

# Agreement in Archi: An LFG Perspective

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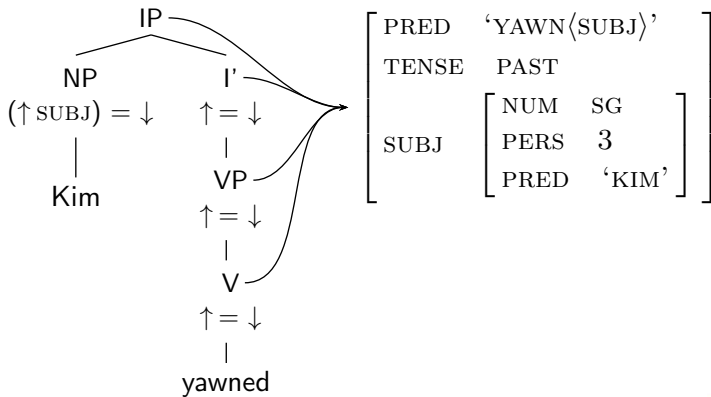
# LFG Syntax

- two co-present (simultaneous) levels: representation at each level is motivated by factors internal to that level, observing lexical integrity and monotonicity
- levels related by a (onto) mapping function
- c-structure: represents dominance and precedence relations, accommodating a range of difference phrase structure models
- f-structure: represents grammatical relations and predication, morphosyntactic properties, local and non-local dependencies
- f-structures are the main input to semantics



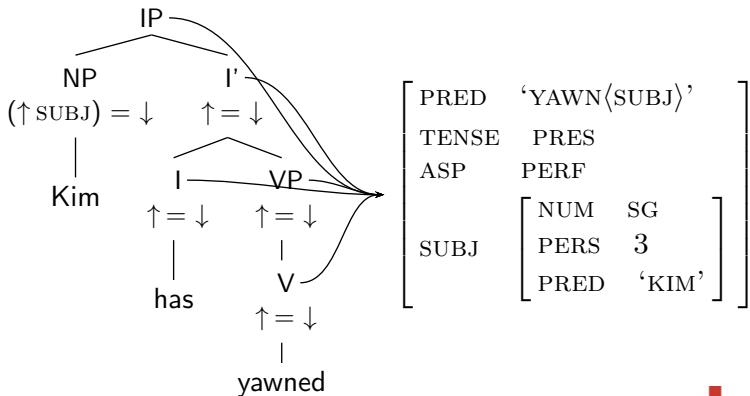
## C and F Structure

(1) Kim yawned

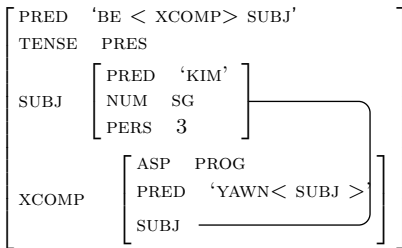
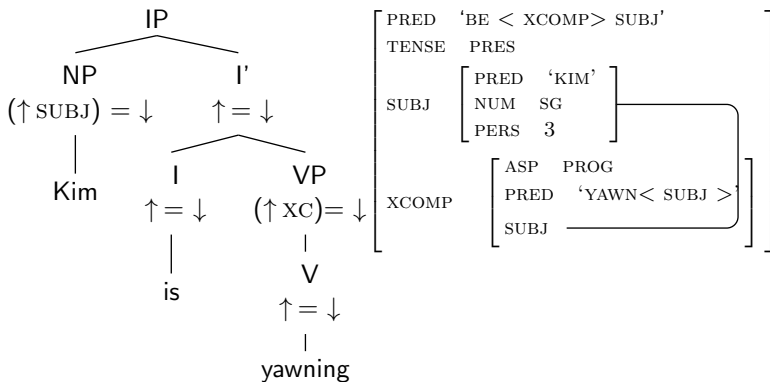


