morphemes does not “anchor” its lowest feature (<Goal>) in the syntactic structure.



We can also have the lexicalization type in Table 9, the most well-known representatives of which are the Ugro-Finnic languages (compare the *Estonian* example in (3)). Table 2, too, contains languages of that type.

One can also imagine a language with spatial markers specified as in Table 10.

### Type 5 languages

Feature specification of lexical items	Lexicalization of spatial roles	<i>Estonian</i> , Finnic (Viitso 1998)	
		LIs	Lexicalization
C: <Source, Goal>	Source: A+C	C = <i>-t</i>	Source: <i>-l-t</i>
B: <Goal>	Goal: A+B	B = <i>-le</i>	Goal: <i>-l-le</i>
A: <Place>	Location: A	A = <i>-l</i>	Location: <i>-l</i>

Table 9

### Impossible lexicalization - Type 1

Feature specification of lexical items	Lexicalization of spatial roles	Example language
C: <Source, Goal, Place>	Source: C	not found
B: <Goal>	Goal: A+B	
A: <Place>	Location: A	

Table 10

So far, I have not found any language in the sample exhibiting this lexicalization pattern. A closer look at Table 10 reveals why. In such a language, a Goal path would be lexicalized by a complex bi-morphemic marker consisting of the “place-morpheme” A and the “goal-morpheme” B. Thus, A would be inserted under the Place head, while B would be inserted under the Goal head, as shown in the diagram below.



There is, however, an alternative way to lexicalize a Goal phrase – namely, by the lexical item C, which is specified for a superset of the features contained in the node. By virtue of *Maximize Span*, spell-out of GoalP by C is the preferred option. Put in other words, the availability of C blocks the lexicalization of GoalP by A+B.<sup>8</sup>

There are other impossible lexicalization types. Consider, for instance, a lan-

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<sup>8</sup>Letting C lexicalize GoalP will lead to a language of the type Location≠Goal=Source. However, note that if C lexicalizes GoalP, we have a violation of *Minimize Junk*. The reason is that when GoalP is spelled out by C, we will have one unused feature – <Source>, while there are no unused feature if we spell out GoalP by A+B. This is a welcome result, given that this pattern is claimed to be unattested (see (1)).

guage, where the locative marker is spelled out as A, the Goal marker as B and the Source marker as A+B. No matter what feature specification we give to the spatial markers in this language, some rule will be violated.

### Impossible lexicalization - Type 2

Feature specification of lexical items 1	Feature specification of lexical item 2	Feature specification of lexical items 3	Lexicalization of spatial roles
B: <Source, Goal, Place>	B: <Source, Goal>	B: <Goal, Place>	Source: A+B Goal: B
A: <Place>	A: <Place>	A: <Place>	Location: A

Table 11

Spell-out by the lexical items in the first column (with feature specification 1) disobeys the *Anchor Condition*, as B does not match its lowest feature <Place> in a Source expression (this head is spelled out by the marker A). Moreover, such a lexicalization leads to a violation of *Maximize Span*, because we choose to lexicalize a given structure by two lexical items (A+B), when a single one (B) will do.

Spell-out by the lexical items with feature specification 2 fails to comply with the *Exhaustive Lexicalization Principle*. The reason is that when B spells out a Goal structure, the Place head remains non-lexicalized.

The third possible feature specification, too, leads to the violation of the *Exhaustive Lexicalization Principle*. In this case it is the Source head that remains non-lexicalized in a Source expression.

Lexicalizations of the type presented in the next Table 12 are also disallowed by the spell-out theory assumed here.

### Impossible lexicalization - Type 3

Feature specification of lexical items 1	Feature specification of lexical items 2	Lexicalization of spatial roles
C: <Source>	C: <Source>	Source: B+C
B: <Goal>	B: <Goal, Place>	Goal: A+B
A: <Place>	A: <Place>	Location: A

Table 12

A spell-out with the lexical items in the first column will be a violation of the *Exhaustive Lexicalization Principle*, because nothing spells out the Place head in the Source expression. A language with the spatial markers of the second column (feature specification 2) violates *Maximize Span*, since the Goal structure can be spelled out by the item B only. It is important to stress that this does not mean

that there exists no language with such lexical items. There are such languages, but there the lexicalization of the three spatial roles comes out differently (see Tables 6 and 7).

For lack of space, I will stop here the discussion of the impossible lexicalization types. Now, I proceed to the second most common syncretism pattern  $\text{Location}=\text{Goal}\neq\text{Source}$ .

