

Online appendix for  
“Areal pressure in grammatical evolution:  
An Indo-European case study”  
by Chundra Cathcart, Gerd Carling,  
Filip Larsson, Niklas Johansson and Erich Ro  
published in *Diachronica* 35: 1 (2018)

**Ancestry relationships**

The following ancestry constraints are imposed upon the phylogenetic sample used in this paper  
(→ indicates that the entity on the left is ancestral to the entity on the right):

Sanskrit → Indo-Aryan  
Old Persian → Middle Persian → Persian, Tajik  
Classical Greek → Middle Greek → Modern Greek  
Latin → Romance  
Old Italian → Italian  
Old French → French, Walloon  
Old Provençal → Provençal  
Old Dutch → Middle Dutch → Dutch  
Old Frisian → Frisian  
Old Spanish → Spanish  
Old Portuguese → Portuguese  
Old Irish → Middle Irish → Irish, Manx, Scottish Gaelic  
Middle Welsh → Welsh  
Middle Breton → Breton  
Old Saxon → Middle Low German → Low German  
Old Norse → North Germanic  
Old Swedish → Swedish  
Old English → Middle English → English  
Old High German → Middle High German → German

## Evaluation metrics

### Capturing data at tips

The following table gives accuracy values for data simulated at the tips of the tree, averaged across languages for each feature.

ALIGNMENT	Compare PROG-PAST	PAST_A=PROG_O	0.79
ALIGNMENT	Compare PROG-PAST	PROG_A=PST_O	0.64
ALIGNMENT	Compare PROG-PAST	PROG_SO=PST_SO	0.97
ALIGNMENT	Noun: Present Progressive	N:PROG: O=so?	0.55
ALIGNMENT	Noun: Present Progressive	N:PROG:A=O?	0.52
ALIGNMENT	Noun: Present Progressive	N:PROG:A=sa?	0.95
ALIGNMENT	Noun: Simple Past	N:PST: O=so?	0.50
ALIGNMENT	Noun: Simple Past	N:PST:A=O?	0.54
ALIGNMENT	Noun: Simple Past	N:PST:A=sa?	0.75
ALIGNMENT	Pronoun: Present Progressive	P:PROG: O=so?	0.79
ALIGNMENT	Pronoun: Present Progressive	P:PROG:A=O?	0.75
ALIGNMENT	Pronoun: Simple Past	P:PST: O=so?	0.62
ALIGNMENT	Pronoun: Simple Past	P:PST:A=O?	0.80
ALIGNMENT	Pronoun: Simple Past	P:PST:A=sa?	0.75
ALIGNMENT	Reflexive Pronoun in trans. Clause	REFL-ref-A	0.89
ALIGNMENT	Reflexive Pronoun in trans. Clause	REFL-ref-O	0.93
ALIGNMENT	Verb: Present Progressive	V:PROG: O=so?	0.86
ALIGNMENT	Verb: Present Progressive	V:PROG:A=O?	0.86
ALIGNMENT	Verb: Present Progressive	V:PROG:A=sa?	0.87
ALIGNMENT	Verb: Present Progressive	V:PROG:sa=so?	0.97
ALIGNMENT	Verb: Simple Past	V:PST: O=so?	0.65
ALIGNMENT	Verb: Simple Past	V:PST:A=O?	0.77
ALIGNMENT	Verb: Simple Past	V:PST:A=sa?	0.67
Nominal morphology	Case marking	CASE-ADJ	0.50
Nominal morphology	Case marking	CASE-ART	0.57
Nominal morphology	Case marking	CASE-LAST	0.66
Nominal morphology	Case marking	CASE-N	0.58
Nominal morphology	Definiteness marking	ADJ-DEF	0.63
Nominal morphology	Definiteness marking	DEF-FIRST	0.58
Nominal morphology	Definiteness marking	DEF-LAST	0.86
Nominal morphology	Definiteness marking	DEF.ART	0.50
Nominal morphology	Definiteness marking	N-DEF	0.64
Nominal morphology	Gender / Noun class	>5 GENDER	0.97
Nominal morphology	Gender / Noun class	ANIM	0.83
Nominal morphology	Gender / Noun class	M/F	0.58
Nominal morphology	Gender / Noun class	NEUTR	0.53
Nominal morphology	Gender agreement	PRED-ADJ	0.51

Nominal morphology	Nominal cases	>7 Cases	0.77
Nominal morphology	Nominal cases	AGG.CASE.NR	0.63
Nominal morphology	Nominal cases	AGGL.CASE	0.62
Nominal morphology	Nominal cases	DAT	0.50
Nominal morphology	Nominal cases	GEN	0.52
Nominal morphology	Nominal cases	GEN/DAT	0.50
Nominal morphology	Nominal cases	O-case	0.52
Nominal morphology	Nominal cases	OBL-Cases	0.52
Nominal morphology	Nominal cases	VOC	0.50
Nominal morphology	Preposition agreement	PRON-AGR	0.69
Nominal morphology	Pronominal Cases	>7 Cases	0.94
Nominal morphology	Pronominal Cases	AGGL.CASE	0.69
Nominal morphology	Pronominal Cases	AGGL.CASE.NR	0.85
Nominal morphology	Pronominal Cases	A≠O	0.69
Nominal morphology	Pronominal Cases	DAT≠O	0.51
Nominal morphology	Pronominal Cases	OBL-Cases	0.55
Nominal morphology	Pronominal Cases	VOC	0.97
TENSE	Continous present	Present ????	0.77
TENSE	Continous present	Progressive present	0.54
TENSE	Future	FUT.AUX	0.50
TENSE	Future	FUT.Participle	0.76
TENSE	Future	FUT.Particle	0.71
TENSE	Future	FUT.Synth	0.50
TENSE	Future	PERF.FUT	0.84
Verbal morphology	present progressive, A	PROG:A-AGR-FULL	0.49
Verbal morphology	present progressive, A	PROG:A-Gender-AGR	0.88
Verbal morphology	present progressive, A	PROG:NO-A-AGR	0.85
Verbal morphology	present progressive, DAT	PROG:DAT-AGR-FULL	0.96
Verbal morphology	present progressive, DAT	PROG:NO-DAT-AGR	0.77
Verbal morphology	present progressive, O	PROG:NO-O-AGR	0.77
Verbal morphology	present progressive, O	PROG:O-AGR-FULL	0.96
Verbal morphology	simple PAST, A	PST:A-AGR-FULL	0.54
Verbal morphology	simple PAST, A	PST:A-Gender-AGR	0.81
Verbal morphology	simple PAST, A	PST:NO-A-AGR	0.63
Verbal morphology	simple PAST, DAT	PST:DAT-AGR-FULL	0.96
Verbal morphology	simple PAST, DAT	PST:DAT-Gender-AGR	0.97
Verbal morphology	simple PAST, DAT	PST:NO-DAT-AGR	0.75
Verbal morphology	simple PAST, O	PST:NO-O-AGR	0.62
Verbal morphology	simple PAST, O	PST:O-AGR-FULL	0.90
Verbal morphology	simple PAST, O	PST:O-Gender-AGR	0.83
Word order	Adpositions	Post	0.52
Word order	Adpositions	Prep	0.58
Word order	Clitic pronouns finite verb	2nd position	0.79
Word order	Clitic pronouns finite verb	OV	0.65

Word order	Clitic pronouns finite verb	vo	0.63
Word order	Clitic pronouns infinitive	2nd position	0.80
Word order	Clitic pronouns infinitive	ov	0.68
Word order	Clitic pronouns infinitive	vo	0.71
Word order	Clitic pronouns participle	2nd position	0.82
Word order	Clitic pronouns participle	ov	0.63
Word order	Clitic pronouns participle	vo	0.69
Word order	Infinitive	ov	0.53
Word order	Infinitive	vo	0.51
Word order	Main clauses	soV	0.53
Word order	Main clauses	svo	0.54
Word order	Main clauses	V2	0.68
Word order	Main clauses	vso	0.87
Word order	Noun-Possessor	n-Poss	0.53
Word order	Noun-Possessor	Poss-N	0.54
Word order	Noun-adjective	AN	0.63
Word order	Noun-adjective	NA	0.58
Word order	Noun-relative clause	NRel	0.72
Word order	Noun-relative clause	RelN	0.75
Word order	Participle	ov	0.51
Word order	Participle	vo	0.51
Word order	Subordinate clause	soV	0.50
Word order	Subordinate clause	svo	0.53
Word order	Subordinate clause	V2	0.91
Word order	Subordinate clause	vso	0.85
Word order	wh-element	wh-V	0.51
Word order	wh-element	wh-initial	0.53

The following table gives accuracy values for data simulated at the tips of the tree, averaged across features for each language.

