

Electronic supplementary material

A Bayesian phylogenetic approach to estimating the stability of linguistic features and the genetic biasing of tone

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Materials and Methods

The data harvesting, processing, statistical analyses and figures were produced using R 2.9 (R Development Core Team 2009) on Linux. The two Bayesian phylogenetic software were run on a Linux cluster at the Max Planck Institute for Psycholinguistics, Nijmegen. BayesLang was developed using GCC (`gcc.gnu.org`) and Code::Blocks (`www.codeblocks.org`).

Linguistic features

The linguistic features and their specific values in various languages are collected from WALS (Haspelmath, Dryer, Gil and Comrie 2005). However, their coding is idiosyncratic and I have re-coded them into the following categories:

- **UNORDERED**: any value can transform in a single step in any other value and all these changes are equally probable;
- **RANKED**: can transform between any adjacent values in any direction, except from the first to the last value and reciprocally, with the instantaneous rate matrix (Felsenstein 2004, Ronquist and Huelsenbeck 2003, Huelsenbeck, Ronquist, Nielsen and Bollback 2001) given by:

$$Q = \begin{pmatrix} -q & 0 & 0 & \dots & 0 & 0 \\ q & -q & 0 & \dots & 0 & 0 \\ 0 & q & -q & \dots & 0 & 0 \\ \cdot & \cdot & \cdot & \cdot & \dots & \cdot & \cdot \\ 0 & 0 & 0 & 0 & \dots & q & - \end{pmatrix}$$

- **CUSTOM**: the instantaneous rate matrix is user-defined for linguistic reasons, by specifying the transitions q_{ij} that are possible (1) or not (0).

MrBayes can handle only ORDERED and UNORDERED, which are, in fact, equivalent to my **RANKED** and **UNORDERED**, respectively (Ronquist and Huelsenbeck 2003), with the **CUSTOM** ones usually relaxed to UNORDERED. These (usually) polymorphic features were transformed into binary features by collapsing disjoint (and, usually, complementary) sets of values into **0** and **1** based on linguistic judgments, with some features producing more than one equally valid binary features (e.g., *Tone* can be decomposed as the presence or absence of any type of tone - *Tone1* - or as the presence or absence of complex tone - *Tone2*). Details concerning the polymorphic and binary codings are given in **Table S1**.

Table S1. The coding of linguistic features. The columns are: **No.** - feature number in WALS, useful for accessing the feature description in the online version of the database at www.wals.info/<feature_number> (checked Feb 2010); **WALS Feature Name** - the original name of the feature in WALS; **Vals** - the original number of values the feature has in WALS; **Short** - feature's short name to be used throughout this paper; **Binary** - feature's short name when the feature is coded binary. Usually it is identical to **Short** but in some cases there are more than one meaningful binary codings of the feature, in which case **Binary** has the form **Short1** and **Short2**. Usually, the binary coding tried to make sense given feature's meaning and to avoid, as much as possible, heavily skewed distributions. However, in a few cases this was not possible, resulting in a lack of binary coding for the feature. If **Binary** is missing then the feature has not been coded in binary form (usually because it covered too few datapoints to be included); **Type** - the feature's type (**UNORDERED**, **RANKED** or **CUSTOM**). If the type is **CUSTOM**, then the column shows the custom instantaneous rate matrix used; **Type (MB)** - the feature's type for MrBayes (**UNORDERED**, **ORDERED**); **Description** - describes the binary coding of the feature (if applicable) or a more general commentary. The binary coding description ends with a grouping of feature values collapsed into 0 versus a set of feature values collapsed into 1. Ignored feature values are not explicitly stated but can be easily inferred from these two sets. The feature values represent those defined in WALS for this feature starting with the first (for example, for *Tone1*, value 1 ("No tones") is coded as 0 versus values 2 ("Simple tone system") and 3 ("Complex tone system") which are collapsed together and coded as 1).

Notes: binary codings implicitly have type **UNORDERED**; if a feature has more than one possible binary codings, these appear immediately under the feature's polymorphic row, with **No.** of the form *N.1* and *N.2*, where *N* is the feature's number. Moreover, their name is as described above; if a feature has a single binary coding, then this would appear in the same row as the polymorphic coding. Feature 133, "Number of Basic Colour Categories" has not been included due to a clerical error, but it is highly probable that it would not have been included in most of the analyses due to its limited coverage. Moreover, the closely related feature 132, "Number of Non-Derived Basic Colour Categories" is in the database.

No.	WALS Feature Name	Vals	Short	Binary	Type	Type (MB)	Description
1	Consonant Inventories	5	Cons		RANKED	ORDERED	
1.1				Cons1			Average and small vs large (1-3 vs 4,5)
1.2				Cons2			Small vs average and large (1,2 vs 3-5)
2	Vowel Quality Inventories	3	Vowel		RANKED	ORDERED	
2.1				Vowel1			Average and small vs large (1,2 vs 3)
2.2				Vowel2			Small vs average and large (1 vs 2,3)
3	Consonant-Vowel Ratio	5	CVRatio		RANKED	ORDERED	
3.1				CVRatio1			Average and small vs large (1-3 vs 4,5)
3.2				CVRatio2			Small vs average and large (1,2 vs 3-5)
4	Voicing in Plosives and Fricatives	4	VoicPF			UNORDERED	
							$\begin{pmatrix} - & 1 & 1 & 0 \\ 1 & - & 0 & 1 \\ 1 & 0 & - & 1 \\ 0 & 1 & 1 & - \end{pmatrix}$
4.1				VoicPF1			None vs at least in one (1 vs 2-4)
4.2				VoicPF2			Both vs at most in one (1-3 vs 4)
5	Voicing and Gaps in Plosive Systems	5	VoicGPS		UNORDERED	UNORDERED	
6	Uvular Consonants	4	UvuIC			UNORDERED	
							$\begin{pmatrix} - & 1 & 1 & 0 \\ 1 & - & 0 & 1 \\ 1 & 0 & - & 1 \\ 0 & 1 & 1 & - \end{pmatrix}$
6.1				UvuIC			None vs at least in one (1 vs 2-4)
7	Glottalized Consonants	8	GlottC			UNORDERED	
							$\begin{pmatrix} - & 1 & 1 & 1 & 0 & 0 & 0 & 0 \\ 1 & - & 0 & 0 & 1 & 1 & 0 & 0 \\ 1 & 0 & - & 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 0 & - & 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 & - & 0 & 0 & 1 \\ 0 & 1 & 0 & 1 & 0 & - & 0 & 1 \\ 0 & 0 & 1 & 1 & 0 & 0 & - & 1 \\ 0 & 0 & 0 & 0 & 1 & 1 & 1 & - \end{pmatrix}$
7.1				GlottC			None vs at least in one (1 vs 2-8)
8	Lateral Consonants	5	LatC			UNORDERED	
							$\begin{pmatrix} - & 1 & 1 & 0 & 1 \\ 1 & - & 1 & 1 & 0 \\ 1 & 1 & - & 0 & 1 \\ 0 & 1 & 0 & - & 1 \\ 1 & 0 & 1 & 1 & - \end{pmatrix}$
8.1				GlottC			None vs at least in one (1 vs 2-5)
9	The Velar Nasal	3	VelarN		RANKED	ORDERED	
9.1				VelarN			No vs yes (3 vs 1,2)
10	Vowel Nasalization	2	VowelN		UNORDERED	UNORDERED	No vs yes (2 vs 1)
11	Front Rounded Vowels	4	FrRoundV			UNORDERED	
							$\begin{pmatrix} - & 0 & 1 & 1 \\ 0 & - & 1 & 1 \\ 1 & 1 & - & 0 \\ 1 & 1 & 0 & - \end{pmatrix}$
11.1				FrRoundV			None vs at least in one (1 vs 2-4)
12	Syllable Structure	3	SylStr		RANKED	ORDERED	
12.1				SylStr1			Simple and moderate vs complex (1,2 vs 3)
12.2				SylStr2			Simple vs moderate and complex (1 vs 2,3)
13	Tone	3	Tone		RANKED	ORDERED	
13.1				Tone1			No tone vs any form of tone (1 vs 2,3)
13.2				Tone2			Absent and simple vs complex (1,2 vs 3)
14	Fixed Stress Locations	7	FixStress		UNORDERED	UNORDERED	No vs yes (1 vs 2-7)
15	Weight-Sensitive Stress	8	WSStress		UNORDERED	UNORDERED	
16	Weight Factors in Weight-Sensitive Stress Systems	7	WFWSStress		UNORDERED	UNORDERED	

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Table S1 – Continued

No.	WALS Feature Name	Vals	Short	Binary	Type	Type (MB)	Description
17	Rhythm Types	5	Rhythm	Rhythm	UNORDERED	UNORDERED	No vs any (5 vs 1-4)
18	Absence of Common Consonants	6	AbsComC	AbsComC	$\begin{pmatrix} - & 1 & 1 & 1 & 1 & 0 & 0 \\ 1 & - & 0 & 0 & 1 & 0 & \\ 1 & 0 & - & 0 & 0 & 1 & \\ 1 & 0 & 0 & - & 1 & 1 & \\ 0 & 1 & 0 & 1 & - & 0 & \\ 0 & 0 & 1 & 1 & 0 & - & \end{pmatrix}$	UNORDERED	No vs any (5 vs 1-4)
19	Presence of Uncommon Consonants	7	PresUnC	PresUnC	$\begin{pmatrix} - & 1 & 1 & 1 & 1 & 1 & 0 & 0 \\ 1 & - & 0 & 0 & 0 & 1 & 0 & \\ 1 & 0 & - & 0 & 0 & 0 & 0 & \\ 1 & 0 & 0 & - & 0 & 1 & 1 & \\ 1 & 0 & 0 & 0 & - & 1 & 1 & \\ 0 & 1 & 0 & 1 & 1 & - & 1 & \\ 0 & 0 & 0 & 1 & 1 & 1 & - & \end{pmatrix}$	UNORDERED	None vs at least one (1 vs 2-7)
20	Fusion of Selected Inflectional Formatives	7	FSInfF	FSInfF	$\begin{pmatrix} - & 0 & 0 & 0 & 1 & 1 & 1 \\ 0 & - & 0 & 1 & 0 & 0 & 1 \\ 0 & 0 & - & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & - & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 & - & 1 & 1 \\ 1 & 0 & 0 & 0 & 1 & - & 1 \\ 1 & 1 & 0 & 1 & 1 & 1 & - \end{pmatrix}$	UNORDERED	
21	Exponence of Selected Inflectional Formatives	5	ESInfF	ESInfF	UNORDERED	UNORDERED	No case vs case (5 vs 1-4)
22	Inflectional Synthesis of the Verb	7	InfVerb	InfVerb	RANKED	UNORDERED	0-5 vs 6-13 categories per word (1-3 vs 4-7)
23	Locus of Marking in the Clause	4	LmarkC	LmarkC	$\begin{pmatrix} - & 0 & 1 & 1 \\ 0 & - & 1 & 1 \\ 1 & 1 & - & 0 \\ 1 & 1 & 0 & - \end{pmatrix}$	UNORDERED	No marking vs marking (1-3 vs 5)
24	Locus of Marking in Possessive Noun Phrases	4	LmarkPNP	LmarkPNP	$\begin{pmatrix} - & 0 & 1 & 1 \\ 0 & - & 1 & 1 \\ 1 & 1 & - & 0 \\ 1 & 1 & 0 & - \end{pmatrix}$	UNORDERED	No marking vs marking (1-3 vs 5)
25	Locus of Marking: Whole-language Typology	5	LmarkWLT	LmarkWLT	UNORDERED	UNORDERED	
26	Prefixing vs. Suffixing in Inflectional Morphology	6	PSInfM	PSInfM	$\begin{pmatrix} - & 0 & 1 & 1 & 1 & 0 \\ 0 & - & 1 & 0 & 0 & 0 \\ 1 & 1 & - & 1 & 0 & 0 \\ 1 & 0 & 1 & - & 1 & 0 \\ 1 & 0 & 0 & 1 & - & 1 \\ 0 & 0 & 0 & 0 & 1 & - \end{pmatrix}$	UNORDERED	
27	Reduplication	3	Redup	Redup	$\begin{pmatrix} - & 1 & 1 \\ 1 & - & 0 \\ 1 & 0 & - \end{pmatrix}$	UNORDERED	No vs any (3 vs 1-2)
28	Case Syncretism	4	CaseS	CaseS	UNORDERED	UNORDERED	No syncretism vs any (4 vs 2,3)
29	Syncretism in Verbal Person/Number Marking	3	SynVPNM	SynVPNM	UNORDERED	UNORDERED	No syncretism vs any (3 vs 2)
30	Number of Genders	5	NoGen	NoGen	RANKED	ORDERED	None vs any (1 vs 2-5)
31	Sex-based and Non-sex-based Gender Systems	3	SexGen	SexGen	UNORDERED	UNORDERED	Sex-based vs non-sex-based (3 vs 2)
32	Systems of Gender Assignment	3	SgenAss	SgenAss	UNORDERED	UNORDERED	Semantic vs semantic and formal (2 vs 3)
33	Coding of Nominal Plurality	9	CodNPlu	CodNPlu	UNORDERED	UNORDERED	
34	Occurrence of Nominal Plurality	6	OccNPlu	OccNPlu	UNORDERED	UNORDERED	None vs any (1 vs 2-6)
35	Plurality in Independent Personal Pronouns	8	PluIPersP	PluIPersP	UNORDERED	UNORDERED	
36	The Associative Plural	4	AssocPlu	AssocPlu	UNORDERED	UNORDERED	Same as additive vs unique (1 vs 2,3)
37	Definite Articles	5	DefArt	DefArt	UNORDERED	UNORDERED	No vs any (4,5 vs 1-3)
38	Indefinite Articles	5	IndefArt	IndefArt	UNORDERED	UNORDERED	No vs any (4,5 vs 1-3)
39	Inclusive/Exclusive Distinction in Independent Pronouns	5	InclExclIP	InclExclIP	UNORDERED	UNORDERED	
40	Inclusive/Exclusive Distinction in Verbal Inflection	5	InclExclVI	InclExclVI	UNORDERED	UNORDERED	
41	Distance Contrasts in Demonstratives	5	DistCDem	DistCDem	RANKED	ORDERED	Two way vs more than two (2 vs 3-5)
42	Pronominal and Adnominal Demonstratives	3	PadDem	PadDem	UNORDERED	UNORDERED	Identical vs different (1 vs 2,3)
43	Third Person Pronouns and Demonstratives	6	P3PrDem	P3PrDem	UNORDERED	UNORDERED	Related vs unrelated (1 vs 2-6)
44	Gender Distinctions in Independent Personal Pronouns	6	GenDIPersP	GenDIPersP	UNORDERED	UNORDERED	No distinction vs any (6 vs 1-5)
45	Politeness Distinctions in Pronouns	4	PolitDPron	PolitDPron	UNORDERED	UNORDERED	No distinction vs any (1 vs 2-4)
46	Indefinite Pronouns	5	IndefPron	IndefPron	UNORDERED	UNORDERED	
47	Intensifiers and Reflexive Pronouns	2	IntRefPron	IntRefPron	UNORDERED	UNORDERED	Identical vs differentiated (1 vs 2)
48	Person Marking on Adpositions	4	PersMADpos	PersMADpos	UNORDERED	UNORDERED	

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Table S1 – Continued

No.	WALS Feature Name	Vals	Short	Binary	Type	Type (MB)	Description	
49	Number of Cases	9	Ncases	Ncases	$\begin{pmatrix} - & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & - & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & - & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & - & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & - & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & - & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & - & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & - & 0 \\ 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & - \end{pmatrix}$	UNORDERED	UNORDERED	No case marking vs any (1 vs 2-9)
50	Asymmetrical Case-Marking	6	AsymCaseM	AsymCaseM		UNORDERED	Symmetrical vs asymmetrical (2 vs 3-6)	
51	Position of Case Affixes	9	PosCaseAff	PosCaseAff		UNORDERED	UNORDERED	
52	Comitatives and Instrumentals	3	ComInstr	ComInstr		UNORDERED	UNORDERED	
53	Ordinal Numerals	8	OrdNum	OrdNum		UNORDERED	UNORDERED	
54	Distributive Numerals	7	DistNum	DistNum		UNORDERED	UNORDERED	
55	Numeral Classifiers	3	NumClas	NumClas		RANKED	ORDERED	
56	Conjunctions and Universal Quantifiers	3	ConjUQu	ConjUQu		UNORDERED	UNORDERED	
57	Position of Pronominal Possessive Affixes	4	PosProPAff	PosProPAff	$\begin{pmatrix} - & 0 & 1 & 1 \\ 0 & - & 1 & 1 \\ 1 & 1 & - & 0 \\ 1 & 1 & 0 & - \end{pmatrix}$	UNORDERED	UNORDERED	None vs any (4 vs 1-3)
58	Obligatory Possessive Inflection	2	OlbPosInfl	OlbPosInfl		UNORDERED	UNORDERED	
59	Possessive Classification	4	PosClas	PosClas		RANKED	ORDERED	
60	Genitives, Adjectives and Relative Clauses	6	GenAdjRelC	GenAdjRelC		UNORDERED	UNORDERED	
61	Adjectives without Nouns	7	AdjNoNoun	AdjNoNoun		UNORDERED	UNORDERED	
62	Action Nominal Constructions	8	ActNomConst	ActNomConst		UNORDERED	UNORDERED	
63	Noun Phrase Conjunction	2	NounPConj	NounPConj		UNORDERED	UNORDERED	
64	Nominal and Verbal Conjunction	3	NomVConj	NomVConj		UNORDERED	UNORDERED	
65	Perfective/Imperfective Aspect	2	PerfImpAsp	PerfImpAsp		UNORDERED	UNORDERED	
66	The Past Tense	4	PastTense	PastTense	$\begin{pmatrix} - & 1 & 0 & 1 \\ 1 & - & 1 & 0 \\ 0 & 1 & - & 0 \\ 1 & 0 & 0 & - \end{pmatrix}$	UNORDERED	UNORDERED	No past tense vs any (4 vs 1-3)
67	The Future Tense	2	FutTense	FutTense		UNORDERED	UNORDERED	
68	The Perfect	4	Perfect	Perfect		UNORDERED	UNORDERED	
69	Position of Tense-Aspect Affixes	5	PosTAAff	PosTAAff		UNORDERED	UNORDERED	
70	The Morphological Imperative	5	MorphImp	MorphImp		UNORDERED	UNORDERED	
71	The Prohibitive	4	Prohibitive	Prohibitive		UNORDERED	UNORDERED	
72	Imperative-Hortative Systems	4	ImpHortSys	ImpHortSys	$\begin{pmatrix} - & 0 & 1 & 1 \\ 0 & - & 1 & 1 \\ 1 & 1 & - & 0 \\ 1 & 1 & 0 & - \end{pmatrix}$	UNORDERED	UNORDERED	
73	The Optative	2	Optative	Optative		UNORDERED	UNORDERED	
74	Situational Possibility	3	SitPoss	SitPoss		UNORDERED	UNORDERED	
75	Epistemic Possibility	3	EpiPoss	EpiPoss		UNORDERED	UNORDERED	
76	Overlap between Situational and Epistemic Modal Marking	3	OvSitEpi	OvSitEpi		RANKED	ORDERED	
77	Semantic Distinctions of Evidentiality	3	SemDistEv	SemDistEv		RANKED	ORDERED	
78	Coding of Evidentiality	6	CodEv	CodEv		UNORDERED	UNORDERED	
79	Suppletion According to Tense and Aspect	4	SuppTAsp	SuppTAsp	$\begin{pmatrix} - & 0 & 1 & 1 \\ 0 & - & 1 & 1 \\ 1 & 1 & - & 0 \\ 1 & 1 & 0 & - \end{pmatrix}$	UNORDERED	UNORDERED	None vs any (4 vs 1-3)
80	Verbal Number and Suppletion	5	VnumSupp	VnumSupp		UNORDERED	UNORDERED	
81	Order of Subject, Object and Verb	7	SOV	SOV		UNORDERED	UNORDERED	
82	Order of Subject and Verb	3	SV	SV		UNORDERED	UNORDERED	
82.1				SV1			No dominant order vs any dominant order (3 vs 1,2)	
82.2				SV2			SV vs VS (1 vs 2)	
83	Order of Object and Verb	3	OV	OV		UNORDERED	UNORDERED	
83.1				OV1			No dominant order vs any dominant order (3 vs 1,2)	
83.2				OV2			OV vs VO (1 vs 2)	
84	Order of Object, Oblique, and Verb	6	OXV	OXV		UNORDERED	UNORDERED	
85	Order of Adposition and Noun Phrase	5	AdposNP	AdposNP		UNORDERED	UNORDERED	
86	Order of Genitive and Noun	3	GenN	GenN		UNORDERED	UNORDERED	
86.1				GenN1			No dominant order vs any dominant order (3 vs 1,2)	

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Table S1 – Continued									
No.	WALS Feature Name	Vals	Short	Binary	Type	Type (MB)	Description		
86.2				GenN2			GN vs NG (1 vs 2)		
87	Order of Adjective and Noun	4	AdjN		UNORDERED	UNORDERED			
87.1				AdjN1			No dominant order vs any dominant order (3 vs 1,2)		
87.2				AdjN2			AdjN vs NAdj (1 vs 2)		
88	Order of Demonstrative and Noun	6	DemN		UNORDERED	UNORDERED			
89	Order of Numeral and Noun	4	NumN		UNORDERED	UNORDERED			
89.1				NumN1			No dominant order vs any dominant order (3 vs 1,2)		
89.2				NumN2			NumN vs NNum (1 vs 2)		
90	Order of Relative Clause and Noun	7	RelClN		UNORDERED	UNORDERED			
91	Order of Degree Word and Adjective	3	DegWAdj		UNORDERED	UNORDERED			
91.1				DegWAdj1			No dominant order vs any dominant order (3 vs 1,2)		
91.2				DegWAdj2			DegAdj vs AdjDeg (1 vs 2)		
92	Position of Polar Question Particles	6	PolQPart		UNORDERED	UNORDERED	No question particle vs any (6 vs 1-5)		
93	Position of Interrogative Phrases in Content Questions	3	IntPhCQ		UNORDERED	UNORDERED			
93.1				IntPhCQ1			No dominant order vs any dominant order (3 vs 1,2)		
93.2				IntPhCQ2			Initial vs non-initial (1 vs 2)		
94	Order of Adverbial Subordinator and Clause	5	AdvSubCl		UNORDERED	UNORDERED			
95	Relationship between the Order of Object and Verb and the Order of Adposition and Noun Phrase	5	OVAOpNP	OVAOpNP	UNORDERED	UNORDERED	Head first vs head second (1,4 vs 2,3)		
96	Relationship between the Order of Object and Verb and the Order of Relative Clause and Noun	5	OVRelN	OVRelN	UNORDERED	UNORDERED	Head first vs head second (1,4 vs 2,3)		
97	Relationship between the Order of Object and Verb and the Order of Adjective and Noun	5	OVAAdjN	OVAAdjN	UNORDERED	UNORDERED	Head first vs head second (1,4 vs 2,3)		
98	Alignment of Case Marking of Full Noun Phrases	6	AlCaseMNP		UNORDERED	UNORDERED			
99	Alignment of Case Marking of Pronouns	7	AlCaseMPr		UNORDERED	UNORDERED			
100	Alignment of Verbal Person Marking	6	AIVPersM		UNORDERED	UNORDERED			
101	Expression of Pronominal Subjects	6	ExpPrS		UNORDERED	UNORDERED			
102	Verbal Person Marking	5	VpersM	VpersM	UNORDERED	UNORDERED	No person marking vs any (1 vs 2-5)		
103	Third Person Zero of Verbal Person Marking	6	P3ZeroVpersM		UNORDERED	UNORDERED			
104	Order of Person Markers on the Verb	5	PersMV	PersMV	UNORDERED	UNORDERED	A and P do not or do not both occur on the verb vs any (1vs 2-5)		
105	Ditransitive Constructions: The Verb 'Give'	4	DCGive		UNORDERED	UNORDERED			
106	Reciprocal Constructions	4	ReciprocalC		UNORDERED	UNORDERED			
107	Passive Constructions	2	PassiveC	PassiveC	UNORDERED	UNORDERED	Absent vs present (2 vs 1)		
108	Antipassive Constructions	3	AntipassiveC	AntipassiveC	UNORDERED	UNORDERED	No antipassive vs any (3 vs 1,2)		
109	Applicative Constructions	8	ApplicativeC	ApplicativeC	UNORDERED	UNORDERED	No applicative vs any (8 vs 1-7)		
110	Periphrastic Causative Constructions	3	PerphrCausC		UNORDERED	UNORDERED	$\begin{pmatrix} - & 0 & 1 \\ 0 & - & 1 \\ 1 & 1 & - \end{pmatrix}$		
111	Nonperiphrastic Causative Constructions	4	NperphrCausC		UNORDERED	UNORDERED	$\begin{pmatrix} - & 1 & 1 & 0 \\ 1 & - & 0 & 1 \\ 1 & 0 & - & 1 \\ 0 & 1 & 1 & - \end{pmatrix}$		
112	Negative Morphemes	6	NegMorph		UNORDERED	UNORDERED			
113	Symmetric and Asymmetric Standard Negation	3	SymAsymStNeg		UNORDERED	UNORDERED			
113.1				SymAsymStNeg1			Symmetric vs asymmetric and both (1 vs 2,3)		
113.2				SymAsymStNeg2			Symmetric and both vs asymmetric (1,2 vs 3)		
114	Subtypes of Asymmetric Standard Negation	7	AsymStNeg		UNORDERED	UNORDERED			
115	Negative Indefinite Pronouns and Predicate Negation	4	NegIndefPr		UNORDERED	UNORDERED			
116	Polar Questions	7	PolarQ		UNORDERED	UNORDERED			
117	Predicative Possession	5	PredPoss		UNORDERED	UNORDERED			
118	Predicative Adjectives	3	PredAdj		UNORDERED	UNORDERED			
118.1				PredAdj1			Verbal encoding vs any (1 vs 2,3)		
118.2				PredAdj2			Nonverbal encoding vs any (1,2 vs 3)		
119	Nominal and Locational Predication	2	NomLocPred	NomLocPred	UNORDERED	UNORDERED	Different vs identical (1 vs 2)		
120	Zero Copula for Predicate Nominals	2	ZeroCopPredNom	ZeroCopPredNom	UNORDERED	UNORDERED	Possible vs impossible (1 vs 2)		
121	Comparative Constructions	4	ComparC		UNORDERED	UNORDERED			
122	Relativization on Subjects	4	RelS	RelS	UNORDERED	UNORDERED	Gap vs any (4 vs 1-3)		
123	Relativization on Obliques	5	RelX	RelX	UNORDERED	UNORDERED	Gap vs any (4 vs 1-3)		

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Table S1 – Continued

No.	WALS Feature Name	Vals	Short	Binary	Type	Type (MB)	Description
124	'Want' Complement Subjects	5	WantCplS		UNORDERED	UNORDERED	
125	Purpose Clauses	3	PurposeC		UNORDERED	UNORDERED	
125.1				PurposeC1			Balanced vs any (1 vs 2,3)
125.2				PurposeC2			Deranked vs any (1,2 vs 3)
126	'When' Clauses	3	WhenC		UNORDERED	UNORDERED	
126.1				WhenC1			Balanced vs any (1 vs 2,3)
126.2				WhenC2			Deranked vs any (1,2 vs 3)
127	Reason Clauses	3	ResonC		UNORDERED	UNORDERED	
127.1				ResonC1			Balanced vs any (1 vs 2,3)
127.2				ResonC2			Deranked vs any (1,2 vs 3)
128	Utterance Complement Clauses	3	UttCplC		UNORDERED	UNORDERED	
128.1				UttCplC1			Balanced vs any (1 vs 2,3)
128.2				UttCplC2			Deranked vs any (1,2 vs 3)
129	Hand and Arm	2	HandArm	HandArm	UNORDERED	UNORDERED	Identical vs different (1 vs 2)
130	Finger and Hand	2	FingerHand	FingerHand	UNORDERED	UNORDERED	Identical vs different (1 vs 2)
131	Numeral Bases	6	NumeralBases		UNORDERED	UNORDERED	
132	Number of Non-Derived Basic Colour Categories	7	BasicColors	BasicColors	RANKED	UNORDERED	Median split (1-4 vs 5-7)
133	Number of Basic Colour Categories						Not included due to a clerical error
134	Green and Blue	7	GreenBlue		UNORDERED	UNORDERED	
135	Red and Yellow	5	RedYellow		UNORDERED	UNORDERED	
136	M-T Pronouns	3	MTPron	MTPron	UNORDERED	UNORDERED	No M-T pronouns vs any (1 vs 2,3)
137	N-M Pronouns	3	NMPron	NMPron	UNORDERED	UNORDERED	No N-M pronouns vs any (1 vs 2,3)
138	Tea	3	Tea	Tea	UNORDERED	UNORDERED	Cha vs Te (1 vs 2)
139	Para-Linguistic Usages of Clicks	3	ParaLingClick	ParaLingClick	UNORDERED	UNORDERED	Logical vs affective (1 vs 2)

Several comments are in order concerning these primary typological data:

- *data reliability*: the specific value a language has on a linguistic feature might not be very reliable and depends on decisions concerning the states the feature can have and the actual value recorded for the language. For example, *Tone* can have 3 possible values and it is not clear if the labeling of such diverse tone systems as those of Norwegian, Japanese and several Bantu languages with the same state (*Simple tone systems*) is meaningful;
- *chance similarity*: given the limited (and usually small) number of possible values a linguistic feature can have, it is to be expected that many languages have similar values simply due to chance. This, in turn, can affect inferences drawn using phylogenetic methods applied to typological data (Greenhill, Atkinson, Meade and Gray 2010).

As a side – but important – note, the original report of a genetic biasing for *Tone* (Dediu and Ladd 2007) is unlikely to be greatly affected by these considerations given that we have endeavored to collect our data from primary sources as much as possible, a strategy unfortunately inapplicable to the current case where I have much more than the approximately 50 languages and 25 linguistic features in (Dediu and Ladd 2007).

Linguistic Classifications

In historical linguistics, there is a core of uncontroversial language families, such as *Indo-European*, based on the strict application of the *comparative method* (Fortson 2004, McMahon and McMahon 2005), but there are also less clear-cut cases and even highly controversial proposals, such as Joseph Greenberg’s (Greenberg 1987) *Amerind*.

The two linguistic classifications used, WALS (Haspelmath et al. 2005) and Ethnologue (Lewis 2009) generally agree, due to the fact that the WALS classification was inspired by the 14th edition of the Ethnologue (<https://dev.livingreviews.org/projects/wals/wiki/Help/Language#LanguageGenealogy>), but there are also several differences between them in what concerns the structure and composition of the proposed families. For most language families, the WALS classification considers only three levels, “Family”, “Genus” and “Language”, avoiding finer splits by using unresolved polytomies. This approach ensures the same standardized classification (with the rare exception of cases like *Niger-Congo*, where there is an intermediate level between family and genus, “Subfamily”, but this level is inconsistently used and was ignored in these analyses).

