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Supporting Online Material for

Phonemic Diversity Supports Serial Founder Effect Model of Language Expansion from Africa

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This PDF file includes:

Methods
SOM Text
Figs. S1 to S8
Tables S1 to S4
References

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Table of Contents

1. Materials and Methods

1.1 Language Data 2

1.2 Modelling a serial founder effect 3

1.3 Alternatives to the single origin model 4

1.4 Accounting for non-independence within language families 5

1.5 Controlling for geographic variation in modern demography 6

1.6 Variation within and between language families 7

2. Supplementary Description and Discussion

1.1 Phonemic diversity and the serial founder effect 8

3. Supporting Figures 12

4. Supporting Tables 20

5. References 37

1. Materials and Methods

1.1 Language Data

Data on phoneme inventory size were taken from the *World Atlas of Language Structures* (WALS - available online at http://www.wals.info/) (*S1*-*S4*) together with information on each language's taxonomic affiliation (family, subfamily and genus) and geographic location (longitude and latitude). WALS contains information on three elements of phonemic diversity – vowel (*S2*), consonant (*S3*) and tone (*S4*) diversity – in a total of 567 languages. Due to uncertainty in ascertaining exact inventory counts across languages, the WALS data are binned into ranges for vowel (small [2-4], medium [5-6], large [7-14]), consonant (small [6-14], moderately small [15-18], average [19-25], moderately large [26-33], large [34+]) and tone (no tone, simple tone and complex tone) diversity. Uncertainty associated with these diversity assignments is only expected to weaken any clinal relationship with geography. WALS values for the three items were standardized (subtracting the mean value and then dividing the difference by the standard deviation) so that they were on comparable scales (mean = 0, standard deviation = 1). The standardized scores were then averaged to produce a measure of total phonemic diversity in each language (Table S1).

Since population demography is thought to affect phonemic diversity, WALS data were combined with estimates of speaker population size and geographic distribution as recorded in Ethnologue (*S5*), using ISO-639-3 reference codes listed for each language in the WALS dataset and checking references by hand. Language area (km^2) was calculated based on digitized language maps (available from Global Mapping International http://www.gmi.org) under a Robinson projection using the ArcGIS v9.1 software package. Population density was calculated as the number of speakers divided by language area. As population size, language area and population density were all positively skewed, $\log_{10}$ of these values was used as the predictor variable for the reported regressions.

Any language listed as a creole or sign language was excluded from analysis, as were all extinct languages (with population zero), leaving a total sample size of 504 languages (Table S1). Raising the population size threshold to exclude endangered languages with population sizes of less than 50 did not appreciably change the results presented in the paper.

1.2 Modelling a serial founder effect

A serial founder effect model of phonemic diversity was used to infer the most likely origin of modern languages, following an approach outlined in studies of human genetic and phenotypic diversity (*S6*). Under this model, during population expansion, small founder groups are expected to carry less phonemic diversity than their larger parent populations. A series of founder events should produce a gradient of decreasing phonemic diversity with increasing distance from the origin. Hence, the point of language origin is predicted to show the strongest negative correlation between phonemic diversity and distance from the origin. This approach does not attempt to infer particular phylogenetic relationships between languages, nor does it require that the probability of encountering a particular phoneme changes with distance from the origin (although it might), only that on average phonemic diversity in languages will decline.

A series of multiple regressions using distance from the origin to predict phonemic diversity were carried out in *R* (*S7*) for 2560 potential origin locations around the globe, corresponding to the locations of all the languages in the WALS database. This sampling strategy covers the entire range of human colonization, with the advantage that areas that were not colonized (e.g. oceans, deserts and the poles) are not sampled and resolution is higher in more heavily populated areas. Since $\log_{10}$ of population size was found to be an important predictor of phonemic diversity (*S8*), to control for regional variation in speaker population size, unless otherwise stated, log population size was also included as a predictor in the regressions reported.

Great circle distances (following the curvature of the earth) between the putative origins and each of the 504 languages for which there was phoneme information were calculated using the Haversine function (*S9*). So that the distances used more

accurately represented plausible migration scenarios (e.g. excluding the possibility of crossing the Indian Ocean or traversing the poles), any distances between continents were constrained to pass through a set of five key waypoints (*S10*), corresponding to approximate migration corridors between continents (Table S4; Figure S8).

To identify the set of putative origin locations that best fit the observed distribution of phonemic diversity under a serial founder effect model, model fit was evaluated using the Bayesian Information Criterion (BIC) (*S11*). Following the genetic studies (*S6*), models within four BIC units of the best fit model were taken to have "considerable support" (*S11*) and this threshold was used to infer the most likely region of language origin.

1.3 Alternatives to the single origin model

To investigate the possibility of multiple language origins, distance from a second origin location was added as a predictor to the model incorporating population size and distance from the best-fit origin in Africa. Any second language origin that has contributed significantly to extant phonemic diversity should produce a cline in residual phonemic diversity after correcting for population size and distance from the best-fit origin in Africa. As above, model fit was evaluated using BIC.

Even under language monogenesis, it is possible that the observed global cline in phonemic diversity is the result of expansions following the last glacial maximum (LGM) into northern Eurasia, the Americas and the remote Pacific, rather than a single expansion from Africa. To test this explanation, the 504 languages in the WALS sample were categorized according to whether they are located in areas likely to have been colonized (or recolonized) after the LGM. This included Eurasia north of 40 degrees latitude (*S12*), all of the Americas and all islands in the Pacific and Indian Ocean first settled during the Austronesian expansion (Table S1). These more recently colonized regions have lower average phonemic diversity than the rest of the world ($t=-6.597$, $df=503$, $p<0.001$). To test whether this can explain the global cline in phonemic diversity from Africa, colonization after the LGM was added as a binary factor to a regression incorporating population size and distance from Africa - only population size and distance from Africa were significant predictors ($r_{distance}=-0.401$,

$p<0.001$; $r_{population}=0.152$, $p=0.001$; $r_{LGM}=0.032$, $p=0.419$). Population size and distance from Africa are also significant predictors of phonemic diversity in a regression with areas colonized after the LGM excluded ($r_{distance}=-0.511$, $p<0.001$; $r_{population}=0.253$, $p<0.001$). Distance from Africa remains a significant predictor in the family level analysis ($r_{distance}=-0.328$, $p<0.028$) and hierarchical linear model ($\beta_{distance}=-3.872 - -2.525 \times 10^{-5}$ [95% HPD], $p<0.001$).