Albanian Tosk	0.66
Angloromani	0.67
Ashkun	0.69
Assamese	0.68
Avestan	0.70
Baluchi	0.70
Bengali	0.69
Breton	0.66
Bulgarian	0.71
Catalan	0.68
Classical Greek	0.67
Cornish	0.69
Croatian	0.70
Czech	0.69

---

Danish	0.67
Dutch	0.69
Elfdalian	0.70
English	0.70
Faroese	0.69
French	0.70
Frisian	0.70
Friulian	0.71
German	0.72
Gilaki	0.70
Gothic	0.72
Gujarati	0.66
Hindi	0.70
Hittite	0.69
Icelandic	0.70
Irish	0.66
Italian	0.70
Kashmiri	0.65
Kati	0.67
Khowar	0.72
Konkani	0.65
Kurdish Kurmanji	0.68
Kurdish Sorani	0.65
Ladin	0.71
Latin	0.72
Latvian	0.74
Lithuanian	0.70
Low German	0.72
Luwian	0.68
Maithili	0.67
Maldivian	0.63
Manx	0.63
Marathi	0.65
Middle Breton	0.70
Middle Dutch	0.71
Middle English	0.72
Middle Greek	0.67
Middle High German	0.73
Middle Irish	0.66
Middle Low German	0.73
Middle Persian	0.68
Middle Welsh	0.70
Modern Armenian	0.67
Modern Greek	0.68

Nepali	0.66
Norwegian Bokmål	0.67
Norwegian Nynorsk	0.67
Old Church Slavonic	0.69
Old Dutch	0.75
Old English	0.72
Old French	0.70
Old Frisian	0.71
Old High German	0.73
Old Irish	0.69
Old Italian	0.70
Old Norse	0.70
Old Persian	0.71
Old Portuguese	0.71
Old Provençal	0.71
Old Prussian	0.74
Old Russian	0.70
Old Saxon	0.72
Old Spanish	0.70
Old Swedish	0.71
Oriya	0.71
Ossetian Iron	0.60
Pali	0.73
Parachi	0.68
Pashto	0.61
Persian	0.70
Polish	0.71
Portuguese	0.68
Prakrit	0.73
Prasun	0.68
Provençal	0.70
Punjabi	0.66
Romani Arli	0.67
Romani Burgenland	0.71
Romani Kale	0.70
Romani Kelderash	0.69
Romani Lovara	0.69
Romani Sepečides	0.69
Romani Sinte	0.67
Romanian	0.67
Romansh	0.69
Russian	0.71
Sanskrit	0.71
Sardinian	0.70

Scandoromani	0.65
Scottish Gaelic	0.63
Serbian	0.70
Shughni	0.69
Sicilian	0.71
Sindhi	0.64
Sinhalese	0.62
Slovene	0.70
Sogdian	0.71
Spanish	0.67
Swedish	0.68
Swiss German	0.69
Tajik	0.70
Talysh	0.66
Tocharian A	0.67
Tocharian B	0.67
Ukrainian	0.72
Upper Sorbian	0.72
Urdu	0.68
Wakhi	0.70
Walloon	0.71
Welsh	0.65
Yiddish	0.71

### Capturing ancient/medieval data

The following table gives accuracy values for data simulated for ancient/medieval languages, averaged across features for each language.

Mean Accuracy	0.84
Classical Greek	0.71
Latin	0.73
Middle Breton	0.87
Middle Dutch	0.84
Middle English	0.85
Middle Greek	0.83
Middle High German	0.90
Middle Irish	0.83
Middle Low German	0.90
Middle Persian	0.74
Middle Welsh	0.82
Old Dutch	0.79
Old English	0.83

Old French	0.82
Old Frisian	0.80
Old High German	0.87
Old Irish	0.80
Old Italian	0.93
Old Norse	0.87
Old Persian	0.77
Old Portuguese	0.90
Old Provençal	0.84
Old Russian	0.90
Old Saxon	0.87
Old Spanish	0.91
Old Swedish	0.86
Sanskrit	0.89

## Dependencies

The following table displays each interdependent feature variant set present in the data, as well as the proportion of stochastic character mapping iterations where a licit combination of states was drawn. Tabulations for illicit combination states are found in `eval_dependencies.py` (space does not permit listing them here).

Grid	Feature	Variant	Probability of licit combination
Verbal morphology	present progressive, O	PROG:NO-O-AGR	0.99
Verbal morphology	present progressive, O	PROG:O-AGR-FULL	
Verbal morphology	present progressive, O	PROG:O-Gender-AGR	
Nominal morphology	Nominal cases	>7 Cases	0.63
Nominal morphology	Nominal cases	OBL-Cases	
Nominal morphology	Nominal cases	DAT	
Nominal morphology	Nominal cases	GEN	
Nominal morphology	Nominal cases	O-case	
Nominal morphology	Nominal cases	VOC	
Verbal morphology	simple PAST, DAT	PST:NO-DAT-AGR	0.98
Verbal morphology	simple PAST, DAT	PST:DAT-AGR-FULL	
Verbal morphology	simple PAST, DAT	PST:DAT-Gender-AGR	
Verbal morphology	simple PAST, A	PST:NO-A-AGR	0.94
Verbal morphology	simple PAST, A	PST:A-AGR-FULL	
Verbal morphology	simple PAST, A	PST:A-Gender-AGR	
Nominal morphology	Definiteness marking	DEF.ART	0.91
Nominal morphology	Definiteness marking	N-DEF	

Grid	Feature	Variant	Probability of licit combination
Nominal morphology	Definiteness marking	ADJ-DEF	
Nominal morphology	Definiteness marking	DEF-LAST	
Nominal morphology	Definiteness marking	DEF-FIRST	
Word order	Clitic pronouns finite verb	2nd position	0.96
Word order	Clitic pronouns finite verb	OV	
Word order	Clitic pronouns finite verb	VO	
Word order	Clitic pronouns infinitive	2nd position	0.96
Word order	Clitic pronouns infinitive	OV	
Word order	Clitic pronouns infinitive	VO	
Nominal morphology	Pronominal Cases	> 7 Cases	0.60
Nominal morphology	Pronominal Cases	OBL-Cases	
Nominal morphology	Pronominal Cases	A=O	
Nominal morphology	Pronominal Cases	DAT=O	
Nominal morphology	Pronominal Cases	VOC	
Word order	Main clauses	SOV	0.61
Word order	Main clauses	SVO	
Word order	Main clauses	V2	
Word order	Main clauses	VSO	
Word order	Clitic pronouns participle	2nd position	0.96
Word order	Clitic pronouns participle	OV	
Word order	Clitic pronouns participle	VO	
Nominal morphology	Case marking	CASE-FIRST	1.00
Nominal morphology	Case marking	CASE-LAST	
Verbal morphology	present progressive, DAT	PROG:NO-DAT-AGR	0.99
Verbal morphology	present progressive, DAT	PROG:DAT-AGR-FULL	
Verbal morphology	present progressive, DAT	PROG:DAT-Gender-AGR	
Word order	Subordinate clause	SOV	0.71
Word order	Subordinate clause	SVO	
Word order	Subordinate clause	V2	
Word order	Subordinate clause	VSO	
Verbal morphology	present progressive, A	PROG:NO-A-AGR	0.97
Verbal morphology	present progressive, A	PROG:A-AGR-FULL	
Verbal morphology	present progressive, A	PROG:A-Gender-AGR	
Verbal morphology	simple PAST, O	PST:NO-O-AGR	0.91
Verbal morphology	simple PAST, O	PST:O-AGR-FULL	
Verbal morphology	simple PAST, O	PST:O-Gender-AGR	
Nominal morphology	Nominal cases	GEN/DAT	0.51
Nominal morphology	Nominal cases	DAT	
Nominal morphology	Nominal cases	GEN	