The Ethnologue classifications are generally more resolved, with the number of levels varying dramatically between language families (in the sample used here, from 1 for language isolates to 14 for *Austronesian*). The actual data for this paper has been harvested from the Ethnologue website (www.ethnologue.com, October 2009) using an automated script and transformed to match the conventions of the WALS database.

Stability estimation

The two different methods for estimating the stability of linguistic features are implemented by two software packages, the custom-written *BayesLang*, and the off-the-shelf phylogeny inference program *MrBayes* (Ronquist and Huelsenbeck 2003).

I wrote *BayesLang* from scratch and it is released under the GPL licence. It was written in cross-platform C++ and implements standard Bayesian phylogeny inference algorithms (Felsenstein 2004, Huelsenbeck et al. 2001, Ronquist and Huelsenbeck 2003) through a multi-threaded Metropolis-Coupled Markov Chain Monte Carlo (*MC³*; (Altekar, Dwarkadas, Huelsenbeck and Ronquist 2004)), with each chain running in a different thread (or CPU/core on multi-CPU/multi-core machines), with the number of hot chains specified by the user. Its input data is organized as a standard Nexus (Maddison, Swofford and Maddison 1997) file (processed using the *NEXUS Class Library* project – <http://sourceforge.net/projects/ncl>), except for the presence of two custom blocks, *trees* and *topology* (**Figure S1**). A single such file contains the information for all the language families to be processed. The *trees* block represents the language families in a slightly customized Newick tree format (Maddison et al. 1997), giving the proto-language names. The *topology* block contains the types of

the linguistic features, the custom instantaneous transition matrices for the custom features and the names of the feature values. These input Nexus files are generated by R (R Development Core Team 2009) scripts directly from the WALS and Ethnologue databases. The topology in the `trees` block is considered as given and the program tries to find the best possible assignment of the unobserved (missing and ancestral) states given the observed values. For each posterior fully specified tree and linguistic feature, the program computes the minimum number of changes taking place from the root to all the observed terminal nodes (akin to a parsimony approach). The linguistic features are then ranked from the most stable (the smallest number of changes) to the least stable (the largest number of changes) and the output for further analyses is represented by this *set of ranks*, one for each posterior tree. The main advantages of `BayesLang` are that it can work with unresolved polytomies, it can use custom instantaneous transition matrices and is relatively fast (mainly because the topology is taken as given). In the analyses reported here, the program was run for 5,000,000 generations, using 1 cold and 6 heated chains, with a burn-in period of approximately 1,000,000 generations, and convergence was reached in all cases (judged by log-likelihood plots).

`MrBayes` is a widely-used Bayesian phylogeny inference program, which is very flexible and offers a wide range of models and algorithms. The input is represented by several Nexus files in the format it accepts (**Figures S2 and S3**), one per language family. The `datatype` was set to `standard` for the polymorphic coding (the `ORDERED` features are specified using the `Ctype ORDERED` directive) and to `restriction` for the binary coding. The linguistic classifications were used to define topological constraints on the phylogeny. As above, these Nexus files are automatically generated by R scripts from the WALS and Ethnologue databases. I used a *gamma* model for the rates (Ronquist and Huelsenbeck 2003) and the program was run for 5,000,000 generations with a sampling frequency of 1000, following 1000 samples as burn-in. Convergence was judged using log-likelihood plots and the Potential Scale Reduction Factor (Ronquist and Huelsenbeck 2003). The consensus trees produced without specifying topological constraints and networks resulting from `SplitsTree4` (Huson and Bryant 2006) for different families suggest that the constraints are essential because the typological data alone is insufficient to reliably reconstruct accepted phylogenies. This is probably due to the quality of the data as well as the variable propensity of typological features to be borrowed, but further investigation is needed. As above, the rates were converted into ranks.

```

#nexus

[ This file was automatically generated by wals2nex.r script using the WALS database. (c) Dan Dediu,
Nov. 2008 ]

[ This file must contain the languages, features, data matrix (actual feature values for all languages)
and tree/classification templates ]

[ Taxlabels (the language ISO codes) are required ]
begin taxa;
  dimensions ntax = 542 ;
  taxlabels aba abu acn ach aga ahu ●●● zsq zte zya zzo zha zhn ;
end;

[ The linguistic features and the data matrix, allowed symbol values 0..9 and . for missing data ]
begin characters;
  dimensions nchar = 65 ;

  [ Charlabels (feature short names) are required ]
  [ It is a good idea to give the list of feature values as a comment ]
  charlabels Cons [0..4] Vowel [0..2] ●●● Tea [0..2] ParaLingClick [0..2] ;
  format datatype=standard missing=. symbols=". 0 1 2 3 4 5 6 7 8 9";

  matrix
  aba .....000.11.....
  abu .....0.....21.....0.....0101111101.....
  acn .....000211.1.....
  ach 1110002..00.00.....
  aga .....2.....0...1.....0000.0.....4...
  ●●●
  ;
end;

[ The tree (classification) templates: basically the Newick format supplemented with protolanguage
names (required) ]
begin trees;
  tree Oregon_Coast = ( (als) Alesia , (coo) Coosan , (siu) Siuslawan ) OregonCoast;
  ●●●
  tree Yukaghir = ( (yko,ytu) YukaghirG ) Yukaghir;
  tree Zaparoan = ( (arb,iqu,zpr) ZaparoanG ) Zaparoan;
end;

[ Linguistic typology specific info ]
begin typology;

  [ The type of the linguistic features: ]
  chartypes RANKED : Cons Vowel ●●● PerphrCausC NperphrCausC ,
  UNORDERED : VowelN SexGen ●●● MTPron NMPron Tea ParaLingClick ;
  custommatrix VoicPF 4
  - 1 1 0
  1 - 0 1
  1 0 - 1
  0 1 1 -
  ;
  ●●●

  [ The labels of the feature values (required) ]
  valuelabels Cons : Small Moderately_small Average Moderately_large Large, ●●● ;
end;

```

Figure S1. Example of a custom Nexus file format accepted by BayesLang. ●●● represent omitted text.

```

#nexus

[ This file was automatically generated by walsbinary2MrBayesnex.r script using the WALS database to be
used by MrBayes. (c) Dan Dediú, March. 2009 ]

[ The linguistic features and the data matrix, allowed symbol values 0..9 and . for missing data ]
begin data;
  dimensions ntax = 11 nchar = 86 ;

  [ Cons1 Cons2 Vowel1 Vowel2 ●●● PassiveC AntipassiveC SymAsymStNeg1 SymAsymStNeg2 ]
  format datatype=restriction missing=.;

  matrix
    000 010100000000000110.00.0●●●1010..111000111000
    aze 011100110010.10100.00..●●●1010..111..0.....
    bsk 111101111011.11100101..●●●101010...000.....
    chv 011100110010.11100000..●●●101010011000.....
    ●●●
  ;
end;

[ The constraints ]
constraint Turkic -1 = aze bsk chv tur tuv ykt ;
constraint Mongolic -1 = dgr kha mgg ;

begin MrBayes;
  set autoclose=yes nowarn=yes;
  lset rates=gamma coding=all;
  report ancstates=yes;
  report siterates=yes;
  prset topologypr = constraints( Turkic , Mongolic );
  mcmc ngen=5000000 samplefreq=1000;
  sumt burnin=1000;
  sump burnin=1000;
end;

```

Figure S2. Example of a custom Nexus file format accepted by MrBayes for binary coding. ●●● represent omitted text.

```

#nexus

[ This file was automatically generated by walspolytomous2MrBayesnex.r script using the WALs database
to be used by MrBayes. (c) Dan Dediu, March. 2009 ]

[ The linguistic features and the data matrix, allowed symbol values 0..9 and . for missing data ]
begin data;
  dimensions ntax = 11 nchar = 86 ;

  [ Cons1 Cons2 Vowel1 Vowel2 ●●● PassiveC AntipassiveC SymAsymStNeg1 SymAsymStNeg2 ]
  format datatype=restriction missing=.;

  matrix
    000 32211113212214121..2216●●●221115213311111111
    aze 33241123.2211.....●●●22..1.....1..
    bsk 43344122.2311....55.....●●●.111.....
    chv 33241123.2311...155..4.●●●62111.....21
    ●●●
  ;
end;

[ The constraints ]
constraint Turkic -1 = aze bsk chv tur tuv ykt ;
constraint Mongolic -1 = dgr kha mgg ;

begin MrBayes;
  set autoclose=yes nowarn=yes;
  lset rates=gamma coding=all;
  report ancstates=yes;
  report siterates=yes;
  Ctype ORDERED : 1 2 3 8 11 12 17 20 29 32 40 41 ;
  prset topologypr = constraints( Turkic , Mongolic );
  mcmc ngen=5000000 samplefreq=1000;
  sumt burnin=1000;
  sump burnin=1000;
end;

```

Figure S3. Example of a custom Nexus file format accepted by MrBayes for polymorphic coding. ●●● represent omitted text.

Outgroups

As briefly discussed in the main paper, the issue of outgroups in phylogenetic studies of language is complex. Indeed, biologists (especially those concerned with multicellular eukaryotes) are in a far better position than linguists because they know that for any taxon (genus, family, order, etc.) of interest there are true outgroups (i.e., entities evolutionarily related to the taxon of interest).

However, given the current state of the art in historical linguistics, it is impossible (by definition) to find a true outgroup for a whole language family. Thus, as a way around this problem, I have used as many language isolates as possible as independent outgroups in as many independent runs in order to compare their effects on the estimation of relative rates of change and to compute an average signal (if appropriate). As reported in the main paper, the 23 language isolates chosen (see details below) tend to produce estimates of stability which correlate strongly, suggesting that at least these estimates are reliable. The reason for picking language isolates as opposed to random languages was to avoid cases where the language family containing the outgroup language would have been included in the analysis.

Potentially, the use of language isolates as outgroups risks producing meaningless results partially reflecting areal phenomena but the comparison of the estimates resulting thus with the estimates produced by `BayesLang` – which does not need an outgroup to root the phylogeny – suggests that the results are valid (see main paper). Thus, the usage of outgroups to root language phylogeny for relative rates estimation seems to be warranted and future research is required to understand the reasons behind this finding.

I have repeated all the analyses using more than one outgroup, where a potential outgroup was taken to be any *language isolate* with enough non-missing data. Due to computational constraints, for the runs using the `WALS` classification I have used either *Basque* or *Ainu* as outgroups, but for the `Ethnologue` classification I have used the full set of 23 language isolates with at most 40% missing data: *Acoma*, *Ainu*, *Aymara*, *Basque*, *Burushaski*, *Cayuvava*, *Japanese*, *Ket*, *Korean*, *Kutenai*, *Lavukaleve*, *Mapudungun*, *Nivkh*, *Paumarí*, *Pirahã*, *Sanuma*, *Trumai*, *Tunica*, *Warao*, *Yagua*, *Yuchi*, *Yukaghir (Kolyma)*, and *Zuni*. This set of outgroups is geographically and typologically diverse and representative for the whole set of language isolates in the `WALS` database ($\chi^2_3 = 5.01$, $p = 0.17$).

The datasets

Both `BayesLang` and `MrBayes` are able to handle reasonable amounts of missing data, but the `WALS` database is too sparse to be used as such (the following concern only the 138 linguistic features included): overall, only $\approx 16.5\%$ of the cells have information, individual linguistic features have between 4.4% and 53.5% (mean 16.5% and median 12.5%) non-missing data cells, while individual languages cover the whole 0% – 100% range with a mean of 16.5% and median 9.5%. There is a trade off between data completeness and geographical and historical linguistic coverage and I have set a maximum acceptable percentage of missing data per linguistic feature and language, coupled with a manual selection of linguistic features based on their completeness and meaningfulness of coding. Moreover, language isolates and language families with too few languages (less than 2 for `BayesLang` and than 3 for `MrBayes`) cannot be used for inference.

The `WALS` and `Ethnologue` classifications do not agree perfectly, allocating some languages to different language families. Thus, the number, names and composition of the language families are not identical, but they are not widely different either. In general, there tend to be more language families selected from `Ethnologue` and this set includes the language families selected from `WALS`, due to the minimum number of languages in a language family required by the phylogenetic software, amplifying the differences between classifications.

B_M

The¹ binary coding with MrBayes resulted in the selection of the following 86 binary features (numbered in the order they are referred to below): *Cons1* (1), *Cons2* (2), *Vowel1* (3), *Vowel2* (4), *CVRatio1* (5), *CVRatio2* (6), *VoicPF1* (7), *VoicPF2* (8), *UvulC* (9), *GlottC* (10), *LatC* (11), *VelarN* (12), *VowelN* (13), *FrRoundV* (14), *SylStr1* (15), *SylStr2* (16), *Tone1* (17), *Tone2* (18), *FixStress* (19), *AbsComC* (20), *PresUnC* (21), *ESlffF* (22), *IffSVerb* (23), *LmarkC* (24), *LmarkPNP* (25), *CaseS* (26), *SynVPNM* (27), *NoGen* (28), *SexGen* (29), *SgenAss* (30), *OccNPlu* (31), *AssocPlu* (32), *DefArt* (33), *IndefArt* (34), *DistCDem* (35), *P3PrDem* (36), *GenDIPersP* (37), *PolitDPron* (38), *IntReflPron* (39), *PersMAdpos* (40), *AsymCaseM* (41), *ComInstr* (42), *OrdNum* (43), *DistNum* (44), *NumClas* (45), *ConjUQu* (46), *PosProPAff* (47), *OlbPosInfl* (48), *PosClas* (49), *NounPConj* (50), *NomVConj* (51), *PerfImpAsp* (52), *PastTense* (53), *FutTense* (54), *Perfect* (55), *MorphImp* (56), *Optative* (57), *OvSitEpi* (58), *SemDistEv* (59), *SuppTAsp* (60), *VnumSupp* (61), *SV1* (62), *SV2* (63), *OVI* (64), *OV2* (65), *AdposNP* (66), *GenN1* (67), *GenN2* (68), *AdjN1* (69), *AdjN2* (70), *NumN1* (71), *NumN2* (72), *DegWAdj1* (73), *DegWAdj2* (74), *PolQPart* (75), *IntPhCQ1* (76), *IntPhCQ2* (77), *OVAAdpNP* (78), *OVRelN* (79), *OVAAdjN* (80), *VpersM* (81), *PersMV* (82), *PassiveC* (83), *AntipassiveC* (84), *SymAsymStNeg1* (85), *SymAsymStNeg2* (86).

A missing data proportion threshold of 60% proved the best in terms of the number of languages and language families selected, resulting in 255 languages in 25 language families using WALS (in the following, the language families are listed with the standard ISO 639 codes for the languages included and the order of linguistic features is the one given in the text):

Language	Feature values
Afro-Asiatic (17 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
amh	111111100110.00100.00.....111.111..1.010..10.1000.01011.0...10100101010..1..000111...
anc	00111111011..01111.00.....1.....1.....10111111111..111000.....
aeg	0101111110100011000010100.11111.100110.1.1100.1000011101010001011111110.11111000111000
bej	010101100010.011100001011.1111..1...1..01.....1000.11011..1..10100100.....01101.111011
bma	0100111110100011001011111.0111.....010.1111..10111100010..0011111111110..110000111010
hau	110111110110000110.0001110.11111111010.1.0110.100110000101000101111110111110.001001011
heb	.....00.....1..0011.11111.11011001.0100110000011010101010111111100.110000101011
irq	11011110111000110001.....11111.001010.00.11011..0...10100010101111111..011111101010
knk	11010110011..00110.00.....1.....001..1110.....10111110.11..11100.....
ker	00010111011..00111000.....11...10.0001...1...0...0000..10111111111..111000100.11
mrg	11001111011..0..10.000.....01000.....1.1011011.10111.....101111111111111000.....
mup	.....011.11.01.11.0.0...1...1..011011111111110.111000100...
ngz	110111110110.00110.00.....110.....011.....10111111111111011000.....
orh	110111110110000111.00110.111111.00001010111.0.0010111011010101001111110011011100011
som	011100101010.00110.01.....1.101..01.011..1..010110.00...1010.0.111010111.11...10
ter	11011111011..00111.000.....0...1011.....1.....10111111111..111000.....11
tgr	11011111011..00100.01.....111..11.....1..0.0101100...10101111010...11100.....
Algic (4 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
cre	000000000000001001001111.010011..1010..0...0.1100.0000100.000.11.....1.....110100
oji	00000100001..0..00.00.....1001.10.....0.....0..1111.....1010.10.0...1..
psm	000101000010001110000.....0100..10101..1.1.....00...1001010.111.....10..0..111011
yur	110111000110001100.000111100.....1..100.01.....1010.....1000..100..10101010111..111011
Altaic (10 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
aze	011100110010.10100.00.....1.1.1...1111.1...1010.101010..111..0.....
bsk	111101111011.11100101.....000.....11.11.....10.....1010010101010..0000.....
chv	011100110010.11100000.....0..1000.1...0.110.1.....10...1010010101010011000.....
dgr	011101110011.11100.00.....1.....0..0.1...1.....10...10100101010..111000101...
eve	0001011000110001000001111000..100000001011101110.0111111010010100101010110000101010
kha	01110011001100..0000010110.0..10000101000111011000.010111010010100101010111000001011
mgg	010111111011.00100.00.....1.01.....1...0...1.....10100101010..0..000.....
tur	0111011100100101000001111000..100101010000111010000111010111010100101010111000101011
tuv	011100100011.11100.00.....00.....110.100.....101...101001010...1..0.0.....

continued ...

¹More information about the linguistic features can be found in Table S1 and on www.wals.info and about the language families on www.wals.info and especially on www.ethnologue.com.

... continued

ykt 011101110011.11100.00.....0.....111.11.1.....0.1.101001010.....000.....

Arawakan (4 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
apu 0001010000001000000000111.01111.0001101.0.0.0.100..001010.100100.0101110..010...111000
cax 00001100000..00100.00.....110..00.11..0.....110.....0..0.11.1011.....11.00110...
goa 00010100001..0.....00.....1.....11...1.1.....1111111110111100.0.....
res 11011110000..00110.00.....00.....110.....10100101010..10.0.0.....

Australian (21 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
amp 11001100001..00100.101011.....1.1.10.....1010.....10100..1111..1.011.....
diy 01001100001..00100110..11..110..1.....010.....1..1010.101111..010..1..1..1..
dyi 00000100001..00100110..11..11011..0.0.1..0.010.....1..0.1010.101111..111.11..1..1..
grr 01001100001..00100110..11.....0.....0001.....111110110..1100.0.....00
goo 0100110000110001001101111.00...01.000000110001101..011000.1001010.0.1110.....1110100
kgu 01001100001..00100110.....1.....0.....0.....1010.101110..10..1100...
kay 00001100001100010011010111.0..011101000.0101.1.01..0010101100100..101010..011..001011
mlk 00010100001..11100010..1.....1.....1..0.01.....1010.0.111110.0..1110...
myi 000101000011001100110111110110.11..100..110.0.101010100100100101010.110...111111110111
mku 00010000001.001100110.....0.....0.....1.....0000001010010111110100.1110.00
mrt 01001100001100010011010111.0.....0000..11000.101..011010.1001011.0.1110..010..0001000
mau 0001010000110011001000010.0110...1110101..00101..11101..01010111010101110001110011
mpa 01001110001..01100.10..10.....00.....1010.1111..1.....
ngi ..001100001100010000110111.0..100001001.110.0.001..01101011001010.100....110..110000
nug 010011000011000100110..1101111.10010101.1.0.0.01.....0000100.0..0.0.....110...110011
pit 1101111000011100100001111.0100..00.01..00111..1..00...1100101010001010100.111000111.00
tiw 0100110000110001001000010.11101.000.1000..01000110.011010.00010111101010..10.001110011
ung 010101000011000100010..11.0.....10..1.0.1...0101.....00..101000.111111.11011110.11
wam 000011000011000100010.....101101...01001.1.....0000..0.11.....110011
wrđ 0001010000110011001101..00100111.110...1.0.....1...10.0.0.0.00.1110...11...110100
yid 0000010000110001000101...1.0..0100110...1...010..01...10.0..1010.101111..011..1000100

Austro-Asiatic (9 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
khs 01010110001100110010010.....110..00111110.11...00010.....000010111111111011.11000100011
khm 011100000111001100100.....0..1.1..0100.11.110..0.000100.000101111111111111000000.00
kmu 011100000111001110100.....110.....01010..01.0...100010000..101111111110.1..0.0000.00
mun 1101111000011001000001111.0100..00.01..00111..1..00...1100101010001010100.111000111.00
nca100..100..11.....11.0000.00000.....1111111101011.0.0.1...00
sed 111111000111.00100100.....1.....1.....1011111111011111000.....
sml 111101100111100100100..10.0.....000..01..010.....0001000.000.11111110..010000101.11
sre 001101100111.01110.00.....0.....0.101111111011111000.....
vie 011100100111000111.000000..0..1.1.010100..101100000000100100010111111110..111000001000

Austronesian (31 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
ata 00010110101..0..00.01.....10..0.0.00.....11111110.10..1110..100...
bkr 001100100011000100000.....00...10..0.10..0111..10...1000..0.1111111010110000100000
bto 00010110001..0..00100.....00...1.....1111111110.10.11000.....
cha 0101011000110001000000111.00..101.100001..110.100101000.0111011111110101010.001101100
dre 111101110011000100101.....1.0.1.10.11.0.001.1...0000..101111111011111000001.00
fij 01010100001100000000101111.0...00100111.1110.10011010100000011111111100.011000111010
haw 00010000001..00000110.....0..11111.0...110.0...010000.1...111111111011.11000.....
iaa 11110111001..10100101.....0...11.....0.1.....00...111111111011110000.....
iba 01010110001..00100.00.....00.....0.....101111111100.10.000.....
ind 0101011100110011001000000..0..1110000100..101110010000100000010111111101010.000010000
irr 00110000000..00100100.....1.....1.....10111101111..0110.0.....
kkv 01010100001..00100.00.....0.....0.....1.....0..101110111111.110.0110...
klv 010101100010000100000.....00...001110.1.1101.1.....0000001111101110..010000110000
krb 000100000001000100.10.....1...00..1..11.1..1...10.0..111111111011.11000111...
kwa 00010100001..00000100.....1.....0.....00...00...10111..1110....0.0.....
len 00010000001..00100100.....01.....1.....101111111111111000.....
mal 010011110011000100100101..00...0101.00011.11010000.10001000001111111111..110000001000
mao 000100000001000000001.11..0..1111110010.111.00001101010000001111111111011000001010
pms 000101000011000100100.....0.....10.10..1.....111.1...10.0..1011111111..011000110011
pai 0100111110110001001001011000.....0.00.0111...00.100011001..1111111.....0..000111
pal0..1.00.10.0.11...1.10...00...1011111101010011001111...
poh 00110000001..01100.00.....0.....1.101.....0..10110..11110.00.000.....
rap 0001000000010000001001111..0..1111110000.11.0..01..01010010001111111110..1..000000011
ruk 01001111001..00100.01.....0.....1.....1111.....11111111010..0110.1.....
sam111110..0.1111..001.....011111111111111..1110000000...
continued...

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tab	010101100011001100100.....00..1.00.101.0..1.11....0....000000101111011110.011000101000
tag	010101100011000100100101...11011...10011.111101.000010101111001111.110.10..110.0.000000
ttn	00010110001..01100.00.....1.11...1.....11.0...0...0....1011110111111111000.....
tgk	00010010001..00100100.....11..0..1.0...1..0.....101111111011111000100...
tuk	0101010001110000001001101.00...1..100100..1010001.0001010001011111111111..10.0.0111000
yap	01110110011..00100001.....11..0..1.....1.1.....0....111111111101000.000100...

Cariban (3 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
car	000100100000000100000.....10.....1..1.11...1.1.....10.11010100101010110..0.0111.10
hix	0001011000100001000000011.11001000111011.100001100.110010.1101110010111011010011111010
mac	.....1.....1001.00010..1..1..1.....10.0100.100101110110100.11110..

Chibchan (3 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
bri	000101110000.0.....00..00.....00.01....0..0.....101001011110...0.1000...
ika	001100100000.00100.00..01010...00100..00.0.001...1...0011101010010110.101..0.1110010
ram	000011100011000100000101...0..1.110100111...101..011110.0001010010111111.110.1100011

Dravidian (5 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
brh	010111110010001100.001011000..11...10000011100100.01101100010.....0..10.....11...100011
knd	010111100010001100.0010110111011.101110001110100001011110110101001010101110.0101010
tml	.....1101...0..10..111.1..0101111.11..10100101010011000...0..
tel	11011110001..00100.00.....10..1...1.....101...10100101010011000.....
tul	01110110001..01100.00.....00.....10100101010...110.0.....

Hokan (3 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
die	11011110101..0..00000.....1.....111.....1.00..1010010..11110..0.....
mar	0101110010100011001011111000..1.1011000.0..100101.1001011.10110100101111..0..0.1111000
pso	0001111011110.0.....00.0110.....00.110.00.....01.....1101..1010010..10..0110..000.11

Indo-European (29 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
alb	011101110010.11100.01.....11..10.010110.0..0....1111..10111111110101..000111.00
arm	00011110111000..00000.0..100..1....10100111100.000.1101101.1010..0101010.....101011
bre	11110111001..11100100.....11...1...01...1..0....1..0..11111111110..110000.....
bul	11010111001..01100.00.....11...1.1.110.0..0.110110.1100.1110.10101010001.....
ctl	01110111001..00100000.....1.....1.101.....1.1..0.111111110.....000.....
eng	0111001100110011000010011111101.11011000101001000000101001010101110.101010010001101011
fre	011100111010111100000001111111.11.11110.01000000001111101110101111111010110000101000
ger	01110011101011100000101111111111.1111010110.000.00101101110100.111101010010..101000
grk	0101011100100011001011011101111.111.11101011..000001011010100.11111101010110001111000
hin	110111110010101100000101111111.00.10100.11101.000011111010101010010101110.0101011
ice	.....1.....11..1111110...1.1.1..0..0.0101101...1011111101010...001...000
iri	.....00.....1.....11...1.10111001001...0..0....1010101111111110..110000101.11
ita	.....0.....1.110.1110101..0...0...1.1...0.111111110100..000101.00
kas	11110110001..0..00.00.....111...0.11001.11.....0...101...10110101010...111.11110..
krd	111101111011.01100.01.....1.11..0..1...1.1.....1....1010111111010.11111111...
lat	000101110010001110100.....111111.110111101011000..0001111011100.11110101010110001101011
lit	11011111001..011..000.....1.000..11.1.11....0....1.11..101110101010110001.....
mhi	.....111..0001.10.00.101...0....1.0...1010010101010111000.....
nep	11011110001..0..00000..11.....10.....1.....0....1.1..10100101010...110.0.....
nor	01110010001..11110000.....111...10..01..0.....10...101110.101010010001.....
pan	.....111100001.10.1...1.....1111100...10100101010101110.0...0..
psh	11011111011.01100000.....111..00...1.1.11..0.....101010.10101010.11.10.....
prs	0101011110100011001001011.00...10.011010010110000011001011101010111110101111111000
pol	11011111001..01100100.....000..11101111....0....1.1.100.11111101010110001101...
rom	01110111001..0..00000.....1.11...11.1011..0..0.11001.10..1011111110100010000.....
rus	1101111100100011000001011101111.000.11101.110.000001100101010101111101010110001101000
snh	01110110001..0..00.00.....0...1.10.0.1.0...0.....10100..100.10...010.....
spa	110101100010000100001101111111.111011101.10..0000011111010100.11111111010010000111000
swe	.....0.....1.110..10.101..0..0.01011011101011110101010010001.....

Khoisan (3 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
ani	00011110110..00110.01.....1.1..0.....100...101010..111...101...
juh	11011110111.00011.01..00..1011.11111000.0..0.00101100000.0..10110101111..111100000000
kho	11011100000000111.011111.1111.1.10011.0001.00.110011010000101010010101010110000101011

Macro-Ge (3 languages)

continued ...

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	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	
brr	001100100000	00000	100011	0	1	101	0	11	10	111	11		
ckr	001100000011	011001000011	10	00000011	0	0	1101101001	001101001011	1100	1100100100					
kng	00110000000	100100	10	1	0	1	1	101001011	11	0	1

Na-Dene (4 languages)

	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85		
hup	11001100111	01100	00	.....	1	.....	1	.....	1	.....	1010	0	0101110	.....	11	.....			
nav	110011100110100110000	.....	0	.....	1	1	11	11	0	1	10	.....	00110110100101111101110	.....	1111	10
sla	1101111001101001100000111	0	.....	1000100	1	11	.....	1010111100011110100101111	.....	1110	.....	1111000				
tli	110011001110001110	101	11	0	1	00	111	1	1010	0	00	10100100	1010	00	110	11

Nakh-Daghestanian (8 languages)

	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85		
arc	110111111110	01100001	110	0	1	1	10100101010	0110	0	1			
ava	11011111111	01100001	.....	11	0	.....	0	.....	11	.....	10100101010101110	0	.....						
hzb	11110111111010010000111	00101	00110	.....	01111000	.....	0	.....	11011010100101010	0	0	000100111					
ing	1101111111000110010111110111	.....	00000	001	1101000	.....	11	111101000101010	.....	010000000000							
lak	110011111110001100	01	1111010	0	001	1	0	1	10	10100	10	0	01001
lez	11011111111001110000010111	0	.....	1001110000111101	000011111101101010010101010011000000011														
rut	110111111110	01110	01	0	1	1	10100101010	0	0						
ttu	110111111110	01100	01	.....	00	.....	1	1	.....	10100101010	.....	111000	.....						