## Analytic Verbal Constructions: Aux Feature

(2) Kim has yawned



# Analytic Verbal Constructions: Aux PRED



## Example Lexical Entries

- (3) *was*: *I*     $(\uparrow \text{TENSE}) = \text{PAST}$   
                            $(\uparrow \text{PRED}) = \text{'BE<XCOMP> SUBJ'}$   
                            $(\uparrow \text{SUBJ}) = (\uparrow \text{XCOMP SUBJ})$   
                            $\text{VP} \in \text{CAT} (\uparrow \text{XCOMP}) \Rightarrow (\uparrow \text{XCOMP ASP}) =_c \text{PROG}$
- (4) *has*: *I*     $(\uparrow \text{TENSE}) = \text{PRES}$   
                            $\text{VP} \in \text{CAT} (\uparrow) \Rightarrow (\uparrow \text{ASP}) =_c \text{PERF}$
- (5) *taken*: *V*     $(\uparrow \text{PRED}) = \text{'YAWNED<SUBJ >'}$   
                            $(\uparrow \text{ASP}) = \text{PERF}$

Discussion for English: see Falk (2008)



## Separation of Morphology and Syntax

Category	MFeat	Syn Info
Attr Adj	{Fem, Sg }	$((\text{ADJ } \uparrow) \text{ GEND}) = \text{FEM}$ $((\text{ADJ } \uparrow) \text{ NUM}) = \text{SG}$
Pred Adj	{Fem, Sg }	$(\uparrow \text{ SUBJ GEND}) = \text{FEM}$ $(\uparrow (\text{SUBJ NUM})) = \text{SG}$
Noun	{Fem, Sg }	$(\uparrow \text{ GEND}) = \text{FEM}$ $(\uparrow \text{ NUM}) = \text{SG}$





# Agreement

- Agreement is syntactically mediated covariation in form
- syntactic agreement typically involves predicate-argument and head-modifier relations
- syntactic agreement holds at the level of f-structure (internal syntax)



## Hybrid Behaviour

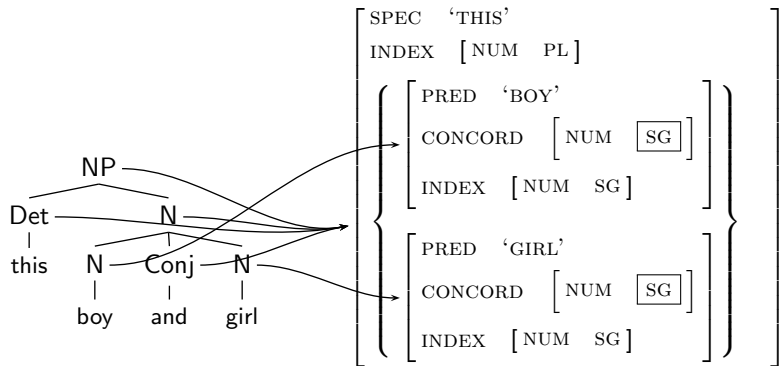
Hybrid behaviour of a single agreement controller motivates different sets of agreement features - INDEX and CONCORD.

*This boy and girl have become skilled at setting the places for their classmates at snacktime.* (<http://www.edvid.com/infant.asp>)

(Wechsler and Zlatić, 2000; King and Dalrymple, 2004)



(6) this boy and girl      this: ( $\uparrow$  CONCORD NUM) = SG



Background

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# Head Modifier Agreement

- attributives: agreement in NUM and GEN
- genitive pronouns: a subset show agreement in NUM and GEN
- demonstratives: agreement in NUM and GEN
- numerals: agreement in NUM and GEN
- quantifiers: no agreement
- nominal-adjectives: no agreement
- genitive nouns: no agreement





# Attributives

$$\left[ \begin{array}{ll} \text{PRED} & \text{'MAN'} \\ \text{CASE} & \text{ABS} \\ \text{NUM} & \text{SG} \\ \text{PERS} & 3 \\ \text{GEND} & \text{I} \\ \text{ADJ} & \{ [\text{PRED} \text{ 'BEAUTIFUL'}] \} \end{array} \right]$$