## PIE reconstructions

The following table gives the probability of reconstructing each feature to Proto-Indo-European, according to our model. Probabilities represent the fraction of instances out of 1000 for which a value of 1 was drawn from a Bernoulli distribution parameterized by  $p(s_f(\text{root})=1 \mid \text{data, tree, } \alpha, (\beta))$  (see Equation 5 above):

Grid	Feature	Variant	Probability in PIE
ALIGNMENT	Compare PROG-PAST	PAST_A=PROG_O	0.14
ALIGNMENT	Compare PROG-PAST	PROG_A=PST_O	0.28
ALIGNMENT	Compare PROG-PAST	PROG_SO=PST_SO	0.98
ALIGNMENT	Noun: Present Progressive	N:PROG: O=so?	0.38
ALIGNMENT	Noun: Present Progressive	N:PROG:A=O?	0.41
ALIGNMENT	Noun: Present Progressive	N:PROG:A=sa?	0.96
ALIGNMENT	Noun: Simple Past	N:PST: O=so?	0.49
ALIGNMENT	Noun: Simple Past	N:PST:A=O?	0.33
ALIGNMENT	Noun: Simple Past	N:PST:A=sa?	0.86
ALIGNMENT	Pronoun: Present Progressive	P:PROG: O=so?	0.15
ALIGNMENT	Pronoun: Present Progressive	P:PROG:A=O?	0.18
ALIGNMENT	Pronoun: Simple Past	P:PST: O=so?	0.31
ALIGNMENT	Pronoun: Simple Past	P:PST:A=O?	0.15
ALIGNMENT	Pronoun: Simple Past	P:PST:A=sa?	0.83
ALIGNMENT	Reflexive Pronoun in trans. Clause	REFL-ref-A	0.94
ALIGNMENT	Reflexive Pronoun in trans. Clause	REFL-ref-O	0.05
ALIGNMENT	Verb: Present Progressive	V:PROG: O=so?	0.09
ALIGNMENT	Verb: Present Progressive	V:PROG:A=O?	0.07
ALIGNMENT	Verb: Present Progressive	V:PROG:A=sa?	0.91
ALIGNMENT	Verb: Present Progressive	V:PROG:sa=so?	0.96
ALIGNMENT	Verb: Simple Past	V:PST: O=so?	0.24
ALIGNMENT	Verb: Simple Past	V:PST:A=O?	0.15
ALIGNMENT	Verb: Simple Past	V:PST:A=sa?	0.76
Nominal morphology	Case marking	CASE-ADJ	0.46
Nominal morphology	Case marking	CASE-ART	0.24
Nominal morphology	Case marking	CASE-LAST	0.25
Nominal morphology	Case marking	CASE-N	0.68
Nominal morphology	Definiteness marking	ADJ-DEF	0.21
Nominal morphology	Definiteness marking	DEF-FIRST	0.31
Nominal morphology	Definiteness marking	DEF-LAST	0.08
Nominal morphology	Definiteness marking	DEF.ART	0.39
Nominal morphology	Definiteness marking	N-DEF	0.22
Nominal morphology	Gender / Noun class	>5 GENDER	0.02
Nominal morphology	Gender / Noun class	ANIM	0.12
Nominal morphology	Gender / Noun class	M/F	0.66

Grid	Feature	Variant	Probability in PIE
Nominal morphology	Gender / Noun class	NEUTR	0.32
Nominal morphology	Gender agreement	PRED-ADJ	0.56
Nominal morphology	Nominal cases	>7 Cases	0.12
Nominal morphology	Nominal cases	AGG.CASE.NR	0.30
Nominal morphology	Nominal cases	AGGL.CASE	0.26
Nominal morphology	Nominal cases	DAT	0.46
Nominal morphology	Nominal cases	GEN	0.56
Nominal morphology	Nominal cases	GEN/DAT	0.43
Nominal morphology	Nominal cases	o-case	0.57
Nominal morphology	Nominal cases	OBL-Cases	0.39
Nominal morphology	Nominal cases	VOC	0.45
Nominal morphology	Preposition agreement	PRON-AGR	0.26
Nominal morphology	Pronominal Cases	> 7 Cases	0.04
Nominal morphology	Pronominal Cases	AGGL.CASE	0.22
Nominal morphology	Pronominal Cases	AGGL.CASE.NR	0.07
Nominal morphology	Pronominal Cases	A≠O	0.75
Nominal morphology	Pronominal Cases	DAT≠O	0.47
Nominal morphology	Pronominal Cases	OBL-Cases	0.32
Nominal morphology	Pronominal Cases	VOC	0.01
TENSE	Continous present	Present ????	0.82
TENSE	Continous present	Progressive present	0.41
TENSE	Future	FUT.AUX	0.45
TENSE	Future	FUT.Participle	0.15
TENSE	Future	FUT.Particle	0.23
TENSE	Future	FUT.Synth	0.40
TENSE	Future	PERF.FUT	0.09
Verbal morphology	present progressive, A	PROG:A-AGR-FULL	0.51
Verbal morphology	present progressive, A	PROG:A-Gender-AGR	0.08
Verbal morphology	present progressive, A	PROG:NO-A-AGR	0.10
Verbal morphology	present progressive, DAT	PROG:DAT-AGR-FULL	0.04
Verbal morphology	present progressive, DAT	PROG:NO-DAT-AGR	0.81
Verbal morphology	present progressive, O	PROG:NO-O-AGR	0.82
Verbal morphology	present progressive, O	PROG:O-AGR-FULL	0.03
Verbal morphology	simple PAST, A	PST:A-AGR-FULL	0.38
Verbal morphology	simple PAST, A	PST:A-Gender-AGR	0.12
Verbal morphology	simple PAST, A	PST:NO-A-AGR	0.26
Verbal morphology	simple PAST, DAT	PST:DAT-AGR-FULL	0.03
Verbal morphology	simple PAST, DAT	PST:DAT-Gender-AGR	0.01
Verbal morphology	simple PAST, DAT	PST:NO-DAT-AGR	0.80
Verbal morphology	simple PAST, O	PST:NO-O-AGR	0.67
Verbal morphology	simple PAST, O	PST:O-AGR-FULL	0.10
Verbal morphology	simple PAST, O	PST:O-Gender-AGR	0.12

Grid	Feature	Variant	Probability in PIE
Word order	Adpositions	Post	0.43
Word order	Adpositions	Prep	0.66
Word order	Clitic pronouns finite verb	2nd position	0.12
Word order	Clitic pronouns finite verb	ov	0.23
Word order	Clitic pronouns finite verb	vo	0.26
Word order	Clitic pronouns infinitive	2nd position	0.12
Word order	Clitic pronouns infinitive	ov	0.22
Word order	Clitic pronouns infinitive	vo	0.18
Word order	Clitic pronouns participle	2nd position	0.12
Word order	Clitic pronouns participle	ov	0.29
Word order	Clitic pronouns participle	vo	0.20
Word order	Infinitive	ov	0.58
Word order	Infinitive	vo	0.39
Word order	Main clauses	sov	0.39
Word order	Main clauses	svo	0.38
Word order	Main clauses	V2	0.16
Word order	Main clauses	vso	0.07
Word order	Noun-Possessor	N-Poss	0.41
Word order	Noun-Possessor	Poss-N	0.62
Word order	Noun-adjective	AN	0.76
Word order	Noun-adjective	NA	0.31
Word order	Noun-relative clause	NRel	0.81
Word order	Noun-relative clause	RelN	0.16
Word order	Participle	ov	0.55
Word order	Participle	vo	0.48
Word order	Subordinate clause	sov	0.51
Word order	Subordinate clause	svo	0.50
Word order	Subordinate clause	V2	0.05
Word order	Subordinate clause	vso	0.09
Word order	WH-element	WH-V	0.41
Word order	WH-element	WH-initial	0.62

## Areal metric

The following table ranks each change type according to its PC2 value, from least to most areal. Asterisks (\*) indicate change types that occurred in parallel in fewer than 80 iterations of the simulation procedure, and were therefore excluded from statistical analyses.