1.4 Accounting for non-independence within language families

Following studies examining the founder effect in human genetic and phenotypic diversity (*S6*), the initial analyses were carried out using linear regressions. However, like our genes, languages contain a legacy of their evolutionary past. Failure to allow for such phylogenetic non-independence can lead to overestimating degrees of freedom and an increase in type I errors (*S13*). The issue of non-independence between related languages was dealt with in three ways. First, analyses were repeated at the language family level, taking means of the variables of interest across all 50 families comprising more than one language (Table S2). For those variables that had been logged, the mean of the logged value was used. Distances were calculated from each putative origin to the centroid location of each language family. Model fit was evaluated using *BIC*. This approach reduces degrees of freedom by only considering variation between language families, weighting each language family equally.

Second, WALS classifies languages at three taxonomic levels – family, sub-family and genus. The effect sizes observed here on the global sample of languages mean we do not expect to reliably detect a serial founder effect separately within each of the language families in WALS. Instead, the initial individual language analyses were repeated on the full data set using a hierarchical linear regression framework to model dependencies at each taxonomic level. This approach applies a variance structure to the data that accounts for relatedness between languages at each level. Analyses were carried out in *R* (*S7*) using the *lmer* function in the *lme4* package (*S14*). P values and credibility intervals on model coefficients (β) were estimated using Markov Chain Monte Carlo sampling implemented in the *pvals.fnc* function as part of the *LanguageR* package (*S15*). Reported model fit was evaluated using BIC, although the

same results applied using residual maximum likelihood (REML) (*S16*). Models relating phonemic diversity to population size and distance from the best-fit origin in Africa (together and separately) were run with and without interaction effects across family groups. Adding an interaction effect did not significantly improve model fit as measured by BIC and REML, indicating that the patterns reported here reflect consistent trends within families that hold across the globe.

Finally, as in ref. (*S6*), the founder effect regressions were repeated with Mantel and partial Mantel tests, an approach to investigating correlations between distance matrices that uses a permutation test to avoid assumptions about the independence of data points and the statistical distributions underlying variables. Mantel tests were carried out on the full language dataset in *Arlequin 3.1* (*S17*), using differences in distance from the origin and log population size to predict differences in phonemic diversity. The results from the Mantel tests were in line with results obtained under the linear models and are reported in Table S3.

1.5 Controlling for modern demography

To control for possible geographic variation in demography, in addition to speaker population size, I examined the effect of three other demographic factors that could plausibly influence phonemic diversity - geographic area (km^2), population density (speaker population per km^2) and local language diversity (languages within a fixed radius). Geographic area and population density may influence the diversification of languages into dialect groups with different phoneme inventories. Population density may also be a proxy for effective population size – the number of speakers an individual actually comes into contact with. Local language density gives an indication of the number of other languages that speakers of the target language are exposed to and so may affect rates of borrowing of phonemes. Local language diversity was calculated based on the total number of languages listed within a 500km, 1000km, 2000km and 3000km radius of each of the 504 sampled languages. The number of languages within 1000km showed the strongest correlation with phonemic diversity and was used to generate the reported results.

First, all of the demographic variables were included in a regression predicting phonemic diversity together with speaker population size and distance from the best-fit origin in Africa. Second, a combination of forwards and backwards stepwise regression based on BIC, as implemented in the *step* function in *R* (*S7*), was used to identify the key predictors of phoneme inventory size at the individual language and language-family levels. At the individual language level, the best model includes distance from Africa ($r_{distance}$=-0.429, p<0.001), log of population size ($r_{population}$=0.181, p<0.001) and geographic area (r_{area}=-0.107, p=0.016). At the family level, the best model includes distance from Africa ($r_{distance}$=-0.401, p<0.001) and log of population size ($r_{population}$=0.300, p<0.036).

1.6 Variation in phonemic diversity within and between language families

Claims about the deep history of human language are frequently criticized because languages are thought to change too rapidly and too unpredictably to allow ancestral inferences beyond ~10kya (*S18*). However, recent work has shown that elements of language, such as commonly used words (*S19*) and some phonemes (*S20*) can be highly stable, some persisting for tens of millennia (*S19*). Variation in phoneme inventory size within versus between families gives insight into rates of change in phonemic diversity through time. If phonemic diversity were highly unstable, variation within families should be high, and language family should explain little or none of the variance in phonemic diversity around the globe. Conversely, relative stability should preserve phoneme inventory size across a family, making language family a good predictor of phonemic diversity globally. In a general linear model, language family as a factor explains 50% of the variance in phonemic diversity (adjusted r-squared=0.502, df=49, p<0.001) and 48% of the variance in phonemic diversity across the largest 10 families (adjusted r-squared=0.476, df=9, p<0.001). This level of conservation within major language families indicates that robust statistical patterns in global phonemic diversity can persist for many millennia and could plausibly reflect a time scale on the order of the African exodus.

2. Supplementary Description and Discussion

2.1 Phonemic diversity and the serial founder effect

We expect the number of phonemes present in a language today to reflect past phoneme inventory size, combined with complex group dynamic processes driving relative rates of merging, splitting and borrowing of phonemes (*S21- S24*). Many factors are likely to influence the rates at which these processes occur (*S23, S24*), and their relative rates will determine the trajectory of phonemic diversity in a language through time.