#### 4.2.2 $\text{Location}=\text{Goal}\neq\text{Source}$

Languages that exhibit this syncretism pattern have one marker that is ambiguous between a Goal path and a Location, and a second marker that expresses a Source path, as, for example, French (M. Starke, p.c.).<sup>9</sup>

- (39) a. J'ai couru au stade.  
*I.have run at/to.the stadium*  
 'I ran at the stadium' or 'I ran to the stadium' (Location or Goal)
- b. J'ai couru du stade.  
*I.have run from.the stadium*  
 'I ran from the stadium' (Source)

In this subsection, I am going to show how such languages can be modeled by applying the syntactic structure for a decomposed Path, plus the adopted lexicalization theory.

An example for a language with the pattern mentioned above is the Tibeto-Burman language *Cogtse Gyarong*, spoken in the Sichuan province of China. According to Nagano (2003), the case ending *-s* in *Cogtse Gyarong* has both a Locative (AT) and an Allative (TO) function. There is a second case suffix, *-y(i)*, that has an Ablative (FROM) function. I suggest the following feature specification of the case endings in *Cogtse Gyarong* (see Table 13).

Notice that there is no dedicated case ending for the locative spatial role only. Thus, when it is necessary to lexicalize a Place head in a locative structure, the only way to go is to use the ending *-s*, which also lexicalizes Goal structures. Under a view of lexicalization governed by the *Superset Principle*, the suffix *-s*

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<sup>9</sup>There exists, of course, the possibility that the marker claimed to be ambiguous between Goal and Location is, in fact, locative only. The Goal interpretation is the result of this locative marker combining with special "Goal-verbs" that are able to lexicalize the Goal head. I do believe that such cases exist (consider the English verb *put*, which combines with a locative phrase, but still (i) is interpreted as Goal-directional).

- (i) She put the pen in the box.

Nevertheless, I am convinced that there are languages where the ambiguity of the Loc/Goal spatial marker is real, as also evidenced by the example in (39a).

### Type 6 languages

Feature specification of lexical items	Lexicalization of spatial roles	<i>Cogtse Gyarong</i> (Nagano 2003)	
		LIs	Lexicalization
B: <Source, Goal, Place>	Source: B	B = $-y(i)$	Source: $-y(i)$
A: < Goal, Place >	Loc = Goal: A	A = $-s$	Loc = Goal: $-s$

Table 13

can legitimately lexicalize a Place head, since the latter is a sub-constituent of the maximal structure  $-s$  can spell out.

There exists another strategy for a language to exhibit the syncretism pattern Location=Goal≠Source. This is the strategy employed by *Meithei* (Chelliah 1997), for instance. *Meithei* has a Source marker that lexicalizes only the Source head. Hence, the Source expression morphologically contains the Loc/Goal marker, as can be seen in Table 14.

### Type 7 languages

Feature specification of lexical items	Lexicalization of spatial roles	<i>Meithei</i> , Kuki-Chin (Chelliah 1997)	
		LIs	Lexicalization
B: <Source>	Source: A+B	B = $-gi$	Source: $-tə-gi$
A: < Goal, Place >	Loc = Goal: A	A = $-tə$	Loc = Goal: $-tə$

Table 14

To recapitulate, there are three ways for a language to exhibit the pattern Location=Goal≠Source and the difference lies in the feature specification of the Source morphemes, which leads to a morphologically decomposable Source marker (Type 7) versus a non-decomposable one (Type 6). What is common for such languages, however, is that they lack a dedicated locative marker endowed only by the feature <Place>. As a consequence, such languages employ the Goal marker <Goal, Place> to lexicalize also a Place structure.

#### 4.2.3 Location=Goal=Source

In this subsection, I turn to languages with spatial markers that do not participate in the distinction between Location, Goal paths and Source paths. Languages that fall into this group have one adposition or case ending that is used in all three cases. The most straightforward way to go is to assume a single spatial marker A with the specification <Source, Goal, Place>. Such a spatial marker will be then able to lexicalize a Source path, when it recruits its full feature set. It will lexicalize a

Goal path and Location, when it does not make use of its <Source> and <Source> plus <Goal> features, respectively. A will be then three-way ambiguous between a Source marker, a Goal marker and a Locative marker. Interestingly, there seem to be no languages with such three-way ambiguous markers.

What we find instead, are languages with a unique spatial marker, which has a *default locative* interpretation. In order for this marker to acquire a Source or a Goal meaning, it has to occur with the right verb. The Bantu language *Tswana* offers an illustration (data from Creissels 2006).