Rank	Grid	Feature	Variant	Change	Condition	PC2
214	*Word order	Adpositions	Prep	gain	N	-0.66
213	ALIGNMENT	Noun: Present Progressive	N:PROG:A=sa?	loss	C	-0.53
212	Nominal morphology	Pronominal Cases	AGGL.CASE.NR	loss	N	-0.48
211	Nominal morphology	Pronominal Cases	AGGL.CASE.NR	gain	N	-0.45
210	Word order	Adpositions	Post	loss	N	-0.4
209	Word order	Clitic pronouns participle	2nd position	loss	N	-0.35
208	*ALIGNMENT	Verb: Present Progressive	V:PROG:sa=so?	gain	S	-0.35
207	Word order	Noun-adjective	AN	loss	N	-0.34
206	Word order	Clitic pronouns infinitive	2nd position	loss	N	-0.33
205	*Nominal morphology	Gender / Noun class	>5 GENDER	loss	S	-0.32
204	*Verbal morphology	simple PAST, DAT	PST:DAT-Gender-AGR	gain	C	-0.32
203	*ALIGNMENT	Noun: Present Progressive	N:PROG:A=sa?	gain	S	-0.3
202	*Verbal morphology	simple PAST, DAT	PST:DAT-Gender-AGR	loss	S	-0.3
201	*ALIGNMENT	Compare PROG-PAST	PROG_SO=PST_SO	gain	S	-0.3
200	*ALIGNMENT	Verb: Present Progressive	V:PROG:A=sa?	gain	S	-0.29
199	*Nominal morphology	Gender / Noun class	>5 GENDER	gain	C	-0.29
198	Word order	Noun-relative clause	RelN	loss	N	-0.28
197	*ALIGNMENT	Verb: Present Progressive	V:PROG:sa=so?	loss	C	-0.26
196	Word order	Clitic pronouns finite verb	2nd position	loss	N	-0.26
195	ALIGNMENT	Reflexive Pronoun in trans. Clause	REFL-ref-O	loss	N	-0.24
194	ALIGNMENT	Reflexive Pronoun in trans. Clause	REFL-ref-A	gain	N	-0.23
193	Word order	Subordinate clause	V2	gain	N	-0.22
192	*ALIGNMENT	Compare PROG-PAST	PROG_SO=PST_SO	loss	C	-0.22
191	Word order	Noun-relative clause	NRel	gain	N	-0.2
190	Nominal morphology	Definiteness marking	DEF-LAST	loss	S	-0.19
189	Word order	Noun-Possessor	N-Poss	gain	N	-0.18
188	*Nominal morphology	Pronominal Cases	>7 Cases	loss	S	-0.18
187	Word order	Main clauses	VSO	gain	N	-0.17
186	*Verbal morphology	present progressive, A	PROG:A-Gender-AGR	loss	S	-0.17
185	Nominal morphology	Definiteness marking	DEF-LAST	gain	C	-0.16
184	Word order	Participle	VO	gain	N	-0.16
183	*Verbal morphology	present progressive, O	PROG:O-AGR-FULL	loss	S	-0.15
182	*Verbal morphology	present progressive, DAT	PROG:DAT-AGR-FULL	loss	S	-0.15
181	ALIGNMENT	Verb: Present Progressive	V:PROG: O=so?	loss	C	-0.14
180	Nominal morphology	Pronominal Cases	AGGL.CASE	loss	N	-0.14
179	Word order	Clitic pronouns finite verb	2nd position	gain	N	-0.13
178	TENSE	Future	FUT.Participle	loss	N	-0.13
177	Word order	Clitic pronouns infinitive	2nd position	gain	N	-0.13

Rank	Grid	Feature	Variant	Change	Condition	PC2
176	ALIGNMENT	Reflexive Pronoun in trans. Clause	REFL-ref-A	loss	N	-0.12
175	ALIGNMENT	Verb: Present Progressive	V:PROG:A=sa?	loss	C	-0.12
174	Word order	Clitic pronouns participle	2nd position	gain	N	-0.12
173	ALIGNMENT	Reflexive Pronoun in trans. Clause	REFL-ref-o	gain	N	-0.12
172	Word order	Noun-Possessor	Poss-N	loss	N	-0.12
171	TENSE	Future	FUT.Particle	loss	N	-0.12
170	Nominal morphology	Nominal cases	>7 Cases	loss	S	-0.12
169	ALIGNMENT	Pronoun: Present Progressive	P:PROG: O=so?	loss	C	-0.11
168	*Nominal morphology	Pronominal Cases	VOC	loss	S	-0.11
167	ALIGNMENT	Pronoun: Present Progressive	P:PROG:A=O?	loss	C	-0.11
166	Nominal morphology	Definiteness marking	N-DEF	loss	N	-0.11
165	Verbal morphology	present progressive, A	PROG:A-Gender-AGR	gain	C	-0.11
164	ALIGNMENT	Pronoun: Simple Past	P:PST:A=sa?	gain	S	-0.1
163	TENSE	Future	PERF.FUT	gain	N	-0.09
162	Nominal morphology	Gender / Noun class	ANIM	loss	S	-0.09
161	ALIGNMENT	Noun: Simple Past	N:PST:A=sa?	gain	S	-0.09
160	Word order	WH-element	WH-initial	loss	N	-0.09
159	ALIGNMENT	Verb: Simple Past	V:PST:A=O?	loss	C	-0.09
158	Nominal morphology	Nominal cases	GEN/DAT	gain	C	-0.09
157	Word order	Main clauses	V2	gain	N	-0.09
156	ALIGNMENT	Compare PROG-PAST	PAST_A=PROG_O	loss	S	-0.09
155	TENSE	Continous present	Present ????	gain	N	-0.08
154	ALIGNMENT	Verb: Present Progressive	V:PROG:A=O?	loss	C	-0.08
153	*Verbal morphology	simple PAST, O	PST:O-AGR-FULL	loss	S	-0.08
152	*Verbal morphology	simple PAST, DAT	PST:DAT-AGR-FULL	loss	S	-0.08
151	Nominal morphology	Pronominal Cases	AGGL.CASE	gain	N	-0.07
150	Word order	Participle	OV	loss	N	-0.07
149	Nominal morphology	Definiteness marking	ADJ-DEF	loss	S	-0.07
148	ALIGNMENT	Pronoun: Simple Past	P:PST:A=O?	gain	S	-0.07
147	Nominal morphology	Nominal cases	AGGL.CASE	gain	S	-0.07
146	Word order	Subordinate clause	VSO	gain	N	-0.07
145	Nominal morphology	Nominal cases	AGG.CASE.NR	loss	N	-0.07
144	*Verbal morphology	present progressive, O	PROG:NO-O-AGR	gain	S	-0.07
143	*Word order	Subordinate clause	VSO	loss	N	-0.07
142	ALIGNMENT	Compare PROG-PAST	PAST A=PROG O	gain	C	-0.07
141	ALIGNMENT	Pronoun: Present Progressive	P:PROG: O=so?	gain	S	-0.07
140	Nominal morphology	Gender / Noun class	M/F	gain	C	-0.06
139	ALIGNMENT	Verb: Simple Past	V:PST:A=sa?	gain	S	-0.06
138	Verbal morphology	simple PAST, O	PST:O-Gender-AGR	loss	S	-0.06
137	Verbal morphology	present progressive, A	PROG:A-AGR-FULL	gain	C	-0.05
136	Verbal morphology	simple PAST, DAT	PST:NO-DAT-AGR	loss	C	-0.05
135	*Verbal morphology	simple PAST, DAT	PST:NO-DAT-AGR	gain	S	-0.04
134	Word order	Infinitive	VO	gain	N	-0.04
133	Verbal morphology	present progressive, A	PR OG:NO-A-AGR	loss	C	-0.04