In population genetics, the founder effect describes the loss of genetic diversity that occurs when a small group breaks off from a larger parent population to found a new population. This occurs when variants from the parent population are not passed on to the new descendent population or are lost during the subsequent population bottleneck due to high rates of drift. Following a bottleneck, genetic diversity will increase again as mutation and migration introduce new variants into the growing population. The same scenario can apply to phonemic diversity if founder populations sometimes sample only a subset of phonemes from the parent population (e.g., from a dialect of the parent language) or are likely to lose phonemes during the subsequent population bottleneck. Splitting and borrowing may still generate new phonemes, but as in the genetic case, the balance will have been temporarily shifted toward diversity loss.

The loss of phonemic diversity following a population bottleneck is predicted under a range of cultural transmission models (*S21, S25- S29*). This effect is expected to operate on top of any immediate reduction of phonemic diversity due to sampling only part of the dialect variation from the parent population. For example, Henrich (*S25*) uses the Price equation (*S30, S31*) and social learning literature to derive a model of cultural transmission in which learners preferentially copy cultural variants from the most prestigious or skilful individuals. When copying is highly accurate this will produce an ever-increasing cultural repertoire. However, if copying involves error, such that some elements are lost in transmission between individuals, then, across a range of parameter values, smaller groups tend to have fewer cultural variants. Although applied in the context of the cumulative evolution of material

culture, Henrich makes explicit the model's relevance to the evolution of other socially transmitted traits, including phonemes - where individuals copy phoneme distinctions made by the most proficient speakers (with some loss), small population size will reduce phoneme diversity. De Boer (*S26, S27*) models the evolution of vowel inventories using a different approach, in which individuals copy any members of their group with some error, and finds the same population size effect. A linguistic founder effect also emerges naturally from recent Darwinian approaches to language change, which treat phonemic variants like competing alleles in a population of utterances (*S21, S29*). Communication constraints may play an additional role. Increased shared information in small close-knit communities is thought to increase the tolerance for reduced contrastive possibilities associated with smaller phoneme inventories (*S28*). Simulations of language evolution also predict that rates of change will be faster in small populations, slowing as populations grow (*S32*), which may act to preserve the effects of any historical bottlenecks[1].

The analyses presented here (Fig. S1) and previous research using a different data set and coding scheme (*S8*) confirm that languages with smaller speaker populations do indeed have smaller phoneme inventories, consistent with a linguistic founder effect. Empirical findings now also support the existence of a cultural founder effect in modern human material culture (*S25, S33*), Acheulean handaxes (*S34*), Polynesian canoe designs (*S35*) and chaffinch song (*S36*). Recent phylogenetic evidence suggests a linguistic founder effect has operated to produce punctuated bursts of evolution during the formation of new languages (*S37*).

One prediction that arises if phoneme distinctions are more likely to be lost in small founder populations is that a succession of founder events during range expansion should produce a progressive reduction in phonemic diversity with increasing distance from the point of origin, paralleling the serial founder effect in population genetics (*S38*). Under this model, populations at the periphery of an expansion into new territory will have undergone more founder events more recently and over greater distances than populations nearer the origin. Over the course of an expansion,

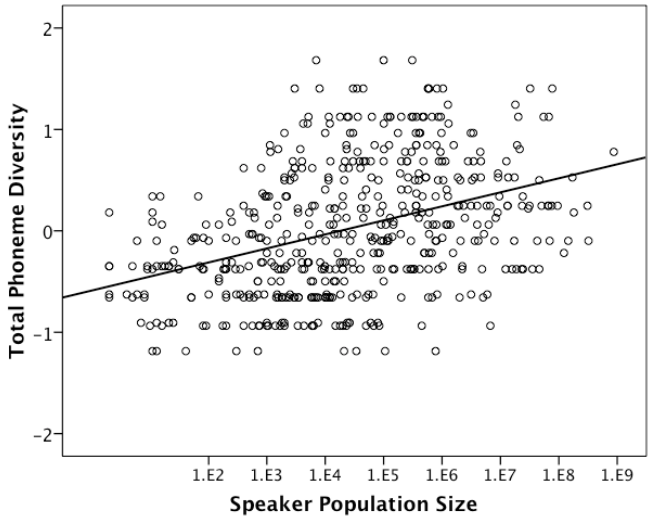
[1] Note that faster rates of change in small populations do not entail greater within-population phonemic diversity. Whilst new distinctions can spread to fixation more quickly in small populations, existing distinctions are more easily lost.

peripheral languages will therefore have experienced an increased likelihood of phoneme loss compared to their relatives nearer the origin. Later localized population movements after the initial expansion could also influence patterns of diversity. Whilst this may add noise to the data, as in the genetic case, populations at the periphery are still expected to carry the legacy of more founder events and hence have fewer phonemes. The impact of more recent founder events on any global trend is limited by the smaller distances involved and the potential to borrow phonemes when moving into already colonized areas (the linguistic analogue to gene flow). By contrast, on a global scale, contact-induced borrowing following expansion may help to maintain a cline, since neighbouring populations at similar points in the expansion (e.g., in Africa versus in Australia) are more likely to encounter similar phonemes and levels of diversity. As with the human genetic and phenotypic data, despite more recent population movements, we therefore expect a large-scale expansion from a single origin to generate a global cline in phonemic diversity, decreasing with increasing distance from the origin.

The serial founder effect model of human genetic and phenotypic diversity has been an important line of evidence supporting a primary African origin to modern humans (*S6, S38- S42*). Here I use the same approach to examine the fit of a serial founder effect model to global variation in phonemic diversity, searching the globe for the putative origin location that produces the strongest relationship between phoneme inventory size and geographic distance. This approach does not assume any particular origin location or any clinal patterning in phonemic diversity. Rather, model support at each origin location is evaluated against support for all other putative origin locations and against the null hypothesis that there is no relationship between phonemic diversity and distance from the origin. No clear relationship between the number of phonemes in a language and geography would suggest either that modern languages are the result of polygenesis (many independent language lineage origins) or that any possible founder effect is too weak to produce a detectable expansion signal in the data. Alternatively, an appreciable linguistic founder effect operating over the course of a major expansion of languages is expected to produce a geographic cline in phonemic diversity, decreasing from the point of language origin.