## Notational Points

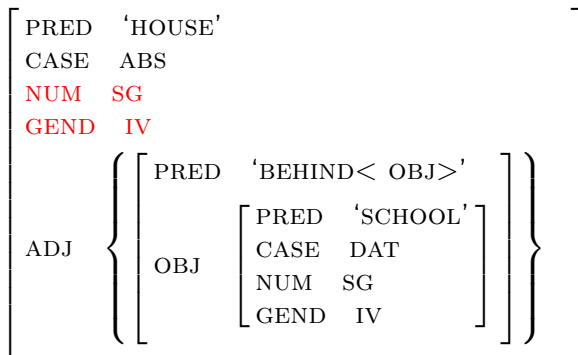
- ADJ is a set-valued feature:  $\in$  may be used in the path in the f-descriptions ( $\downarrow \in (\uparrow \text{ ADJ}) \equiv (\uparrow \text{ ADJ } \in) = \downarrow$ )
- the formalism supports both Outside-In ( $\uparrow \text{ GF}$ ) and Inside-Out ( $\text{ GF } \uparrow$ ) expressions.







# Attributives



## Some Pronominal (Genitive) Possessors

first person genitive pronouns as modifiers agree in number and gender with the head noun, others do not

(11) w-is                      ušdu  
I.SG-1SG.GEN brother(I)[ABS.SG]  
my brother

(12) d-is                      došdur  
II.SG-1SG.GEN sister(II)[ABS.SG]  
my sister



# Pronominal Possessors

PRED CASE PERS NUM GEND  POSS	'BROTHER<POSS>'							
	ABS							
	3							
	SG							
	I							
	<table style="border-collapse: collapse; margin-left: 20px;"> <tr> <td style="border-left: 1px solid black; border-right: 1px solid black; padding: 10px;">CASE</td> <td style="padding: 10px;">GEN</td> </tr> <tr> <td style="border-left: 1px solid black; border-right: 1px solid black; padding: 10px;">PRED</td> <td style="padding: 10px;">'PRO'</td> </tr> <tr> <td style="border-left: 1px solid black; border-right: 1px solid black; padding: 10px;">NUM</td> <td style="padding: 10px;">SG</td> </tr> <tr> <td style="border-left: 1px solid black; border-right: 1px solid black; padding: 10px;">PERS</td> <td style="padding: 10px;">1</td> </tr> </table>	CASE	GEN	PRED	'PRO'	NUM	SG	PERS
CASE	GEN							
PRED	'PRO'							
NUM	SG							
PERS	1							



## Pronominal Possessors

(13) *w-is* (my)  $(\uparrow \text{ PRED}) = \text{'PRO'}$

$(\uparrow \text{ NUM}) = \text{SG}$

$(\uparrow \text{ PERS}) = 1$

$(\uparrow \text{ CASE}) = \text{GEN}$

$( (\text{ POSS } \uparrow) \text{ NUM}) = \text{SG}$

$( (\text{ POSS } \uparrow) \text{ GEND}) = \text{I}$

### Partiality

we do not have to specify any sort of null or default agreement for the non-agreeing pronominals: the morphology should produce all and only the correctly inflected forms

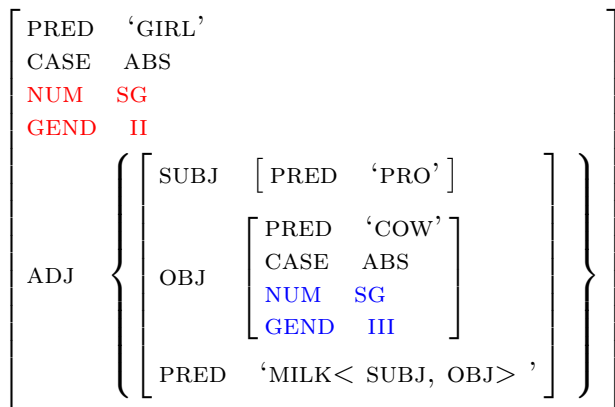


## Deverbal Attributives

- (14)  $\chi^{\text{f}}\text{on}$   $\text{b-a}<\text{r}>\text{ca-t:ur}$   
 cow(III)[SG.ABS] III.SG-<IPFV>milk-IPFV-ATTR-II.SG  
 $\text{lo}$   
 girl(II)[SG.ABS]  
 the girl who is milking the cow



## Deverbal Attributives



(simplified)



## Deverbal Attributives

(15) *b-a<r>ca-t:ur* ( $\uparrow$  PRED) = ‘MILK<SUBJ, OBJ>’