Rank	Grid	Feature	Variant	Change	Condition	PC2
132	ALIGNMENT	Pronoun: Present Progressive	P:PROG:A=O?	gain	S	-0.04
131	Verbal morphology	present progressive, O	PROG:NO-O-AGR	loss	C	-0.04
130	Verbal morphology	simple PAST, A	PST:NO-A-AGR	loss	C	-0.04
129	ALIGNMENT	Pronoun: Simple Past	P:PST:A=sa?	loss	C	-0.03
128	Verbal morphology	present progressive, DAT	PROG:NO-DAT-AGR	gain	S	-0.03
127	Nominal morphology	Case marking	CASE-LAST	loss	S	-0.03
126	Verbal morphology	simple PAST, O	PST:NO-O-AGR	loss	C	-0.02
125	*Verbal morphology	present progressive, DAT	PROG:DAT-AGR-FULL	gain	C	-0.02
124	*Verbal morphology	present progressive, O	PROG:O-AGR-FULL	gain	C	-0.02
123	Verbal morphology	simple PAST, A	PST:A-Gender-AGR	loss	S	-0.02
122	TENSE	Continuous present	Present ????	loss	N	-0.02
121	ALIGNMENT	Noun: Simple Past	N:PST:A=sa?	loss	C	-0.02
120	Nominal morphology	Preposition agreement	PRON-AGR	gain	C	-0.01
119	ALIGNMENT	Verb: Simple Past	V:PST:O=so?	loss	C	-0.01
118	Nominal morphology	Definiteness marking	DEF.ART	gain	N	-0.01
117	Word order	Noun-relative clause	RelN	gain	N	0
116	Nominal morphology	Case marking	CASE-LAST	gain	C	0
115	Word order	WH-element	WH-initial	gain	N	0
114	*Verbal morphology	simple PAST, DAT	PST:DAT-AGR-FULL	gain	C	0
113	Verbal morphology	simple PAST, O	PST:NO-O-AGR	gain	S	0.01
112	Word order	Noun-adjective	AN	gain	N	0.01
111	Nominal morphology	Nominal cases	O-case	gain	C	0.01
110	ALIGNMENT	Verb: Simple Past	V:PST:A=Sa?	loss	C	0.01
109	Nominal morphology	Case marking	CASE-ADJ	gain	C	0.01
108	*Nominal morphology	Pronominal Cases	VOC	gain	C	0.01
107	ALIGNMENT	Pronoun: Simple Past	P:PST:O=so?	gain	S	0.02
106	Nominal morphology	Definiteness marking	N-DEF	gain	N	0.02
105	*Nominal morphology	Pronominal Cases	A≠O	gain	C	0.02
104	ALIGNMENT	Noun: Present Progressive	N:PROG:A=O?	loss	C	0.02
103	ALIGNMENT	Noun: Simple Past	N:PST:A=O?	loss	C	0.02
102	Verbal morphology	present progressive, DAT	PROG:NO-DAT-AGR	loss	C	0.02
101	ALIGNMENT	Noun: Present Progressive	N:PROG:O=so?	loss	C	0.02
100	Verbal morphology	present progressive, A	PROG:NO-A-AGR	gain	S	0.02
99	ALIGNMENT	Pronoun: Simple Past	P:PST:O=so?	loss	C	0.03
98	*Word order	Main clauses	VSO	loss	N	0.03
97	Word order	Subordinate clause	V2	loss	N	0.03
96	Nominal morphology	Definiteness marking	DEF-FIRST	loss	S	0.03
95	Verbal morphology	simple PAST, A	PST:A-Gender-AGR	gain	C	0.03
94	Word order	WH-element	WH-V	loss	N	0.03
93	Word order	Clitic pronouns finite verb	OV	gain	N	0.03
92	Verbal morphology	simple PAST, O	PST:O-Gender-AGR	gain	C	0.03
91	ALIGNMENT	Compare PROG-PAST	PROG_A=PST_O	gain	C	0.04
90	Word order	Clitic pronouns infinitive	VO	gain	N	0.04
89	TENSE	Future	FUT.AUX	gain	N	0.04

Rank	Grid	Feature	Variant	Change	Condition	PC2
88	ALIGNMENT	Verb: Present Progressive	V:PROG: O=SO?	gain	S	0.04
87	Nominal morphology	Pronominal Cases	OBL-Cases	gain	C	0.04
86	Nominal morphology	Pronominal Cases	DAT≠O	gain	C	0.04
85	Verbal morphology	simple PAST, A	PST:A-AGR-FULL	loss	S	0.05
84	Nominal morphology	Nominal cases	DAT	gain	C	0.05
83	Word order	Clitic pronouns finite verb	OV	loss	N	0.05
82	Word order	Subordinate clause	SVO	loss	N	0.05
81	TENSE	Future	FUT.Synth	gain	N	0.05
80	Word order	Noun-relative clause	NRel	loss	N	0.05
79	Nominal morphology	Definiteness marking	DEF-FIRST	gain	C	0.05
78	TENSE	Future	FUT.Participle	gain	N	0.05
77	Nominal morphology	Nominal cases	AGGL.CASE	loss	N	0.06
76	Word order	Noun-Possessor	N-Poss	loss	N	0.06
75	TENSE	Continuous present	Progressive present	gain	N	0.06
74	TENSE	Continuous present	Progressive present	loss	N	0.06
73	Nominal morphology	Case marking	CASE-ART	gain	C	0.06
72	Nominal morphology	Nominal cases	GEN	loss	S	0.07
71	Nominal morphology	Gender / Noun class	M/F	loss	S	0.07
70	ALIGNMENT	Compare PROG-PAST	PROG_A=PST_O	loss	S	0.07
69	Word order	Noun-Possessor	Poss-N	gain	N	0.07
68	Nominal morphology	Pronominal Cases	DAT≠O	loss	S	0.08
67	Nominal morphology	Case marking	CASE-N	gain	C	0.08
66	Nominal morphology	Gender / Noun class	NEUTR	loss	S	0.08
65	*ALIGNMENT	Pronoun: Simple Past	P:PST:A=O?	loss	C	0.08
64	Word order	Subordinate clause	SOV	loss	N	0.08
63	Word order	WH-element	WH-V	gain	N	0.08
62	ALIGNMENT	Verb: Simple Past	V:PST: O=SO?	gain	S	0.08
61	Nominal morphology	Gender / Noun class	ANIM	gain	C	0.09
60	ALIGNMENT	Verb: Present Progressive	V:PROG:A=O?	gain	S	0.09
59	ALIGNMENT	Verb: Simple Past	V:PST:A=O?	gain	S	0.09
58	Verbal morphology	simple PAST, O	PST:O-AGR-FULL	gain	C	0.09
57	ALIGNMENT	Noun: Simple Past	N:PST: O=SO?	loss	C	0.09
56	Word order	Clitic pronouns infinitive	OV	loss	N	0.09
55	Word order	Clitic pronouns finite verb	VO	loss	N	0.09
54	Nominal morphology	Nominal cases	AGG.CASE.NR	gain	S	0.09
53	Verbal morphology	present progressive, A	PROG:A-AGR-FULL	loss	S	0.1
52	Nominal morphology	Gender agreement	PRED-ADJ	loss	S	0.1
51	Nominal morphology	Nominal cases	>7 Cases	gain	C	0.1
50	Verbal morphology	simple PAST, A	PST:NO-A-AGR	gain	S	0.1
49	Nominal morphology	Nominal cases	GEN	gain	C	0.1
48	Word order	Clitic pronouns infinitive	VO	loss	N	0.11
47	Nominal morphology	Pronominal Cases	>7 Cases	gain	C	0.11
46	Nominal morphology	Pronominal Cases	OBL-Cases	loss	S	0.11
45	Nominal morphology	Definiteness marking	ADJ-DEF	gain	C	0.11