- (40) a. Monna o dule motse-ng.  
           1man 3SG leave.PERF 3village-LOC  
           ‘The man left the village’ (Source)
- b. Monna o ile motse-ng.  
           1man 3SG go.PERF 3village-LOC  
           ‘The man went to the village’ (Goal)

The same pattern is replicated by the Mande language *Wan* (Nikitina 2006). In *Wan*, the same prepositional phrase is interpreted as expressing Location, Goal, and Source, depending on the verb. With verbs encoding Source of motion, the PP denotes Source, with verbs encoding Goal of motion, the PP denotes Goal, and with static verbs, the PP denotes Location.

- (41) a. `ã gō kālē gó.  
           3.PL leave.PAST forest in  
           ‘They left the forest’ (Source)
- b. `ã gā kālē gó.  
           3.PL go.PAST forest in  
           ‘They went to the forest’ (Goal)
- c. `ã yā kālē gó.  
           3.PL sleep.PAST forest in  
           ‘They sleep in the forest’ (Location)

In the light of these data, I suggest that the spatial markers in *Tswana* (-ng) and *Wan* (gó) are specified only for the feature <Place>, hence the default locative interpretation noted by Creissels (2006). Regarding Goal and Source structures, I argue that it is actually the verb that spells out the Goal and Goal+Source heads, respectively. Thus, in Table 15 I propose the following specifications for the relevant lexical items in the *Wan* examples above.

So, in languages which are said to syncretize all three spatial roles, I propose that there is one spatial marker with the feature <Place>, which is *locative only*. The Source and Goal readings of this marker are triggered only in the presence



### Type 8 languages

Feature specification of lexical items	Lexicalization of spatial roles	Wan, Mande (Nikitina 2006)	
		LIs	Lexicalization
C: <Verb, Source, Goal>	Source: C+A	C = <i>gō</i>	Source: <i>gō + gó</i>
B: <Verb, Goal>	Goal: B+A	B = <i>gā</i>	Goal: <i>gā + gó</i>
A: <Place>	Location: A	A = <i>gó</i>	Location: <i>gó</i>

Table 15

of certain verbs that lexicalize the Source and Goal heads in the structure. In a sense, type 8 languages are like type 5 languages (*Estonian, Hungarian*), the only difference being that the former employ a verb to lexicalize the Source and Goal heads and a case marker or adposition to lexicalize a Place head, while the latter make use exclusively of case markers (or adpositions) to spell out all three heads. This leads to the conclusion that the syncretism pattern Location=Goal=Source is, in actuality, non-existent. Languages where this seems to be the case in reality possess one spatial marker which uniformly spells out the Place head, the Goal and the Source head being lexicalized by the verb.

## 4.3 The unattested patterns

### 4.3.1 Location=Source≠Goal

In the previous section, I discussed the syncretism pattern Location=Goal=Source and argued that a more thorough investigation of the data reveals that it is actually not found among languages. Let us now turn to other syncretisms between the three spatial roles that are unattested cross-linguistically (the ones mentioned by Andrews 1985, see (1)).

I start the discussion with the pattern Location=Source≠Goal. A language representing this lexicalization type has one marker that syncretizes the notions of Location and Source, and a separate marker to express Goal. One possible feature specification of these two markers is presented in Table 16.

Feature specification of lexical items	Lexicalization of spatial roles	Example language
B: <Source, Goal, Place>	Source: B	not attested
A: <Goal>	Goal: B+A	
	Location: B	

Table 16

This hypothetical language will use B to lexicalize a Source path, since no other lexical item has the relevant feature <Source>. Likewise, B will lexicalize Location by virtue of being the only entry with the feature <Place>. Now, turning to Goal paths, we can imagine a scenario in which B lexicalizes Place and the lexical item A, specified as <Goal> lexicalizes the Goal head. The result will be that the Goal expression will be morphologically complex, still different from the locative and Source expression. Notice, however, that GoalP can be lexicalized by one item only — B, as B has the features <Goal, Place> . Therefore, B will “block” the formation of the bi-morphemic spatial marker A+B by virtue of *Maximize Span*.