( $\uparrow$  OBJ CASE) = ABS

( $\uparrow$  OBJ NUM) = SG

( $\uparrow$  OBJ GEND) = III

(( ADJ  $\in$   $\uparrow$  ) NUM) = SG

(( ADJ  $\in$   $\uparrow$  ) GEND) = II





# Templates for Agreement Generalisations

- Templates are named functional descriptions, that is, named collections of equations.
- They allow generalisations to be stated and can be used as abbreviatory devices and called in lexical entries
- They can also be called in c-structure rules, but we make no use of this here
- Templates can be parameterised, so that they take an argument.



## Using Templates: Gender and Number

$$(16) \text{ I.SG(P)} \equiv \begin{array}{l} (\text{P GEND}) = \text{I} \\ (\text{P NUM}) = \text{SG} \end{array}$$

$$(17) \text{ II.SG(P)} \equiv \begin{array}{l} (\text{P GEND}) = \text{II} \\ (\text{P NUM}) = \text{SG} \end{array}$$

$$(18) \text{ III.SG(P)} \equiv \begin{array}{l} (\text{P GEND}) = \text{III} \\ (\text{P NUM}) = \text{SG} \end{array}$$

$$(19) \text{ IV.SG(P)} \equiv \begin{array}{l} (\text{P GEND}) = \text{IV} \\ (\text{P NUM}) = \text{SG} \end{array}$$



## Using Agreement Templates

Pronominal Possessors	@I.SG(POSS ↑)
Attributives	@I.SG(ADJ ∈ ↑)
Demonstratives	@I.SG(↑)



Background

Agreement in the Nominal Domain

**Agreement in the Clausal Domain**

Biabsolute Constructions



## Case Assignment

- transitive verbs show Ergative Absolute alignment
- intransitive verbs take an Absolute argument
- some verbs show Dative Absolute alignment
  
- predicates (verbs, predicate adjectives) agree with the Absolute argument
- predicates inflect for NUM and GEN of the agreement controller



## Absolute Controller

- (20) buwa d-awɣa  
 mother(II)[SG.ABS] II.SG-come.PFV  
 Mother came
- (21) zari noŋš darcʼ-li-r-š  
 1SG.ERG horse(III)[SG.ABS] post-OBL.SG-CONT-ALL  
 e(b)tʼni  
 (III.SG)tie.PFV  
 I tied the horse to the post
- (22) to-w-mi-s Ajša d-ak:u  
 that.one-1.SG-OBL.SG-DAT Aisha(II)[SG.ABS] II.SG-see.PFV  
 He has seen Aisha



## Morphological Ergativity

In a morphologically ergative language the obliqueness ordering of grammatical relations in the basic verbal voice matches the obliqueness ordering at argument structure, but case marking does not reflect the obliqueness ordering of grammatical functions

Arg1(TR) A	Arg1(INT) S	Arg2(TR) P
SUBJ	SUBJ	OBJ
ERG	ABS	ABS



## Syntactic Ergativity

In a syntactically ergative language the obliqueness ordering of grammatical relations in the basic verbal voice does not match the obliqueness ordering at argument structure (inverse mapping)

Arg1(TR) A	Arg1(INT) S	Arg2(TR) P
OBJ	SUBJ	SUBJ
ERG	ABS	ABS

(Manning, 1996)





## Syntactic or Morphological Ergativity in Archi?

- Does the Absolutive Argument correspond to the most prominent surface grammatical function or not?
- evidence from other syntactic phenomena show that the argument to function mapping is not inverse (hence Arg1 = SUBJ) (morphological ergativity)
- however agreement is syntactically ergative (controlled by S/P (ABS) argument)



## Intransitive Verb

(23) *d-awfa* (↑ PRED) = ‘CAME< SUBJ >’

(↑ TNS) = PFV

(↑ SUBJ CASE) = ABS

(↑ SUBJ GEND) = II

(↑ SUBJ NUM) = SG



## Transitive Verb: Absolutive Object

(24) *e(b)t'ni/tied* ( $\uparrow$  PRED) = 'TIE< SUBJ, OBJ >'