Rank	Grid	Feature	Variant	Change	Condition	PC2
44	Nominal morphology	Pronominal Cases	A≠O	loss	S	0.11
43	Word order	Clitic pronouns participle	VO	gain	N	0.12
42	Word order	Main clauses	SVO	loss	N	0.12
41	Word order	Adpositions	Post	gain	N	0.12
40	Nominal morphology	Definiteness marking	DEF.ART	loss	N	0.12
39	TENSE	Future	FUT.AUX	loss	N	0.13
38	Nominal morphology	Nominal cases	DAT	loss	S	0.13
37	Word order	Clitic pronouns participle	OV	gain	N	0.14
36	Word order	Clitic pronouns participle	VO	loss	N	0.14
35	Nominal morphology	Nominal cases	OBL-Cases	loss	S	0.14
34	Nominal morphology	Gender agreement	PRED-ADJ	gain	C	0.14
33	Nominal morphology	Nominal cases	VOC	gain	C	0.14
32	Word order	Main clauses	SOV	loss	N	0.14
31	ALIGNMENT	Noun: Simple Past	N:PST: O=SO?	gain	S	0.15
30	ALIGNMENT	Noun: Simple Past	N:PST:A=O?	gain	S	0.15
29	Word order	Clitic pronouns infinitive	OV	gain	N	0.16
28	Nominal morphology	Nominal cases	O-case	loss	S	0.16
27	Nominal morphology	Case marking	CASE-N	loss	S	0.17
26	Word order	Clitic pronouns finite verb	VO	gain	N	0.17
25	Word order	Main clauses	SVO	gain	N	0.17
24	Verbal morphology	simple PAST, A	PST:A-AGR-FULL	gain	C	0.17
23	Nominal morphology	Case marking	CASE-ADJ	loss	S	0.18
22	ALIGNMENT	Noun: Present Progressive	N:PROG: O=SO?	gain	S	0.18
21	Nominal morphology	Nominal cases	OBL-Cases	gain	C	0.18
20	*Nominal morphology	Preposition agreement	PRON-AGR	loss	S	0.18
19	ALIGNMENT	Noun: Present Progressive	N:PROG:A=O?	gain	S	0.19
18	Word order	Main clauses	SOV	gain	N	0.19
17	Nominal morphology	Case marking	CASE-ART	loss	S	0.19
16	Nominal morphology	Nominal cases	GEN/DAT	loss	S	0.19
15	Word order	Adpositions	Prep	loss	N	0.2
14	Nominal morphology	Gender / Noun class	NEUTR	gain	C	0.2
13	Word order	Infinitive	OV	loss	N	0.2
12	Word order	Subordinate clause	SVO	gain	N	0.2
11	TENSE	Future	FUT.Particle	gain	N	0.21
10	Word order	Clitic pronouns participle	OV	loss	N	0.21
9	Word order	Infinitive	OV	gain	N	0.21
8	Nominal morphology	Nominal cases	VOC	loss	S	0.23
7	TENSE	Future	FUT.Synth	loss	N	0.23
6	Word order	Subordinate clause	SOV	gain	N	0.24
5	Word order	Infinitive	VO	loss	N	0.28
4	Word order	Main clauses	V2	loss	N	0.29
3	TENSE	Future	PERF.FUT	loss	N	0.38
2	Word order	Participle	VO	loss	N	0.41
1	Word order	Participle	OV	gain	N	0.5

The following table includes a description of each feature variant in each grid, along with the condition (simplifying, neutral, or complexifying) of its gain or loss. Asterisks (\*) indicate features that show no attested differentiation across Indo-European languages, and are thus excluded from this paper's analysis.

Grid	Feature	Variant	Description	Gain condition	Loss condition	
Word order	Adpositions	Prep	Does the language have a substantial set of prepositions?	N	N	
		Post	Does the language have a substantial set of postpositions?	N	N	
	Noun-adjective	NA	Do most adjectives occur after the noun?	N	N	
		AN	Do most adjectives occur before the noun?	N	N	
	Noun-relative clause	NRel	Do most relative clauses occur after the noun?	N	N	
		RelN	Do most relative clauses occur before the noun?	N	N	
	Noun-Possessor	N-Poss	Do most possessors occur after the noun they possess? The possessor should be an animate noun, and neither a proper name nor a pronoun!	N	N	
		Poss-N	Do most possessors occur before the noun they possess? The possessor should be an animate noun, and neither a proper name nor a pronoun!	N	N	
	WH-element	WH-initial	Is the wh-question word always obligatorily the first element in a question?	N	N	
	WH-element	WH-V	Does the wh-question word always immediately precede the verb? I.e. stand directly before the verb?	N	N	
	Main clauses	svo		What is the canonical (neutral) word order in a main clause? NB: V2 languages like Swedish and German do NOT count as SVO even though SVO is most frequent.	N	N
			V2	V2 implies that initial adverb triggers V-SUBJ word order (Swedish, German etc.)	N	N
		vso			N	N
	Subordinate clause	sov			N	N
		svo	What is the canonical (neutral) word order in a subordinate clause? NB: V2 languages like Swe and Ger do NOT count as SVO even though SVO is most frequent	N	N	
		V2	V2 implies that initial adverb triggers V-SUBJ word order (Swedish, German etc.).	N	N	
		vso		N	N	
			sov		N	N

Grid	Feature	Variant	Description	Gain condition	Loss condition
	Infinitive	vo	Does the object normally occur before or after an infinitive?	N	N
		ov	Does the object normally occur before or after an infinitive?	N	N
	Participle	vo	Does the object normally occur before or after an infinitive?	N	N
		ov	Does the object normally occur before or after an infinitive?	N	N
	Clitic pronouns finite verb	vo	Does the clitic object pronoun normally occur before or after an finite verb? If a language does not have clitic object pronouns, it would be 0 in both OV and VO.	N	N
		ov	Does the clitic object pronoun normally occur before or after an finite verb? If a language does not have clitic object pronouns, it would be 0 in both OV and VO.	N	N
		2nd position	Does the clitic pronoun always occur in 2nd position, not specifically before or after the verb?	N	N
	Clitic pronouns infinitive	vo	Does the clitic object pronoun normally occur before or after an infinitive? If a language does not have clitic object pronouns, it would be 0 in both OV and VO.	N	N
		ov	Does the clitic object pronoun normally occur before or after an infinitive? If a language does not have clitic object pronouns, it would be 0 in both OV and VO.	N	N
		2nd position	Does the clitic pronoun always occur in 2nd position, not specifically before or after the verb?	N	N
	Clitic pronouns participle	vo	Does the clitic object pronoun normally occur before or after a participle? If a language does not have clitic object pronouns, it would be 0 in both OV and VO.	N	N
		ov	Does the clitic object pronoun normally occur before or after a participle? If a language does not have clitic object pronouns, it would be 0 in both OV and VO.	N	N
		2nd position	Does the clitic pronoun always occur in 2nd position, not specifically before or after the verb?	N	N
Nominal morphology	Nominal cases	O-case	Are there different noun forms for agent case and object case? English: 0 (no cases) Russian: 1 (different noun forms for accusative and nominative) Basque: 1 (different noun forms for ergative and absolutive)	C	S