Niger-Congo (30 languages)

	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85		
akn	00110010000	00110	00	01	1	1	1	10111	0	1011	10111111111	0			
bam	01110110011	00010	00	01	00	0	1	0	101	10100101111	1	0	1000	11	
bir	01110111001	00111	01	.....	11	.....	1	.....	00	.....	10111111111	.....	111000	.....	00
dgb	01011111001	000110	01	.....	1	10	.....	0	1	.....	1011010111111	.....	101	0	.....				
dan	01110011011	00111	01	.....	.....	10100101111	.....	111011	.....										
dio	01110010001	01100100	.....	1101	11	11	0	1	1	.....	001000	000101111111111	.....	011000111	11		
doy	01110111011	101111	01	1	10	0	0	1	1	1011	1011111	111	00111		
ewe	11110110011	00110	01	.....	01	10	.....	011	01	.....	1011	001000101010101111	.....	111100110011		
ewo	11110111001	00111	01	.....	1	1	.....	1	.....	1	.....	10111111111	.....	111000	.....				
fye	11011110011	00110	00	.....	1	11	.....	1	.....	1	.....	10111111111	.....	111000	.....				
gbb	11110111011	00110	01	.....	011	.....	0	0	101	.....	10111111011	.....	111001	.....	11
grb	0111001000111000110010111	01001	00	110	0	1	.....	000	.....	111110	00010110101111	.....	110100001010				
igb	111101110011000010	01	.....	0	.....	00	0	1	0	0	.....	10100010111111111	.....	011000000010		
ijo	01110011001	00010	01	00	11	1	1	101	10	1010	101010	011	00101	11
kis	0	0001	101	000100	0	01	10	100	11111110	010	101			
kfe	001100110011100100100	1001	10	01101	010	1	1010	1011	101111	110	00110000				
luv	001101100011	000101000111	11011000	11110	1	.....	101	1011110	000101111111111	.....	11000110011							
mro	01110110001	00110	01	00	1	10	1011	111111	111	00				
mum	01010111011	00111	01	.....	11	0	0	.....	0	.....	101110	1111	.....	111000000	.....				
ndt	11110110001	00111	00	.....	.....	0	.....	0	.....	10111111111	.....	11000	.....						
nko	01010111000000110	00	.....	1101	.....	111	01	.....	11	.....	1000	1011111111111111000111011				
non	01110010001	01111	00	00	0	0	1011	111111	111	00				
san	111101110110100010	010001	00	.....	01	001	0	0	.....	0001000000	100010111111011111001000000							
sup	0011011100111001111000001	1011111	110100	1101000	1101000	11011000010101000101111	.....	10	0	1000011									
swa	1101111100110000001010011	1101111	0	1010	1110	1001	011110100010111111111	.....	111000111011										
tne	00110010001	101110	01	.....	11	.....	0	1	0111	.....	10111111111	.....	110000	.....					
wlf	11110110001	001100	00	.....	11	.....	0	1	1	1101011	1	.....	1011111111011110000	.....					
yor	001100100010100011	0111110	0	.....	1000000110	1110	00011000100100010111111111	.....	010000000011									
zan	01110011001	0	10	01	110	1	0	1	101110	1011	110	1111		
zul	11011110011	0001101010011	11011000	11010	1	01	001111111101000101111111	.....	111000111011										

Nilo-Saharan (19 languages)

	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
bag	1111011001111001111000110	10	1	10	00001	1	.....	100	1100000	0010111111111	.....	111000110011				
ber	01011100011	00110	01	.....	0	1	.....	1	.....	1011	.....	1111	.....	00111	.....		
din	01110010001	00111	10	.....	1	.....	1	1	.....	100	.....	11111111011	.....				
fur	000101100011000110	00	11	0	.....	000110	0	0000	.....	00	01010100101111	.....	11011101	00	
ik	11110111001	01110	00	11	.....	11	.....	00	.....	1	.....	111110	1111	110000	.....		
knr	111101110011000110	00	11	00	.....	10110000	0111	011001111111000101010001111111010011111011									
kch	00010110001	100100	000011	.....	1	1	00	10	.....	100001	.....	101101011111100	100001	.....			
kse	000101100011	0	.....	00	.....	0	010	000101	1	.....	0	.....	11000101000101000101111	.....	110011001111
knm	0101011000110001100001	11	1	.....	100	0010011	.....	1011	.....	1	001101000101111100	.....	011111	11	
lan	1111001000111001101100111	10	1	01100001	1	00	01	1100010100010111111111	.....	011000110100							
lug	11110111011	00111	01	1000	1	0	01	1	1	100	01011111111	11	
luo	01110110001	00110	00	.....	111	.....	1110	1	.....	10	.....	10111111111	.....	011000	.....		
maa	01110000011	00110	0011	00	0	010	1111111111111111000	11						
mab	01110111001	101110	00	0	1	0	10	0	1010	101000	111110010111111	11		

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mr1	01110010011.000110001...110.....00.11.....1.....0..0011111.111111..011.00111000
nan	00110000001..00110.0010.....1.1.0..0.11.....100.....10.....11111111111..111000110...
nar	00010110001..00110.00..10.....1.....0..000.....101001011.....011.....
nti	11111110110000011.01.....1...1.10100011111..1.....10.0..100.0101010..10...110.00
nbd	.....0..1.11010..1.010.00110..100101.....10.0..1010010111110011011101.10

Oto-Manguean (5 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
cso	00010110001..0..11.00.....1.....0.....1.....0..111111111011110000.....
cle	010101100011.00111000.....1100..00110.01.00...1.....11.010111111111010110000101.00
chq	11110110011.110011.01.....1.....1.....111111111100.110000.....
mxs	1001011011000011.010000.01101.00000101..0.0.000.0101010001011111111100.010000100000
otm	011101110010101110.010111..0.....0000..1...0000...1001..111111101010110001110011

Penutian (6 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
klm	11001110111..01100000.....0.....0.0.....1.....0.0.010101010110.....00
mne	00010100011..00100000.....0.....1.10.111..0111...1..1010.1010...010.00100.00
mss	0001000000110001000001011000.....0100..0.1.0.100.....101100100..0.0.10...10...111.00
nez	110111001110001100000.....000.....00001.0.1...110.1...1000..0.0..10101010110...111100
tsi	11001110110001100100.....00...100.0..01..1111..0.....1..111111101010011001110.11
win	110111101110.00100.00..11.....10...11..0.011.....1.1..0.0..10.....101.10

Salishan (3 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
bco	11001100111..01100.00.....10.....1.....1.....111111110...0..001...11
shu	11011100111..01100.00.....1.....1.100010.1..111111.....1.0.....10
sqv	11001100111000110010111110.0.....11..0...1.1...10000.....001001111111010..1..0.1111.10

Sepik (3 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
ala	0111001000000011000000111.01101110011000011.0.00001111010.01010100101010101000110011
awt	.....1.....11.....011..1.....00.0.0000.....1010010111111111001000...
kwo	011101100000.001...00.....10.....0.....1010010101011111000.....

Sino-Tibetan (19 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
ao	00010010001.000111.00.....110.....1.....1.....10100101111101..0.1.....
baw	01011110011.00110100...000..1.00.00.....0..0...0010..1010010111111110.1110.11
bod	00010011001..00110.00.....00.....1.....1010.1010110.011..0.....
brm	111101110011000111.011011..0...0000011000.1111.001.0001001000101001011110011001000010
cnt	011100000011.10111.00.....0...1.00.0..1011...110010.110010111010101011011...11
cti	01010111011..00111.00.....00.....1.....10100101111...110.1.....
gar	000101100001000100.0010..0...1000.1000.0.111.0...0...10010010100101111..011011000.11
jng	11011110001..00111.00.....00.....0.....10100101111011011001.....
ksg	00110110011..00111.01.0.....00.....101110111111111000.....
kyl	001100100011000111.00.....1..0000.0...1.0.....00.1..1011.101111..111.00000.11
lad	11011110011001100100.00.....0.0...1..0..0011.....11010010100101111..0110.1000.11
lah	11110111011.00111.001...0...011.00.0.1.1...0.0001.0.1..10100100.111111100.000.11
lep	111101110011.111...00...0.0..1011.00..01...0..01...1000..10100101111..1110.1001...
lim	.....1.....0.10100.0.10.0..111...11.1..1010.10101010.11.00111...
mnd	1101011010110101110001011..0..11..011100.11011.0011100000100010111010101011011001011
mei	110101100011000110.0010110.0...1110100000111.110001000111010010100100.11..11100.000011
new	01001110001..00100.00.....10.....1.0.....0.....101001010110111000.....
nis	00110010001..01110.00.....0.....101001010110..110.0.....
tam	11010100001..00110.00.....111.....1.....10100101011..111000.....

Uralic (6 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
fin	0011001100110101001001011100..1.00000101111001100000101101100101101010101010101010
hun	1111011100100111001001011000..11110101010.1111100000100001010100.010101010.11...111000
kty	000101000011.00100.00.....0.....1011..1..01...100...10100..10...110.0.....
kzy	11110111001..01100.00.....0.....1.0.00.....1..1011.101010.....1.....
nen	1101111000110011001011011110.....0..11.110.1001.011010110010100..1010....0.0101.10
skp	001100001011.101..000.....1.....1..1..0.....1010.101010...11..0.....

Uto-Aztecan (7 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
cah	0100110010110011001001...000.....0..00.11..1..0...10.10110100101010..0110101101..
cmn	00010000000000100100...1.0..10101.001011.1..0.....10.10110100101010111010111111
hop	01010100100..11110000.....1...1.....10110100101010101110.0.....
nht	00010100000..00100100.....00...00.10111...001...0...1001100.11111111010.10000111.00