The hypothetical feature specification of the lexical entries in Table 16 led us to a violation of one of the lexicalization rules we adopt and therefore, to an impossible language. An alternative way to model a language exhibiting this pattern is presented in Table 17:

Feature specification of lexical items	Lexicalization of spatial roles	Example language
B: <Source, Goal, Place>	Source: B Goal: A	not attested
A: <Goal, Place>	Location: B	

Table 17

In this language, B will lexicalize a Source path, as it has the right feature specification. The item A will equally successfully lexicalize a Goal path, since it is a perfect match. Concerning the lexicalization of a locative structure, we want it to be lexicalized by B, so that the Source and the Location marker end up being syncretic. B can, in fact, spell out Place, as the latter is a sub-constituent of the entire structure B is specified for. However, the existence of A will prevent lexicalization of Location by B. The reason is that A itself can spell out Place and therefore A and B are competitors. The domain of application of A is, however, a proper subset of the domain of application of B. Therefore A will apply to express Location, thus blocking B from lexicalizing the structure. Or, put in simple terms, A will spell out Place because it has fewer superfluous features (<Goal>) than B (<Source, Goal>). In other words, the lexicalization in Table 17 violates the *Minimize Junk* rule.

Summing up, the lexicalization pattern Location=Source≠Goal is correctly predicted to be impossible by the decomposed Path structure I defend and the lexicalization theory I adopt. This lexicalization pattern is, in fact, an instantiation of the so called \*A-B-A syncretism discussed by Bobaljik (2007) and analyzed by Caha (2008) in the light of the *Superset* spell-out theory.

### 4.3.2 Location≠Goal=Source

Finally, I turn to the last logically possible syncretism pattern Location≠Goal=Source. A representative of this type would be a language that has one dynamic spatial marker, expressing the notion of Path (no matter whether Goal or Source oriented), and a second stative marker for the notion of location. In other words, this language will have spatial markers expressing the opposition between  $\pm$  directional, but giving no information as to the orientation of the directional marker. One can imagine that languages exhibiting this pattern have the following two markers:

Feature specification of lexical items	Lexicalization of spatial roles	Example language
B: <Source, Goal, Place> A: <Place>	Source: B Goal: B Location: A	not attested

Table 18

The same pattern is obtained if we exclude the feature <Place> from the specification of the lexical item B.

Feature specification of lexical items	Lexicalization of spatial roles	Example language
B: <Source, Goal> A: <Place>	Source: A+B Goal: A+B Location: A	not attested

Table 19

As the reader can verify, the lexicalization types in Tables 18 and 19 do not violate any of the assumed spell-out rules regulating the insertion of phonological material into the syntactic structure I propose. As a consequence, these language types are expected to be perfectly grammatical. And yet, they appear to be unattested. This observation suggests the involvement of a third factor in the lexicalization of the three spatial notions.

Let us then take a closer look at the “dynamic” portion of the syntactic structure for paths. Under the Path decomposition analysis argued for here, the Goal projection is dominated by a Source projection. The Source head is the locus of a reversal operation which applies to the Goal phrase. Thus, in a sense, a Source path is the “opposite” (or the negation) of a Goal path. This means that

a language with a Goal=Source syncretism has one spatial marker that expresses a certain meaning and its opposite. From a pragmatic point of view it is unacceptable to have such a “contradictory” lexical item.<sup>10</sup> I suggest that it is for that reason that the syncretism pattern Location≠Goal=Source is unattested, although it is grammatical. Notice that this does not exclude the possibility that a *given lexical item A* includes the features <Source> and <Goal> in its feature specification (see, for instance, languages of Type 1, 4-8). As long as there is a disambiguating lexical item B that limits the use of A to one of the spatial roles only, the item A is not used in a contradictory way. In the light of this discussion, it is not surprising anymore that the syncretism pattern Location=Goal=Source turned out to be unattested. Recall from Section 4.2.3 that such a language is supposed to have a *unique* spatial marker endowed by the features <Source, Goal, Place>, which will lead to the same type of contradiction as in a language with the pattern Location≠Goal=Source.

## 5 Conclusion

In this paper, I investigated the lexicalization of Location, Source and Goal paths in languages world-wide. I started out with an investigation of the syncretism patterns for Source, Goal and Location markers across languages. I noted a curious fact: not all logically possible syncretisms are attested. This motivated a detailed analysis of paths with the purpose of solving this riddle. For this reason, I explored the way Source and Goal paths are expressed in languages, mainly focussing on their morphological composition. This investigation led to the conclusion that Source paths tend to be more complex than Goal paths such that the former morphologically contain the latter. I took this to indicate a more complex underlying syntactic structure.

On the basis of these findings, I argued for a decomposition of the Path head in the syntactic structure for spatial expressions. Thus, I proposed the existence of a Source head and a Goal head instead of a unique Path head. The Goal head is the lower directional head and it takes a Place projection as a complement. The Source head dominates the Goal head, and they are both present in a Source path. Thus, the main point in this paper is that there does not exist a unique path head

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<sup>10</sup>There are potential counterexamples, for example those verbs that have both an ornative and a privative meaning like *seed*, *trim*, etc.