It is worth noting that fitting a serial founder effect model to phoneme inventory data describes an inherently stochastic (probabilistic) process and does not entail that phonemic diversity is entirely determined by population size via a serial founder effect. Distance from the best-fit origin in Africa and population size are shown to be significant predictors of phonemic diversity, explaining approximately 30% of global variation, but other socio-linguistic processes (*S23, S24*) and more recent population movements clearly also play a role. Neither of these factors are expected to systematically bias results to produce the observed global cline in phonemic diversity.

A



B

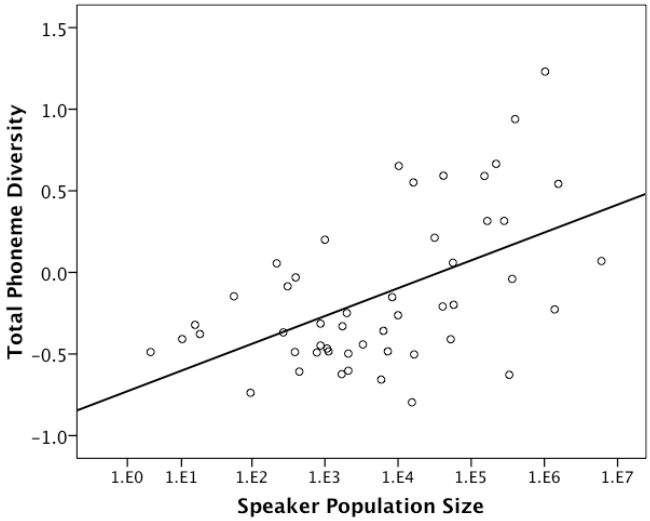


Fig. S1. Relationship between log population size and phonemic diversity. (**A**) plot of log speaker population size against total phonemic diversity in 504 languages sampled from WALS, showing fitted regression line (linear regression - r=0.385, df=503, p<0.001; hierarchical linear model β=0.0338-0.0985 [95% HPD], p=0.009). The same relationship holds when the analysis is restricted to languages with speaker populations of 5000 or less, a range in line with speaker populations of modern hunter-gatherers (*S5*) and likely to have characterised much of human prehistory (linear regression - r=-0.250, n=172, p<0.001; hierarchical linear model β=0.0312-0.1969 [95% HPD], p=0.025). (**B**) plot of mean log population size against mean total phonemic diversity for 50 language families with N>1, showing fitted regression line (r=0.468, df=49, p<0.001).

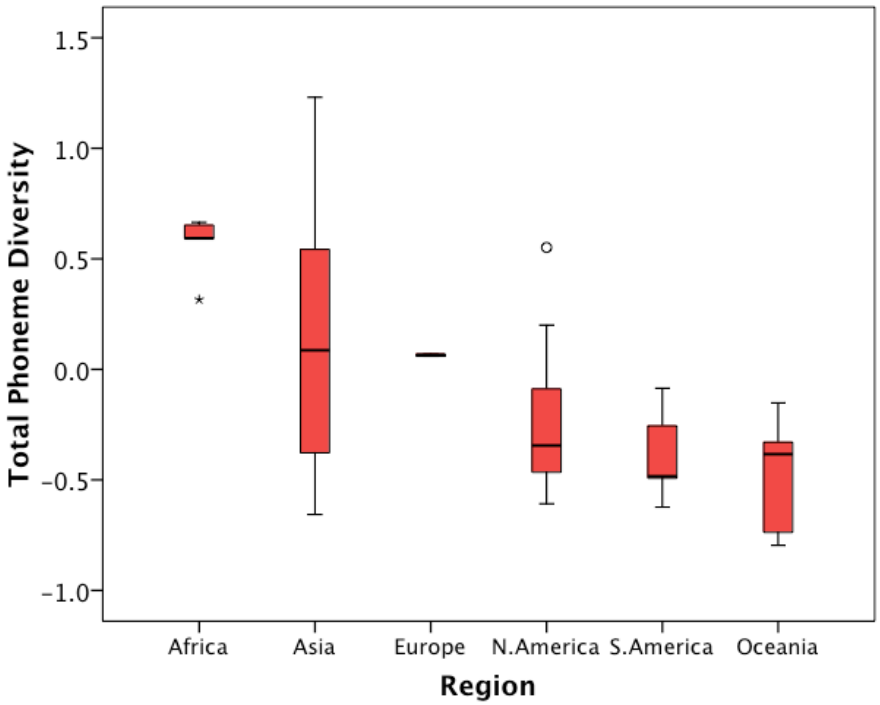


Fig. S2. Boxplot of language family mean phonemic diversity. Consistent with the individual-level plot (Fig. 1B), regions show substantial variation in phonemic diversity (χ^2=18.8, df=5, p=0.002), with the highest diversity in Africa and lowest diversity in Oceania and South America.