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ood 01010110001.01100.00.....10.....0.1...011011.1.1.1111.0.101010111.01.....
pip .....0.....011.0...110100.1.0.10.1.1.....10.01011111111010.0.001111...
yaq 00010110001000011010010111.0..1101.00010011...00000111010010110100101010111010001000

```

There were 320 languages in 33 language families using **Ethnologue**²:

Language	Feature values
Afro-Asiatic (18 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
aar	.....10.....0.....10100101111.0.011.....
aeg	010111110100011000010100.11111.100110.1.1100.100001110101000101111110.11111000111000
amh	11111100110.00100.00.....111.111..1.010..10.1000.01011.0...10100101010..1.000111...
anc	0011111011.01111.00.....1.....10111111111..111000.....
bej	010101100010.011100001011.1111.1.1.1.01.....1000.11011.1.1.10100100.....01101.111011
bma	010011110100011001011111.0111.....010.1111...10111100010..001111111110..11000011010
hau	11011110110000110.0001110.1111111010.1.0110.1001100001010001011111011110.001001011
heb	.....00.....1..0011.11111.11011001.01001100000110101010111111100.110000101011
irq	1101110111000110001.....11111.001010.00.11011...0...10100010101111111.01111101010
ker	0001011011.00111000.....11..10.0001..1..0...0000..10111111111..111000100.11
knk	11010110011.00110.00.....1.....001..1110.....10111110.11.11100.....
mrg	1100111011.0.10.000.....01000.....1.1011011.10111.....1011111111111000.....
mup	.....011.11.01.11.0.0..1...1..0110111111110.111000100...
ngz	11011110110.00110.00.....110.....011.....101111111111011000.....
orh	11011110110000111.00110.111111.00001010111.0.001011011010101010011111001011100011
som	011100101010.00110.01.....1.101..01.011..1..010110.00...1010.0.111010111.11...10
ter	1101111011.00111.000.....0...1011.....1.....10111111111..111000...11
tgr	1101111011.00100.01.....111.11.....1..0.0101100...10101111010..11100.....
Algic (5 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
abw	.....1.....0.....10100101111.010011..1010..0...0.1100.0000100.000.11.....1.....110100
cre	0000000000000001001001111.010011..1010..0...0.1100.0000100.000.11.....1.....110100
oji	00000100001..0.00.00.....1001.10.....0.....0.....1111.....1010.10.0...1..
psm	000101000010001110000.....0100..10101..1.1.....00...1001010.111.....10..0..111011
yur	110111000110001100.000111100...1..100.01.....1010....1000..100..10101010111...111011
Altaic (11 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
aso	.....1.....0.....10100110010.10100.00.....1.1.1...1111.1...1010.101010..111..0.....
aze	011100110010.10100.00.....1.1.1...1111.1...1010.101010..111..0.....
bsk	11110111011.11100101.....000.....11.11.....10...1010010101010...000.....
chv	011100110010.11100000.....0.1000.1...0.110.1.....10...10100101010011000.....
dgr	011101110011.11100.00.....1.....0.0.1...1.....10...10100101010..111000101...
eve	0001011000110001000001111000..1000000001011101110.0111110100101001010101010000101010
kha	01110011001100..000010110.0..10000101000111011000.01011101001010010101010111000001011
mgg	01011111011.00100.00.....1.01.....1...0...1.....10100101010..0.000.....
tur	0111011100100101000001111000..100101010000111010000111010111010100101010111000101011
tuv	011100100011.11100.00.....00.....110.100.....101...101001010...1..0.0.....
ykt	011101110011.11100.00.....0.....111.11..1.....0.1..101001010.....000.....
Arawakan (5 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
acg	.....1.....1.....101101011...10100.....
apu	0001010000001000000000111.01111.0001101.0.0.0.100..001010.100100.0101110..010...111000
cax	00001100000..00100.00.....110.00.11.0.....110.....0.0.11.1011...11.00110...
goa	00010100001.0.....00.....1.....11..1.1.....1111111110111100.0.....
res	11011110000..00110.00.....00.....110.....10100101010..10.0.0.....
Australian (22 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
abn	.....0.....1.0.....0.....001010.0.11.....1000...
amp	11001100001.00100.101011.....1.1.10.....1010.....10100..1111..1..011.....
diy	01001100001..00100110..11..110..1.....010.....1..1010.101111..010..1..1..

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²Of which 24 languages families are shared with **WALS**: *Afro-Asiatic, Algic, Altaic, Arawakan, Australian, Austro-Asiatic, Austronesian, Cariban, Chibchan, Dravidian, Hokan, Indo-European, Khoisan, Macro-Ge, Na-Dene, Niger-Congo, Nilo-Saharan, Oto-Manguean, Penutian, Salishan, Sepik, Sino-Tibetan, Uralic, Uto-Aztecan.*

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dyi	00000100001..00100110..11..11011..0..0..1...0..010.....1..0..1010.101111..111.11...1..
goo	01001100001100010011011111.00...01.000000110001101..011000.1001010.0.1110.....1110100
grr	01001100001..00100110..11.....0.001.....1111110110..1100.0...00
kay	00001100001100010011010111.0..011101000.0101.1.01..0010101100100..101010..011...001011
kgu	01001100001..00100110.....1.....0.....0.....1010.101110...10..1100...
mau	0001010000110011001000010.0110...1110101...00101..11101..010101110101011110001110011
mku	00010000001.001100110.....0...0.....1..01.....1.....00000010100101111110100.1110.00
mlk	00010100001..11100010...1.....1.....1...0..01.....1010.0.111110.0...1110...
mpa	01001110001..01100.10..10.....00.....1010.1111..11111..1.....
mrt	01001100001100010011010111.0.....0000..11000.101..011010.1001011.0.1110..010..0001000
myi	000101000011001100110111110110.11..100..110.0.101010100100100101010.110...111111110111
ngi	.001100001100010000110111.0..100001001.110.0.001..01101011001010.100...110...110000
nug	010011000011000100110..1101111.10010101.1.0.0..01.....0000100.0..0.0.....110...110011
pit	010011000011..00100110...1..0.....100001.....00...1001..1010010111111..0.1110.11
tiw	0100110000110001001000010.11101.000.1000..01000110.011010.00010111101010..10.00110011
ung	010101000011000100010..11.0.....10..1.0.1...0.101.....00..101000.111111.11011110.11
wam	000011000011000100010...101101...01001.1.....0000..0.11.....110011
wrd	0001010000110011001101...00100111.110...1.0.....1...10.0.0.00.1110...11...110100
yid	0000010000110001000101...1.0..0100110...1...010..01....10.0..1010.101111..011..1000100

Austro-Asiatic (9 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
bbp	.....1.....11.....0.001.0..0.....0..10...0.1...0.0.11111100.10...110...
khm	011100000111001100100.....0..1.1...0100.11.110..0.000100.000101111111111111000000.00
khs	01010110001100110010010...110.00111110.11...00010...00001011111111011.11000100011
kmu	011100000111001110100.....110.....01010...01.0...100010000..101111111110.1..0.0000.00
nca	.....100..100..11.....11.0000.00000.....111111101011.0.0.1...00
sed	111111000111.00100100.....1.....1.....1011111111011111000.....
sml	11110110011100100100..10.0.....000..01..010...0001000.000.111111110..010000101.11
sre	001101100111.01110.00.....011111.0...110.0...010000.1...1111111101111000.....
vie	011100100111000111.000000..0..1.1.010100..10110000000100100010111111110..111000001000

Austronesian (32 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
ace	.....1.....11.....0.001.0..0.....0..10...0.1...0.0.11111100.10...110...
ata	00010110101..0..00.01.....10..0..0..00.....11111110.10..1110..100...
bkr	001100100011000100000.....00...10..0.10...0111..10...1000..0.1111111010110000100000
bto	00010110001..0..00100.....00...1.....1111111110.10.11000.....
cha	0101011000110001000000111.00..101.100001..110.100101000.01110111111110101010.001101100
dre	111101110011000100101.....1.0.1.10.11.0.001.1...0000..10111111101111000001.00
fij	01010100001100000000101111.0...00100111.1110.10011010100000011111111100.011000111010
haw	00010000001..00000110.....0..111111.0...110.0...010000.1...111111111011.11000.....
iaa	11110111001..10100101.....0...11.....0.1.....00...111111111011110000.....
iba	01010110001..00100.00.....00.....0.....101111111100.10.000.....
ind	0101011100110011001000000..0..1110000100..101110010000100000010111111101010.000101000
irr	00110000000..00100100.....1.....1.....10111010111..0110.0.....
kkv	01010100001..00100.00.....0.....0.....1.....0..101110111111.110.0110...
klv	010101100010000100000.....00...001110.1.1101.1.....00000011111101110..010000110000
krb	000100000001000100.10.....1...00..1..11.1..1...10.0..111111111011.11000111...
kwa	00010100001..00000100.....1...0.....00...00...10111..1110....0.0.....
len	00010000001..00100100.....01.....1.....1.....101111111111111000.....
mal	010011110011000100100101..00...0101.00011.11010000.10001000001111111111..110000001000
mao	000100000001000000001.11..0..1111110010.111.00001010100000011111111111011000001010
pai	0100111110110001001001011000.....0.00.0111...00.100011001..1111111.....0..000111
pal	.....0..1.00.10..0.11...1..10...00...1011111101010011001111...
pms	000101000011000100100.....0.....10.10..1.....111.1...10.0..10111111111..011000110011
poh	00110000001..01100.00.....110.1.....1.101.....0..101110.11110.00.000.....
rap	0001000000010000001001111..0..1111110000.11.0..01..01010010001111111110..1..000000011
ruk	01001111001..00100.01.....0.....0.1...1111.....11111111010..0110.1.....
sam	.....11110..0.1111..001.....01111111111111..1110000000..
tab	010101100011001100100.....00..1.00.101.0..1.11...0...00000010111011110.011000101000
tag	010101100011000100100101...11011..10011.111101.000010101111001111.110.10..110.0.000000
tgk	00010010001..00100100.....11..0..1.0...1..0.....101111111101111000100...
ttn	00010110001..01100.00.....1.11..1...11.0...0...0...10111011111111110000.....
tuk	0101010001110000001001101.00...1..100100..1010001.0001010001011111111111..10.0.0111000
yap	01110110011..00100001.....11..0..1...1.1.....0.....111111111101000.000100...

Carib (4 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
akw	00110011000..00100.00.....
car	000100100000000100000.....10.....1..1.11...1..1...10.11010100101010110..0.0111.10
hix	00010110000100001000000011.11001000111011.100001100.110010.1101110010111011010011111010

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mac1.....1001.00010..1..1..1.....10.0100.100101110110100.11110..

Chibchan (4 languages)
1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
bgl
bri 000101110000.0.....00..00.....00.01.....0..0.....101001011110.....0.1000...
ika 001100100000.00100.00..01010...00100..00.0.001...1.....0011101010010110.101..0.1110010
ram 000011100011000100000101...0..1.110100111.....101..011110.000101001011111.110.1100011

Chukotko-Kamchatkan (3 languages)
1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
alu1.....0.....0.....
chk 0001000010110011001001010110..10001000.011110100000101000000010100101010..0110.0110111
ite 110111101111.011...00.....0.....00.....11.....0..1010.0.0.1010.11.....

Dravidian (6 languages)
1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
bdg
brh 010111110010001100.001011000..11...10000011100100.01101100010.....0..10.....11...100011
knd 010111100010001100.0010110111011.101110001110100001011110110101001010101110.0101010
tel 11011110001..00100.00.....0..1..1.....101...1010010101001000.....
tml1101...0..10..111.1...0101111.11..10100101010011000...0..
tul 01110110001..01100.00.....00.....10100101010...110.0.....

Hokan (5 languages)
1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
acm 11010100101..0..10.00.....0.....1..10111.....0..110.10
die 11011110101..0..00000.....1.....111.....1.00..1010010..11110..0.....
krk 11010100000010..100000111.10...1...001011..0.110.1001110.1..100.0101110.....111010
mar 1101110010100011001011111000..1.1011000.0..100101.1001011.10110100101111..0..0.1111000
pso 000111101110.0.....00.0110.....00.110.00.....01.....1101..1010010..10..0110..000.11

Indo-European (30 languages)
1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
afr1..0..0..010.....0101...1.....
alb 011101110010.11100.01.....11..10.010110.0..0.....1111..1011111110101..000111..00
arm 00011110111000..00000.0..100..1...10100111100.000.1101101.1010..0101010.....101011
bre 11110111001..11100100.....11...1...01...1..0.....1..0..1111111110..110000.....
bul 11010111001..01100.00.....11...1.1110.0..0.110110.1100.1110.10101010001.....
ctl 01110111001..00100000.....1...1.101.....1.1..0.111111110.....000.....
eng 0111001100110011000010011111101.110110001010010000001010010101110.101010010001101011
fre 011100111010111100000001111111.11.11110.0100000001111101110101111111010110000101000
ger 01110011101011100000101111111111.1111010110.000.00101101110100.111101010010...101000
grk 0101011100100011001011011101111.111.11101011..0000011011010100.1111101010110001111000
hin 110111110010101100000101111111.00.10100.11101.000011111010101010010101110.0101011
ice1...11..1111110...1.1.1..0..0.0101101...1011111101010...001...000
ira00...1.....11...1.10111001001...0..0.....101010111111110..110000101.11
ita0.....1.110.1110101...0...0...1.1...0.111111110100..000101.00
kas 11110110001..0..00.00.....111...0.11001.11.....0...101...10110101010...111.11110..
krd 111101111011.01100.01.....1.11..0..1..1..1.....1.....101011111010.11111111...
lat 000101110010001110100...111111.11011101011000..0001111011100.1111010101010001101011
lit 11011111001..011..000.....1.000..11.1.11.....0.....1.11..101110101010110001.....
mhi111..0001.10.00.101...0...1.0...1010010101010111000.....
nep 11011110001..0..00000..11.....10.....1.....0.....1.1..10100101010...110.0.....
nor 01110010001..11110000.....111...10..01...0.....10...101110.101010010001.....
pan111100001.10.1...1.....1111100...10100101010101110.0...0..0...
pol 11011111001..01100100.....000..11101111.....0...1.1.100.11111101010110001101...
prs 0101011110100011001001011.00...10.0111010010110000011001011101010111110101111111000
psh 110111111011.01100000.....111..00...1..1.11..0.....101010.10101010.11.10.....
rom 01110111001..0..00000.....1.11...11.1011..0..0.11001.10..101111111010010000.....
rus 1101111100100011000001011101111.000.11101.110.000001100101010101111101010110001101000
snh 01110110001..0..00.00.....0...1.10.0.1.0...0.....10100..100.10...010.....
spa 110101100010000100001101111111.111011101.10..0000011111010100.1111111101001000011000
swe0.....1.110..10.101..0..0.01011011101011110101010010001.....

Khoisan (3 languages)
1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
ani 00011110110..00110.01.....1.1..0.....100...101010..111...101...
juh 11011110111.00011.01..00..1011.11111000.0..0.00101100000.0..10110101111..111100000000
kho 11011100000000111.011111.1111.1.10011.0001.00.110011010000101010010101010110000101011

Macro-Ge (4 languages) continued ...

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	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
api	00110000000	.0	.00	.00
brr	001100100000	.00000	.100011
ckr	001100000011	.011001000011	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
kng	00110000000	.100100	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Mayan (3 languages)

	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
aci	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
htc	01010100011	.00100001	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
jak	1101110011100001	001000011	.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Na-Dene (6 languages)

	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
aht	00011110111	.01100	.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
hai	110011001110001	100	.000101	.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
hup	11001100111	.01100	.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
nav	1100111001101001	10000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
sla	1101111001101001	100000111	.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
tli	110011001110001	110	.101	.11	.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Niger-Congo (30 languages)

	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
abd	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
akn	00110010000	.00110	.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
bam	011101110011	.00010	.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
bir	01110111001	.00111	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
dan	01110011011	.00111	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
dgb	01011111001	.000110	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
dio	011100100011	.01100100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
doy	01110111011	.10111	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
ewe	111101110011	.00110	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
ewo	11110111001	.00111	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
fye	11011110011	.00110	.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
gbb	11110111011	.00110	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
grb	01110010001110001	10010111	.01001	.00	.110	.0	.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
igb	111101110011000010	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
ijo	01110011001	.00010	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
kfe	001100110011100100100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
kis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
luv	000101100011	.000101000111	.11011000	.11110	.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
mro	01110110001	.00110	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
mum	01010111011	.00111	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
ndt	11110110001	.00111	.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
nko	010101110000000110	.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
non	01110010001	.01111	.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
sup	0011011100111001111000001	.1011111	.110100	.1101000	.1101000	.1101000	.1101000	.1101000	.1101000	.1101000	.1101000	.1101000	.1101000	.1101000	.1101000	.1101000	.1101000	.1101000
swa	110111100110000001010011	.1101111	.0	.1010	.1110	.1001	.0111010000101111111111	.1110000111011	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
tne	00110010001	.101110	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
wlf	11110110001	.001100	.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
yor	001100100010100011	.0111110	.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
zan	01110011001	.0	.10	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
zul	11011110011	.000101010011	.11011000	.11010	.1	.01	.001111111010001011111111	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Nilo-Saharan (21 languages)

	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
acl	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
bag	1111011001111001111000110	.10	.1	.10	.00001	.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
ber	01011100011	.00110	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
din	01110010001	.00111	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
fur	000101100011000110	.00	.11	.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
ik	11110111001	.01110	.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
kch	00010110001	.100100	.000011	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
knm	0101011000110001100001	.11	.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
knr	111101110011000110	.00	.11	.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
kro	011100000111000110000000110	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
kse	000101100011	.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
lan	1111001000111001101100111	.10	.1	.01100001	.1	.00	.01	.1100010100010111111111	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
lug	11110111011	.00111	.011	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
luo	01110110001	.00110	.00
maa	01110000011	.00110	.0011
mab	01110111001	.101110	.00

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mrl	01110010011.000110001....110.....00.11.....1.....0..0011111.111111..011.00111000
nan	00110000001..00110.0010.....1.1.0..0.11.....100.....10.....11111111111..111000110...
nar	00010110001..00110.00..10.....1.....0..000.....101001011.....011.....
nbd	.....0..1.11010..1.010.00110..100101.....10.0..101001011110011011101.10
nti	11111110110000011.01.....1...1.10100011111...1.....10.0..100.0101010..10....110.00

North Caucasian (10 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
abk	000011111100011000010111.011011110.1.1101110.10000111111101010010110.10011001110011
arc	110111111110.01100001.....110.....0.....1.1..10100101010..0110.0...1..
ava	11011111111..01100001.....11.0.....0.....11....10100101010101110.0.....
hzb	1111011111010010000111..001101.00110..01111000..0...11011010100101010..0..00010011
ing	1101111111000110010111110111..00000.001.1101000.....11.11110100101010..01000000000
kab	110011111110.0..00.01.....01.0.....1.....1....1010010.....01100.....111
lak	11001111110001100.01....1111010...0..001.1.....0...1.10..10100..10.....0.01001..
lez	1101111111001110000010111.0..100110000111101.00001111101010100101010011000000011
rut	110111111110.01110.01.....0.....1.1..10100101010.....0.0.....
ttu	110111111110.01100.01.....00.....1.1..10100101010..111000.....

Oto-Manguean (6 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
amz	001101000010.01111.00.....
chq	11110110011.110011.01.....1.....111111111100.110000.....
cle	010101100011.00111000.....1100..00110.01.00...1.....11.0101111111010110000101.00
cso	00010110001..0..11.00.....1.....1.....0..111111111011110000.....
mxc	000101110010100011.010000.01101.00000101..0.0.000.0101010001011111111100.010000100000
otm	011101110010101110.010111..0.....0000..1...0000...1001..11111111010101110001110011

Penutian (8 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
als	.....1.....11111101010....0.1.....
coo	110111101110001100000..11.00..1.100.0.1.0...0.0..00....1011..110.00.101010110...111.00
klm	11001110111..01100000.....0.0.....0.0.....1.....0.0.010101010110.....00
mne	00010100011..00100000.....0.....1.10.111..0111...1..1010.1010...010.00100.00
mss	0001000000110001000001011000.....0100..0.1.0.100.....101100100..0.0.10...10...111.00
nez	110111001110001100000.....000.....00001.0.1..110.1...1000..0.0..101010110...111100
tsi	110011101110001100100.....00...100.0.01..1111..0.....1..111111101010011001110.11
win	110111101110.00100.00..11.....10...11..0.011.....1.1..0.0..10.....101.10

Salishan (3 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
bco	11001100111..01100.00.....10.....1.....1..111111110...0..001....11
shu	11011100111..01100.00.....1.1.100010.1..1111111.....1..0.....10
sqw	11001100111000110010111110.0.....11..0...1.1...10000...0010011111111010..1..0.1111.10

Sepik (4 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
aba	.....1010010..11.....0.....
ala	011100100000011000000111.01101110011000011.0.00001111010.0101010010101011011000110011
awt	.....1.....11.....011..1.....00.0.0000.....101001011111111001000...
kwo	011101100000.001...00.....10.....0.....101001010101111000.....

Sino-Tibetan (20 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
acn	.....10100100.11..11100.....
ao	00010010001.000111.00.....110.....1.....1.....1010010111101..0.1.....
baw	010111110011.00110100.....000..1.00.00..00....0...0...0010..1010010111111110.1110.11
bod	00010011001..00110.00.....00.....1.....1010.1010110.011..0.....
brm	111101110011000111.011011..0...000011000.1111.001.0001001000101001011110011001000010
cnt	011100000011.10111.00.....0..1..00..0..1011...110010.11001011110101010111011..11
cti	01010111011..00111.00.....00.....1.....10100101111..110.1.....
gar	000101100001000100.0010..0...1000.1000.0.111.0...0...10010010100101111..011011000.11
jng	11011110001..00111.00.....00.....0.....101001011110111001.....
ksg	00110110011..00111.01.0.....00.....101110111111111000.....
kyl	001100100011000111.00.....1..0000.0...1.0.....00.1..1011.101111..111.00000.11
lad	110111110011001100.00...0.0...1..0..0011.....11010010100101111..0110.1000.11
lah	111101111011.00111.001...0...011.00..0.1..1...0.0001.0.1..10100100.111111100.000.11
lep	111101110011.111...00...0.0..1011.00..01...0..01...1000..10100101111..1110.1001...
lim	.....1.....0.10100.0.10.0..111...11.1..1010.10101010.11.00111...
mei	110101100011000110.0010110.0...1110100000111.110001000111010010100100.11..11100.000011
mnd	1101011010101011100010111.0..11..011100.11011.001110000010001011110101010111011001011
new	01001110001..00100.00.....10.....1.0.....0.....1010010101110111000.....

continued...

... continued

nis 00110010001.01110.00.....0.....101001010110.110.0.....
tam 11010100001.00110.00.....111.....1.....10100101011.111000.....

Tai-Kadai (3 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
don0.....100.0.....0.....0.111.1110.1110.0.010..
nun 01010100011.0.11.00.....000.....0.....00...101111111011111000.....
tha 011100100011000111.000001.0...01.00100.1101100000001001000101111111111111000001000

Trans-New Guinea (18 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
aga1...1...1.....1010.101010.0...0.....
ame 1101011000100001000010111.10..1.01100000.110010011101110000011010010111111111011110011
asm 0101000000000001001000010.00...11.110000.....0110.01111001001010.10111111111.01110011
dag 0001001000000001...000111.10...00.00.01...1010.01101.0000101001011111.11011110000
dni 001100000011.001001000111.10...000.100.101...111...11101011001010010.....0..01.110011
eka 00010000001.0000100100010.1.....0..01.....111.....1.01..1010.....11.....110...
ham 001100001101.01110.00.....1.....1.....1.....1001..10100..111101110.1110.10
kew 010101000010.000100001111.10...00.000.00.1.0.000..011110.11010100101011..1110.0100000
kiw 00010010000..00010.000.....0.....0.....10...10100101010...110.0.....
kob 01110000011000100100.00.10..1.01000000110.0.10111...1000..1010010111111111001100000
mrd 00010111001..00100100.....1110.1...1.0.10..1.0.....1101..1010010..0...1..0..110...
sue 110100100000000010.00..01110.1.....01001..0.000.0011010.11010100101111..0110.1100011
tau11.....1.01000.....10...101.1...1..0..10100101111..1110.1110000
una 011100100011.00110.00...000.....0..0111..1.....1000..1010010111110011001110000
usa 000100100000000100000..11.10..0.1..00.111.1.....00.....000111010010111100110.1110011
wah 00010100001..00110110.....01.....01.....1.....10100101111..111011.....
yar 00010010000..00000.00.....0.....0.....1010.10101111111..0...11
ygr 00010110011..01110.00.....011.....1...1011.....10100101011..011000.....

Tucanoan (3 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
bno 00010010000..00010.10.....
brs01.....1011.011011..1110.0000..011..01001001010.100100.10..01001.100000
cub 00010010000..00010011.....011.10.....0.....11100101010..010010101.....

Tupi (4 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
ach 00010000001..000...00.....
gua 0101011000101000001000011.00..1.101000.1.11.0.10000011011.10010110101110...111.0110011
srn 01110010000..00000.00.....0.....00.....1.....1.....101001011..111100.1.....
urk 000100000001100100100.....00...000100.11.1...1.11...10.1..10100101110111100.1100.00

Uralic (7 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
ene1.....1.....10100..10...0..0.0.....
fin 001100110010101001001011100..1.000001011100110000010110110010110101010110101101010
hun 1111011100100111001001011000..11110101010.1111100000100001010100.010101010.11...111000
kty 000101000011.00100.00.....0.....1011..1.01...100...10100..10...110.0.....
kzy 11110111001..01100.00.....0.....1.0.00.....1..1011.101010.....1.....
nen 1101111000110011001011011110.....0..11.110.1001.011010110010100..1010.....0.0101.10
skp 001100001011.101..000.....1.....1..1..0.....1010.101010...11..0.....

Uto-Aztecan (7 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
cah 0100110010110011001001...000.....0..00.11..1...0...10.10110100101010..0110101101..
cmn 000100000000000100100...1.0..10101.001011.1..0.....10.1011010010101010111010111111
hop 01010100100..11110000.....1...1.....10110100101010101110.0.....
nht 00010100000..00100100.....00...00.10111...001...0...1001100.1111111010.10000111.00
ood 01010110001..01100.00.....10.....0.1...011011..1..1111.0.101010111.01.....
pip0.....011..0...110100.1.0.10.1.1...10.0101111111010..0..001111..
yaq 00010110001000011010010111.0..1101.00010011...00000111010010110100101010111010001000

Wakashan (3 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
hei111111110.....001.....
kwk 11011110111.001100000.....0.....1..1.1.....1..0.1111110.....0.1.....
mak ..0111101110.01100000.....0...0..0.00.....0...100010.1001111.0.0.0.10110...110010

West Papuan (3 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
gll1.....1.....1.....0.....
continued...

... continued

tid1.....1100.11.11..0....1.1...0.....1011110111111011000100...
 wma 00010110001..00100.00.....0..0.....1.....10111101111..011000100...

B_B

For binary coding with BayesLang and WALS I used the same 86 binary features, resulting in 186 languages (50% language-wise maximum missing data) distributed across 26 language families³:

Language	Feature values
Afro-Asiatic (14 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
aeg	0101111110100011000010100.11111.100110.1.1100.1000011101010001011111110.11111000111000
amh	111111100110.00100.00.....111.111..1.010..10.1000.01011.0...10100101010..1..000111...
bej	010101100010.011100001011.1111..1...1..01...1000.11011..1..10100100...01101.111011
bma	0100111110100011001011111.0111.....010.1111...10111100010..0011111111110..110000111010
hau	110111110110000110.0001110.11111111010.1.0110.10011000010100010111111011110.001001011
heb	.....00.....1..0011.11111.11011001.0100110000011010101010111111100.110000101011
irq	110111101111000110001.....11111.001010.00.11011...0...10100010101111111..011111101010
ker	00010111011..00111000.....11...10.0001...1...0...0000..10111111111..111000100..11
mrg	11001111011..0..10.000.....01000.....1.1011011.10111...10111111111111000.....
ngz	110111110110.00110.00.....110.....011.....1011111111111011000.....
orh	110111110110000111.00110.111111.00001010111.0.00101110110101010100111111001011100011
som	011100101010.00110.01.....1.101..01.011...1..010110.00...1010.0.111010111.11...10
ter	11011111011..00111.000.....0...1011...1.....10111111111..111000...11
tgr	11011111011..00100.01.....111..11.....1..0.0101100...10101111010...11100.....
Algic (3 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
cre	0000000000000001001001111.010011..1010..0..0.1100.0000100.000.11.....1.....110100
psm	000101000010001110000.....0100..10101...1.1.....00...1001010.111.....10...0..111011
yur	110111000110001100.000111100...1..100.01.....1010.....1000..100..10101010111...111011
Altaic (6 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
bsk	111101111011.11100101.....000.....11.11.....10...1010010101010..000.....
chv	011100110010.11100000.....0..1000.1....0.110.1.....10...10100101010011000.....
dgr	011101110011.11100.00.....1.....0..0.1...1.....10...10100101010..111000101...
eve	0001011000110001000001111000..1000000001011101110.0111111010010100101010110000101010
kha	01110011001100..0000010110.0..10000101000111011000.01011101001010010101010111000001011
tur	0111011100100101000001111000..10010101000011101000011101011101010001010101110000101011
Arawakan (2 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
apu	00010100000010000000000111.01111.0001101.0.0.0.100..001010.100100.0101110..010...111000
cax	00001100000..00100.00.....110..00.11..0.....110.....0..0.11.1011.....11.00110...
Australian (17 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
amp	11001100001..00100.101011.....1.1.10.....1010.....10100..1111..1..011.....
diy	01001100001..00100110..11..110..1.....010.....1..1010.101111..010..1..1..
dyl	00000100001..00100110..11..11011..0..0..1...0..010.....1..0..1010.101111..111.11...1..
goo	0100110000110001001101111.00...01.000000110001101..011000.1001010.0.1110.....1110100
kay	00001100001100010011010111.0..011101000.0101.1.01..00010101100100..101010..011..001011
mau	0001010000110011001000010.0110.....1110101...00101..11101..010101111010101110001110011
mku	00010000001.001100110.....0..0.....1..01.....1.....0000001010010111110100.1110..00
mrt	01001100001100010011010111.0.....0000..11000.101..011010.1001011.0.1110..010..0001000
myi	000101000011001100110111110110.11..100..110.0.101010100100100101010.110...11111110111
ngi	..001100001100010000110111.0..100001001.110.0.001..01101011001010.100.....110...110000
nug	010011000011000100110..1101111.10010101.1.0.0..01.....0000100.0..0.0.....110...110011
pit	010011000011.00100110.....1.0.....100001.....00...1001..1010010111111...0.1110.11
tiw	0100110000110001001000010.11101.000.1000..01000110.011010.00010111101010..10.001110011
ung	010101000011000100010..11.0.....10..1.0.1...0.101.....00..101000.111111.11011110.11

continued...

³Of which 22 are in common with those in the corresponding B_M using WALS: Afro-Asiatic, Algic, Altaic, Arawakan, Australian, Austro-Asiatic, Austronesian, Cariban, Chibchan, Dravidian, Hokan, Indo-European, Khoisan, Na-Dene, Nakh-Daghestanian, Niger-Congo, Nilo-Saharan, Oto-Manguean, Penutian, Sino-Tibetan, Uralic, Uto-Aztecan.

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wam	000011000011000100010...101101...01001.1.....0000..0.11.....110011
wrd	0001010000110011001101...00100111.110...1.0.....1.....10.0..0.0.00.1110...11...110100
yid	0000010000110001000101...1.0..0100110...1...010..01...10.0..1010.101111..011..1000100

Austro-Asiatic (6 languages)

	1...5.....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