( $\uparrow$  TNS) = PFV

( $\uparrow$  SUBJ CASE) = ERG

( $\uparrow$  OBJ CASE) = ABS

( $\uparrow$  OBJ GEND) = III

( $\uparrow$  OBJ NUM) = SG



[	PRED 'COME<SUBJ>'  SUBJ [ <table style="border-collapse: collapse; margin-left: 20px;"> <tr> <td style="padding: 2px;">PRED</td> <td style="padding: 2px;">'MOTHER'</td> </tr> <tr> <td style="padding: 2px;">NUM</td> <td style="padding: 2px;">SG</td> </tr> <tr> <td style="padding: 2px;">GEND</td> <td style="padding: 2px;">II</td> </tr> <tr> <td style="padding: 2px;">PERS</td> <td style="padding: 2px;">3</td> </tr> <tr> <td style="padding: 2px;">CASE</td> <td style="padding: 2px;">ABS</td> </tr> </table> ]	PRED	'MOTHER'	NUM	SG	GEND	II	PERS	3	CASE	ABS	]
PRED	'MOTHER'											
NUM	SG											
GEND	II											
PERS	3											
CASE	ABS											

[	PRED 'TIE<SUBJ, OBJ>'  OBJ [ <table style="border-collapse: collapse; margin-left: 20px;"> <tr> <td style="padding: 2px;">PRED</td> <td style="padding: 2px;">'HORSE'</td> </tr> <tr> <td style="padding: 2px;">NUM</td> <td style="padding: 2px;">SG</td> </tr> <tr> <td style="padding: 2px;">GEND</td> <td style="padding: 2px;">III</td> </tr> <tr> <td style="padding: 2px;">CASE</td> <td style="padding: 2px;">ABS</td> </tr> </table> ]  SUBJ [ <table style="border-collapse: collapse; margin-left: 20px;"> <tr> <td style="padding: 2px;">PRED</td> <td style="padding: 2px;">'PRO'</td> </tr> <tr> <td style="padding: 2px;">NUM</td> <td style="padding: 2px;">SG</td> </tr> <tr> <td style="padding: 2px;">PERS</td> <td style="padding: 2px;">1</td> </tr> <tr> <td style="padding: 2px;">CASE</td> <td style="padding: 2px;">ERG</td> </tr> </table> ]	PRED	'HORSE'	NUM	SG	GEND	III	CASE	ABS	PRED	'PRO'	NUM	SG	PERS	1	CASE	ERG	]
PRED	'HORSE'																	
NUM	SG																	
GEND	III																	
CASE	ABS																	
PRED	'PRO'																	
NUM	SG																	
PERS	1																	
CASE	ERG																	



## Agreement Templates

### Intransitive Verb

(25) *d-awʕa* (↑ PRED) = ‘CAME< SUBJ >’  
@II.SG(↑ SUBJ)

### Transitive Verbs (EA and DA)

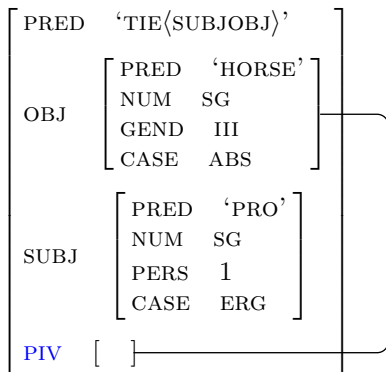
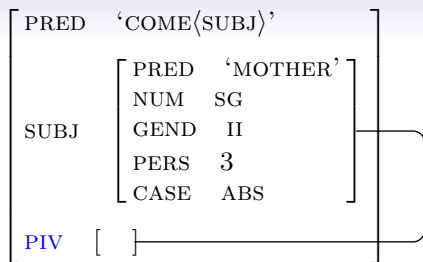
(26) *e(b)t'ni/tied* (↑ PRED) = ‘TIE< SUBJ OBJ >’  
@III.SG(↑ OBJ)



## Using Pivot

- Falk (2006) proposes use of a syntactic PIVOT in f-structure representations
- PIV has language-specific assignment: in NOM-ACC languages it is identified with  $\widehat{GF}$  (highest function, SUBJ)
- in cases of syntactic ergativity, it denotes  $\widehat{GF}$  of intransitives and OBJ of transitives
- Belyaev (2013) proposes that PIV is relevant for (some) agreement patterns in Dargwa





## Controllers and C-structure

Controllers do not have to be overt NPs in the c-structure and can also be UDC fillers. These follow from an f-structure approach

- (27) jamu-m porma-li-t  
 this-III.SG form(III)-SG.OBL-SUP  
 a<r>χu-li, e<r>χ:u zon  
 lie.down<II.SG>.PFV.CVB remain<II.SG>.PFV 1SG.ABS  
 Having lain down in this way, I stayed (there).