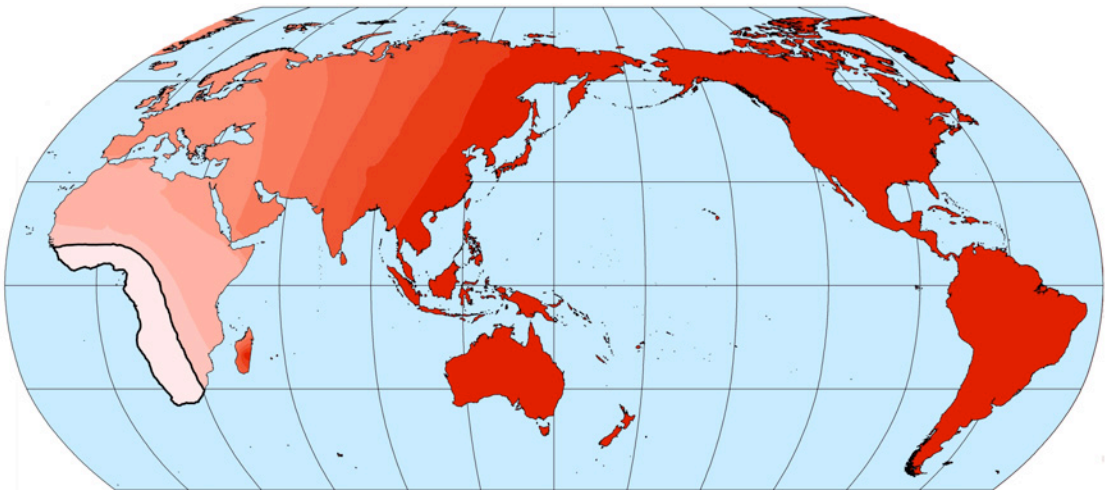


Fig. S3. Likely area of language origin under a founder effect model of phonemic diversity without controlling for population size, inferred from individual languages. Lighter shading implies a stronger inverse relationship between phonemic diversity and distance from the origin and better fit of the model, as measured by Bayesian Information Criterion (BIC). The most likely region of origin, comprising those locations within four BIC units of the best-fit origin location, is the area of lightest shading outlined in bold.

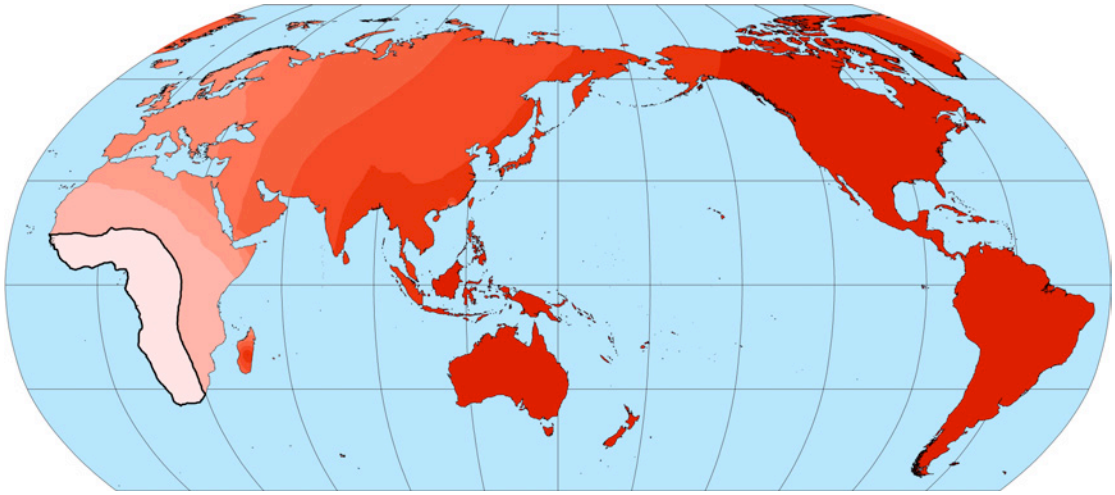


Fig. S4. Likely area of language origin under a founder effect model of phonemic diversity controlling for population size, inferred from individual languages using a hierarchical linear model that accounts for dependencies at the family, subfamily and genus levels. Lighter shading implies a stronger inverse relationship between phonemic diversity and distance from the origin and better fit of the model, as measured by Bayesian Information Criterion (BIC). The most likely region of origin, comprising those locations within four BIC units of the best-fit origin location, is the area of lightest shading outlined in bold. The effect of distance from origin in the best-fit model remains highly significant (β=-3.94 – -1.94 x 10^{-5} [95% HPD], p=<0.001).

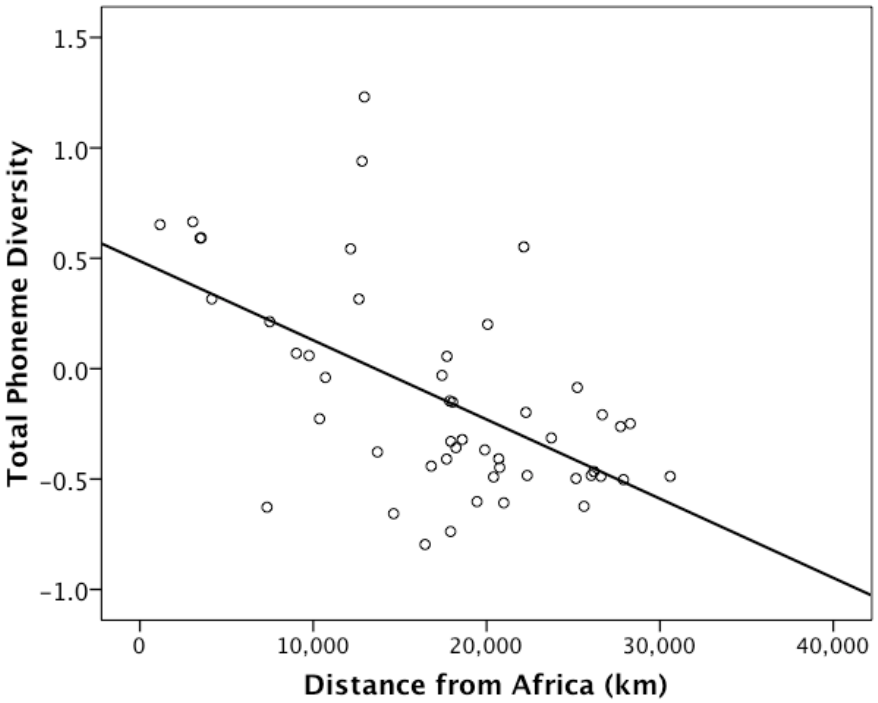


Fig. S5. Plot of distance from the best fit origin in Africa to the centroid location of each language family with N>1 against mean language family phonemic diversity. Distance from Africa alone explains 33.3% of the variation in phonemic diversity (fitted line; r=0.577, n=50, p<0.001) and 16.1% of the variation after controlling for modern speaker population size ($r_{distance}$=-0.401, n=50, p=0.004; $r_{population}$=0.300, n=50, p<0.001; R=0.627, $F_{2,49}$=15.190, p<0.001).