khm	011100000111001100100.....0..1.1...0100.11.110..0.000100.000101111111111111000000.00
khs	01010110001100110010010...110..00111110.11...00010.....0000101111111011.11000100011
kmu	111100000111001110100.....110.....01010...01.0...100010000..10111111110.1..0.0000.00
mun	1101111000111001000001111.0100..00.01..00111..1..00...110010101001010100.111000111.00
sml	111101100111100100100...10..0.....000..01..010.....0001000.000.111111110..010000101.11
vie	011100100111000111.000000..0..1.1.010100..101100000000100100010111111110..111000001000

Austronesian (21 languages)

	1...5.....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
bkr	00110010001100010000.....00.....10..0.10...0111..10...1000..0.11111111010110000100000
cha	0101011000110001000000111.00..101.100001..110.100101000.01110111111110101010.001101100
dre	111101110011000100101.....0.....1.0.1.10.11.0.001.1...0000..10111111101111000001.00
fij	0101010000110000000101111.0.....00100111.1110.10011010100000011111111100.011000111010
haw	00010000001..00000110.....0...11111.0...110.0...010000.1...111111111011.11000.....
iaa	11110111001..10100101.....0.....11.....0.1.....00...111111111011110000.....
ind	0101011100110011001000000..0..1110000100..1011100100001000000101111111101010.000101000
klv	010101100010000100000.....00.....001110.1.1101.1.....00000011111101110..010000110000
krb	000100000001000100.10.....0.....1..00..1...11.1..1...10.0..111111111011.11000111...
mal	010011110011000100100101..00...0101.00011.11010000.10001000001111111111..110000001000
mao	000100000001000000001.11..0..1111110010.111.000011010100000011111111110110000001010
pai	0100111110110001001001011000.....0.00.0111.....00.100011001..111111.....0.000111
pms	000101000011000100100.....0.....10.10..1.....111.1.....10.0..10111111111..011000110011
poh	00110000001..01100.00.....0.....110.1.....1.101.....0..101110.11110.00.000.....
rap	00010000000100000010011111..0..1111110000.11.0..01..01010010001111111110..1..000000011
tab	010101100011001100100.....00..1.00.101.0..1.11...0.....000000101111011110.011000101000
tag	010101100011000100100101...11011..10011.111101.000010101111001111.110.10..110.0.000000
tgk	00010010001..00100100.....0.....11..0..1.0...1..0.....0101111110111110000100...
ttn	00010110001..01100.00.....0.....1.11...1.....11.0...0.....010111011111111000.....
tuk	0101010001110000001001101.00...1..100100..1010001.000101000101111111111..10.0.0111000
yap	01110110011..00100001.....0.....11..0..1...1.1.....0.....111111111101000.000100...

Aymaran (2 languages)

	1...5.....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
aym	110011001110.0010010011111.1.....1..00.1001..100.....110100101001010101110.0111.10
jaq	11001100111.000100100.....0.....100.....011.1.....1.1.....10101010.....110.10

Cariban (2 languages)

	1...5.....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
car	000100100000000100000.....10.....1..1.11...1.1.....10.1101010010101010..0.0111.10
hix	0001011000100001000000011.11001000111011.100001100.110010.1101110010111011010011111010

Chibchan (2 languages)

	1...5.....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
ika	001100100000.00100.00..01010...00100..00.0.001..1.....0011101010010110.101..0.1110010
ram	000011100011000100000101...0..1.110100111.....101..011110.0001010010111111.110.1100011

Dravidian (3 languages)

	1...5.....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
brh	010111110010001100.001011000..11...10000011100100.01101100010.....0..10.....11...100011
knd	010111100010001100.0010110111011.101110001110100001011110110101001010101110.0101010
tel	11011110001..00100.00.....0.....0..1...1.....101...1010010101010011000.....

Hokan (2 languages)

	1...5.....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
mar	0101110010100011001011111000..1.1011000.0..100101.1001011.10110100101111..0..0.1111000
pso	000111101110.0.....00.0110.....00.110.00.....01.....1101..1010010..10..0110..000.11

Indo-European (21 languages)

	1...5.....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
alb	011101110010.11100.01.....0.....11..10.010110.0..0.....1111..1011111110101..000111.00
arm	00011110111000..00000.0..100..1.....10100111100.000.1101101.1010..0101010.....101011
bre	11110111001..11100100.....0.....11...1...01...1..0.....1..0..1111111110..110000.....
bul	1101011001..01100.00.....0.....11.....1.1.110.0..0.110110.1100.1110.101010110001.....
eng	0111001100110011000010011111101.11011000101001000000101001010101110.101010010001101011
fre	0111001110101111000000001111111.11.11110.01000000001111101110101111111010110000101000
ger	011100111011011100000101111111111.1111010110.000.00101101110100.111101010010...110000

continued...

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grk	0101011100100011001011011101111.111.11101011..0000011011010100.11111101010110001111000
hin	11011111001010110000010111111111.00.10100.11101.00001111101010101001010101110.0101011
iri	.....00.....1.....11...1.10111001001...0.0....10101011111111110..110000101.11
kas	11110110001..0..00.00.....111....0.11001.11.....0....101...10110101010...111.11110..
krd	111101111011.01100.01.....1.11..0..1..1..1.....1.....1010111111010.111111111...
lat	000101110010001110100...111111.110111101011000..0001111011100.11110101010110001101011
lit	11011111001..011..000.....1.000..11.1.11.....0....1.11..1011110101010110001.....
nor	01110010001..11110000.....111...10..01...0.....10...101110.101010010001.....
pol	11011111001..01100100.....000..11101111.....0....1.1.100.1111101010110001101...
prs	0101011110100011001001011.00...10.0111010010110000011001011101010111110101111111000
psh	110111111011.01100000.....111..00...1..1.11..0.....101010.10101010.11.10.....
rom	01110111001..0..00000.....1.11...11.1011..0..0.11001.10..1011111111010010000.....
rus	1101111100100011000001011101111.000.11101.110.0000011001010101011111101010110001101000
spa	1101011000100001000011011111111.111011101.10..0000011111010100.11111111010010000111000

Khoisan (2 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
juh	110111110111.00011.01..00..1011.11111000.0..0.00101100000.0..10110101111..11110000000
kho	11011100000000111.011111.1111.1.10011.0001.00.110011010000101010010101010110000101011

Na-Dene (3 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
nav	1100111001101001100001110...0.....1.1.11.11.0.1..10...00110110100101111101110.1111.10
sla	1101111001101001100000111.0...1000100.1.11...1010111110000111101000101111..1110.1111000
tli	110011001110001110.101.11.0.....1.00.111..1.1010....0.00..10100100.1010...00.110.11

Nakh-Daghestanian (6 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
arc	110111111110.01100001.....110.....0.....1.1..10100101010.0110.0...1..
ava	11011111111..01100001.....11.0....0.....11...101001010101110.0.....
hzb	11110111111010010000111..001101.00110..01111000...0...11011010100101010..0..000100111
ing	11011111111000110010111110111..00000.001.1101000.....11.11110100101010..010000000000
lak	110011111110001100.01...1111010...0..001.1.....0...1.10..10100..10.....0.01001..
lez	11011111111001110000010111.0..1001110000111101.00001111101101010101010011000000011

Niger-Congo (19 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
akn	00110010000..00110.00.....01.....1.1.1.10111.0...1011.10111111111..0.....
bam	011101110011.00010.00.....01.....00.0.1.....0.....101...10100010111..1.0.1000.11
dio	011100100011.01100100.....1101..11.11..0..1..1...001000.00010111111111..011000111.11
doy	01110111011.101111.01.....1.10..0..0.....1..1.....1011.101111..111.00111...
ewe	111101110011.00110.01..01.10...0110.0011.01...1011.0010001010101010111..111100110011
gbb	11110111011..00110.01.....011.....0..0.101.....10111111011..111001...11
grb	0111001000111000110010111.01001.00.110.0..1...000..111110.00010110101111..110100001010
igb	111101110011000010.01.....0.....00.0.1.0.0..0.....1010001011111111..011000000010
ijo	01110011001..00010.01..00.....11..1.1.....101.....10...1010.101010..011.00101.11
kfe	001100110011100100100.....1001.10.01101...010...1...1010..1011.101111..110.00110000
luv	000101100011.000101000111.11011000.11110..1...101.1011110.00010111101111..11000110011
nko	010101110000000110.00....1101...111.01.....11...1000..1011111111111111000111011
san	111101110110100010.010001.00...01..001.0.0...0001000000.1000101111110111111001000000
sup	001101110011100111000001..101111.110100.1101000.1110110001010100101111..10.0.1000011
swa	1101111100110000001010011.1101111.0.1010.1110.1001.011110100010111111111..111000111011
tne	00110010001.101110.01.....11.....0...1.0111.....10111111111..110000.....
wlf	11110110001.001100.00.....11.....0...1..1..1101011.1...101111111101110000.....
yor	001100100010100011.0111110.0..1000000110.1110.0001100010010001011111111..010000000011
zul	11011110011.0001101010011.11011000.11010..1.01.00111111101000101111111...11100011011

Nilo-Saharan (15 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
bag	1111011001111001111000110.10..1.10.00001.1...100.1100000..0010111111111..111000110011
fur	000101100011000110.00..11.0.....000110..0.000.....00.01010100101111..11011101.00
kch	00010110001.100100.000011....1.1..00.10...100001.....101101011111100.100001...
knm	0101011000110001100001.11.1...100.0010011...1011...1..001101000101111100..011111.11
knr	111101110011000110.00..11.00..10110000.0111.01100111111100010101001111111010011111011
kse	000101100011.0.....00.....0..010.000101.1...0...1100010100010100101111..110011001111
lan	1111001000111001101100111.10..1.01100001..1.00.01.110001010001011111111..011000110100
lug	11110111011..00111.011.01.....1000.....1.0..01.1...1...100.0101111111111.....11
luo	01110110001..00110.00.....111.....1110.1.....10...10111111111..011000.....
maa	01110000011..00110.0011.....00.....0..010.....111111111111110000...11
mab	01110111001.101110.00....0....1..0..10....0.....1010..101000.111110011011111.11
mrl	01110010011.000110001...110.....00.11....1.....0..0011111.111111..011.00111000
nan	00110000001..00110.0010.....1.1.0..0.11...100.....10...11111111111..111000110...

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nbd0..1.11010..1.010.00110..100101.....10.0..1010010111110011011101.10
nti	111111110110000011.01.....1...1.10100011111...1.....10.0..100.0101010..10.....110.00
Oto-Manguean (3 languages)	
	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
cle	010101100011.00111000.....1100..00110.01.00...1.....11.010111111111010110000101.00
mxo	000101110010100011.010000.01101.00000101..0.0.000.0101010001011111111100.010000100000
otm	011101110010101110.010111..0.....0000..1...0000...1001..1111111101010110001110011
Penutian (4 languages)	
	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
mne	00010100011..00100000.....0...1.10.111..0111...1..1010.1010...010.00100.00
mss	0001000000110001000001011000.....0100..0.1.0.100.....101100100..0.0.10...111.00
nez	110111001110001100000.....000.....00001.0.1...110.1...1000..0.0..10101010110...111100
tsi	110011101110001100100.....00...100.0..01..1111..0.....1..1111111101010011001110.11
Sino-Tibetan (10 languages)	
	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
baw	010111110011.00110100.....000..1.00.00..00.....0...0.....0010..1010010111111110.1110.11
brm	111101110011000111.011011..0...0000011000.1111.001.0001001000101001011110011001000010
cnt	011100000011.10111.00.....0...1..00..0...1011...110010.1100101110101010111011...11
gar	000101100001000100.0010..0...1000.1000.0.111.0...0...10010010100101111..011011000.11
kyl	001100100011000111.00.....1..0000.0...1.0.....00.1..1011.101111..111.00000.11
lad	110111110011001100.00...0.0.....1..0..0011.....11010010100101111..0110.1000.11
lah	111101111011.00111.001.....0...011.00..0.1..1...0.0001.0.1..10100100.111111100.000.11
lep	111101110011.111...00...0.0..1011.00..01...0..01...1000..10100101111..1110.1001...11
mei	110101100011000110.0010110.0...1110100000111.110001000111010010100100.11...11100.000011
mnd	11010110101010101110001011..0..11..011100.11011.00111000001000101111010101011011001011
Trans-New Guinea (11 languages)	
	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
ame	11010110001000010000101111.10..1.011100000.11001001110111000001101001011111111011110011
asm	0101000000000001001000010.00...11.110000.....0110.01111001001010.10111111111.01110011
dni	001100000011.001001000111.10...000.100.101...111..11101011001010010.....0..01.110011
eka	00010000001.0000100100010.1.....0..01.....111.....1.01..1010.....11.....110...
ham	001100001101.01110.00.....1.....1.....1.....1.....1001..10100..1111101110.1110.10
kew	010101000010.000100001111.10...00.000.00.1.0.000..011110.11010100101011..1110.0100000
kob	011100000011000100100..00.10..1.01000000110.0.10111...1000..101001011111110011000000
sue	1101001000000000010.00..01110..1....01001...0.000.0011010.11010100101111..0110.1100011
una	011100100011.00110.00...000.....0..0111...1.....1000..1010010111110011001110000
usa	000100100000000100000..11.10..0.1..00.111.1.....00.....000111010010111100110.1110011
ygr	00010110011..01110.00.....011.....1....1011.....10100101011..011000.....
Tucanoan (2 languages)	
	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
brs	.....01.....1011.011011..1110.0000..011..01001001010.100100.10..01001.100000
cub	00010010000..00010011.....011.10.....0.....11100101010..010010101...
Tupian (2 languages)	
	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
gua	0101011000101000001000011.00..1.101000.1.11.0.10000011011.10010110101110...111.0110011
urk	000100000001100100100.....00...000100.11.1...1..11...10.1..1010010110111100.1100.00
Uralic (3 languages)	
	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
fin	0011001100110101001001011100..1.000001011100110000010110110010110101010101010101010
hun	1111011100100111001001011000..11110101010.1111100000100001010100.010101010.11...111000
nen	110111100011001100101011110.....0..11.110.1001.011010110010100..1010.....0.0101.10
Uto-Aztecan (5 languages)	
	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
cah	0100110010110011001001.....000.....0..00.11..1...0...10.10110100101010..0110101101..
cmn	000100000000000100100...1.0..10101.001011.1..0.....10.1011010010101010111010111111
nht	00010100000..00100100.....00...00.10111...001...0...1001100.11111111010.10000111.00
ood	01010110001..01100.00.....10.....0.1...011011..1..1111.0.101010111.01.....
yaq	00010110001000011010010111.0..1101.00010011...00000111010010110010101010111010001000

Using the **Ethnologue** produced 303 languages in 39 language families⁴:

⁴Of which 25 are shared with **WALS**: *Afro-Asiatic, Algic, Altaic, Arawakan, Australian, Austro-Asiatic, Austronesian, Aymaran, Cariban,*

Language	Feature values
Afro-Asiatic (17 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
aeg	0101111110100011000010100.11111.100110.1.1100.1000011101010001011111110.1111100011000
amh	111111100110.00100.00.....111.111..1.010..10.1000.01011.0...10100101010..1..000111...
anc	001111110111.01111.00.....1.....101111111111..111000.....
bej	010101100010.011100001011.1111..1...1.01....1000.11011..1..10100100....01101.111011
bma	0100111110100011001011111.0111....010.1111...10111100010..0011111111110..11000011010
hau	110111110110000110.0001110.11111111010.1.0110.100110000101000101111110111110.001001011
heb	.....00.....1..0011.11111.11011001.0100110000011010101010111111100.110000101011
irq	11011110111000110001.....11111.001010.00.11011...0...1010001010111111..011111101010
ker	00010111011..00111000.....11...10.0001...1...0...0000..10111111111..111000100.11
knk	11010110011..00110.00.....1.....001..1110....1011110.11..11100.....
mrg	11001111011..0..10.000.....01000....1.1011011.10111....10111111111111000.....
mup	.....011.11.01.11.0.0...1...1...01101111111110.111000100...
ngz	110111110110.00110.00.....110.....011.....10111111111101000.....
orh	110111110110000111.00110.111111.00001010111.0.00101110110101010001111110011011100011
som	011100101010.00110.01.....1.101..01.011...1..010110.00...1010.0.111010111.11...10
ter	11011111011..00111.000.....0.....1011....1....10111111111..111000...11
tgr	11011111011..00100.01.....111..11.....1..0.0101100...10101111010...11100.....
Algic (4 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
cre	000000000000001001001111.010011..1010..0...0.1100.0000100.000.11.....1.....110100
oji	00000100001..0..00.00.....1001.10.....0.....0.....1111.....1010.10.0...1..
psm	000101000010001110000....0100..10101..1.1.....00...1001010.111.....10...0..111011
yur	110111000110001100.000111100....1..100.01....1010....1000..100..10101010111...111011
Altaic (10 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
aze	011100110010.10100.00.....1.1.1...1111.1...1010.101010..111..0.....
bsk	111101111011.11100101.....000.....11.11.....10...1010010101010..000.....
chv	011100110010.11100000.....0..1000.1...0.110.1.....10...10100101010011000.....
dgr	011101110011.11100.00.....1.....0.0.1....1.....10...101000101010.11000101..
eve	0001011000110001000001111000..1000000001011101110.0111111010010100101010110000101010
kha	01110011001100..0000010110.0..10000101000111011000.010111010010100101010111000001011
mgg	010111111011.00100.00.....1.01.....1.....0...1.....10000101010..0..000.....
tur	0111011100100101000001111000..100101010000111010000111010111010100010101110000101011
tuv	011100100011.11100.00.....00.....110.100....101...101001010...1..0.0.....
ykt	011101110011.11100.00.....0.....111.11..1.....0.1..101001010.....000.....
Arawakan (4 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
apu	00010100000010000000000111.01111.0001101.0.0.0.100..001010.100100.0101110..010...111000
cax	00001100000..00100.00.....110.00.11..0.....110.....0..0.11.1011....11.00110...
goa	00010100001..0.....00.....1.....11...1.1.....111111111011100.0.....
res	11011110000..00110.00.....00.....110.....10100101010..10.0.0.....
Australian (21 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
amp	11001100001..00100.101011....1.1.10.....1010.....10100..1111..1..011.....
diy	01001100001..00100110..11..110..1.....010.....1..1010.101111..010..1...1..
dyi	00000100001..00100110..11..11011..0..0.1...0..010....1..0..1010.101111..111.11...1..
goo	01001100001100010011011111.00...01.000000110001101..011000.1001010.0.1110.....1110100
grr	01001100001..00100110..11.....0001.....1111110110..1100.0....00
kay	00001100001100010011010111.0..011101000.0101.1.01..0010101100100..101010..011...001011
kgu	01001100001..00100110.....1.....0.....1010.101110...10..1100...
mau	0001010000110011001000010.0110...1110101...00101..11101..010101111010101110001110011
mku	00010000001.001100110.....0...0.....1..01....1.....0000001010010111110100.1110.00
mlk	00010100001..11100010...1.....1...1...0..01.....1010.0.111110.0...1110...
mpa	01001110001..01100.10..10.....00.....1010.1111..11111..1.....
mrt	01001100001100010011010111.0.....0000..11000.101..011010.1001011.0.1110..010..0001000
myi	000101000011001100110111110110.11..100..110.0.1010100100100101010.110...11111110111
ngi	..001100001100010000110111.0..100001001.110.0.001..01101011001010.100....110...110000
nug	010011000011000100110..1101111.10010101.1.0.0..01.....0000100.0..0.0...110...110011
pit	010011000011..0100110...1.0.....100001.....00....1001..1010010111111..0.1110.11
tiw	0100110000110001001000010.11101.000.1000..01000110.011010.00010111101010..10.001110011
ung	010101000011000100010..11.0....10..1.0.1...0.101.....00..101000.111111.11011110.11

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Chibchan, Dravidian, Hokan, Indo-European, Khoisan, Na-Dene, Niger-Congo, Nilo-Saharan, Oto-Manguean, Penutian, Sino-Tibetan, Trans-New Guinea, Tucanoan, Tupian, Uralic, Uto-Aztecan.

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wam	000011000011000100010...101101...01001.1.....0000..0.11.....110011
wrd	0001010000110011001101...00100111.110...1.0.....1....10.0..0.0.00.1110...11...110100
yid	0000010000110001000101...1.0..0100110...1...010..01...10.0..1010.101111..011..1000100

Austro-Asiatic (8 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
khm	011100000111001100100.....0..1.1...0100.11.110..0.000100.00010111111111111111000000.00
khs	01010110001100110010010.....110..00111110.11...00010.....00001011111111011.11000100011
kmv	011100000111001110100.....110.....01010..01.0...100010000..101111111110.1..0.0000.00
nca	.....100..100..11.....11.0000.00000.....1111111101011.0.0.1...00
sed	111111000111.00100100.....1.....1.....1.....1011111110111111000.....
sml	11110110011100100100...10..0.....000..01..010.....0001000.000.111111110..010000101.11
sre	001101100111.01110.00.....0.....0.....0.....0..101111111011111000.....
vie	011100100111000111.000000..0..1.1.010100..10110000000100100010111111110..111000001000

Austronesian (31 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
ata	00010110101..0..00.01.....10..0..0..00.....11111110.10..1110..100...
bkr	001100100011000100000.....00.....10..0.10...0111..10...1000..0.11111111010110000100000
bto	00010110001..0..00100.....00...1.....1111111110.10.11000.....
cha	0101011000110001000000111.00..101.100001..110.100101000.0111011111101010.001101100
dre	111101110011000100101.....1.0.1.10.11.0.001.1.....0000..101111111011111000001.00
fij	01010100001100000000101111.0...00100111.1110.10011010100000011111111100.011000111010
haw	00010000001..00000110.....0...11111.0...110.0...010000.1...111111111011.11000.....
iaa	11110111001..10100101.....0...11.....0.1.....00...111111111011110000.....
iba	01010110001..00100.00.....00.....0.....0.....101111111100.10.000.....
ind	0101011100110011001000000..0..1110000100..101110010000100000010111111101010.000101000
irr	00110000000..00100100.....1.....1.....1.....10111101111..0110.0.....
kkv	01010100001..00100.00.....0.....0.....1.....0..101110111111.110.0110...
klv	010101100010000100000.....00.....001110.1.1101.1.....00000011111101110..010000110000
krb	000100000001000100.10.....1...00..1..11.1..1...10.0..111111111011.11000111...
kwa	00010100001..00000100.....1...0.....00.....00...10111..1110....0.0.....
len	00010000001..00100100.....01.....1.....1.....10111111111011110000.....
mal	010011110011000100100101..00...0101.00011.11010000.10001000001111111111..110000001000
mao	0001000000010000000001.11..0..1111110010.111.000011010100000011111111110110000001010
pai	0100111110110001001001011000.....0.00.0111.....00.100011001..111111.....0..000111
pal	.....0..1.00.10..0.11...1.10...00...1011111101010011001111...
pms	000101000011000100100.....0.....10.10..1.....111.1...10.0..10111111111..011000110011
poh	00110000001..01100.00.....110.1.....1.101.....0..101110.11110.00.000.....
rap	0001000000010000001001111..0..1111110000.11.0..01..01010010001111111110..1..000000011
ruk	01001111001..00100.01.....0.....0.....0.....1111.....11111111010..0110.1.....
sam	.....111110..0.1111..001.....0111111111111..1110000000...
tab	010101100011001100100.....00..1.00.101.0..1.11...0...00000010111011110.011000101000
tag	010101100011000100100101...11011..10011.111101.000010101111001111.110.10..110.0.000000
tgk	00010010001..00100100.....11..0..1.0...1..0.....101111111101111000100...
ttn	00010110001..01100.00.....1.11...1...11.0..0..0...101110111111111000.....
tuk	0101010001110000001001101.00...1..100100..1010001.000101000101111111111..10.0.0111000
yap	01110110011..00100001.....11..0..1...1.1.....0.....111111111101000.000100...

Aymaran (2 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
aym	110011001110.001001001111.1.....1..00.1001...100.....110100101001010101110.0111.10
jaq	11001100111.000100100.....0.....100.....011..1....1..1.....10101010.....110.10

Carib (3 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
car	0001001000000000100000.....10.....1..1.11...1.1.....10.1101010010101010..0.0111.10
hix	0001011000100001000000011.11001000111011.100001100.110010.110111001011101010011111010
mac	.....1.....1001.00010..1..1...1.....10.0100.100101110110100.11110...

Chibchan (3 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
bri	000101110000.0.....00..00.....00.01.....0..0.....101001011110.....0.1000...
ika	001100100000.00100.00..01010...00100..00.0.001...1...0011101010010110.101..0.1110010
ram	000011100011000100000101...0..1.110100111.....101..011110.0001010010111111.110.1100011

Chukotko-Kamchatkan (2 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
chk	0001000001011001001010110..10001000.011110100000101000000010100101010..0110.0110111
ite	110111101111.011...00.....0.....00.....11.....0.....1010.0.0.1010.11.....

Dravidian (5 languages)

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	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
brh	010111110010001100	0010110000	11	10000011100100	01101100010	0	10	11	100011	00110	0	10	11	100011	00110	0	10	11
knd	010111100010001100	001011011011	10111000111010000101111011010100101010101110	0101010														
tel	11011110001	00100	00	0	1	1	101	1010010101010011000										
tml	1101	0	10	111	1	0101111	11	1010010101010011000	0									
tul	01110110001	01100	00	00	10100101010	110	0											

Hokan (4 languages)

	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
die	11011110101	0	00000	1	111	1	00	1010010	11110	0								
krk	11010100000010	100000111	10	1	001011	0	110	1001110	1	100	0101110	111010						
mar	0101110010100011001011111000	1	1011000	0	100101	1001011	10110100101111	0	0	1111000								
pso	000111101110	0	00	0110	00	110	00	01	1101	1010010	10	0110	000	11				

Indo-European (29 languages)

	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
alb	011101110010	11100	01	11	10	010110	0	0	1111	10111111110101	000111	00						
arm	00011110111000	00000	0	100	1	10100111100	000	1101101	1010	0101010	101010							
bre	11110111001	11100100	11	1	01	1	0	11111111110	110000									
bul	11010111001	01100	00	11	1	110	0	0	110110	1100	1110	101010110001						
ctl	01110111001	00100000	1	1	101	1	0	101101	1011111010	000								
eng	0111001100110011000010011111101	11011000101001000000101001010101110	101010010001101011															
fre	0111001110101111000000001111111	11	11110	01000000001111011010111111010110000101000														
ger	01110011101011100000101111111111	1111010110	000	00101101110100	111101010010	101000												
grk	0101011100100011001011011101111	111	1101011	0000011011010100	11111101010110001111000													
hin	1101111100101011000001011111111	00	10100	11101	00001111010101010010101110	01010111												
ice	1	11	1111110	1	1	1	0	0	0101101	1011111101010	001	000						
iri	00	1	11	1	10111001001	0	0	1010101111111110	110000101	11								
ita	0	1	110	1110101	0	0	1	1	0	111111110100	000101	00						
kas	11110110001	0	00	00	111	0	11001	11	0	101	101101010	111	11110					
krd	11110111011	01100	01	1	11	0	1	1	1	1010111111010	11111111							
lat	000101110010001110100	111111	11011110101000	000111011100	11110101010110001101011													
lit	11011111001	011	000	1	000	11	1	11	0	1	11	1011110101010110001						
mhi	111	0001	10	00	101	0	1	0	1010010101010111000									
nep	11011110001	0	00000	11	10	1	0	1	1	10100101010	110	0						
nor	01110010001	11110000	111	10	01	0	10	10	10	1010010001								
pan	111100001	10	1	1	1111100	10100101010101110	0	0										
pol	11011111001	01100100	000	11101111	0	1	1	100	11111101010110001101									
prs	0101011110100011001001011	00	10	011101001011000001100101110101111110101111111000														
psh	11011111011	01100000	111	00	1	1	11	0	101010	10101010	11	10						
rom	01110111001	0	00000	1	11	11	1011	0	0	11001	10	1011111111010010000						
rus	1101111100100011000001011101111	000	11101	110	0000011001010101011111101010110001101000													
snh	01110110001	0	00	00	0	1	10	0	1	0	10100	100	10	010				
spa	1101011000100001000011011111111	111011101	10	0000011111010100	11111111010010000111000													
swe	0	1	110	10	101	0	0	01011011101011110101010010001										

Iroquoian (2 languages)

	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
che	00011100001	00110	00	00	1	1	0	10010101010110000										
ond	11000000010	011101100111	0110	1000001	100	10101011101111	10	10110	110011									

Khoisan (3 languages)

	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
ani	00011110110	00110	01	1	0	100	101010	111	101									
juh	110111110111	00011	01	00	1011	11111000	0	0	00101100000	0	10110101111	11110000000						
kho	11011100000000111	011111	1111	1	10011	0001	00	1100110100001010100101010110000101011										

Macro-Ge (3 languages)

	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
brr	001100100000	00000	100011	0	1	101	0	11	11									
ckr	001100000011	011001000011	10	00000011	0	0	1101101001	001101001011	1100	1100100								
kng	00110000000	100100	10	1	0	1	101001011	11	0	1								

Mataco-Guaicuru (2 languages)

	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
abi	1101010010100011	000	1	0	0	1	0000	0	0	101110	0	10	1000	110	11			
wch	0101010011100001001000011	0	010	00	1	111	1011010000010111101110	110000110011										

Mayan (2 languages)

	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
htc	01010100011	00100001	11	1111111101010010001														

continued ...

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jak 1101110011100001001000011.0...1.010000.1.11.1.100111000101100111111110101001000111111

Na-Dene (5 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
hai 110011001110001100.000101.0...10.0.01.110011.1...1011.10100101111...100.1000.00
hup 11001100111.01100.00...1...1...1...1010.0.0101110...11...
nav 110011100110100110000...0...1.1.11.11.0.1.10...0011011010010111101110.1111.10
sla 1101111001101001100000111.0...1000100.1.11...1010111100011110100101111.1110.1111000
tli 110011001110001110.101.11.0...1.00.111.1.1010...0.00.10100100.1010...00.110.11

Niger-Congo (29 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
akn 00110010000.00110.00...01...1...1.10111.0...1011.10111111111.0...
bam 011101110011.00010.00...01...00.0.1...0...101...10100101111.1.0.1000.11
bir 01110111001.00111.01...11...1...1...10111111111.111000...00
dan 01110011011.00111.01...1...1...10100101111.111011...
dgb 01011111001.000110.01...1.10...0...1...1011011111111.101.0...
dio 011100100011.01100100...1101.11.11.0.1...1...001000.00010111111111.011000111.11
doy 01110111011.101111.01...1.10.0.0...1...1...1011.101111.111.00111...
ewe 111101110011.00110.01...01.10...0110.0011.01...1011.00100010101010101111.111100110011
ewo 11110111001.00111.01...1...1...10111111111.111000...
fye 11011110011.00110.00...1.11...1...1...10111111111.111000...
gbb 11110111011.00110.01...011...0.0.101...10111111011.111001...11
grb 0111001000111000110010111.01001.00.110.0.1...000.111110.00010110101111.110100001010
igb 111101110011000010.01...0...00.0.1.0.0.0...10100010111111111.011000000010
ijo 01110011001.00010.01...00...11.1.1...101...10...1010.101010.011.00101.11
kfe 001100110011100100100...1001.10.01101...010...1...1010.1011.101111.110.00110000
kis0.....0001.101.000100.0.01...10...100.11111110.010...101...
luv 000101100011.000101000111.11011000.11110...1...101.1011110.00010111111111...11000110011
mro 01110110001.00110.01...00...1...1...10111111111.111000...
mum 01010111011.00111.01...11.0.0...0...101110.1111.111000000...
ndt 11110110001.00111.00...0...0...10111111111.111000...
nko 010101110000000110.00...1101...111.01...11...1000.1011111111111111000011011
non 01110010001.01111.00...00...0...0...1011.111111.111.00...
sup 0011011100111001111000001.1011111.110100.1101000.1110110001010100101111.10.0.1000011
swa 1101111100110000001010011.1101111.0.1010.1110.1001.011110100010111111111.11100011011
tne 00110010001.101110.01...11...0.1.0111...10111111111.111000...
wlf 11110110001.001100.00...11...0...1...1101011.1...101111111101110000...
yor 001100100010100011.0111110.0.1000000110.1110.00011000100100010111111111.010000000011
zan 01110011001.0.10.01...110...1.0...1...101110.1011...110.1111...
zul 11011110011.0001101010011.11011000.11010.1.01.00111111101000101111111...11100011011

Nilo-Saharan (20 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
bag 111101100111001111000110.10.1.10.00001.1...100.1100000.0010111111111.111000110011
ber 01011100011.00110.01...0.1...1...1...1011...1111.1...00111...
din 01110010001.00111.10...1...1...1...100...11111111011...
fur 000101100011000110.00.11.0...000110.0.000...00.01010100101111.11011101.00
ik 11110111001.01110.00.11...11...00...1...111110.1111.110000...
kch 00010110001.100100.000011...1.1.00.10...100001...101101011111100.100001...
knm 0101011000110001100001.11.1...100.0010011...1011...1...00110100101111100.011111.11
knr 111101110011000110.00.11.00...10110000.0111.0110011111110001010100111111010011111011
kro 011100000111000110000000110...10001.10.0111...001.1100110.0011111.1111110.011.00001111
kse 000101100011.0...00...0...010.000101.1...0...1100010100010100101111.110011001111
lan 1111001000111001101100111.10.1.01100001.1.00.01.1100010100010111111111.011000110100
lug 11110111011.00111.011.01...1000...1.0.01.1...1...100.010111111111...11
luo 01110110001.00110.00...111...1110.1...10...10111111111.011000...
maa 01110000011.00110.0011...00...0...010...111111111111111000...11
mab 01110111001.101110.00...0...1...0.10...0...1010.101000.111110011011111.11
mrl 01110010011.000110001...110...00.11...1...0011111.111111.011.00111000
nan 00110000001.00110.0010...1.1.0.0.11...100...10...11111111111.111000110...
nar 00010110001.00110.00.10...1...0...0...000...101001011...011...