Grid	Feature	Variant	Description	Gain condition	Loss condition
		DAT	Are there different noun forms for object case and the case of the receiver of an act of giving? E.g. The man gives a book (O) to the child (DAT).	C	S
		GEN	Is there a special noun form to express genitive which is not the same as agent/object case?	C	S
		GEN/DAT	Is there a special noun form to express genitive which is not the same as dative case?	C	S
		VOC	Is there a special noun form to express vocative which is not the same as agent or object case?	C	S
		OBL-Cases	Are there any cases besides Agent, Object, Genitive, Dative, Vocative?	C	S
		>7 Cases	Are there more than 7 cases?	C	S
		AGGL.CASE	Are there any cases which are visibly agglutinative?	N	N
		AGGL.CASE.NR		N	N
	Pronominal cases	A≠O	Same as nominal case, just for pronouns! Look at 1st and 2nd person pronouns, and ignore 3rd person pronouns (which often come from demonstratives).	C	S
		DAT≠O	Same as nominal case, just for pronouns! Look at 1st and 2nd person pronouns, and ignore 3rd person pronouns (which often come from demonstratives).	C	S
		VOC	Same as nominal case, just for pronouns! Look at 1st and 2nd person pronouns, and ignore 3rd person pronouns (which often come from demonstratives).	C	S
		OBL-Cases	Same as nominal case, just for pronouns! Look at 1st and 2nd person pronouns, and ignore 3rd person pronouns (which often come from demonstratives).	C	S
		>7 Cases	Same as nominal case, just for pronouns! Look at 1st and 2nd person pronouns, and ignore 3rd person pronouns (which often come from demonstratives).	C	S
		AGGL.CASE	Same as nominal case, just for pronouns! Look at 1st and 2nd person pronouns, and ignore 3rd person pronouns (which often come from demonstratives).	N	N
		AGGL.CASE.NR		N	N

Grid	Feature	Variant	Description	Gain condition	Loss condition
*	Case marking	CASE-LAST	Is the case marking obligatory on the last element of the NP (so it is only realized once in the NP, even if it consists of several elements)?	N	N
		CASE-FIRST	Is the case marking obligatory on the first element of the NP (so it is only realized once in the NP, even if it consists of several elements)?	C	S
		CASE-N	Is the case marking obligatory realized on the noun?	C	S
		CASE-ADJ	Is the case marking obligatorily realized on the adjective?	C	S
		CASE-ART	Is the case marking obligatorily realized on the article?	C	S
	Gender / Noun class	M/F	Is there a gender distinction between masculine and feminine realized on an agreeing article or adjective? Can be either on the adjective (Russian) or on both the article and the adjective (German), or even on a verb (as in some NE Caucasian languages). Don't count single exceptions like <i>kLe bror</i> in Swedish!	C	S
		NEUTR	Is there a special neutral gender for nouns realized on an agreeing article, adjective or verb?	C	S
		ANIM	Is there a special noun class for non-human animates realized on an agreeing article, adjective or verb?	C	S
	Definiteness marking	>5 GENDER	Are there more than 5 noun classes (or genders)?	C	S
		DEF.ART	Is there a special word class of definite articles which occur in NPs without adjectives? E.g.: German, English but not Swedish!	N	N
		N-DEF	Is there a suffix for definiteness on the noun? E.g.: Swedish but not English!	N	N
		ADJ-DEF	Is there a suffix for definiteness on the adjective? This includes when ADJ has a different form in definite and indefinite NPs ( <i>Swe det stora huset, Ger das grosse Haus</i> ).	C	S
		DEF-LAST	Is the definiteness marking obligatory on the last element of the NP (so it is only realized once in the NP, even if it consists of several elements)? If there is no definiteness marking at all, it will be 0!	C	S

Grid	Feature	Variant	Description	Gain condition	Loss condition
		DEF-FIRST	Is the definiteness marking obligatory on the first element of the NP (so it is only realized once in the NP, even if it consists of several elements)? If there is no definiteness marking at all, it will be 0!	C	S
	Gender agreement	PRED-ADJ	Does a predicative adjective agree with the Subject of the clause in gender?	C	S
	Preposition agreement	PRON-AGR	Does a preposition agree with its object?	C	S
Verbal morphology A	Simple PAST,	PST:A-AGR-FULL	In Simple Past: does the verb cross-reference the agent in all persons /numbers?	C	S
		PST:NO-A-AGR	In Simple Past: does the verb not cross-reference the agent on the verb at all (e.g. Swedish)?	S	C
		PST:A-Gender-AGR	In Simple Past, does the verb agree in gender with the subject of a transitive verb? (e.g. as in Russian and Polish).	C	S
Simple PAST, O	Simple PAST, O	PST:O-AGR-FULL	In Simple Past: does the verb cross-reference the object in all persons /numbers?	C	S
		PST:NO-O-AGR	In Simple Past: does the verb not cross-reference the object on the verb at all (e.g. Swedish, English, Russian)	S	C
		PST:O-Gender-AGR	In Simple Past, does the verb agree in gender with the object of a transitive verb?	C	S
Simple PAST, DAT	Simple PAST, DAT	PST:DAT-AGR-FULL	In Simple Past: does the verb cross-reference the dative in all persons /numbers?	C	S
		PST:NO-DAT-AGR	In Simple Past: does the verb not cross-reference the dative on the verb at all (e.g. Swedish, English, Russian)	S	C
		PST:DAT-Gender-AGR	In Simple Past, does the verb agree in gender with the indirect object of a ditransitive verb?	C	S
Present Progressive, A	Present Progressive, A	PROG:A-AGR-FULL	In Present Progressive: does the verb cross-reference the agent in all persons / numbers?	C	S
		PROG:NO-A-AGR	In Present Progressive: does the verb not cross-reference the agent on the verb at all (e.g. Swedish)	S	C
		PROG:A-Gender-AGR	In Present Progressive: does the verb agree in gender with the subject of a transitive verb?	C	S
Present Progressive, O	Present Progressive, O	PROG:O-AGR-FULL	In Present Progressive: does the verb cross-reference the object in all persons / numbers?	C	S
		PROG:NO-O-AGR	In Present Progressive: Does the verb not cross-reference the object on the verb at all (e.g. Swedish, Russian)	S	C