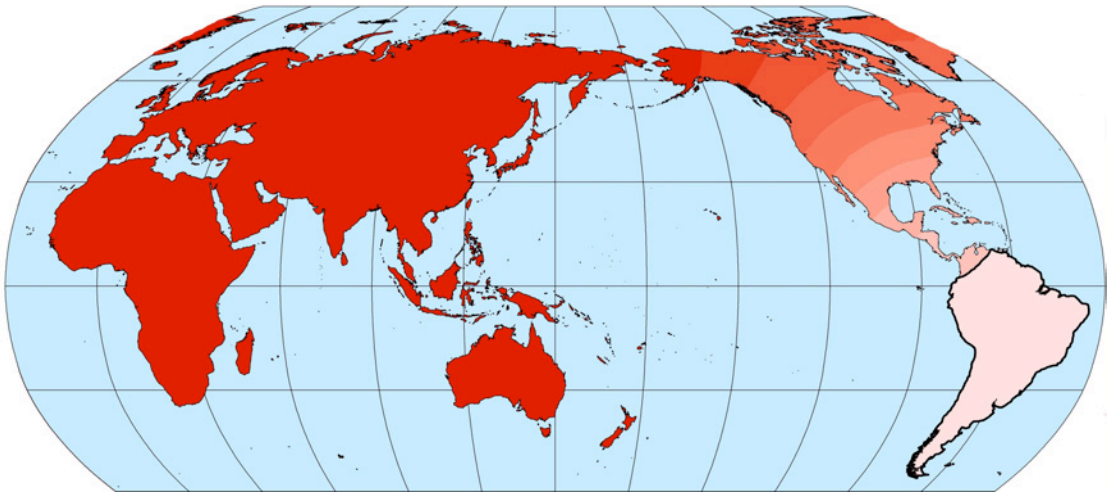


Fig. S6. The region of best fit for a founder effect model allowing a second origin location, after removing those cases where distance from the second origin and phonemic diversity are not inversely correlated. Lighter shading implies a better fit of the model, as measured by BIC, assuming an inverse linear relationship between phonemic diversity and distance from the secondary origin. The overall set of best-fit locations do not yield a significant inverse relationship between distance from the secondary origin and phonemic diversity after controlling for population size and distance from Africa. The language-family and hierarchical linear models showed no support for a secondary origin location – adding a second origin did not improve the fit of either model as measured by BIC and all putative second origin locations were within four BIC units.

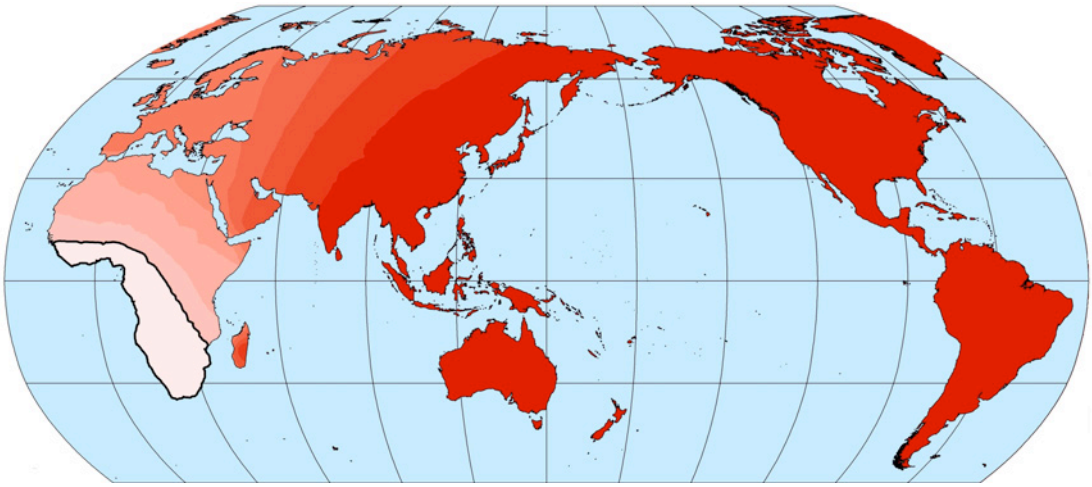


Fig. S7. Likely area of language origin under a founder effect model of phonemic diversity, controlling for population size, population density, language area and local language diversity (number of other languages within 1000km). Lighter shading implies a better fit of the model, as measured by BIC. The most likely region of origin, comprising those locations within four BIC units of the best-fit origin location, is the area of lightest shading outlined in bold.