- (28) k<sup>w</sup>i χuwt:i je-b  
 who.SG.ABS [I.SG]go.POT this.PL-PL[ABS]  
 a<b>ča-s  
 <I/II.PL>kill-FIN  
 Who will go to kill them?





## Other Agreement Targets

- a small set of first person pronominal forms show agreement with the absolutive argument in the clause
- some adverbial elements (and a postposition) also show agreement with the absolutive argument
- lexically driven approach: some elements show agreement with the PIV





## Genitive 1st Person Pronouns

- (30) b-is                      duχriq<sup>ɬ</sup>                      χ<sup>ɬ</sup>on  
 III.SG-1SG.GEN village(IV).IN cow(III)[SG.ABS]  
 b-i  
 III.SG-be.PRES  
 I have a cow in the village



## Dative 1st Person Pronouns

- (31) to-r-mi                      b-ez                      χῑοşon  
 that.one-II.SG-ERG III.SG-1SG.DAT dress(III)[SG.ABS]  
 a(b)u  
 (III.SG)make.PFV  
 She made a dress for me

The agreement target is the benefactive OBL, controller is the absolute OBJ argument



## Controller as Non-overt

- (32) d-ez                      χir            d-e<r>q<sup>f</sup>a-r-ši  
 II.SG-1SG.DAT behind II.SG-<IPFV>go-IPFV-CVB  
 d-i  
 II.SG-be.PRS  
 She goes after me (male speaking)

The controller is the absolutive SUBJ argument expressed inflectionally



## Lexical Entry (without PIVOT)

(33) *b-ez* (me) ( $\uparrow$  PRED) = 'PRO'

( $\uparrow$  NUM) = SG

( $\uparrow$  PERS) = 1

( $\uparrow$  CASE) = DAT

$((GF \uparrow) GF1) = \%AGRC$

$(\%AGRC \text{ CASE}) = \text{ABS}$

$\text{@III.SG}(\%AGRC)$



## Lexical Entry (using PIVOT)

(34) *b-ez* (me) ( $\uparrow$  PRED) = 'PRO'

( $\uparrow$  NUM) = SG

( $\uparrow$  PERS) = 1

( $\uparrow$  CASE) = DAT

@III.SG(( GF  $\uparrow$ ) PIV)



## Dative Oblique Object

- (35) d-ez                      χir            d-e<r>q<sup>1</sup>a-r-ši  
 II.SG-1SG.DAT behind II.SG-<IPFV>go-IPFV-CVB  
 d-i  
 II.SG-be.PRS  
 She goes after me (male speaking)

The agreement target is the dative OBL OBJ (object of preposition), controller is the absolutive SUBJ argument



## Other Agreement Targets

$$\left[ \begin{array}{l} \text{PIV} \left[ \begin{array}{l} \text{NUM SG} \\ \text{GEND II} \end{array} \right] \\ \text{OBL} \left[ \text{OBJ} \left[ \text{TARGET} \right] \right] \\ \text{ADJ} \left\{ \left\{ \text{TARGET} \right\} \right\} \\ \text{GF} \left[ \text{TARGET} \right] \end{array} \right]$$

we need to refine the definition of the PathOut:  
 $\text{@III.SG}((\text{PATHOUT} \uparrow) \text{PIV})$



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**Biabsolute Constructions**



## Biabsolutives

Biabsolutives occur as an alternative to EA and DA alignments. Both ABS are full syntactic arguments. They are found only in periphrastic constructions involving the copula and a converb, and their distribution is conditioned by the form of the converb.