Grid	Feature	Variant	Description	Gain condition	Loss condition
*	Present Progressive, DAT	PROG:O-Gender-AGR	In Present Progressive: does the verb agree in gender with the object of a transitive verb?	C	S
		PROG:DAT-AGR-FULL	In Present Progressive: does the verb cross-reference the dative in all persons / numbers?	C	S
		PROG:NO-DAT-AGR	In Present Progressive: Does the verb not cross-reference the dative on the verb at all (e.g. Swedish, English, Russian)	S	C
*		PROG:DAT-Gender-AGR	In Present Progressive: does the verb agree in gender with the indirect object of a ditransitive verb?	C	S
*	Allocutive agreement	ALLOC	Does the verb agree with the receiver (the person one is speaking to) without the speaker being an argument in the sentence (allocutive agreement, probably no for all languages but Basque!)	C	S
TENSE	Future	FUT.AUX	Is there a Future formed by an auxiliary? (E.g. <i>will</i> in English)	N	N
		PERF.FUT	Is there a Future formed by using the perfective aspect? (No if the language does not have verbal aspects! Eg. Russian, Georgian)	N	N
		FUT.Participle	Is there a Future formed by a participle? (E.g. Armenian, Basque)	N	N
		FUT.Particle	Is there a Future formed by a particle preceding a finite verb? (E.g. Albanian)	N	N
		FUT.Synth	Is there a synthetic Future? (E.g. French, Spanish)	N	N
	Continuous Present	Present Progressive present	Is there a Progressive Present form constructed by combining a present participle with a finite auxiliary verb?	N	N
ALIGNMENT	Noun: Simple Past	N:PST:A=O?	In Simple Past: Is the noun form for A the same as for O? I.e., does the noun look the same when it is subject of a transitive clause than when it is object of a transitive clause?	S	C
		N:PST:A=sa?	In Simple Past: Is the noun form for A the same as for Sa? I.e., does the noun look the same when it is subject of a transitive clause as when it is subject of an agentive intransitive verb such as 'work' or 'dance'?	S	C
		N:PST: O=so?	In Simple Past: Is the noun form for O the same as for So? I.e., does the noun look the same when it is object of a transitive clause as when it is subject of an unaccusative verb such as 'fall' or 'die'?	S	C

Grid	Feature	Variant	Description	Gain condition	Loss condition
*	Noun: Present Progressive	N:PST:sa=so?	In Simple Past: Does a noun bear the same case form when it is Sa (subject of e.g. work) or So (subject of e.g. 'fall' or 'die')? I.e., there does not exist a split into stative and active intransitive verbs.	S	C
N:PROG:A=O?		In Present Progressive: Is the noun form for A the same as for O? I.e., does the noun look the same when it is subject of a transitive clause than when it is object of a transitive clause?	S	C	
N:PROG:A=sa?		In Present Progressive: Is the noun form for A the same as for Sa? I.e., does the noun look the same when it is subject of a transitive clause than when it is subject of an agentive intransitive verb such as "work" or "dance"?	S	C	
N:PROG: O=so?		In Present Progressive: Is the noun form for O the same as for So? I.e., does the noun look the same when it is object of a transitive clause than when it is subject of an unaccusative verb such as "fall" or "die"?	S	C	
*	Pronoun: Simple Past	N:PROG:sa=so?	In Present Progressive: Does a noun bear the same case form when it is Sa (subject of e.g. work) or So (subject of e.g. fall or die)? I.e., there does not exist a split into stative and active intransitive verbs.	S	C
P:PST:A=O?		In Simple Past: Is the pronoun form for A the same as for O? I.e., does the pronoun look the same when it is subject of a transitive clause than when it is object of a transitive clause?	S	C	
P:PST:A=sa?		In Simple Past: Is the pronoun form for A the same as for Sa? I.e., does the pronoun look the same when it is subject of a transitive clause than when it is subject of an agentive intransitive verb such as "work" or "dance"?	S	C	
P:PST: O=so?		In Simple Past: Is the pronoun form for O the same as for So? I.e., does the pronoun look the same when it is object of a transitive clause than when it is subject of an unaccusative verb such as "fall" or "die"?	S	C	
*		P:PST:sa=so?	In Simple Past: Does the pronoun bear the same case form when it is Sa (subject of e.g. work) or So (subject of e.g. fall or die)? I.e., there does not exist a split into stative and active intransitive verbs.	S	C

Grid	Feature	Variant	Description	Gain condition	Loss condition
	Pronoun: Present Progressive	P:PROG:A=O?	In Present Progressive: Is the pronoun form for A the same as for O? I.e., does the pronoun look the same when it is subject of a transitive clause than when it is object of a transitive clause?	S	C
*		P:PROG:A=sa?	In Present Progressive: Is the pronoun form for A the same as for Sa? I.e., does the pronoun look the same when it is subject of a transitive clause as when it is subject of an agentive intransitive verb such as “work” or “dance”?	S	C
		P:PROG: O=so?	In Present Progressive: Is the pronoun form for O the same as for So? I.e., does the pronoun look the same when it is object of a transitive clause than when it is subject of an unaccusative verb such as “die” or “fall”?	S	C
*		P:PROG:sa=so?	In Present Progressive: Does a pronoun bear the same case form when it is Sa (subject of e.g. work) or So (subject of e.g. fall or die)? I.e., there does not exist a split into sta-tive and active intransitive verbs.	S	C
	Verb: Simple Past	V:PST:A=O?	In Simple Past: Is the verb affix for A the same as for O? I.e., does the verb look the same when it refers to the subject of a transitive clause than when it refers to the object of a transitive clause? If there is no O-marking on the verb, but there is an S-marking, the answer would be no, they do not look the same. (e.g. German, Russian) If there is neither an O, nor an A marking like in Swedish, the answer would be yes, they look the same!	S	C
		V:PST:A=sa?	In Simple Past: Is the verb affix for A the same as for Sa? I.e., does the verb look the same when it refers to subject of a transitive clause than when it refers to subject of an agentive intransitive verb like “work” or “dance”?	S	C
		V:PST: O=so?	In Simple Past: Is the verb affix for O the same as for So? I.e., does the verb look the same when it refers to the object of a transitive clause as when it refers to the subject of an unaccusative verb (such as “fall” or “die”)?	S	C

Grid	Feature	Variant	Description	Gain condition	Loss condition
*		V:PST:sa=so?	In Simple Past: Is the verb affix the same for Sa (subject of e.g. work) as or So (subject of e.g. fall or die)? I.e. does the verb agreement affix look the same regardless of whether the verb is “work” or “die” (as in German: “arbeitete-st”, “starb-st”). I.e., there does not exist a split into unaccusative and agentive intransitive verbs.	S	C
	Verb: Present Progressive	V:PROG:A=O?	In Present Progressive: Is the verb affix for A the same as for O? I.e., does the verb look the same when it refers to the subject of a transitive clause than when it refers to the object of a transitive clause? If there is no O-marking on the verb, but there is an S-marking, the answer would be no, they do not look the same. (e.g. German, Russian) If there is neither an O, nor an A marking like in Swedish, the answer would be yes, they look the same!	S	C
		V:PROG:A=sa?	In Present Progressive: Is the verb affix for A the same as for Sa? I.e., does the verb look the same when it refers to subject of a transitive clause as when it refers to subject of an agentive intransitive verb such as “work”?	S	C
		V:PROG: O=so?	In present progressive: Is the verb affix the same for O as for So? I.e., does the verb look the same when it refers to the object of a transitive clause as when it refers to the subject of an unaccusative verb (such as “fall” or “die”)?	S	C
		V:PROG:sa=so?	In Present Progressive: Is the verb affix the same for Sa (subject of e.g. work) as or So (subject of e.g. fall or die)? I.e. does the verb agreement affix look the same regardless of whether the verb is “work” or “die” (as in German: “arbeite-t”, “stirb-t”). I.e., there does not exist a split into unaccusative and agentive intransitive verbs.	S	C

Grid	Feature	Variant	Description	Gain condition	Loss condition
	Compare PROG-PAST	PROG_SO=PST_SO	Does the subject of e.g. die or fall bear the same case in both progressive present and simple past? (the answer for Megrelian would be no)	S	C
		PROG_A=PST_O	Does the subject of a transitive verb in the present progressive bear the same case form as the object of a transitive verb in the simple past? (e.g. as in Georgian)	C	S
		PAST_A=PROG_O	Does the subject of a transitive verb in the simple past bear the same case form as the object of a verb in the present progressive? (e.g. in Kurdish)	C	S
	Reflexive pronoun in transitive clause	REFL-ref-A	In a transitive clause, can O be a reflexive which refers back to A (as in English “herself”, Swedish “sig”?)	N	N
		REFL-ref-O	In a transitive clause, can A be a reflexive which refers back to O (as appears to be the case in some Caucasian languages)?	N	N