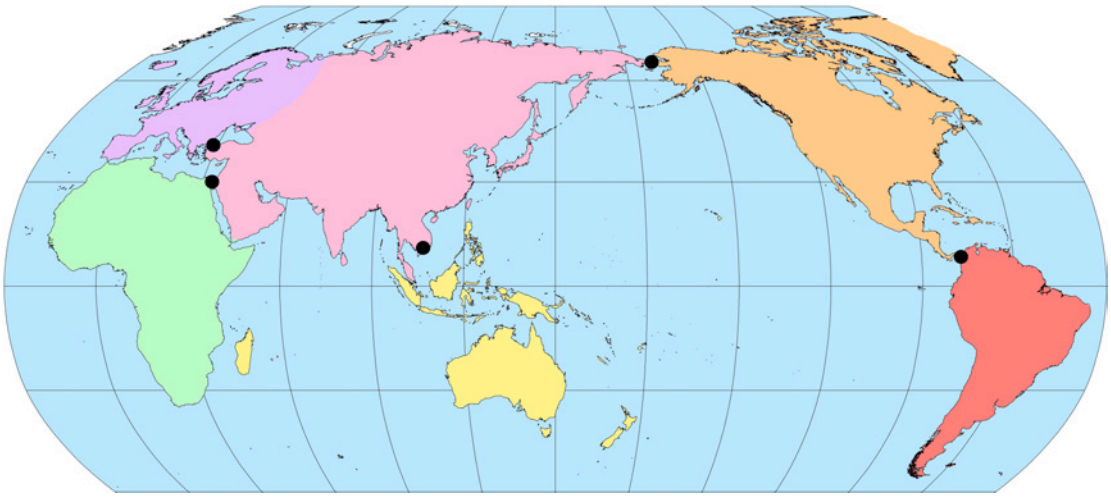


Fig. S8. World map showing location of waypoints used in distance calculations. Great circle distances between points on different continents (coloured) were constrained to pass through five key waypoints so that distance measures more accurately reflected plausible migration scenarios.

Supplementary Information for Atkinson, Q. D. (In prep) Phonemic diversity supports serial founder effect model of language spread from Africa.

Supplementary Table S1 - Data table for sample of 504 languages from the World Atlas of Langauge Structures (WALS; http://wals.info/) showing family affiliation, location, vowel*, consonant† and tone‡ diversity, total phoneme diversity and population size§.

* Normalized vowel diversity based on WALS feature #2 "Vowel Quality Inventories"

† Normalized consonant diversity based on WALS feature #1 "Consonant Inventories"

‡ Normalized tone diversity based on WALS feature #13 "Tone"

§Population size information was taken from - Gordon, Raymond G., Jr. (ed.), Ethnologue: Languages of the World, Fifteenth edition. Dallas, Tex.: SIL International. Online version: http://www.ethnologue.com/ (2005).

Language Name	WALS code	Family	Latitude	Longitude	Normalized Vowel Diversity*	Normalized Consonant Diversity†	Normalized Tone Diversity‡	Total Normalized Phoneme Diversity	ISO codes	Estimated Speaker Pop. Size§	Distance from best fit origin
Abkhaz	abk	Northwest Caucasian	43.08	41	-1.2345266	-1.5544112	-0.7687792	-1.185905651	abk	105952	5856.362
Acoma	aco	Keresan	34.92	-107.58	-0.4846364	-0.7169629	1.86204304	0.220147906	kjq	3391	18601.19
Andoke	adk	Andoke	-0.67	-72	1.3900889	-1.5544112	0.54663194	0.127436542	ano	619	23780.16
Aleut (Eastern)	aea	Eskimo-Aleut	54.75	-164	-1.2345266	0.9579338	-0.7687792	-0.348457316	ale	490	14629.42
Arabic (Egyptian)	aeg	Afro-Asiatic	30	31	-0.4846364	0.12048546	-0.7687792	-0.377643382	arz	46321000	4153.443
Aghem	agh	Niger-Congo	6.67	10	1.3900889	0.9579338	0.54663194	0.964884878	agq	26727	881.8563
Ahtna	aht	Na-Dene	62	-145	-0.4846364	-1.5544112	-0.7687792	-0.935942272	aht	80	14623.91
Aikan?°	aik	Arawakan	-12.67	-60.67	-0.4846364	0.12048546	0.54663194	0.060826985	tba	90	25594.8
Ainu	ain	Ainu	43	143	-0.4846364	0.12048546	0.54663194	0.060826985	ain	15	13493.04
Akan	akn	Niger-Congo	6.5	-1.25	1.3900889	-1.5544112	0.54663194	0.127436542	aka	8300000	1470.907
Akawaio	akw	Cariban	6	-59.5	1.3900889	-1.5544112	-0.7687792	-0.311033824	ake	5000	24637.7
Alamblak	ala	Sepik	-4.67	143.33	1.3900889	0.12048546	-0.7687792	0.247265066	amp	1527	16591.58
Albanian	alb	Indo-European	41	20	1.3900889	0.12048546	-0.7687792	0.247265066	aln als	5823075	6143.505
Alladian	ald	Niger-Congo	5.17	-4.33	1.3900889	-1.5544112	0.54663194	0.127436542	ald	23000	1692.825
Alawa	alw	Australian	-15.17	134.25	-1.2345266	0.9579338	-0.7687792	-0.348457316	alh	17	16364.65
Amele	ame	Trans-New Guinea	-5.25	145.58	-0.4846364	1.79538213	-0.7687792	0.180655509	aey	5300	16846.07
Amharic	amh	Afro-Asiatic	10	38	1.3900889	0.9579338	-0.7687792	0.526414511	amh	17417913	3391.289
Amo	amo	Niger-Congo	10.33	8.67	1.3900889	0.12048546	0.54663194	0.685735432	amo	12263	1290.098
Arrernte (Mparntwe)	amp	Australian	-24	136	-1.2345266	0.9579338	-0.7687792	-0.348457316	aer	2175	17174.91
Amuesha	amu	Arawakan	-10.5	-75.42	-1.2345266	0.9579338	-0.7687792	-0.348457316	ame	9831	24708.83
Amuzgo	amz	Oto-Manguean	16.83	-98	1.3900889	-0.7169629	1.86204304	0.845056353	amu	23000	20824.28
Araona	ana	Tacanan	-12.33	-67.75	-1.2345266	1.79538213	-0.7687792	-0.06930787	aro	81	25142.92
Angas	anc	Afro-Asiatic	9.5	9.5	1.3900889	-1.5544112	1.86204304	0.565906908	anc	400000	1194.595
//Ani	ani	Khoisan	-18.92	21.92	-0.4846364	-0.7169629	0.54663194	-0.218322461	hnh	1000	2384.497
Angaatiha	ant	Trans-New Guinea	-7.22	146.25	-0.4846364	0.9579338	0.54663194	0.33997643	agm	2100	17001.11
Ao	ao	Sino-Tibetan	26.58	94.67	-0.4846364	-1.5544112	1.86204304	-0.05900154	njo	141000	10314.41