Biabsolutive clauses potentially contain two ABS agreement controllers. The converb agrees with the OBJ absolutive irrespective of whether the SUBJ is also ABS. However the copula agrees with the highest absolutive-marked GF.



## Biabsolutives

Other agreement targets mainly agreement with the OBJ ABS (the PIV), however there appears to be some variability across context (for dative pronouns) and across context, lexeme and speakers for (the few) agreeing adverbs. Such agreement patterns seem to be independent of linear position. The emphatic particle does not vary as to controller.



## Converbs and BAC

Converb	Pres Cop	Past Cop	BAC	FEAT
IPFV-ši	Pres1	Imperf1	BAC possible	IPFV.SIMUL
IPFV-mat	Pres2	Imperf2	BAC oblig	IPFV.CONT
PFV-li	Perf1	Pluperf1	BAC impos	PFV.CONSEC
PFV-mat	Perf2	Pluperf2	BAC impos	PFV.CONT
POT-ši	Inceptive	Past incept	BAC impos	POT.SIMUL



## Verbal Periphrasis

The choice between the Aux Feature analysis (the copula does not head its own f-structure) and the Aux PRED analysis (the copula has a PRED value and takes an XCOMP with SUBJ re-entrancy) is not crucial here

I assume an Aux-feat approach, with the copula introducing values for TNS and the CVB values for ASP



## Ergative-Absolute Converbs

- (36) *et'ni-li* (↑ PRED) = 'TIE< SUBJ, OBJ >'  
(↑ ASP) = PFV.CONSEC  
(↑ SUBJ CASE) = ERG  
(↑ OBJ CASE) = ABS  
©IV.SG(↑ PIV )



## Obligatory BAC Converbs

- (37) *e<r>t'im-mat* ( $\uparrow$  PRED) = 'TIE< SUBJ, OBJ >'  
 ( $\uparrow$  ASP) = IPFV.CONT  
 ( $\uparrow$  OBJ CASE) = ABS  
 { ( $\uparrow$  SUBJ CASE) = ABS  $\wedge$  ( $\uparrow$  TENSE) |  
 ( $\uparrow$  SUBJ CASE) = ERG  $\wedge$   $\neg$  ( $\uparrow$  TENSE) }  
 @IV.SG( $\uparrow$  PIV )

The IPFV.CONT converb in a periphrasis requires BAC  
 BAC is only possible in tensed clauses





## Optional BAC Converbs

- (38)  $e\langle r \rangle t'in\text{-}\dot{s}i$  ( $\uparrow$  PRED) = 'TIE< SUBJ OBJ >'  
 ( $\uparrow$  ASP) = IPFV.SIMUL  
 ( $\uparrow$  OBJ CASE) = ABS  
 { ( $\uparrow$  SUBJ CASE) = ABS|ERG  $\wedge$  ( $\uparrow$  TENSE) |  
 ( $\uparrow$  SUBJ CASE) = ERG  $\wedge$   $\neg$  ( $\uparrow$  TENSE) }  
 @IV.SG( $\uparrow$  PIV )

It is likely that further (semantic/i-structure) information is associated with the mapping under which the SUBJ is in ABS case

# Copula

The copula agrees with the highest absolutive argument.

- (39) *d-i: I*     $(\uparrow \text{TENSE}) = \text{PRES}$   
                    $(\uparrow \text{ASP})$   
                    $\{(\uparrow \text{SUBJ CASE}) = \text{ABS} \wedge \text{@II.SG}(\uparrow \text{SUBJ}) \mid$   
                    $(\uparrow \text{SUBJ CASE}) = \neg \text{ABS} \wedge \text{@II.SG}(\uparrow \text{OBJ}) \}$



## Summary: Agreement Templates

Verb, Converb, Pred Adj	@IV.SG( $\uparrow$ PIV )
Exceptional Targets	@IV.SG(( PATHOUT $\uparrow$ ) PIV )
Copula	@IV.SG( $\uparrow$ SUBJ OBJ )
Pronominal Possessors	@IV.SG(POSS $\uparrow$ )
Attributives	@IV.SG(ADJ $\in$ $\uparrow$ )
Demonstratives	@IV.SG( $\uparrow$ )



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