- (i) a. seed the grapes = remove seeds from the grapes
- b. seed the lawn = put seeds in the lawn

Buck (1997) investigates that type of verbs in English and convincingly argues that they do not express opposite meanings. Hence, these verbs are not an example of contradictory lexical items.

in the syntactic structure for directionals.

After presenting the underlying syntactic structures for Goal and Source paths, I discussed their spell-out. I adopted a lexicalization principle saying that a lexical item can spell out both terminal and non-terminal nodes, which allows it to lexicalize more than one head in the structure. In addition, a lexical item is allowed to spell out a sub-constituent of the structure it can lexicalize according to its feature specification (*The Superset Principle*). In the remainder of the paper, I went through each of the syncretism patterns for Source, Goal and Location and showed how the syntactic structure I defend and the lexicalization principle I adopt provide an explanation for the existence of the attested syncretism strategies and the non-existence of the unattested ones.

It has to be borne in mind that the discussion in this paper involves only three heads (Source, Goal, and Place), while it is generally recognized that the syntactic structure for directional expressions is far more fine-grained (see Koopman 2000, den Dikken to appear, Svenonius to appear). The addition of heads increases the number of possible spatial markers and lexicalization types. Assuming, for example, a Deg head between Place and Goal (Koopman 2000, Svenonius to appear),<sup>11</sup> we predict that there are languages with two types of locative markers: one that is specified for Deg, and one which is not. English is a good example for such a language, as Svenonius (2008) argues. He suggests that the English prepositions *beside* and *near* spell out the Deg head and this accounts for their incompatibility with measure phrases, as well as for the closeness component in their meaning. Other English prepositions, like *behind* and *above* do not lexicalize Deg. A Deg head between Place and Goal can also result in a language with two types of Goal markers: one with the feature Deg, and the other one without it. Taking the closeness component in meaning to be indicative of the presence of Deg, a good potential example are languages like Hungarian (Kenesei et al. 1997) and Basque (Hualde and de Urbina 2003) where there is a special Terminative marker (meaning ‘up to’) and a “regular” Allative marker (meaning ‘to’).

Finally, there are two important issues related to the subject of this paper which I did not go into. The first one concerns the so called Ablative-Locative transfer (Mackenzie 1978): a historical process where a (originally) Source marker starts being used as a locative marker. Under my proposal, this is quite unexpected and requires serious research. The second issue relates to the role of the verb in the lexicalization of directional structures. I discussed some cases, where the verb spells out a directional head thus licensing a specific interpretation of the phrase below. It is interesting to explore this question some more, as there are universal

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<sup>11</sup>To be more precise, in the works cited the Deg head is between Place and Path. Given that I decompose the Path head into several heads, the lowest of which is Goal, it is reasonable to assume that the Deg head will be between Place and Goal.

tendencies for certain verbs to license particular paths, e.g. deictic verb trigger a Source or Goal interpretation of a locative expression, depending on whether they are oriented towards the speaker or away from the speaker, respectively.

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## Appendix: Languages included in the survey

Family	Genus	Languages
Altaic	Turkic	Chuvash, Uzbek
	Mongolic	Buryat, Dagur, Kalmuck, Khalka, Ordos
Arawakan	Arawakan	Yanesha
Austronesian	Oceanic	Iaai, Jabêm, Kaulong, Longgu, Mwotlap, Niuafou‘ou, Raga, Sye, Tobiat, Xârâcúú, ‘Ala‘ala
Cholon	Cholon	Cholon
Dravidian	Dravidian	Telugu, Gondi
Finno-Ugric	Finnic	Estonian, Mari, Mordva, Permyak
	Ugric	Khanty, Mansi
Jivaroan	Jivaroan	Jivaroan
Indo-European	Celtic	Breton, Scottish Gaelic
Mayan	Mayan	Quechua
Niger-Congo	Bantu	Zulu
	Mande	Wan
Quechua	Quechua	Quechua
	Baric	Garó
	Bodic	Chantyal, Kham, Nar-Phu, Newari, Tibetan, Tshangla
Sino-Tibetan	Gyalrong	Gotse-Gyarong
	Kuki-Chin	Hakha-Lai
	Lolo-Burmese	Akha, Burmese, Lahu
	Qiangic	Qiang
Uralic	Samoyedic	Nenets
Uru-Chipaya	Uru-Chipaya	Puquina, Uru
Isolates		Basque, Mapudungun