nbd0...1.11010.1.010.00110.100101...10.0.101000111110011011101.10
nti 111111110110000011.01...1...1.101000111111...1...10.0.100.0101010.10...110.00

North Caucasian (10 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
abk 0000111111100011000010111.011011110.1.1101110.100001111111101010010110.10011001110011
arc 110111111110.01100001...110...0...1.1.101000101010.0110.0...1...
ava 11011111111.01100001...11.0...0...11...10100101010101110.0...
hzb 11110111111010010000111.001101.00110.01111000...0...11011010100101010.0.000100111
ing 110111111110001100101111110111...00000.001.1101000...11.111110100101010.010000000000

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kab	110011111110.0.00.01.....01.0.....1.....1.....1010010.....01100....111
lak	110011111110001100.01.....1111010.....0.001.1.....0.....1.10..10100..10.....0.01001..
lez	11011111111001110000010111.0..1001110000111101.0000111111011010100101010011000000011
rut	110111111110.01110.01.....0.....1.....1.1..10100101010.....0.0.....
ttu	110111111110.01100.01.....00.....1..1..10100101010..111000.....

Oto-Manguean (5 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
chq	11110110011.110011.01.....1.....111111111100.110000.....
cle	010101100011.00111000.....1100.00110.01.00...1.....11.010111111111010110000101.00
cso	00010110001.0..11.00.....1.....1.....0..111111111011110000.....
mxo	00010110010100011.010000.01101.00000101..0.0.000.0101010001011111111100.010000100000
otm	011101110010101110.010111..0.....0000..1....0000....1001..1111111101010110001110011

Penutian (7 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
coo	110111101110001100000..11.00..1.100.0.1.0...0.0.00...1011..110.00.101010110...111.00
klm	11001110111..01100000.....0.....0.....0.....0.....0.010101010110.....00
mne	00010100011..00100000.....0.....1.10.111..0111...1..1010.1010...010.00100.00
mss	0001000000110001000001011000.....0100..0.1.0.100.....101100100..0.0.10...10...111.00
nez	110111001110001100000...000.....00001.0.1..110.1...1000..0.0..10101010110...111100
tsi	110011101110001100100.....00...100.0.01..1111..0.....1..1111111101010011001110.11
win	110111101110.00100.00..11.....10...11..0.011.....1.1..0.0..10.....101.10

Salishan (3 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
bco	11001100111..01100.00.....10.....1.....1..111111110...0..001...11
shu	11011100111..01100.00.....1..1.100010.1..1111111...1..0.....10
sqw	110011001110001100101111110.0....11..0...1.1..10000....0010011111111010..1..0.1111.10

Sepik (3 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
ala	0001001000000110000000111.01101110011000011.0.00001111010.0101010010101010101000110011
awt	.....1.....11.....011..1....00.0.0000.....101001011111111001000...
kwo	011101100000.001...00.....10.....0.....1010010101011111000.....

Sino-Tibetan (19 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
ao	00010010001.000111.00.....110.....1.....1.....10100101111101..0.1.....
baw	010111110011.00110100.....000..1.00.00.00.....0...0.....0010..1010010111111110.1110.11
bod	00010011001..00110.00.....0000.....1.....1010.1010110.011..0.....
brm	111101110011000111.011011..0...0000011000.1111.001.000100100010100101111001001000010
cnt	011100000011.10111.00.....0...1..00..0...1011...110010.11001011110101010111011...11
cti	01010111011..00111.00.....0000.....1.....10100101111...110.1.....
gar	000101100001000100.0010..0...1000.1000.0.111.0...0...10010010100101111..011011000.11
jng	11011110001..00111.00.....0000.....0.....1010010111110111001.....
ksg	00110110011..00111.01.0.....00.....1011101011111111000.....
kyl	001100100011000111.00.....1..0000.0...1.0.....00.1..1011.101111..111.00000.11
lad	110111110011001100.00.....0.0.....1..0.0011.....11010010100101111..0110.1000.11
lah	111101111011.00111.001...0...011.00..0.1..1...0.0001.0.1..10100100.111111100.000.11
lep	111101110011.111...00...0.0..1011.00..01...0..01...1000..10100101111..1110.1001...
lim	.....1.....0.10100.0.10.0..111...11.1..1010.10101010.11.00111...
mei	110101100011000110.0010110.0...1110100000111.110001000111010010100100.11..11100.000011
mnd	11010110101010101100010111.0..11..011100.11011.001110000010001011110101010111011001011
new	01001110001..00100.00.....10.....1.0.....0...1010010101110111000.....
nis	00110010001..01110.00.....0.....101001010110..110.0.....
tam	11010100001..00110.00.....111.....1.....10100101011..111000.....

Tacanan (2 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
ana	1100111100100000001001...1....000..0..01....0...00001001001010010110...0..011001.10
tac	000011100000.00000101.....00.....0.....1..10100100...1100.....

Tai-Kadai (2 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
nun	01010100011..0..11.00.....000.....0.....00...101111111011111000.....
tha	011100100011000111.000001..0...01.00100.110110000000010010001011111111111100001000

Trans-New Guinea (17 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
ame	11010110001000010000101111.10..1.01100000.11001001110111000001101001011111111011110011
asm	0101000000000001001000010.00...11.110000.....0110.01111001001010.10111111111.01110011

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dag	0001001000000001...000111.10...00.00.01....1010.01101.00001010010111111.11011110000
dni	001100000011.001001000111.10...000.100.101...111...11101011001010010.....0.01.110011
eka	00010000001.0000100100010.1.....0.01.....111.....1.01..1010.....11.....110...
ham	001100001101.01110.00....1.....1.....1.....1.....1001..10100...1111101110.1110.10
kew	010101000010.000100001111.10...00.000.00.1.0.000...011110.11010100101011..1110.0100000
kiw	00010010000...00010.000.....0.....0.....10.....10100101010...110.0.....
kob	01110000001000100100...00.10..1.01000000110.0.10111...1000..10100101111111001100000
mrd	00010111001..00100100...1110.1...1..0.10...1..0....1101..1010010..0...1..0..110...
sue	110100100000000010.00..01110..1.....01001...0.000.0011010.11010100101111..0110.1100011
tau	.....11.....1.01000...10...101.1...1..0..10100101111..1110.1110000
una	011100100011.00110.00...000.....0..0111...1.....1000..1010010111110011001110000
usa	000100100000000100000..11.10..0.1..00.111.1.....00....0001110100101111100110.1110011
wah	00010100001..00110110.....01.....1.....10100101111..111011.....
yar	00010010000..00000.00.....1010.10101111111..0.....11
ygr	00010110011..01110.00.....011.....1.....1011.....10100101011..011000.....

Tucanoan (2 languages)

	1...5.....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
brs	.....01.....1011.011011..1110.0000..011..01001001010.100100.10..01001.100000
cub	00010010000..00010011.....011.10.....0.....11100101010..010010101.....

Tupi (3 languages)

	1...5.....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
gua	01010110001010000001000011.00..1.101000.1.11.0.10000011011.10010110101110...111.0110011
srn	01110010000..00000.00.....0...00.....1.....1..101001011..111100.1.....
urk	000100000001100100100...00...000100.11.1...1..11...10.1..1010010111011100.1100.00

Uralic (6 languages)

	1...5.....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
fin	0011001100110101001001011100...1.0000010111100010000010110110010110101010101010
hun	1111011100100111001001011000..11110101010.1111100000100001010100.010101010.11..111000
kty	000101000011.00100.00.....0.....1011..1..01...100...10100..10...110.0.....
kzy	11110111001..01100.00.....0.....1.0..00.....1..1011.101010.....1.....
nen	1101111000110011001011011110.....0..11.110.1001.011010110010100..1010....0.0101.10
skp	001100001011.101..000.....1.....1..1..0.....1010.101010...11..0.....

Uto-Aztecan (7 languages)

	1...5.....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
cah	0100110010110011001001...000.....0..00.11..1..0...10.10110100101010..0110101101..
cmn	000100000000000100100...1.0..10101.001011.1..0.....10.101101001010101011101011111
hop	01010100100..11110000.....1.....1.....10110100101010101110.0.....
nht	00010100000..00100100...00...00.10111...001...0...1001100.11111111010.10000111.00
ood	01010110001..01100.00.....10.....0.1...011011..1..1111.0.101010111.01.....
pip	.....0.....011..0...110100.1.0.10.1..1...10.01011111111010..0..001111...
yaq	00010110001000011010010111.0..1101.00010011...00000111010010110100101010111010001000

Wakashan (2 languages)

	1...5.....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
kwk	11011110111.001100000.....0.....1..1.1.....1..0.1111110.....0.1.....
mak	..0111101110.01100000.....0...0..0.00.....0...100010.1001111.0.0.0.10110...110010

West Papuan (2 languages)

	1...5.....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
tid	.....1.....1100.11.11..0...1.1..0.....1011110111111011000100...
wma	00010110001..00100.00.....0..0.....1.....10111101111..011000100.....

Yanomam (2 languages)

	1...5.....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
shi	00010000000..00100100.....1.....10100101110..1100.1.....
snm	0011000000001001001001011.....1.00.01...1.001..0100000100101001011..110110.1001111

Yukaghir (2 languages)

	1...5.....10...15...20...25...30...35...40...45...50...55...60...65...70...75...80...85
yko	010101101011010100000..10110...1000000.011100.10101001010010010101010..011000100.11
ytu	01010110101..111100.00.....10100010101010.110.0.....

P_M

Using MrBayes and WALS resulted in the selection of 68 polymorphic features [Cons (1), Vowel (2), CVRatio (3), VoicPF (4), UvulC (5), GlotC (6), LatC (7), VelarN (8), VowelN (9), FrRoundV (10), SylStr (11), Tone (12), AbsComC (13), LmarkC (14), LmarkPNP (15), Redup (16), NoGen (17), DefArt (18), IndefArt (19), DistCDem (20), PadDem (21), P3PrDem (22), GenDIPersP (23), PolitDPron (24), PersMAdpos (25), Ncases (26), AsymCaseM (27), OrdNum (28), NumClas (29), PosProPAff (30), OlbPosInfl (31), PosClas (32), NomVConj (33), PerfImpAsp (34), PastTense (35), FutTense (36), Perfect (37), MorphImp (38), Optative (39), OvSitEpi (40), SemDistEv (41), SuppTAsp (42), VnumSupp (43), SV (44), OV (45), AdposNP (46), GenN (47), AdjN (48), NumN (49), DegWAdj (50), PolQPart (51), IntPhCQ (52), OVAdpNP (53), OVRelN (54), OVAAdjN (55), VpersM (56), PersMV (57), PassiveC (58), AntipassiveC (59), ApplicativeC (60), SymAsymStNeg (61), PredAdj (62), NomLocPred (63), ZeroCOPredNom (64), WhenC (65), HandArm (66), MTPron (67), NMPron (68)] and 162 languages in 18 language families⁵:

Language	Feature values
Afro-Asiatic (13 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65..
amh	43421223.1211.1232...1.322.1221.21231.3...111111.2.111521...221.111
aeg	3244412321311441234215113116122111114121141122223212444521381222...11
bej	32321123.132122123...1.226...221.11231...2...11113...621255213.3321...11
bma	31542123213112212...1113246.2222142412...41222221.114445213821122.13
hau	42441523212213212114111131161221224242221411222122234431113332112111
heb	.....32...221232212113116122112114121111222213114442113832221211
irq	4252254121221...25542141292312...1...122141112222.622222113823123...
ker	2234132...1231...1.11.112926.2...1...5231...122222.22444312...3.....
mrg	4154134...1.21...14221...1222.14131...12222222444...312....
ngz	42541343.1221...1122...12...122222262444...211.1..
orh	4244152321231451255211312646142221123122111112221621222123833221.11
som	33222123.1221...1.3443...1.324.2...22114.23...114321142522...23121...
tgr	4244122...1211...1212...2...2123123...112211...2211...221....
Algic (3 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65..
cre	11211113212111112...31131192.1111.2424123.41325...3...532111111.211
psm	2231112321321...2243113.1946...1...123243322...1.4...541313...2..
yur	424116432131111112...261293...122...1231...13411113255551383112...13
Altaic (4 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65..
chv	33241123.2311...155...4...62412...12...111111162111.....21
eve	223211212121233155211613827121111113113341111111211121138222232..
kha	3324112221.112211552326227251221.212341334111111122111113832223121
tur	333411232221123114223362262522211111412131111111221112113832213221
Australian (18 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65..
amp	4151112...1213221.1.311...2223...111.22.3.122...222.211
diy	3151112...121322122...22...3...11.122.61.52...13.222.211
dyi	1131112...12132214...21...1.65.1.22...1...115122.32.22...25.212...11
goo	314111212121332111.2.161283112223211452.241113321...5.2552281...2211
kay	2141112121213221112216611821...22.2414422341135111.62555111383...1.11
mlk	1231112...4313521...3.163.1.22...11.3221.3...2522...312...11
myi	223111212131333131...2611751122222124123241112323.22225421833222211
mku	1221112.21313...2...3.293...2...523141111222611.2522...1212.2..
mrt	31511121212132221...2116118611222.211442.241125321.61.54111381...3211
mau	22311121213111415...31521213.1122.11141...111221112114435423833121.11
ngi	.1411121212112211552126115511422.211442234111513...31.555423812212211
nug	31411121212133215553111118311.22...52312133533...5155552333...211
pit	31411121.1213...1...461285...1...4232...1111222...152542...321232..
tiw	314111212121114125521.31211114123211412.141122111.234435423532121211
ung	3231112121213121.14...3.174.1323...31...1113222.2122532...33221.11
wam	2141112121213...4...21261175...5231...32...522373...12...

continued...

⁵Of which 17 are shared with B_M WALS: Afro-Asiatic, Algic, Altaic, Australian, Austro-Asiatic, Austronesian, Cariban, Indo-European, Na-Dene, Nakh-Daghestanian, Niger-Congo, Nilo-Saharan, Oto-Manguean, Penutian, Sino-Tibetan, Uralic, Uto-Aztecan .

...continued

wrd 2231112121313...133.3126.1731...2...12.1...331321...2555552281...3211
yid 1131112121213...11553.26.175.14...2...42.1...115122.62...21122512223...

Austro-Asiatic (6 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...
khs 3232112121311...1255312322116.4211...31411222212.24442123833111...
khm 3321133221311...111...64211424...242252.14112222222444112...1112.1...
kmu 3321172121321...2...111211.34...224225231...12222232.4.4112...1...
mun 424211221121132.255...13.2723.2...1...11311111111322111531...1311...11
sml 43321421112112411...2116.233.3...2422523.41322221.61444211...3...1...
vie 331313212123144111.2.3642118342112423522141122221.224441113811121.11

Austronesian (20 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...
bkr 3232112121211...134...6.211.22...1...4231...3222211314443123.1...1...
cha 3232112121211111.311613116122111424.222112222111134432112111111111
dre 4334112121211...1.1.21.2.211614222...5231...122221212444111...1...12...
fij 32311121211111121553116241161221221225231412222213624445213721112121
haw 1211112...1113...1111313.1...514...114245.2...2222212.2444...1...
iaa 5334113...2211...1111...11.12...52...222221211444...111...
ind 32341121213114421242116421152221124225231411222211534443113211121211
klv 3232112321211...115531431311832...523141222121.614445223811121...
krb 1211111121213...1...16.411.32...2...12.1...2222212.2444521...1...
mal 315411212121125111451.6131361421.1424423141222222.414441113311112121
mao 1211111121111221111313612114.421221235231412222226244411138231221...
pms 2231112121211...1.14...26.311...2132...12.1...122222.624445223833111...
pai 31442131212113311...21.612134...21224234232...2222...4...1122331111.11
poh 1311112...1311...1.1321.3...3222...1...122322363444...1...
rap 12211111211113221123136121161.22.2123522141222221.1.444112383...1211
tab 3232112121311...155...26221153...1...523141122122362444211351...1...
tag 32321121212113512...3116311361.211141411124122.231.31.451123311112211
tgk 1222115...1211...1.11...6.3...2...122221222444312...112...
tuk 32311321211114211...311632113242212414223111222222.23454521331122.11
yap 3332162...1211...11...6.3...22...5...222221163444312...1...

Cariban (3 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...
car 2222111321211...31...2.4114.1...12.31111111126.1.1551...2222.1...
hix 223211332121111325531221311111113122412.311211121261122521382223.11
mac2552126.3...5.1...12.11131112126115253138.222...

Indo-European (19 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...
alb 33341123.3311...31...21246614...2122...12222111.444531...1221...
arm 1243322321.11...21...36225361.21.1123122.311.1111...211383221...
bul 5234112...1311...1...13714...112312.311322311131443...221...
eng 33141122213112233112123122371421121215211111223111614432113832212221
fre 3143123123114232121253221171421111112212311222211114442113812212221
ger 3314312223112233121153224661421121212121132211161555211381...2221
grk 323411232131133331231.322367.421111211211313222111114435313812211221
hin 5244112311311321255...2632...61.2111113122131111111121512113832212.21
iri32...3.14313313227.4...121131222221.11444211...321122...
kas 4332112...1.11...2.21.222445...1...121...121111...235352138...22...
lat 2234112321321...22221522256714...12113321211322111111443211383222...
lit 5244113...13.1...5521...3.637...1.12...122111111443...222.1...
psh 42443132.1311...1255...2.336.4...311141111.2521...
prs 323421232131131114.236323225242111124222331112221122225213812211.21
pol 4254112...1311...55...222667...1.1.31322211111443211...222.2...
rom 3334112...1.11...32...3.236.4...11242.11...122221161444...221.2...
rus 425411232131122335521.3226671421111241211311222111314432113812222121
spa 4233112321211323212311122137.421111111211313222211614445313812112221
swe3121...2.237.4...2121421211122111161443...221...

Na-Dene (3 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...
nav 4153124311221...3...51.3.411511...1...522244111122152152531...2111.2...
sla 4243164311221113.55216613116.12321213523225111122.121525313811111211
tli 515142532132211...4...61473.3122...5.31...1111311...115532...3121...11

Nakh-Daghestanian (3 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...
hzb 4334424311211...15553326.286414...1...413211111111.6.111212183221...
continued...

...continued

ing	525442232131132.5552.16.28661421.....41.333111111.61111112381...3.11
lez	52544223233112231423346128641.2111113413231111111621111123832113111

Niger-Congo (17 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...
akn	1322111.1221.1.2.....1...14132.3...1241222525.4....3112...
bam	33341121.1121....1....612116.....122...111122.2.152112..3311.1..
dio	33121121.1311...531..52.2116.2...241452.141122222.62444521..3...1..
ewe	43341121.12214211212..613116.222.2414522111121122.223445223833111...
gbb	4334132..1221....31.....1222.....122212.22443....3311..11
grb	332211211113122.355..5212116.421.121322.141121122.113441113321111.23
igb	5334112121121...11....61211614.....122141122222.6244411233231131..
ijo	3324112..112144..33...3.3...122....22....11.111.62.11311..3...3...
kfe	2314112211211...331411122311.14..2...4221..124122.21544522381...11..
luv	22331131.1121121555..5222116.2222221312.141122222..2444522383...2.11
nko	3234111321221...5..3152.311....2...2231..1222222244452135332122..
san	433413231112142.11...162211..421124245.2141122212222443112381...1.11
sup	233411211123141.53111221292614212122322313111122.23152112383112.12
swa	42441121211112152.21.2121171221.2113122141122222.12444521333321.111
wlf	4332112.21311...2.11.....6.2..221231.2...122221211444...3.111...
yor	2322112311131311155211622114142122422521141122222.61444112383111.11
zul	4253154.21221122555..52121161.212121312214112222..22444521333213211

Nilo-Saharan (15 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...
bag	433213211231142114..161311..2212142452..41122222.22444522383112..11
fur	223211212122122.....61344.1421....52.111111122..2122211..1....11
knr	43341121212213211112.16126451221211131231111112222611225413333121113
kch	2232112.1121122..1...16.2...1422.....121122263344111.....
kse	22321121.1..1...114111612135.4..21424122141111122.51122111153...11
knm	323211212122122..3422.612626.222....1..14511112216.122551..3312...
lan	43121121112231131433216131131.2221424122141122222.62444522131...1.11
lug	4334173..123142..55.....1.222....4....131122222555....3....11
luo	3332112..1221..2.1132.....512.....12....122222.62444....312.2..
maa	3321132..1221....55.....1.22.....22222212444....3311..11
mab	3334112.11321...1...6.332..4.....1221..111322162122551..3...1..
mrl	3322132.21221...1....61344..2.....5..143224222.62544521381111.2..
nan	1311112..1221...1.3.32.6.2..6.221....12....222222.22444522.....
nti	5344132321131...14311613136.2.....12.1..131111.53555532..1...1..
nbd	.....22.1412..61362.1122....12.1..111122162122211..2...31..

Oto-Manguean (3 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...
cle	32321121.1231..22553346.3111.2.....11.12122221111444211..1...12..
mxo	223411231113144.5552.1623111142111414423121222221361444212381...1.11
otm	333411231132111.1.....612..4..211....1232..2222111114435223833111.11

Penutian (5 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...
mne	2231152..1211..3.....6.1...1112.2213...2..11.11..61.11212..1...212
mss	22211222121133.1..2126116271221.....12224113.331..1555541..1...223
nez	4241464321311..11..211611826.1112...1231..33.111111555521231221.2..
tsi	5152264321311..11142..6.213.32.....2..222211162443532..3...2..
win	42424243.121132.....46.143.1412.....1.3..33.1.....555211..2...212

Sino-Tibetan (10 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...
baw	32441121.1221...155..16.242..4..1...5221..111122222152522..3...3...
brm	43341121212312221552.13427283.21.242252214111122162112112382112..11
cnt	33211121.2231...1..211....43...214235.2241122111122433...3...2..
gar	2232111221211..1.55..661172534..1...423241111122.62122112..3111...
kyl	2312112121231.....2.161211.34.....52.3..124122.22544112..3.....
lad	4254112121311...1.3...6.2525.....113341111122.621.2112..3311...
lah	43342121.1231..122..16.2..3...2423.2.2..111132222115112..3112...
lep	43341121.43.1...112..16.223..4..2...4231..111122.221.2111...311...
mdn	42333122232312211..2163221143.2121424521141122111122433111383111211
mei	4232112121221221122212612625.12122422413341111132.221151123331113.11

Trans-New Guinea (11 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...
ame	52321123212111211413116121151424222125231421111222221225323132123.11
asm	321111132121114112.4.461211..412.2213423241115122222.12532323222..13

continued...

... continued

dni	13111122.121113.155..361362..112.12141222411111...6.12.532333...3.11
ham	13112211.1321..1.....2.186..1..2....1232..111.221221.2522..2...3...
kew	32311133.112122.155..16126281421.221312.311111112.221512123112121211
kob	332111222121144.14121161213111222...1231..111122221122123812221.11
sue	522211132112142.1....62243.14211221412.211111122.621.2212383.....
tau	.....32..412316.1..1.1222....1..1..111122.221525323.1....11
una	33221122.1221...1....6.2134.1.....1231..111122162112532321.....
usa	122211132121111.12...16.3938...1....231131111221621.2532313222..21
ygr	1232133..1321....4232.....2...1413.....111112.62111..222.1..

<i>Uralic</i> (3 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65..
fin	2324112222112331552116238371221121231212411211111313432113822212221
hun	43341123223112111112166338272221121245221111311111.2555513812221221
nen	424211212131132.1....6.36471221.2114222341111.11...1.1211..2222..21

<i>Uto-Aztecan</i> (6 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65..
cah	3141412221311..11....6.2525.1..1....12.243111111.6212153213.31111..
cmn	1211111321211..112431.61234..4.....12.242111111132121531133...32..
nht	2231111..1211...155..263411.11..1....1232313222211.1444521..132111..
ood	3232113..1311..1.14.....11..112231..2..224311112543.....111.112
pip	.....3.....111111213614...11.....12.111222211.6.443521.....212
yaq	2232112321221331141..1612224.421111141232421111111121211113111121.12

However, using MrBayes and **Ethnologue** resulted in the selection of 70 polymorphic features⁶ [*Cons* (1), *Vowel* (2), *CVRatio* (3), *VoicPF* (4), *UvulC* (5), *GlottC* (6), *LatC* (7), *VelarN* (8), *VowelN* (9), *FrRoundV* (10), *SylStr* (11), *Tone* (12), *FixStress* (13), *AbsComC* (14), *PresUnC* (15), *LmarkC* (16), *LmarkPNP* (17), *Redup* (18), *NoGen* (19), *DefArt* (20), *IndefArt* (21), *DistCDem* (22), *PadDem* (23), *P3PrDem* (24), *GenDIPersP* (25), *PolitDPron* (26), *PersMAdpos* (27), *Ncases* (28), *AsymCaseM* (29), *OrdNum* (30), *NumClas* (31), *PosProPAff* (32), *OlbPosInfl* (33), *PosClas* (34), *NomVConj* (35), *PerfImpAsp* (36), *PastTense* (37), *FutTense* (38), *Perfect* (39), *MorphImp* (40), *Optative* (41), *OvSitEpi* (42), *SemDistEv* (43), *SuppTAsp* (44), *VnumSupp* (45), *SV* (46), *OV* (47), *AdposNP* (48), *GenN* (49), *AdjN* (50), *NumN* (51), *DegWAdj* (52), *PolQPart* (53), *IntPhCQ* (54), *OVAdpNP* (55), *OVRelN* (56), *OVAdjN* (57), *VpersM* (58), *PersMV* (59), *PassiveC* (60), *AntipassiveC* (61), *ApplicativeC* (62), *SymAsymStNeg* (63), *PredAdj* (64), *NomLocPred* (65), *ZeroCopPredNom* (66), *WhenC* (67), *HandArm* (68), *MTPron* (69), *NMPron* (70)] and 278 languages in 28 language families⁷:

Language	Feature values
<i>Afro-Asiatic</i> (17 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
aeg	324441232131114441234215113116122111114121141122223212444521381222..11
amh	43421223.121.11..1232...1.322.1221.21231.3...111111.2.111521...221.111
bej	32321123.13211122123...1.226..221.11231..2..11113..621255213.3321..11
bma	3154212321317142212...1113246.2222142412..41222221.114445213821122.13
diz	3234122..133.1123.2....3.2...1.22....1.....211...312..11
hau	424415232122.113212114111131161221224242221411222122234431113332112111
heb	.....32...7..2212322121131161221121141211111222213114442113832221211
irq	425225412122114...25542141292312..1...122141112222.622222113823123...
ker	2234132..123111...1.11.112926.2..1...5231..122222.22444312..3.....
knk	4232134..122.11...3.....422.1114.....122232.22445.....211....
mrq	4154134..1.2.11...14221.....1222.14131.....12222222444.....312....
mup	.....11..61.3..414..2...4...42122222322444312.....1..
ngz	42541343.122.11...1122.....12.....122222262444.....211.1..
orh	424415232123.114.1255211312646142221123122111112221621222123833221.11
som	33222123.122.14..1.3443..1.324.2..22114.23...114321142522...23121...
ter	5254134..123.11.....222....1....122222.22444.....3.....
tgr	4244122..121.14..1212.....2...2123123...112211..2211.....221....

continued ...

⁶These 70 features include the 68 selected for WALS with the addition of *FixStress* (13) and *PresUnC* (15), due to the fact that they cross the missing data threshold with the addition of the new languages.

⁷Of which 17 are shared with the WALS classification: *Afro-Asiatic*, *Algic*, *Altaic*, *Australian*, *Austro-Asiatic*, *Austronesian*, *Cariban*, *Indo-European*, *Na-Dene*, *Niger-Congo*, *Nilo-Saharan*, *Oto-Manguan*, *Penutian*, *Sino-Tibetan*, *Trans-New Guinea*, *Uralic*, *Uto-Aztecan*.

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Algic (4 languages)

	1...	5...	10...	15...	20...	25...	30...	35...	40...	45...	50...	55...	60...	65...	70
cre	1121111321215111112	.31131192.1111	.2424123.41325	...	3...	532111111	.211								
psm	223111232132111	...	2243113.1946	...	1...	123243322	...	1..4.	541313	...	2..				
wiy	3241114	.1.1111	...	2.....	1.....	4..1..	13412	..	31555	...	3...	211			
yur	424116432131	.1111112	...	261293	..	122....	1231	..	134111132555551383112	..	13				

Altaic (11 languages)

	1...	5...	10...	15...	20...	25...	30...	35...	40...	45...	50...	55...	60...	65...	70
aze	33241123	.221.11	.....	522	...	1113.1	...	11.111	.22	..	1.....	1..			
bsk	43344122	.231715	...	55	.....	4.2	.....	12	...	1111111	..	111	.....	
chv	33241123	.231111	...	155	..4.	62412	.....	12	...	111111162111	.....	21			
dgr	33341122	.331.11	.....	6.2	...	2.....	12	...	111111	.22111211	.....			
eve	223211212121111233155211613827121111113113341111111211112111138222232	..													
evn	22321121	.1.1.11	...	552	.....	5.2	.....	12	...	311.1	...	1.1	.....	222	....
kha	3324112221	.11112211552326227251221	..	2123413341111111221111113832223121	..										
mga	32442122	.121.11	...	41	.....	4.2	.....	111111	..	6.111	.....	1..			
tur	33341123222111123114223362262522211111412131111111221112113832213221	..													
tuv	33221122	.231.11	...	1.55	.....	41221	...	121	..	11111	..	2.1.1	.....	21	....
ykt	33341132	.231.11	...	1	.....	6.2	.....	2.3	..	11111	..	111	.....	221	....

Arawakan (4 languages)

	1...	5...	10...	15...	20...	25...	30...	35...	40...	45...	50...	55...	60...	65...	70
apu	123111131111111113255215311921111213241432	..	241131121	..	61555521381	...	1.11								
cax	2141111	..	121.11	..	1255	..	22.2	...	111	.....	1.	32512	..	2.44522	.....
goa	1231113	..	1.11	...	2	.....	3.1	.....	2222212114	..	4	.....	112	..	2..
res	4242111	..	122.11	...	55	.....	111	.....	111111	..	13151	.....	2	..	

Australian (24 languages)

	1...	5...	10...	15...	20...	25...	30...	35...	40...	45...	50...	55...	60...	65...	70
alw	4141112	..	131631	..	1	.....	222	..	11142	..	1.332	..	3	.....	555
amp	4151112	..	121.31221	..	1.311	.....	2223	.....	111	..	22	..	3.122	.....	222.211
diy	3151112	..	12123122122	.....	22	.....	3	..	11.122	..	61.52	..	13.222	..	211
djp	3151112	..	131.31221	.....	421	.....	5	..	1.11	..	3.3	..	1	.....	1211
dyi	1131112	..	1212312214	..	21	..	1.65	..	1.22	.....	1.1	..	115122	..	32.22
goo	31411121212123132111	..	2.161283112223211452	..	241113321	..	5.2552281	..	2211						
grr	3141112	..	12123122	.....	1422	.....	222123	..	514	..	4	.....	1	.....
kay	214111212121231221112216611821	..	22	..	2414422341135111	..	62555111383	..	1.11						
kgu	3151112	..	121231	.....	6.1	.....	1	.....	11	..	121	..	1.2412	..	212
mau	22311121212316111415	..	31521213	..	1122	..	11141	..	1111221112114435423833121	..	11				
mku	1221112	..	2131231	..	2	.....	3.293	..	2	.....	5231411111222611	..	2522	..	1212.2
mlk	1231112	..	431131	..	21	.....	3.163	..	1.22	.....	11	..	3221	..	3.2522
mpa	3142112	..	131.31341	.....	21	.....	11422	..	222552	.....	2	.....		
mrt	3151112121212312221	..	2116118611222	..	211442	..	241125321	..	61	..	54111381	..	3211		
myi	2231112121213163133131	..	2611751122222124123241112323	..	222225421833222211										
ngi	141112121211152211552126115511422	..	211442234111513	..	31	..	555423812212211	.....	6	.....	1.5521	..	3.1	.....	2.1
ngl	.....	6	.....	1.5521	..	3.1	.....	2.1	.....	52	.....	33532	..	3	..
nug	314111212121216313215553111118311	..	22	.....	52312133533	..	51555552333	..	211						
pit	31411121	..	121231	...	1	..	461285	.....	1	..	4232	..	1111222	..	152542
tiw	31411121212161114125521	..	31211114123211412	..	141122111	..	234435423532121211								
ung	323111212121131121	..	14	..	3	..	174	..	1323	.....	31	..	1113222	..	2122532
wam	214111212121131	...	4	..	21261175	.....	5231	..	32	.....	522373	..	12	..	
wrd	223111212131631	..	133	..	3126	..	1731	...	2	.....	12	..	1	..	331321
yid	113111212121131	..	11553	..	26	..	175	..	14	..	2	.....	42	..	1

Austro-Asiatic (9 languages)

	1...	5...	10...	15...	20...	25...	30...	35...	40...	45...	50...	55...	60...	65...	70
chr	.....	1	.....	1.55	..	6.2	...	4	.....	52	..	1	..	122221321444112	..
khm	332113322131711	..	111	.....	64221424	..	242252	..	14112222222444112	..	1112	..	1	..	
khs	323211212131711	..	1255312322116	..	4211	.....	31411222212	..	24442123833111	..					
kmu	332117212132711	...	2	.....	111211	..	34	..	224225231	..	12222232	..	4	..	4112
nca	.....	44	..	312	.....	2421	..	24245	.....	2222112	..	34	..	3	.....
sed	53411721	..	121711	..	1	.....	122221242444	.....	112	..	1	..			
sml	4332142111217112411	..	2116	..	233	..	3	.....	2422523	..	41322221	..	61444211	..	3
sre	13321321	..	132	..	11	.....	1	.....	1	..	122221222444	.....	112	..	
vie	331313212123	..	1144111	..	2	..	3642118342112423522141122221	..	224441113811121	..	11				

Austronesian (34 languages)

	1...	5...	10...	15...	20...	25...	30...	35...	40...	45...	50...	55...	60...	65...	70
ace	7	..	11	..	5531	..	6.2	...	4	..	1	5	..
ata	1233212	..	1.1	..	14	14	..	6.2	...	1	222231	..	224

continued...

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bkr	232211212121111...134...6.211.22..1....4231..3222211314443123.1...1...
bto	2232112..1.1611...55...2.....2222231.2444.....111....
cha	32321121212111121111.311613116122111424.22211222211113443211211111111
dre	433411212121215..1.1.21.2.211614222...5231..122221212444111..1...12..
fij	3231112121111151121553116241161221221225231412222213624445213721111211
haw	1211112..111631..1111313.1...514..114245.2...2222212.2444.....1..
iaa	5334113..221215..1111.....11.12.....52...222221211444.....111....
ind	3234112121316114421242116421152221124225231411222211534443113211121211
kkv	3231112..121.11..1.....6.....2.....1..1221222.24.4522.....
klv	323211232121111..115531431311832.....523141222121.614445223811121...
kos	.....1431162311.32.....122222112444521.....1..
krb	12111112121.31..1.....16.411.32..2...12.1..2222212.2444521.....1..
kwa	2231112..111611.....2.....1...52...122.21...4.4.....112.1..
len	2221112..121611...42.....2.....122222222444.....112.1..
mal	3154112121216112.111451.6131361421.1424423141222222.4144411331111211
mao	12111112111111221111313612114.421221235231412222226244411138231221..
mok	.....11..3.1...11.32.....523.41322322111444.....11211..
pai	3144213121216113311..21.612134..21224234232..2222...4..1122331111.11
pal	.....155..26.2116.2..1...52...122211162443521.....1..
pms	223111212121511..1.14..26.311..2132...12.1..122222.624445223833111...
poh	131112..131.11..1..1321.3...3222.....1..122322363444.....1..
rap	122111121116113221123136121161.22.2123522141222221.1.444112383...1211
ruk	3144112..121.15..1.....12...1113.....222211.624.3.....
sam	.....1.113136.2..32.21.....43222222.124441123...112.1..
sun	.....1...1..4...6.2.....12422.....122221312444111..112....
tab	323211212131611...155..26221153...1...523141122122362444211351...1...
tag	3232112121216113.12..3116311361.211141411124122.231.31.451123311112211
tgk	1222115..121211..1.11..6.3...2.....122221222444312..112....
tin	.....3.....1.143..6.2114.2..1...5.....32221115.443211...1...
ttn	1232112..131.11...12...2...24..1...5.....122122222444.....
tuk	3231132121116114211..311632113242212414223111222222.234545213311122.11
yap	3332162..121115...11...6.3...22.....5.....222221163444312.....1..

Carib (3 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
car	22211132121111.31...2.4114.1.....12.31111111126.1.1551..2222.1..
hix	223211332121111113253122131111113122412.3112111212611225213822223.11
mac	.....7.....2552126.3..5.1.....12.11131112126115253138.222....

Chibchan (3 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
bri	22341113.1...1144.....61293.4.....1111223.1.2112...311....
ika	23221113.121.114231553.16.262111..2...52232111112312.152522332...31..
ram	2142112121211113..1112.261376..122.211312.1411111222.21.22123832223112

Dravidian (4 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
brh	324411232131.1122.1...4612825122111123123111..1.1...2.5.212383...1...
knd	325211232131.112213.22332326251421221131212111111122151211312223211
tel	4242112..121.11.....121...111111162111.....222....
tml	.....13..23..3..6...221131.22..111111162111...38.22231..

Hokan (4 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
die	4243212..1.1111...1.....112...1.31..11114226.155.....3112
krk	4231111311.211111111...61234.11112241312.2..131121...555551332111.212
mar	32412123213171531111451261162.11232241411.344111122.6.152551331...3.11
pso	22424223.1...1122..55..231262...23....4133..1111.1.621..112..3...1...

Indo-European (30 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
alb	33341123.331.15...31...21246614.....2122..12222111.444531..1221....
arm	1243322321.1111..21...36225361.21.1123122.311.1111.....211383221....
bre	4334112..231611...11...2...7.2.....1..1..222221.11444.....221.2..
bul	5234112..131.11...1.....13714...112312.311322311131443.....221....
ctl	3334112..121111..3..2.....137.....2.2...322221...444.....2..
dut	.....1.....11..322136.4.....4.1211132211.6.555211...221.2..
eng	3314112221311152233112123122371421121215211111223111614432113832212211
fre	331431231231111423212125322117142111111221231122221114442113812212221
ger	331431222231111223312115322466142112121221211132211161555211381...2221
grk	32341123213151533331231.322367.421111211211313222111114435313812211221
hin	524411231131111321255..2632..61.2111113122131111111111121512113832212.21

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ice2..22.334.....467.4...2121222...1222111..443...381221....
 iri32...2...3.14313313227.4.....121131222221.11444211..321122...
 ita1.....3.1221.322137.4..1...2.1...32222116.444211..1...22...
 kas 4332112..1.1.11...2..21.222445...1...121...121111..235352138...22...
 krd 43342122.131.14...33...6.3...2.....1.....1122211.2222521.....
 lat 223411232132211...22221522256714..12113321211322111111443211383222...
 lit 5244113..13.111...5521..3.637.....1.12..122111111443.....222.1..
 nep 4242112..1.111122.....3.....1.....1.2..111111..21.1.....211.2..
 nor 3322112..232111...32...2...7.4.....42...122311161443.....2...
 pan1255212.2.26.....1113123...111111112151...38...22...
 pol 4254112..131611...55...222667.....1.1.31322211111443211...222.2...
 prs 32342123213171131114.2363232252421111242223311122211122225213812211.21
 psh 42443132.131111..1255...2.336.4.....311141111.2521.....
 rom 3334112..1.1111...32...3.236.4...11242.11..122221161444.....221.2...
 rus 4254112321311112233521.322667142111124121131122211131443211381222121
 snh 3332112..1.1.11.....2.3.5261.....111.131..121.....212.1..
 spa 423311232121115323212311122137.421111111211313222211614445313812112221
 swe1.....3121..2.237.4...2121421211122111161443.....221....
 wel6....3.1422.323117.....1.2...222221311444211..211.2..

Iroquoian (3 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
 che 1241112..122.11...55.....1.....2..311111131111.....311.2...
 ond 4111123.13265111331421161111..121.14144222212251..131...522333111.211
 snc 1211111.11.1111...3.....11...1414...4133.....555...33.111.211

Khoisan (3 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
 ani 2252221..122.12.....3..1.2.....13.111.22555311.....
 juh 52541222.113.1244.5113.521211.14232142452.1..121122.323441123511211211
 kho 424111132123.122213.32.11222261.121122352311111111131111313333111.11

Mayan (4 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
 htc 3231122..121115..1.12.....222211161443.....2...
 jak 424142232121211111.422.1614115312121424122241222211161443531163111.111
 mam1.....3.4212.....6.1..1...12.2..222231.31445...2.3111...
 tzu113126.4...1131...12.2..3222313114455312..1111.11

Na-Dene (5 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
 hai 515146432131.1141.114...6.213.24122...4223..111122..11.2112..1...211
 hup 4151224..131.11...2.....1.....342331121..2555.....121.2...
 nav 415312431122111..3...51.3.411511..1...522244111122152152531..2111.2...
 sla 42431643112211113.55216613116.12321213523225111122.121525313811112211
 tli 515142532132.2111...4..61473.3122...5.31..1111311..115532..3121..11

Niger-Congo (26 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
 akn 1322111..122.11..1.2.....1...14132.3...1241222525.4.....3112...
 bam 33341121.112.11...1...612116.....122...111122.2.152112..3311.1...
 bir 3334112..123.13...11.....52...122222.22444...1.....
 dgb 3244112.1222.13...14.....4..2.....1211222.13.4.....311...
 dio 33121121.131211...531..52.2116.2...241452.141122222.62444521..3...1...
 doy 3334132.1133.13...24...6.2...2..2.....124122.22544521.....
 ewe 43341121.122.134211212..613116.222.2414522111121122.22344522383311...
 ewo 4334112..123.13...1.31.....6...2.....122222.12444.....
 fni1...2.2116.222.....2...122.22..1444531..1122.21
 gbb 4334132..122.13...31.....1222.....122212.22443...3311..11
 grb 33221121113311322.355..5212116.421.121322.141121122.113441113321111.23
 igb 533411212112.13..11...61211614.....122141122222.6244411233231131..
 ijo 3324112..112.1344..33...3.3...122...22...11.111.62.11311..3...3...
 kfe 231411221121211..3314111223311.14..2...4221..124122.21544522381...11...
 kis2.....42.555215612..6.....12...132222361555311.....1...
 luv 22331131.112611121555..5222116.2222221312.141122222..2444522333...2.11
 mro 3332112..122.15...55.....2.....12...124222.12544.....
 mum 3234132..123.13...12...6.2.....5...122322.22444112...1...
 nko 323411132122.11...5..3152.311...2...2231..1222222244452135332122...
 sup 23341121113321141.531112212926142121223223131111122.231521123833112.12
 swa 42441121211161512152.21.2121171221.213122141122222.12444521333321.111
 tne 2322112.1132.13...33.....4...2112.....122222.21444.....311...
 wlf 4332112.2131.11..2.11.....6.2..221231.2...122221211444...3.111...

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yor	232211231113.13311155211622114142122422521141122222.614441123831111.11
zan	3324113.1.2.13...4...3.2...2.....122312..24.3521...311....
zul	4253154.2122612122555..52121161.212121312214112222..224445213333213211

Nilo-Saharan (20 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
bag	433213211123711142114..161311..2212142452..41122222.22444522383112..11
din	3322112..123.31...3.....2.....134222262555.....111....
fur	223211212122.1122.....61344.1421....52.111111122..2122211..1....11
ik	4334112..132.1122.....21.....1.....222322.21444.....112.2..
kch	2232112.1121.1122..1...16.2...1422.....121122263344111.....
knm	32321121212211122..3422.612626.222....1..14511112216.122551..3312....
knr	433411212122.113211112.1612645122121113123111112222611225413333121113
kro	332113212122111423.5531.312662.4222142312.14322.222362.441111331111111
kse	22321121.1...11...114111612135.4..21424122141111122.51122111153....11
lan	4312112111222311131433216131131.2221424122141122222.62444522131...1.11
lug	4334173..123.1342..55.....1.222...4.....131122222555.....3....11
luo	3332112..122.11..2.1132.....512.....12....122222.62444.....312.2..
maa	3321132..122.11...55.....1.22.....22222212444....3311..11
mab	3334112.1132.11...1...6.332..4.....1221..111322162122551..3....1..
mrl	3322132.2122115...1...61344..2.....5..143224222.62544521381111.2..
nan	1311112..122.11..1.3.32.6.2..6.221....12....222222.22444522.....
nar	2232112..122.1124..2.....1.21.....11112....122.....312..11
nbd	.....1..22.1412..61362.1122....12.1..111122162122211..2...31..
nti	534413232113.13...14311613136.2.....12.1..131111.53555532..1...1..
tna	.....552.16.2646.....1...11222222.22444531...112.1..

North Caucasian (9 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
abk	11542223213111411131221.1.4225112111113112211111231621125323431113211
arc	42544243.131114...4.....1.2..111111.621.1...28.321....
ava	5254424..131114.....41.....11...1111111321.1.....221....
hzb	433442431121114..15553326.286414..1...413211111111.6.111212183221....
ing	52544223213121432.5552.16.28661421....41.333111111.61111112381...3.11
kab	51544353.1.1.17...3.23.....1.....1111..6211...2.3111....
lak	515442232131.14...4...6.282....1...1.21..111.1...1.131228.....
lez	5254422323311112231423346128641.2111113413231111111621111123832113111
ttu	52544243.131.14...55.....1..3..111111.32111.....

Oto-Manguean (4 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
cle	32321121.123111..22553346.3111.2.....11.121222221111444211..1...12..
cso	2232112..1.3.11...1.....1..222221221444.....311....
mxc	223411231113.1544.5552.1623111142111414423121222221361444212381...1.11
otm	333411231132.1511.1.....612..4..211....1232..2222111114435223833111.11

Penutian (7 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
coo	5252424321311111111142..6.172.14..1...1222..231311121555551..1111..11
klm	4152262..131111.1...21.....14.....4.....331111151555.....1...2..
mne	2231152..121111..3.....6.1...1112.2213...2..11.11..61.11212..1...212
mss	2221122212111133.1..2126116271221....12224113.331..1555541..1...223
nez	424146432131111..11..211611826.1112...1231..33.111111555521231221.2..
tsi	515226432131711..11142..6.213.32.....2..222211162443532..3...2..
win	42424243.121.1132.....46.143.1412.....1.3..33.1.....555211..2...212

Sino-Tibetan (13 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
ao	1223112.2123.11...2221.....1.....4.....11112212.152.....
baw	32441121.122711...155..16.242..4..1...5221..111122222152522..3...3...
bod	2224112..122.11...55.....1.....11.112362.51.....112....
brm	433411212123.152221552.13427283.21.242252214111122162112112382112..11
cnt	33211121.223.11...1..211....43...214235.2241122111122433...3...2..
gar	223211122121.11..1.55..661172534..1...423241111122.62122112..3111....
kyl	231211212123.11.....2.161211.34.....52.3..124122.22544112..3.....
lad	425411212131.11...1.3...6.2525.....113341111122.621.2112..3311....
lah	43342121.123.11...122..16.2...3...2423.2.2..111132222115112..3112....
lep	43341121.43..11...112..16.223..4..2...4231..111122.221.2111...311....
lim	.....1.....3233612..11.13.....11.2..11.1111.2.11541.....2...
mei	423211212122.11221122212612625.12122422413341111132.221151123331113.11
mund	4233312223231112211..2163221143.21214245211411221111224331113831111211

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Trans-New Guinea (15 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
ame	5232112321211131211413116121151424222125231421111222221225323132123.11
asm	32111113212171114112.4.461211..412.2213423241115122222.12532323222..13
dag	12221113212..11111155...61293..222.21141.31411111222.2122532381221..11
dni	13111122.12171113.155..361362..112.12141222411111...6.12.532333...3.11
eka	1211113.211213114.....6.293...12....1.32..11...2.....522...222.1..
ham	13112211.132.11..1.....2.186..1..2....1232..111.221221.2522..2...3...
kew	32311133.11211122.155..16126281421.221312.311111112.221512123112121211
kob	33211122212161144.14121161213111222...1231..111122221122123812221.11
mrđ	2234113..121711...4....3.2111.1.....1132..1111.3.2.1..522...221....
sue	522211132112.1142.1.....62243.14211221412.211111122.621.2212383.....
tau	.....32..412316.1..1.1222...1..1..111122.221525323.1.....11
una	33221122.122.11...1.....6.2134.1.....1231..111122162112532321.....
usa	12221113212111111.12...16.3938...1....231131111221621.2532313222..21
wsk311.11...6.4....122.....1111222.21.2212...212..31
ygr	1232133..132.11...4232.....2...1413.....111112.62111.....222.1..
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Tucanoan (3 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
brs31.....3133..313312221.412.2224423342311131.611252123813213211
cub	1212111..112145.....2123.2...4.....211111.61121211.....2..
ret3552123.3.....2....1..3..111111.11151532...22222..
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Tupi (3 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
gua	32331123111171111.11432161311511211211421.241121121..23.45523831121211
srn	3322111..111.11..1155.....1.....2..11112.2211.2.....
urk	222111121121711...1553116.311..1..2....22.2..1111212211.2212.3111212..
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Uralic (4 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
fin	232411222212112331552116238371221121231212411211111313432113822212221
hun	4334112322312112111112166338272221121245221111311111.25555513812221221
kyt	22311122.121.11.....337.2..2....123...111.1...21.1.....222....
nen	42421121213121732.1.....6.36471221.2114222341111.11...1.1211..2222..21
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Uto-Aztecan (9 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
cah	314141222131211..11....6.2525.1..1....12.243111111.6212153213.31111..
cmn	121111132121211..112431.61234..4.....12.242111111132121531133...32..
hop	3231211..432111..1.....4.3.....2421111111121.1.....112.1..
lui	32312121.1.1111..1.....11.....131121.31555.....112
nht	2231111..121611...155..263411.11..1....1232313222211.1444521..132111..
ood	3232113..131.11..1.14.....11..112231..2..224311112543.....111.112
pip	.....3.....111111213614...11.....12.111222211.6.443521.....212
tsh	.....1..22.155312.....5.4.....1..2..113111332551.....31232..
yaq	223211232122211331141..1612224.4211111141232421111111121211113111121.12
<hr/>	
Wakashan (3 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
kwk	5252464.2131111..1.....1.....2.....2..32221...4.3.....111....
mak	.2524243.131111..1..21.61111..4...142412.34122433313155552382.....
nuu	5151465..131.14411.....6.1.....2..22..332...52111.1.111.211

P_B

The polymorphic coding with BayesLang resulted in the selection of 70 polymorphic features⁸: *Cons* (1), *Vowel* (2), *CVRatio* (3), *VoicPF* (4), *UvulC* (5), *GlottC* (6), *LatC* (7), *VelarN* (8), *VowelN* (9), **FrRoundV** (10), *SylStr* (11), *Tone* (12), *FixStress* (13), *AbsComC* (14), *PresUnC* (15), *LmarkC* (16), *LmarkPNP* (17), *Redup* (18), *NoGen* (19), *DefArt* (20), *IndefArt* (21), *DistCDem* (22), *PadDem* (23), *P3PrDem* (24), *GenDIPersP* (25), *PolitDPron* (26), *PersMAdpos* (27), *Ncases* (28), *AsymCaseM* (29), *OrdNum* (30), *NumClas* (31), *PosProPAff* (32), *OlbPosInfl* (33), *PosClas* (34), *NomVConj* (35), *PerfImpAsp* (36), *PastTense* (37), *FutTense* (38), *Perfect* (39), *MorphImp* (40), *Optative* (41), *OvSitEpi* (42), *SemDistEv* (43), *SuppTAsp* (44), *VnumSupp* (45), *SV* (46), *OV* (47), *AdposNP*

⁸The 68 for P_M plus *FixStress* (13) and *PresUnC* (15).

(48), *GenN* (49), *AdjN* (50), *NumN* (51), *DegWAdj* (52), *PolQPart* (53), *IntPhCQ* (54), *OVAdpNP* (55), *OVReIN* (56), *OVAdjN* (57), *VpersM* (58), *PersMV* (59), *PassiveC* (60), *AntipassiveC* (61), *ApplicativeC* (62), *SymAsym-StNeg* (63), *PredAdj* (64), *NomLocPred* (65), *ZeroCopPredNom* (66), *WhenC* (67), *HandArm* (68), *MTPron* (69), *NMPron* (70).

For **WALS** there were 249 languages in 25 language families⁹:

Language	Feature values
Afro-Asiatic (17 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
aeg	213330121020003330123104002005011000003010030011112101333410270111...00
amh	32310112.010.00..0121...0.211.0110.10120.2...000000.1.000410...110.000
bej	21210012.02100011012...0.115...110.00120...1..00002..510144102.2210...00
bma	2043101210206031101...0002135.1111031301...30111110.003334102710011.02
diz	2123011..022.0012.1...2.1...0.11...0.....100...201...00
hau	313304121011.002101003000020050110113131110300111011123320002221001000
heb	.....21...6...110121101002005011001003010000011102003331002721110100
irq	314114301011003...14431030181201..0...011030001111.511111002712012...
ker	1123021..012000...0.00.001815.1..0...4120..011111.11333201..2.....
knk	3121023..011.00...2.....311.0003.....011121.11334.....100....
mrg	3043023..0.1.00...03110...0111.03020...011111113333.....201....
mup	.....00.50.2..303..1...3...31011111211333201.....0..
ngz	31430232.011.00...0011...01.....011111151333.....100.0..
orh	313304121012.003.01441002015350311100120110000001110510111012722110.00
som	22111012.011.03..0.2332..0.213.1..11003.12...003210031411...12010...
ter	4143023..012.00.....111.....0.....011111.11333.....2.....
tgr	3133011..010.03..0101.....1...1012012...001100..1100.....110....
Algic (4 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
cre	0010000210104000001..20020081.0000.1313012.30214...2...421000000.100
psm	112000121021000...1132002.0835...0...012132211...0.3..430202...1..
wiy	2130003..0.0000...1.....0.....3..0..02301..20444.....2...100
yur	313005321020.0000001...150182..011.....0120..023000021444440272001..02
Altaic (11 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
aze	22130012.110.00.....411...0002.0...00.000.11..0.....0..
bsk	32233011.120604...44.....3.1.....01.....0000000.000.....
chv	22130012.120000...044..3...51301.....01...000000051000.....10
dgr	22230011.220.00.....5.1...1.....01...000000.11000100.....
eve	1121001010100001220441005027160100000020022300000001000010027111121..
evn	11210010.0.0.00...441.....4.1.....01...200.0...0...0...111...
kha	2213001110.00001100441215116140110.10123022300000000110000002721112010
mgg	21331011.010.00...30.....3..1.....000000.5.000.....0..
tur	222300121110000120031122511514111000003010200000000110001002721102110
tuv	22110011.120.00..0.44.....30110...010...00000..1.0.0.....10
ykt	22230021.120.00...0.....5.1.....1.2..00000...000.....110....
Arawakan (4 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
apu	01200002000000000214410420081000102130321.130020010.50444410270...0.00
cax	1030000..010.00..0144..11.1...000.....0..21401...1.33411.....101
goa	0120002..0..00...1.....2.0.....1111101003.3.....001.1..
res	3131000..011.00...44.....000.....000000.02040.....1..
Australian (24 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
alw	3030001..020520..0.....111.00031..0..221.2...444.....
amp	3040001..010.20110.0.200.....1112.....000.11.2.011.....111.100
diy	2040001..01012011011.....11.....2..00.011.50.41...02.111.100
djp	2040001..020.20110.....310.....4..0.00.2.2.0.....0100
dyi	0020001..0101201103..10..0.54.0.11...0..0.004011.21.11...14.101..00
goo	20300010101012021000.1.050172001112100341.130002210...4.1441170...1100

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⁹Sharing 22 with *B_B WALS* (Afro-Asiatic, Algic, Altaic, Australian, Austro-Asiatic, Austronesian, Cariban, Indo-European, Na-Dene, Nakh-Daghestanian, Niger-Congo, Nilo-Saharan, Oto-Manguean, Penutian, Sino-Tibetan, Uralic, Uto-Aztecan) and a 17 with *P_M* also *WALS* (Afro-Asiatic, Algic, Altaic, Australian, Austro-Asiatic, Austronesian, Cariban, Indo-European, Na-Dene, Nakh-Daghestanian, Niger-Congo, Nilo-Saharan, Oto-Manguean, Penutian, Sino-Tibetan, Uralic, Uto-Aztecan).

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grr	2030001..01012011.....0311.....111012.403.3.....0.....
kay	103000101010120110001105500710..11.1303311230024000.51444000272...0.00
kgu	2040001..010120.....5.0.....0.....00.010..0..1301...101....
mau	1120001010205000304..20410102.0011.00030..0000110001003324312722010.00
mku	0110001.1020120..1.....2.182..1.....4120300000111500.1411..0101.1..
mlk	0120001..320020.10.....2.052.0.11.....00.2110.2..1411...201..00
mpa	2031001..020.20230.....10.....00311.111441.....1..
mrt	2040001010101201110..1005007500111.100331.130014210.50.43000270...2100
myi	11200010102052022020...1500640011111013012130001212.111114310722111100
ngi	.030001010100041100441015004400311.100331123000402..20.444312701101100
ngl	.....5.....0.4410.2.0....1..0....41....22421.2..444431...211..00
nug	2030001010105202104442000007200.11....41201022422..40444441222...100
pit	20300010.010120...0...350174....0...3121..0000111..041431..210121..
tiw	20300010101050003014410.20100003012100301.030011000.123324312421010100
ung	212000101010020010.03...2.063.0212.....20..0002111.101110...22110.00
wam	103000101010020...3..10150064.....4120..21.....411262...01..
wrd	112000101020520..022.2015.0620....1...01.0..220210..1444441170...2100
yid	002000101010020..00442.15.064.03..1...31.0..004011.51..10011401112...

Austro-Asiatic (10 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70

chr	.....0.....0.44...5.1...3.....41.0..011110210333001...001.0..
khm	221002211020600..000...53100313...131141.03001111111333001..0001.0..
khs	212100101020600..0144201211005.3100....20300111101.13331012722000...
kmu	221006101021600...1...000100.23..113114120..01111121.3.3001..0.....
mun	31310011001000021.144..02.1612.1..0....00200000000211000420..0200.00
nca	.....33.201.....1310.13134.....1111001.23..2.....0000..00
sed	42300610.010600..0.....011110131333.....001.0..
sml	3221031000106001300..1005.122.2...1311412.30211110.50333100..2...0..
sre	02210210.021.00.....0.....0..011110111333.....001....
vie	220202101012.0033000.1.2531007231001312411030011110.113330002700010.00

Austronesian (34 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70

ace	.....6...00..4420.5.1...3..0...4.1..221110242444411...0010.00
ata	0122101..0.0.03...03...5.1..0.....111120.113.4101.....
bkr	121100101010000...023...5.100.11..0...3120..2111100203332012.0...0..
bto	1121001..0.0500...44...1.....1111120.1333.....000....
cha	21210010101000010000.200502005011000313.111001111000023321001000000000
dre	322300101010104..0.0.10.1.100503111...4120..011110101333000..0...01..
fij	2120001010000040010442005130050110110114120301111102513334102610000100
haw	0100001..000520..0000202.0...403..003134.1...1111101.1333.....0..
iaa	4223002..110104..0000...00.01.....41...111110100333.....000....
ind	2123001010205003310131005310041110013114120300111100423332002100010100
kkv	2120001..010.00..0...5.....1.....0..0110111.13.3411.....
klv	212100121010000..004420320200721.....412030111010.503334112700010...
kos	.....0320051200.21.....011111001333410.....0..
krb	010000001010.20..0...05.300.21..1...01.0..1111101.1333410.....0..
kwa	1120001..000500.....1.....0...41...011.10...3.3.....001.0..
len	1110001..010500...31.....1.....01111111333.....001.0..
mal	2043001010105001.000340.5020250310.0313312030111111.303330002200000100
mao	010000001000000110000202501003.310110124120301111115133300027120110..
mok	.....00..2.0...00.21.....412.30211211000333.....00100..
pai	2033102010105002200..10.501023..10113123121..1111...3..0011220000.00
pal	.....044..15.1005.1..0...41...011100051332410.....0..
pms	112000101010400..0.03..15.200..1021...01.0..011111.513334112722000...
poh	0200001..020.00..0..0210.2...2111.....0..011211252333.....0..
rap	0110000010005002110012025010050.11.1012411030111110.0.333001272...0100
ruk	2033001..010.04..0.....01...0002.....111100.513.2.....
sam	.....0.002025.1..21.10.....32111111.013330012..001.0..
sun	.....0...0..3...5.1.....01311.....011110201333000...001....
tab	212100101020500...044..15110042...0...412030011011251333100240...0..
tag	2121001010105002.01..2005200250.100030300013011.120.20.340012200001100
tgk	0111004..010100..0.00...5.2...1.....011110111333201...001....
tin	.....2.....0.032..5.1003.1..0...4...21110004.332100.....0..
ttn	0121001..020.00...01...1...13..0...4...01101111333.....
tuk	2120021010005003100..200521002131101303112000111111.123434102200011.00
yap	2221051..010004...00...5.2...11.....4...111110052333201.....0..

Cariban (3 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70

car	111100021010000..20....1.3003.0.....01.20000000015.0.0440..1111.0..
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hix	11210022101000000214420110200000002011301.2001000101500114102711112.00
mac	.....6.....1441015.2..4.0.....01.00020001015004142027.111....

Chibchan (3 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
bri	11230002.0...0033.....50182..3.....0000112..0.1001...200...
ika	12110002.010.003120442.05.151000..1....4112100001201.041411221...20..
ram	1031001010100002..0001.150265..011.100201.0300000111.10.11012721112001

Dravidian (4 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
brh	213300121020.0011.0...3501714011000012012000..0.0...1.4.101272...0...
knd	214100121020.001102.1122121514031011002010100000000110401002011112100
tel	3131001..010.00.....010...000000051000.....111....
tml	.....02..12..2...5....110020.11..000000051000...27.11120..

Hokan (3 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
die	3132101..0.0000.....0.....001.....0.20..00003115.044.....2001
mar	21301012102060420000340150051.00121130300.233000011.5.041440220...2.00
pso	11313112.0...0011..44..120151...12.....3022..0000.0.510..001..2...0...

Indo-European (30 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
alb	22230012.220.04....20...10135503.....1011..01111000.333420..0110....
arm	0132211210.0000..10...25114250.10.0012011.200.0000.....100272110....
bre	3223001..120500...00...1...6.1.....0..0..111110.00333.....110.1..
bul	4123001..020.00....0.....02603...001201.200211200020332.....110....
ctl	2223001..010000..2..1.....026.....1.1...211110...333.....1..
dut	.....0.....00...211025.3.....3.0100021100.5.444100...110.1..
eng	2203001110200041122001012011260310010104100000112000503321002721101100
fre	2203201201200003121010142110060310000001101200111100003331002701101110
ger	220320111120000112201004211355031001010110100021100050444100270...1110
grk	21230012102040422220120.211256.310000100100202111000003324202701100110
hin	413300120020000210144..1521..50.1000002011020000000010401002721101.10
ice	.....1...11.223.....356.3...1010111...0111000..332...270110....
iri	.....21...1....2.03202202116.3.....010020111110.00333100..210011..
ita	.....0.....2.0110.211026.3..0...1.0...21111005.333100..0...11..
kas	3221001..0.0.000...1..10.111334...0...010...010000..124241027...11..
krd	32231011.020.03....22...5.2...1.....0.....0011100.1111410.....
lat	112300121021100...11110411145603..01002210100211000000332100272111....
lit	4133002..02.000...4410..2.526.....0.01..011000000332.....111.0..
nep	3131001..0.000011.....2.....0....0.1..000000..10.0.....100.1..
nor	2211001..121000...21...1...6.3.....31...011200050332.....1..
pan	.....0144101.1.15.....0002012...000000001040...27...11..
pol	3143001..020500...44...111556.....0.0.20211100000332100...111.1..
prs	21231012102060020003.1252121141310000131112200011100011114102701100.10
psh	31332021.020000..0144...1.225.3.....0010...200030000.1410.....
rom	2223001..0.0000...21...2.125.3...00131.00..011110050333.....110.1..
rus	31430012102000011224410.2115560310000130100200111000203321002701111010
snh	2221001..0.0.00.....1.2.4150.....000.020..010.....101.0..
spa	312200121010004212101200011026.310000000100202111100503334202701001110
swe	.....0.....2010..1.126.3...1010310100011000050332.....110....
wel	.....5....2.0311.212006.....0.1...111110200333100...100.1..

Khoisan (3 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
ani	1141110..011.01.....2..0.1.....02.000.11444200.....
juh	41430111.002.0133.4002.410100.03121031341.0..010011.212330012400100100
kho	313000021012.011102.21.00111150.0100112412000000000200002002222000.00

Macro-Ge (2 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
brr	02010002.000.2000.....5.3...012....4.....1.....0...410..2001..00
ckr	02000010.0206000100441005020000000111133..03200001..000412011700010.00

Na-Dene (4 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
hup	3040113..020.00...1.....0.....231220010..1444.....010.1..
nav	304201320011000..2...40.2.300400..0...411133000011041041420..1000.1..
sla	313205320011000002.44105502005.01210102412114000011.010414202700000100

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tli 404031421021.1000...3..50362.2011....4.20..0000200..004421..2010..00

Nakh-Daghestanian (7 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
arc 31433132.020003...3.....0.1..000000.510.0...17.210...
ava 4143313..020003.....30.....00.....0000000210.0.....110...
hzb 322331320010003..04442215.175303..0....302100000000.5.000101072110...
ing 41433112102010321.4441.05.17550310....30.222000000.50000001270...2.00
lak 404331121020.03...3....5.171....0...0.10..000.0...0.020117.....
lez 4143311212200001120312235017530.10000023021200000000510000012721002000
ttu 41433132.020.03....44.....0..2..000000.21000.....

Niger-Congo (27 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
akn 0211000..011.00..0.1.....0...03021.2...0130111414.3.....2001...
bam 22230010.001.00....0...501005.....011...000011.1.041001..2200.0..
bir 2223001..012.02....00.....41....011111.11333.....0.....
dgb 2133001.1011.02....03.....3..1.....0100111.02.3.....200...
dio 22010010.020100...420..41.1005.1...130341.030011111.51333410..2...0..
doy 2223021.0022.02....13...5.1...1.1.....013011.11433410.....
ewe 32230010.011.023100101..502005.111.1303411000010011.112334112722000...
ewo 3223001..012.02....0.20.....5....1.....011111.01333.....
fni0...1.1005.111.....1...011.11..0333420...0011.10
gbb 3223021..011.02....20.....0111.....011101.11332.....2200..00
grb 22110010000200211.244..4101005.310.010211.030010011.002330002210000.12
igb 422300101001.02..00....50100503.....011030011111.5133300122120020..
ijo 2213001..001.0233..22...2.2....011.....11....00.000.51.00200..2..2...
kfe 120300110010100..220300011200.03..1...3110..013011.10433411270...00..
kis1.....31.444104501..5.....01....021111250444200.....0...
luv 11220020.001500010444..4111005.1111110201.030011111..1333411222...1.00
mro 2221001..011.04....44.....1.....01....013111.01433.....
mum 2123021..012.02....01...5.1.....4.....011211.11333001.....0..
nko 212300021011.00...4..2041.200....1...1120..0111111133341024221011..
san 322302120001.0231.00..051100..310013134.103001110111332001270...0.00
sup 12230010001210030.420001101815031010112112020000011.120410012722001.01
swa 31330010100050401041.10.1010060110.1002011030011111.01333410222210.000
tne 1211001.0021.02....22.....3...1001.....011111.10333.....200....
wlf 3221001.1020.00...1.00.....5.1..110120.1...011110100333...2.000...
yor 121100120002.02200044100511003031011311410030011111.503330012720000.00
zan 2213002..0.1.02...3....2.1...1.....011201..13.2410..200....
zul 3142043.1011501011444..41010050.101010201103001111..11333410222102100

Nilo-Saharan (19 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
bag 322102100012600031003..050200..1101031341..30011111.11333411272001..00
din 2211001..012.20....2.....1.....023111151444.....000...
fur 112100101011.0011.....50233.0310....41.000000011..1011100..0.....00
ik 3223001..021.0011.....10.....0.....111211.10333.....001.1..
kch 1121001.0010.0011..0...05.1...0311.....010011152233000.....
knm 21210010101100011..2311.501515.111.....0..03400001105.011440..2201...
knr 322300101011.002100001.05015340110100020120000001111500114302222010002
kse 11210010.0...00...003000501024.3..10313011030000011.40011000042...00
lan 3201001000111200020322105020020.1110313011030011111.51333411020...0.00
lug 3223062..012.0231..44.....0.111...3....020011111444.....2...00
luo 2221001..011.00..1.0021.....401.....01....011111.51333.....201.1..
maa 2210021..011.00....44.....0.11.....111111101333.....2200..00
mab 2223001.0021.00...0...5.221..3.....0110..000211051011440..2...0..
mrl 2211021.1011004...0...50233..1.....4..032113111.51433410270000.1..
nan 0200001..011.00..0.2.21.5.1..5.110....01....111111.11333411.....
nar 1121001..011.0013..1.....0.10.....00001...011.....201..00
nbd0..11.0301..50251.0011....01.0..000011051011100..1..20...
nti 423302121002.02....03200502025.1.....01.0..020000.42444421..0...0...
tna441.05.1535.....0...00111111.11333420...001.0..

Oto-Manguean (4 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
cle 21210010.012000..11442235.2000.1.....00.010111110000333100..0...01..
cso 1121001..0.2.00....0.....0.....0..111110110333.....200...
mxc 112300120002.0433.4441.0512000031000303312010111110250333101270...0.00
otm 222300120021.0400.0....501..3..100....0121..1111000003324112722000.00

Penutian (6 languages)

continued ...

...continued

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
klm	3041151..020000..0...10.....03.....3.....220000040444.....0...1..
mne	1120041..010000..2.....5.0...0001.1102...1..00.00..50.00101..0...101
mss	11100011101000022.0..1015005160110.....01113002.220..0444430..0...112
nez	313035321020000..00..100500715.0001....0120..22.000000444410120110.1..
tsi	404115321020600..00031..5.102.21.....1..111100051332421..2...1..
win	31313132.010.0021.....35.032.0301.....0.2..22.0.....444100..1...101
Salishan (2 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
shu	4130353..020.00..0.....2...031301.1..1111...4.3.....1...0..
sqv	304035321020503200.00...5.0156.2100....12230111100.2.342420..10002000
Sepik (2 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
ala	22110002102000001011310420161503101010301.0000000001510004112022002.00
awt	.....5..11..01...2.0..00310.....000011111001001..101..00
Sino-Tibetan (13 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
ao	0112001.1012.00...1110.....0.....3.....00001101.041.....
baw	21330010.011600...044..05.131..3..0....4110..000011111041411..2...2...
bod	1113001..011.00...44.....0.....000000000000.001251.40.....001...
brm	322300101012.041110441.02316172.10.1311411030000011051001001271001..00
cnt	22100010.112.00...0..100.....32...103124.1130011000011322.....2...1..
gar	112100011010.00..0.44..550061423..0...312130000011.51011001..2000....
kyl	120100101012.00...1.050100.23.....41.2..013011.11433001..2.....
lad	314300101020.00...0.2...5.1414.....002230000011.510.1001..2200....
lah	32231010.012.00...011..05.1...2...1312.1.1..000021111004001..2001....
lep	32230010.32..00...001..05.112..3..1...3120..000011.110.1000...200....
lim	.....0.....2122501..00.02....00.1..00.0000.1.00430.....1...
mei	312100101011.00110011101501514.01011311302230000021.110040012220002.00
mdn	3122201112120001100..1052110032.10103134100300110000113220002720000100
Uralic (4 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
fin	1213001111101001220441005127260110010120101300100000202321002711101110
hun	3223001211201001000001055227161110010134110000200000.14444402701110110
kty	11200011.010.00.....226.1.1...012...000.0...10.0.....111....
nen	31310010102010621.0.....5.25360110.1003111230000.00...0.0100..1111..10
Uto-Aztecan (9 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
cah	203030111020100..00...5.1414.0.0...01.132000000.5101042102.200000..
cmn	10000021010100..001320.50123..3.....01.131000000021010420022...21..
hop	2120100..321000..0.....3.2.....1310000000010.0.....001.0..
lui	21201010.0.0000..0.....00.....020010.20444.....001
nht	1120000..010500...044..152300.00..0...0121202111100.0333410..021000..
ood	2121002..020.00..0.03.....00..001120..1..113200001432.....000.001
pip	.....2.....000000102503...00.....01.000111100.5.332410.....101
tsh	.....0..11.044201.....4.3.....0..1..002000221440.....20121..
yaq	112100121011100220030..0501113.310000030121310000000010100002000010.01

Using the **Ethnologue** resulted in 195 languages in 28 language families¹⁰:

Language	Feature values
Afro-Asiatic (13 languages)	
	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
aeg	213330121020003330123104002005011000003010030011112101333410270111..00
amh	32310112.010.00..0121...0.211.0110.10120.2...000000.1.000410...110.000
bej	21210012.02100011012...0.115..110.00120..1..00002..510144102.2210..00
bma	2043101210206031101...0002135.1111031301..30111110..003334102710011.02
hau	313304121011.002101003000020050110111313111030011011123320002221001000

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¹⁰Of which 22 are shared with **WALS**: *Afro-Asiatic, Algic, Altaic, Arawakan, Australian, Austro-Asiatic, Austronesian, Cariban, Chibchan, Dravidian, Hokan, Indo-European, Khoisan, Macro-Ge, Na-Dene, Niger-Congo, Nilo-Saharan, Oto-Manguean, Penutian, Sino-Tibetan, Uralic, Uto-Aztecan.*

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heb21...6...1101211010020050110010030100000111102003331002721110100
irq	314114301011003...14431030181201...0...011030001111.511111002712012...
ker	1123021..012000...0.00.001815.1..0...4120..011111.11333201..2.....
mrg	3043023..0.1.00...03110.....0111.03020....011111111333.....201....
orh	313304121012.003.01441002015350311100120110000001110510111012722110.00
som	22111012.011.03..0.2332..0.213.1..11003.12...003210031411.....12010...
tas	.0430012.020603...3221.....1.....0....21.1...1.....001....
tgr	3133011..010.03..0101.....1...1012012...001100..1100.....110....

Algic (3 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
cre	0010000210104000001..20020081.0000.1313012.30214...2...421000000.100
psm	112000121021000...1132002.0835...0...012132211...0..3..430202...1..
yur	313005321020.0000001...150182..011.....0120..023000021444440272001..02

Altaic (7 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
bsk	32233011.120604...44.....3.1.....01....0000000..000.....
chv	22130012.120000...044..3...51301.....01....000000051000.....10
eve	11210010101000012204410050271601000000200223000000001000010027111121..
kha	2213001110.00001100441215116140110.1012302230000000011000002721112010
tur	222300121110000120031122511514111000003010200000000110001002721102110
tuv	22110011.120.00..0.44.....30110....010...00000..1.0.0.....10
ykt	22230021.120.00...0.....5.1.....1.2..00000...000.....110....

Arawakan (2 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
apu	01200002000000000214410420081000102130321.130020010.50444410270...0.00
cax	1030000..010.00..0144..11.1...000.....0..21401...1.33411.....101

Australian (19 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
alw	3030001..020520..0.....111.00031..0..221.2...444.....
amp	3040001..010.20110.0.200.....1112.....000.11.2.011.....111.100
diy	2040001..01012011011.....11.....2..00.011.50.41...02.111.100
dyi	0020001..0101201103..10..0.54.0.11...0..0.004011.21.11...14.101..00
goo	20300010101012021000.1.050172001112100341.130002210...4.1441170...1100
kay	103000101010120110001105500710..11.1303311230024000.51444000272...0.00
mau	1120001010205000304..20410102.0011.00030..0000110001003324312722010.00
mku	0110001.1020120..1.....2.182..1.....4120300000111500.1411..0101.1..
mlk	0120001..320020.10.....2.052.0.11.....00.2110.2...1411...201..00
mrt	2040001010101201110..1005007500111.100331.130014210.50.43000270...2100
myi	11200010102052022020..1500640011111013012130001212.111114310722111100
ngi	.030001010100041100441015004400311.100331123000402..20.444312701101100
ngv	2030001010105202104442000007200.11.....41201022422..4044441222...100
pit	20300010.010120...0...350174.....0...3121..0000111..041431..210121..
tiw	20300010101050003014410.20100003012100301.030011000.123324312421010100
ung	212000101010020010.03...2.063.0212.....20..0002111.1011421..22110.00
wam	103000101010020...3..10150064.....4120..21.....411262...01..
wrd	112000101020520..022.2015.0620...1...01.0..220210..1444441170...2100
yid	002000101010020..00442.15.064.03..1...31.0..004011.51..10011401112...

Austro-Asiatic (5 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
khm	221002211020600..000...53100313...131141.030011111111333001..0001.0..
khs	212100101020600..0144201211005.3100.....20300111101.13331012722000...
kmu	221006101021600...1...000100.23..113114120..01111121.3.3001..0.....
sml	3221031000106001300..1005.122.2...1311412.30211110.50333100..2...0...
vie	220202101012.0033000.1.2531007231001312411030011110.113330002700010.00

Austronesian (19 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
bkr	121100101010000...023...5.100.11..0...3120..2111100203332012.0...0...
cha	21210010101000010000.200502005011000313.111001111000023321001000000000
dre	32230010101010104..0.0.10.1.100503111...4120..0111101013330000..0...01..
fij	2120001010000040010442005130050110110114120301111102513334102610000100
haw	0100001..000520..0000202.0...403..003134.1...1111101.1333.....0..
iaa	4223002..110104..0000.....00.01.....41...111110100333.....0000....
ind	2123001010205003310131005310041110013114120300111100423332002100010100
klv	212100121010000..004420320200721.....412030111010.503334112700010...
krb	010000001010.20..0.....05.300.21..1...01.0..1111101.1333410.....0...
mal	2043001010105001.000340.5020250310.0313312030111111.303330002200000100

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mao	010000001000000110000202501003.3101101241203011111115133300027120110..
pai	2033102010105002200..10.501023..10113123121..1111....3..0011220000.00
pms	112000101010400..0.03..15.200..1021...01.0..011111.513334112722000...
rap	0110000010005002110012025010050.11.1012411030111110.0.333001272...0100
tab	212100101020500...044..15110042...0...412030011011251333100240...0...
tag	2121001010105002.01..2005200250.100030300013011.120.20.340012200001100
tgk	0111004..010100..0.00...5.2...1.....011110111333201...001....
tuk	2120021010005003100..200521002131101303112000111111.123434102200011.00
yap	2221051..010004....00...5.2...1.....4.....111110052333201.....0..

Aymaran (2 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70
aym	30403112.010500220..1...502512.110....3022300000000110.0440..1...0..
jaq	4040111.1010500..00...5500...01.....0..2.....0000.....441..1...02

Carib (2 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70
car	111100021010000..20....1.3003.0.....01.20000000015.0.0440..1111.0..
hix	11210022101000000214420110200000002011301.2001000101500114102711112.00

Chibchan (3 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70
bri	11230002.0...0033.....50182..3.....0000112..0.1001...200....
ika	12110002.010.003120442.05.151000..1...41121000001201.041411221...20..
ram	1031001010100002..0001.150265..011.100201.0300000111.10.11012721112001

Dravidian (2 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70
brh	213300121020.0011.0...3501714011000012012000..0.0...1.4.101272...0...
knd	214100121020.001102.11221215140310110020101000000000110401002011112100

Eskimo-Aleut (2 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70
grw	203230311010600222044203502656.110013030101300000110510114101212002.20
ypk	.....01...0..222044..05.0554.1.....0.213022..2..2044444117...21..

Hokan (4 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70
ccp	2040103210206002010.....010.0..
krk	3120000200.100000000...50123.00001130201.1..020010...444440221000.101
mar	21301012102060420000340150051.00121130300.233000011.5.041440220...2.00
pso	11313112.0...0011..44..120151...12.....3022..0000.0.510..001..2...0...

Indo-European (22 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70
alb	22230012.220.04....20...10135503.....1011..01111000.333420..0110....
arm	0132211210.0000..10...25114250.10.0012011.200.0000.....100272110....
bre	3223001..120500...00...1...6.1.....0..0..111110.00333.....110.1..
bul	4123001..020.00....0.....02603...001201.200211200020332.....110....
eng	2203001110200041122001012011260310010104100000112000503321002721101100
fre	2203201201200003121010142110060310000001101200111100003331002701101110
ger	220320111120000112201004211355031001010110100021100050444100270...1110
grk	21230012102040422220120.211256.310000100100202111000003324202701100110
hin	413300120020000210144..1521..50.1000002011020000000010401002721101.10
ice	.....1..11.223.....356.3...1010111...0111000..332...270110....
iri	.....21...1...2.03202202116.3.....010020111110.00333100..210011..
kas	3221001..0.0.00...1..10.111334...0...010...010000..124241027...11..
lat	112300121021100...11110411145603..01002210100211000000332100272111....
lit	4133002..02.000...4410..2.526.....0.01..011000000332.....111.0..
nor	2211001..121000...21...1...6.3.....31...011200050332.....1..
pol	3143001..020500...44...111556.....0.0.20211100000332100...111.1..
prs	21231012102060020003.1252121141310000131112200011100011114102701100.10
psh	31332021.020000..0144...1.225.3.....200030000.1410.....
rom	2223001..0.0000...21...2.125.3...00131.00..011110050333.....110.1..
rus	31430012102000011224410.2115560310000130100200111000203321002701111010
spa	312200121010004212101200011026.310000000100202111100503334202701001110
swe	.....0.....2010..1.126.3...1010310100011000050332.....110....

Khoisan (2 languages)

	1...5....10...15...20...25...30...35...40...45...50...55...60...65...70
juh	41430111.002.0133.4002.410100.03121031341.0..010011.212330012400100100

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kho 313000021012.011102.21.00111150.010011241200000000020000200222000.00

Macro-Ge (2 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
brr 02010002.000.2000.....5.3....012.....4.....1.....0...410..2001..00
ckr 02000010.0206000100441005020000000111133..03200001..000412011700010.00

Mataco-Guaicuru (2 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
abi 41203012102..00.....5.100..2...1313...0..01122.0.0334411..2...1..
wch 212015121010100202.03...50000..00211103012030011010.00333411272200.101

Na-Dene (4 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
hai 404035321020.0030.003...5.102.13011...3112..000011..00.1001.0...100
nav 304201320011000..2...40.2.300400..0....411133000011041041420..1000.1..
sla 313205320011000002.44105502005.01210102412114000011.010414202700000100
tli 404031421021.1000....3..50362.2011....4.20..0000200..004421..2010..00

Niger-Congo (15 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
akn 0211000..011.00..0.1.....0...03021.2...0130111414.3.....2001...
bam 22230010.001.00....0...501005.....011...000011.1.041001..2200.0..
dio 22010010.020100...420..41.1005.1...130341.030011111.51333410..2...0..
ewe 32230010.011.023100101..502005.111.1303411000010011.112334112722000...
grb 22110010000200211.244..4101005.310.010211.030010011.002330002210000.12
igb 422300101001.02..00....50100503.....011030011111.5133300122120020..
ijo 2213001..001.0233..22...2.2...011.....11...00.000.51.00200..2...2...
kfe 120300110010100..220300011200.03..1...3110..013011.10433411270..00..
luv 11220020.001500010444..4111005.1111110201.030011111..1333411222...1.00
nko 212300021011.00...4..2041.200....1...1120..01111111133341024221011..
sup 12230010001210030.420001101815031010112112020000011.120410012722001.01
swa 31330010100050401041.10.1010060110.1002011030011111.01333410222210.000
wlf 3221001.1020.00..1.00.....5.1..110120.1...011110100333...2.000....
yor 121100120002.02200044100511003031011311410030011111.503330012720000.00
zul 3142043.1011501011444..41010050.101010201103001111..113334102222102100

Nilo-Saharan (15 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
bag 322102100012600031003..050200..1101031341..30011111.11333411272001..00
fur 112100101011.0011.....50233.0310.....41.000000011..1011100..0...00
kch 1121001.0010.0011..0...05.1...0311.....010011152233000.....
knm 21210010101100011..2311.501515.111.....0..03400001105.011440..2201...
knr 322300101011.002100001.05015340110100020120000001111500114302222010002
kro 221002101011000312.4420.201551.3111031201.03211.111251.330000220000000
kse 11210010.0...00...003000501024.3..10313011030000011.40011000042....00
lan 3201001000111200020322105020020.1110313011030011111.513334112020...0.00
lug 3223062..012.0231..44.....0.111...3....020011111444....2...00
luo 2221001..011.00..1.0021.....401.....01...011111.51333...201.1..
mab 2223001.0021.00....0...5.221..3.....0110..000211051011440..2...0..
mrl 2211021.1011004...0...50233..1.....4..032113111.51433410270000.1..
nan 0200001..011.00..0.2.21.5.1..5.110....01...111111.11333411.....
nbd0..11.0301..50251.0011.....01.0..000011051011100..1...20..
nti 423302121002.02...03200502025.1.....01.0..020000.42444421..0...0...

North Caucasian (6 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
abk 00431112102000300020110.0.31140010000020011000000120510014212320002100
ava 4143313..020003.....30.....00...0000000210.0.....110...
hzb 322331320010003..04442215.175303..0...302100000000.5.000101072110...
ing 41433112102010321.4441.05.17550310....30.222000000.50000001270...2.00
lak 404331121020.03...3...5.171....0...0.10..000.0...0.020117.....
lez 4143311212200001120312235017530.10000023021200000000510000012721002000

Oto-Manguean (3 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
cle 21210010.012000..11442235.2000.1.....00.010111110000333100..0...01..
mxc 112300120002.0433.4441.05120000310000303312010111110250333101270...0.00
otm 222300120021.0400.0.....501..3..100...0121..1111000003324112722000.00

Penutian (6 languages)

1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
continued...

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coo	4141313210200000000031..5.061.03..0...0111..1202000104444440..0000..00
mne	1120041..010000..2.....5.0...0001.1102...1..00.00..50.00101..0...101
mss	11100011101000022.0..1015005160110....01113002.220..0444430..0...112
nez	313035321020000..00..100500715.0001....0120..22.000000444410120110.1..
tsi	404115321020600..00031..5.102.21.....1..111100051332421..2...1..
win	31313132.010.0021.....35.032.0301.....0.2..22.0.....444100..1...101

Sino-Tibetan (11 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
baw	21330010.011600...044..05.131..3..0...4110..000011111041411..2...2...
brm	322300101012.041110441.02316172.10.1311411030000011051001001271001..00
cnt	22100010.112.00...0..100.....32...103124.1130011000011322.....2...1..
gar	112100011010.00..0.44..550061423..0....312130000011.51011001..2000....
kyl	120100101012.00.....1.050100.23.....41.2..013011.11433001..2.....
lad	314300101020.00...0.2...5.1414.....002230000011.510.1001..2200....
lah	32231010.012.00...011..05.1...2...1312.1.1..000021111004001..2001....
lep	32230010.32..00...001..05.112..3..1...3120..000011.110.1000..200....
mei	312100101011.00110011101501514.01011311302230000021.110040012220002.00
mand	3122201112120001100..1052110032.10103134100300110000113220002720000100
tib	4221001..11100011.0...0.1.....10.....2...000

Trans-New Guinea (12 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
ame	4121001210100020100302005010040313111014120310000111110114212021012.00
asm	21000002101060003001.3.350100..301.1102312130004011111.01421212111..02
dag	01110002101..00000044..50182..111.10030.20300000111.1011421270110..00
dni	02000011.01060002.044..250251..001.01030111300000..5.01.421222...2.00
eka	0100002.100102003.....5.182..01.....0.21..00...1.....411..111.0..
ham	02001100.021.00..0.....1.075..0..1...0121..000.110110.1411..1...2...
kew	21200022.00100011.044..05015170310.110201.200000001.110401012001010100
kob	22100011101050033.03010050102000111...0120..0000111110011012701110.00
mrđ	1123002..010600...3....2.1000.0.....0021..0000.2.1.0..411...110....
sue	411100021001.0031.0...51132.03100110301.100000011.510.1101272.....
una	22110011.011.00...0...5.1023.0.....0120..000011051001421210.....
usa	01110002101000000.01...05.2827...0....120020000110510.1421202111..10

Tupi (2 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
gua	21220012000060000.00321050200400100100310.130010010..12.34412720010100
urk	111000010010600...0442005.200..0..1...11.1..0000101100.1101.2000101..

Uralic (4 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
fin	1213001111101001220441005127260110010120101300100000202321002711101110
hun	3223001211201001000001055227161110010134110000200000.14444402701110110
kty	11200011.010.00.....226.1..1...012...000.0...10.0.....111....
nen	31310010102010621.0.....5.25360110.1003111230000.00...0.0100..1111..10

Uto-Aztecan (6 languages)

	1...5...10...15...20...25...30...35...40...45...50...55...60...65...70
cah	203030111020100..00.....5.1414.0..0...01.132000000.5101042102.20000..
cmn	010000021010100..001320.50123..3.....01.131000000021010420022...21..
nht	1120000..010500...044..152300.00..0...0121202111100.0333410..021000..
ood	2121002..020.00..0.03.....00..001120..1..113200001432.....000.001
pip	.....2.....000000102503..00.....01.000111100.5.332410.....101
yaq	112100121011100220030..0501113.310000030121310000000010100002000010.01

Datasets summary

Overall, there are **16** language families shared by all datasets (*Afro-Asiatic, Algic, Altaic, Australian, Austro-Asiatic, Austronesian, Cariban, Indo-European, Na-Dene, Niger-Congo, Nilo-Saharan, Oto-Manguean, Penutian, Sino-Tibetan, Uralic, Uto-Aztecan*).

41 language families appear in at least one dataset (sorted by the number of datasets and alphabetically by name):

Language family	Number of datasets	Datasets							
		WALS				Ethnologue			
		Binary		Polymorphic		Binary		Polymorphic	
B_M	B_B	P_M	p_B	B_M	B_B	P_M	p_B		
<i>Afro-Asiatic</i>	8	✓	✓	✓	✓	✓	✓	✓	✓
<i>Alaic</i>	8	✓	✓	✓	✓	✓	✓	✓	✓
<i>Altaic</i>	8	✓	✓	✓	✓	✓	✓	✓	✓
<i>Australian</i>	8	✓	✓	✓	✓	✓	✓	✓	✓
<i>Austro-Asiatic</i>	8	✓	✓	✓	✓	✓	✓	✓	✓
<i>Austronesian</i>	8	✓	✓	✓	✓	✓	✓	✓	✓
<i>Cariban</i>	8	✓	✓	✓	✓	✓	✓	✓	✓
<i>Indo-European</i>	8	✓	✓	✓	✓	✓	✓	✓	✓
<i>Na-Dene</i>	8	✓	✓	✓	✓	✓	✓	✓	✓
<i>Niger-Congo</i>	8	✓	✓	✓	✓	✓	✓	✓	✓
<i>Nilo-Saharan</i>	8	✓	✓	✓	✓	✓	✓	✓	✓
<i>Oto-Manguean</i>	8	✓	✓	✓	✓	✓	✓	✓	✓
<i>Penutian</i>	8	✓	✓	✓	✓	✓	✓	✓	✓
<i>Sino-Tibetan</i>	8	✓	✓	✓	✓	✓	✓	✓	✓
<i>Uralic</i>	8	✓	✓	✓	✓	✓	✓	✓	✓
<i>Uto-Aztecan</i>	8	✓	✓	✓	✓	✓	✓	✓	✓
<i>Arawakan</i>	7	✓	✓		✓	✓	✓	✓	✓
<i>Chibchan</i>	7	✓	✓		✓	✓	✓	✓	✓
<i>Dravidian</i>	7	✓	✓		✓	✓	✓	✓	✓
<i>Hokan</i>	7	✓	✓		✓	✓	✓	✓	✓
<i>Khoisan</i>	7	✓	✓		✓	✓	✓	✓	✓
<i>Trans-New Guinea</i>	6		✓	✓		✓	✓	✓	✓
<i>Macro-Ge</i>	5	✓			✓	✓	✓	✓	✓
<i>Tupian</i>	5		✓			✓	✓	✓	✓
<i>Nakh-Daghestanian</i>	4	✓	✓	✓	✓				
<i>North Caucasian</i>	4					✓	✓	✓	✓
<i>Salishan</i>	4	✓			✓	✓	✓		
<i>Sepik</i>	4	✓			✓	✓	✓		
<i>Tucanoan</i>	4		✓			✓	✓	✓	
<i>Aymaran</i>	3		✓				✓		✓
<i>Mayan</i>	3					✓	✓	✓	
<i>Wakashan</i>	3					✓	✓	✓	
<i>Chukotko-Kamchatkan</i>	2					✓	✓		
<i>Iroquoian</i>	2						✓	✓	
<i>Mataco-Guaicuru</i>	2						✓		✓
<i>Tai-Kadai</i>	2					✓	✓		
<i>West Papuan</i>	2					✓	✓		
<i>Eskimo-Aleut</i>	1								✓
<i>Tacanan</i>	1						✓		
<i>Yanomam</i>	1						✓		
<i>Yukaghir</i>	1						✓		

Results

This section displays the **Tables S1-S10** containing correlations, principal components analyses and rankings referred to in the main text.

Results using the binary coding

Correlations across datasets, principal components analysis and rankings of binary features.

Table S2. Binary coding: correlations between methods and datasets summarized using medians and means. Upper triangle: Pearson's r ; lower triangle: p -values.

			B_M				B_B			
			WALS		Ethnologue		WALS		Ethnologue	
			Median	Mean	Median	Mean	Median	Mean	Median	Mean
B_M	WALS	Median	-	0.98	0.81	0.76	0.82	0.79	0.78	0.78
		Mean	0	-	0.84	0.78	0.83	0.80	0.82	0.81
	Ethnologue	Median	0	0	-	0.96	0.77	0.75	0.78	0.77
		Mean	0	0	0	-	0.71	0.69	0.70	0.71
B_B	WALS	Median	0	0	0	$2.8 \cdot 10^{-14}$	-	0.97	0.67	0.65
		Mean	0	0	0	$2.1 \cdot 10^{-13}$	0	-	0.61	0.59
	Ethnologue	Median	0	0	0	$3.8 \cdot 10^{-14}$	$1.1 \cdot 10^{-12}$	$4.8 \cdot 10^{-10}$	-	0.97
		Mean	0	0	0	$1.7 \cdot 10^{-14}$	$1.5 \cdot 10^{-11}$	$2 \cdot 10^{-9}$	0	-

Table S3. Principal components analysis of binary ranks. PC_1 explains 81.4% of the variance, PC_2 , 10.7% and PC_3 , 3.8%.

			PC_1	PC_2	PC_3
B_M	WALS	Median	0.405	-0.035	0.600
		Mean	0.413	-0.003	0.482
	Ethnologue	Median	0.175	0.013	0.031
		Mean	0.244	0.015	0.113
B_B	WALS	Median	0.387	-0.448	-0.338
		Mean	0.373	-0.536	-0.316
	Ethnologue	Median	0.380	0.490	-0.329
		Mean	0.377	0.520	-0.267

Table S4. Ranking of binary features from the most stable to the most unstable, as given by their PC_1 scores.

Rank	Feature	PC_1 score
1	NumN1	-107.21
2	AbsComC	-106.55
3	AdjN1	-103.28
4	FrRoundV	-101.68
5	OV1	-101.84
6	GenN1	-92.01
7	OVApNP	-89.22
8	Tone2	-88.65
9	SV1	-89.17
10	IntPhCQ1	-86.85
11	Vowel2	-78.74
12	SV2	-69.15
13	UvulC	-68.03
14	SylStr2	-68.50
15	AdposNP	-64.67
16	Optative	-64.56
17	GenN2	-60.98
18	LatC	-57.03
19	DegWAdj1	-53.30
20	OccNPlu	-50.12

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Table S4 – Continued

Rank	Feature	PC ₁ score
21	OrdNum	-43.21
22	GlottC	-42.87
23	Tone1	-35.89
24	VnumSupp	-38.06
25	VoicPF2	-34.10
26	VpersM	-32.38
27	PresUnC	-30.34
28	OV2	-28.65
29	OVRelN	-25.18
30	NumN2	-30.62
31	DegWAdj2	-23.96
32	MorphImp	-23.10
33	VelarN	-20.70
34	ComInstr	-21.37
35	LmarkPNP	-17.26
36	VowelN	-23.01
37	SexGen	-16.43
38	VoicPF1	-16.94
39	AdjN2	-11.23
40	OlbPosInfl	-8.91
41	NumClas	-2.30
42	GenDIPersP	-8.95
43	Vowel1	1.23
44	SgenAss	0.91
45	NoGen	3.16
46	LmarkC	14.80
47	CaseS	11.92
48	IntPhCQ2	14.32
49	AntipassiveC	16.24
50	PastTense	21.26
51	PersMApos	18.44
52	SynVPNM	25.89
53	CVRatio1	23.46
54	OVAadjN	24.61
55	ESlflF	25.46
56	CVRatio2	28.81
57	SuppTasp	31.92
58	DistNum	31.46
59	PosClas	30.66
60	ConjUQu	40.90
61	PosProPAff	40.60
62	lflSVerb	44.77
63	NomVConj	47.40
64	PerflmpAsp	50.43
65	NounPConj	51.06
66	PolitDPron	54.63
67	SemDistEv	50.18
68	IntReflPron	54.26
69	SylStr1	58.36
70	Cons2	57.00
71	PersMV	61.17
72	FutTense	65.13
73	AsymCaseM	63.75
74	AssocPlu	67.56
75	Cons1	70.20
76	IndefArt	76.40
77	P3PrDem	77.04
78	OvSitEpi	79.16
79	PassiveC	79.84
80	DistCDem	84.08
81	Perfect	85.57
82	FixStress	82.63
83	DefArt	87.38
84	PolQPart	87.10
85	SymAsymStNeg1	90.82
86	SymAsymStNeg2	105.00

Results using the polymorphic coding

Correlations across datasets, principal components analysis and rankings of polymorphic features.

Table S5. Polymorphic coding: correlations between methods and datasets summarized using medians and means. Upper triangle: Pearson’s r ; lower triangle: p -values.

			P_M				P_B			
			WALS		Ethnologue		WALS		Ethnologue	
			Median	Mean	Median	Mean	Median	Mean	Median	Mean
P_M	WALS	Median	-	0.98	0.77	0.76	0.69	0.67	0.58	0.59
		Mean	0	-	0.80	0.81	0.72	0.71	0.58	0.59
	Ethnologue	Median	$1.8 \cdot 10^{-14}$	$2.2 \cdot 10^{-16}$	-	0.97	0.63	0.63	0.51	0.51
		Mean	$4.2 \cdot 10^{-14}$	0	0	-	0.66	0.66	0.54	0.54
P_B	WALS	Median	$8.7 \cdot 10^{-11}$	$5.7 \cdot 10^{-12}$	$7.1 \cdot 10^{-9}$	$8.9 \cdot 10^{-10}$	-	0.97	0.76	0.75
		Mean	$3.8 \cdot 10^{-10}$	$1.9 \cdot 10^{-11}$	$1.2 \cdot 10^{-8}$	$7.3 \cdot 10^{-10}$	0	-	0.75	0.74
	Ethnologue	Median	$2.6 \cdot 10^{-7}$	$2.3 \cdot 10^{-7}$	$1 \cdot 10^{-5}$	$1.8 \cdot 10^{-6}$	$6.7 \cdot 10^{-14}$	$3 \cdot 10^{-13}$	-	0.99
		Mean	$1.1 \cdot 10^{-7}$	$1.2 \cdot 10^{-7}$	$8.2 \cdot 10^{-6}$	$1.6 \cdot 10^{-6}$	$1.3 \cdot 10^{-13}$	$5 \cdot 10^{-13}$	0	-

Table S6. Principal components analysis of polymorphic ranks. PC_1 explains 76.1% of the variance, PC_2 , 13.3% and PC_3 , 6.5%.

			PC_1	PC_2	PC_3
P_M	WALS	Median	0.377	0.470	0.239
		Mean	0.384	0.472	0.157
	Ethnologue	Median	0.226	0.279	0.049
		Mean	0.171	0.182	0.022
P_B	WALS	Median	0.418	-0.134	-0.535
		Mean	0.412	-0.135	-0.572
	Ethnologue	Median	0.378	-0.461	0.375
		Mean	0.379	-0.445	0.402

Table S7. Ranking of polymorphic features from the most stable to the most unstable, as given by their PC_1 scores.

Rank	Feature	PC_1 score
1	AbsComC	-88.47
2	FrRoundV	-82.49
3	VowelN	-75.09
4	Optative	-74.75
5	UvulC	-67.85
6	OlbPosInfl	-64.71
7	NomLocPred	-59.97
8	Tone	-53.80
9	NMPron	-52.22
10	GenN	-43.34
11	ZeroCopPredNom	-41.88
12	NumClas	-41.00
13	AntipassiveC	-39.93
14	MTPron	-37.07
15	SV	-35.25
16	HandArm	-34.74
17	PosClas	-34.62
18	GlottC	-33.74
19	OV	-29.45
20	PredAdj	-28.80
21	NumN	-28.72
22	PassiveC	-27.65

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Table S7 – Continued

Rank	Feature	PC ₁ score
23	PerfImpAsp	-26.18
24	Redup	-24.63
25	VelarN	-21.00
26	PadDem	-19.35
27	SuppTAsp	-17.51
28	DegWAdj	-15.87
29	FufTense	-15.48
30	AdposNP	-14.05
31	NoGen	-11.89
32	PosProPAff	-10.87
33	VnumSupp	-10.21
34	AdjN	-6.42
35	Vowel	-6.41
36	GenDIPersP	-2.02
37	PastTense	0.10
38	LatC	0.14
39	IntPhCQ	3.41
40	NomVConj	3.55
41	WhenC	7.07
42	SemDistEv	12.44
43	OVApNP	17.20
44	SylStr	18.43
45	PersMAdpos	19.82
46	LmarkPNP	22.03
47	DistCDem	25.62
48	PolitDPron	27.92
49	SymAsymStNeg	32.02
50	OvSitEpi	32.19
51	ApplicativeC	37.12
52	OVRelN	37.43
53	VpersM	38.87
54	VoicPF	39.09
55	MorphImp	39.11
56	LmarkC	39.85
57	Perfect	48.11
58	PersMV	55.68
59	OVAAdjN	58.17
60	IndefArt	65.37
61	P3PrDem	68.16
62	DefArt	71.84
63	AsymCaseM	71.97
64	OrdNum	73.48
65	PolQPart	75.03
66	CVRatio	76.96
67	Ncases	78.86
68	Cons	80.40

Comparing and combining binary and polymorphic codings

Comparisons and combined results from binary and polymorphic codings.

Table S8. Correlations between methods and datasets summarized using medians and means across binary and polymorphic codings. Each cell contains the Pearson's r (bold) and the associated p -value.

		B_M				B_B				
		WALS		Ethnologue		WALS		Ethnologue		
		Median	Mean	Median	Mean	Median	Mean	Median	Mean	
P_M	WALS	Median	0.71 $2.9 \cdot 10^{-12}$	0.70 $6.8 \cdot 10^{-12}$	0.52 $3.8 \cdot 10^{-06}$	0.56 $4.3 \cdot 10^{-7}$	0.68 $9 \cdot 10^{-11}$	0.69 $3.5 \cdot 10^{-11}$	0.58 $1.3 \cdot 10^{-7}$	0.56 $3.1 \cdot 10^{-7}$
		Mean	0.72 $1.8 \cdot 10^{-12}$	0.71 $3.5 \cdot 10^{-12}$	0.53 $1.8 \cdot 10^{-6}$	0.58 $1.5 \cdot 10^{-7}$	0.68 $8.2 \cdot 10^{-11}$	0.69 $4.2 \cdot 10^{-11}$	0.6 $3.8 \cdot 10^{-8}$	0.58 $1.5 \cdot 10^{-7}$
	Ethnologue	Median	0.54 $9.2 \cdot 10^{-7}$	0.54 $9.1 \cdot 10^{-7}$	0.49 $1.5 \cdot 10^{-5}$	0.53 $2.3 \cdot 10^{-6}$	0.55 $5.6 \cdot 10^{-7}$	0.56 $3.5 \cdot 10^{-7}$	0.47 $2.9 \cdot 10^{-5}$	0.46 $5.3 \cdot 10^{-5}$
		Mean	0.54 $1.5 \cdot 10^{-6}$	0.54 $1.1 \cdot 10^{-6}$	0.49 $1.3 \cdot 10^{-5}$	0.53 $1.6 \cdot 10^{-6}$	0.52 $2.9 \cdot 10^{-6}$	0.53 $1.9 \cdot 10^{-6}$	0.46 $4.6 \cdot 10^{-5}$	0.44 0.00012
P_B	WALS	Median	0.35 0.0024	0.34 0.0037	0.3 0.011	0.3 0.0098	0.46 $6.3 \cdot 10^{-5}$	0.48 $2.3 \cdot 10^{-5}$	0.21 0.073	0.2 0.1
		Mean	0.39 0.00074	0.38 0.0013	0.32 0.0067	0.33 0.0054	0.49 $1.5 \cdot 10^{-5}$	0.52 $3.3 \cdot 10^{-6}$	0.21 0.081	0.18 0.14
	Ethnologue	Median	0.39 0.00085	0.39 0.00082	0.39 0.00066	0.39 0.00078	0.35 0.0026	0.35 0.0024	0.37 0.0017	0.34 0.0034
		Mean	0.39 0.00072	0.39 0.00082	0.39 0.00078	0.38 0.0011	0.35 0.0026	0.36 0.0024	0.37 0.0013	0.35 0.0025

Table S9. Principal components analysis of combined binary and polymorphic ranks. PC_1 explains 67.4% of the variance, PC_2 , 16.1% and PC_3 , 6.0%.

		PC_1		PC_2		PC_3	
B_M	WALS	Median	0.369	0.215	0.033		
		Mean	0.365	0.227	0.088		
	Ethnologue	Median	0.220	0.140	0.074		
		Mean	0.155	0.104	0.048		
0.348 B_B	WALS	Median	-0.427				
		Mean	0.344	0.117	-0.485		
	Ethnologue	Median	0.256	0.220	0.377		
		Mean	0.250	0.231	0.399		
P_M	WALS	Median	0.267	-0.220	-0.003		
		Mean	0.268	-0.215	0.009		
	Ethnologue	Median	0.152	-0.158	0.010		
		Mean	0.110	-0.128	0.025		
P_B	WALS	Median	0.165	-0.407	-0.157		
		Mean	0.168	-0.388	-0.207		
	Ethnologue	Median	0.168	-0.376	0.307		
		Mean	0.171	-0.378	0.319		

Table S10. Ranking of binary features from the most stable to the most unstable, as given by their composite (binary & polymorphic) PC_1 scores.

Rank	Feature	Category	PC_1 score	Avg. binary rank	Avg. polymorphic rank
1	AbsComC	Phonology	-132.4	5.8	3.3
2	FrRoundV	Phonology	-124.9	7.5	5.2
3	NumN1	Word Order	-103.0	5.7	25.6
4	OV1	Word Order	-97.6	7.5	25.3
5	Tone2	Phonology	-96.9	12.1	16.1
6	GenN1	Word Order	-96.7	11.0	19.4
7	SV1	Word Order	-91.1	12.2	22.3
8	Optative	Verbal Categories	-90.2	21.5	11.5
9	AdjN1	Word Order	-88.0	7.1	32.6

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Table S10 – Continued

Rank	Feature	Category	PC ₁ score	Avg. binary rank	Avg. polymorphic rank
10	UvulC	Phonology	-86.4	20.0	12.5
11	SV2	Word Order	-74.2	19.3	22.3
12	GenN2	Word Order	-69.3	22.2	19.4
13	IntPhCQ1	Word Order	-68.2	13.6	36.2
14	OVApNP	Word Order	-65.6	12.0	40.0
15	Vowel2	Phonology	-64.8	15.5	32.9
16	AdposNP	Word Order	-59.2	21.6	30.0
17	VowelN	Phonology	-56.8	37.2	10.1
18	Tone1	Phonology	-53.0	30.4	16.1
19	OlbPosInfl	Nominal Syntax	-51.1	37.0	12.8
20	DegWAdj1	Word Order	-51.0	25.5	29.5
21	GlottC	Phonology	-49.0	30.5	24.3
22	LatC	Phonology	-43.5	22.6	36.0
23	SylStr2	Phonology	-41.3	20.1	41.5
24	VnumSupp	Verbal Categories	-38.0	30.5	32.0
25	NumN2	Word Order	-37.4	34.9	25.6
26	OV2	Word Order	-34.6	34.1	25.3
27	DegWAdj2	Word Order	-29.2	34.5	29.5
28	VelarN	Phonology	-22.9	35.9	28.2
29	NumClas	Nominal Categories	-20.9	40.9	20.8
30	GenDIPersP	Nominal Categories	-10.9	41.8	33.0
31	AdjN2	Word Order	-8.4	39.8	32.6
32	VpersM	Simple Clauses	-6.6	31.5	48.5
33	LmarkPNP	Morphology	-5.4	34.7	43.2
34	AntipassiveC	Simple Clauses	-4.7	47.5	21.4
35	NoGen	Nominal Categories	-2.3	43.4	31.0
36	VoicPF2	Phonology	-1.2	30.6	48.5
37	PosClas	Nominal Syntax	0.6	51.9	24.0
38	OVRen	Word Order	2.7	34.9	48.3
39	OrdNum	Nominal Categories	4.1	28.3	60.6
40	MorphImp	Verbal Categories	4.1	35.8	48.8
41	Vowel1	Phonology	4.7	43.5	32.9
42	VoicPF1	Phonology	13.2	38.1	48.5
43	SuppTAsp	Verbal Categories	16.8	51.4	29.2
44	IntPhCQ2	Word Order	18.4	48.0	36.2
45	PastTense	Verbal Categories	19.4	49.3	35.9
46	PosProPAff	Nominal Categories	31.4	56.5	31.3
47	PersMAdpos	Nominal Categories	33.2	50.6	42.6
48	LmarkC	Morphology	35.2	45.2	49.7
49	PerfImpAsp	Verbal Categories	37.6	59.4	26.0
50	NomVConj	Nominal Syntax	39.1	56.4	37.0
51	FutTense	Verbal Categories	50.1	63.1	29.6
52	PassiveC	Simple Clauses	50.1	68.0	25.9
53	SemDistEv	Verbal Categories	54.5	60.3	39.6
54	OVAAdjN	Word Order	56.0	52.2	55.0
55	PolitDPron	Nominal Categories	64.5	59.3	45.2
56	SylStr1	Phonology	65.0	61.6	41.5
57	CVRatio1	Phonology	67.8	52.1	61.4
58	CVRatio2	Phonology	72.2	52.7	61.4
59	DistCDem	Nominal Categories	80.4	67.9	44.1
60	PersMV	Simple Clauses	81.1	62.5	53.8
61	OvSitEpi	Verbal Categories	83.1	67.0	45.5
62	AsymCaseM	Nominal Categories	85.0	61.4	60.2
63	SymAsymStNeg1	Simple Clauses	92.7	72.0	45.4
64	Perfect	Verbal Categories	92.7	68.8	50.1
65	Cons2	Phonology	94.3	62.2	63.6
66	P3PrDem	Nominal Categories	96.2	66.3	58.3
67	IndefArt	Nominal Categories	100.1	67.3	57.5
68	Cons1	Phonology	102.7	66.2	63.6
69	SymAsymStNeg2	Simple Clauses	103.1	75.9	45.4
70	DefArt	Nominal Categories	111.4	70.2	60.2
71	PolQPpart	Word Order	113.1	71.2	61.5

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