Apinay?©	api	Macro-Ge	-5.5	-48	1.3900889	-1.5544112	-0.7687792	-0.311033824	apn	800	26237.66
Apurin?£	apu	Arawakan	-9	-67	-0.4846364	-1.5544112	-0.7687792	-0.935942272	apu	2000	24858.32
Arabela	arb	Zaparoan	-2	-75.17	-0.4846364	0.9579338	-0.7687792	-0.098493936	arl	50	23781.04
Archi	arc	Nakh-Daghestanian	42	46.83	-0.4846364	0.9579338	-0.7687792	-0.098493936	aqc	1000	6097.646
Armenian (Eastern)	arm	Indo-European	40	45	-0.4846364	-1.5544112	-0.7687792	-0.935942272	hye	6723840	5840.478
Arapesh	arp	Torricelli	-3.47	143.17	1.3900889	-0.7169629	-0.7687792	-0.031884379	aon ape	20865	16523.81
Asmat	asm	Trans-New Guinea	-5.5	138.5	-0.4846364	0.12048546	-0.7687792	-0.377643382	tml	290	16146.7
Atayal	ata	Austronesian	24.5	121.33	-0.4846364	-1.5544112	-0.7687792	-0.935942272	tay	84330	12854.41
Avar	ava	Nakh-Daghestanian	42.5	46.5	-0.4846364	1.79538213	-0.7687792	0.180655509	ava	600959	6111.7
Awngi	awn	Afro-Asiatic	10.83	36.67	1.3900889	0.9579338	0.54663194	0.964884878	awn	356980	3289.198
Awa Pit	awp	Barbacoan	1.5	-78.25	-1.2345266	-1.5544112	-0.7687792	-1.185905651	kwi	21000	23367.25
Aymara	aym	Aymaran	-17	-69	-1.2345266	0.9579338	-0.7687792	-0.348457316	ayc ayr	2227642	25571.11
Azerbaijani	aze	Altaic	40.5	48.5	1.3900889	0.12048546	-0.7687792	0.247265066	azb azj	31423529	6117.956
Bagirmi	bag	Nilo-Saharan	11.67	16	1.3900889	0.9579338	1.86204304	1.403355244	bmi	44761	1605.154
Bai	bai	Sino-Tibetan	26	100	1.3900889	-0.7169629	1.86204304	0.845056353	bca	800000	10834.68
Bajau	baj	Austronesian	-4.33	123	-0.4846364	0.9579338	-0.7687792	-0.098493936	bdl	90000	14645.09
Bambara	bam	Niger-Congo	12.5	-7.5	1.3900889	0.12048546	0.54663194	0.685735432	bam	2786385	2418.978
Bawm	baw	Sino-Tibetan	22.5	92.25	-0.4846364	0.12048546	0.54663194	0.060826985	bgr	13793	10245.05
Bobo Fing	bbf	Niger-Congo	11.83	-4.42	1.3900889	0.12048546	1.86204304	1.124205799	bbo bwq	365091	2115.293
Bella Coola	bco	Salishan	52.5	-126.67	-1.2345266	0.9579338	-0.7687792	-0.348457316	blc	20	16137.59
Beembe	bee	Niger-Congo	-3.92	14.08	-0.4846364	-0.7169629	0.54663194	-0.218322461	beq	3200	588.6359
Beja	bej	Afro-Asiatic	18	36	-0.4846364	0.12048546	0.54663194	0.060826985	bej	1178000	3602.099
Bengali	ben	Indo-European	24	90	1.3900889	0.9579338	-0.7687792	0.526414511	ben	171070202	9970.793
Berta	ber	Nilo-Saharan	10.33	34.67	-0.4846364	0.12048546	0.54663194	0.060826985	wti	146799	3066.326
B?©t?©	bet	Niger-Congo	6.25	-6.25	1.3900889	0.12048546	1.86204304	1.124205799	bev	130000	1935.879
Birom	bir	Niger-Congo	9.67	8.83	1.3900889	0.12048546	1.86204304	1.124205799	bom	300000	1215.749
Bisa	bis	Niger-Congo	11.5	-0.5	-0.4846364	-0.7169629	-0.7687792	-0.656792827	bib	581900	1796.459
Bakair??	bki	Cariban	-14	-55	1.3900889	-0.7169629	-0.7687792	-0.031884379	bkq	570	26123.49
Batak (Karo)	bkr	Austronesian	3.25	98.25	1.3900889	-0.7169629	-0.7687792	-0.031884379	btx	600000	11791.44
Berber (Middle Atlas)	bma	Afro-Asiatic	33	-5	-1.2345266	0.12048546	-0.7687792	-0.627606761	tzm	3150000	4098.419
Baining	bng	Baining-Taulil	-4.58	152	-0.4846364	-1.5544112	-0.7687792	-0.935942272	byx	6350	17483.1
Barasano (Northern)	bno	Tucanoan	0.33	-70.25	-0.4846364	-1.5544112	0.54663194	-0.497471906	bao	700	23811.14
Bodo	bod	Sino-Tibetan	26.83	92	-0.4846364	-0.7169629	0.54663194	-0.218322461	brx	603301	10054.89
Bariba	brb	Niger-Congo	10	2.5	1.3900889	-0.7169629	1.86204304	0.845056353	bba	560000	1470.541
Bardi	brd	Australian	-16.58	122.92	-1.2345266	-0.7169629	-0.7687792	-0.906756206	bcj	20	15678.92
Breton	bre	Indo-European	48	-3	1.3900889	0.9579338	-0.7687792	0.526414511	bre	532722	8020.355
Brahui	brh	Dravidian	28.5	67	-0.4846364	0.12048546	-0.7687792	-0.377643382	brh	2210000	7633.551
Burmese	brm	Sino-Tibetan	21	96	1.3900889	0.9579338	1.86204304	1.403355244	mya	32301581	10666.4
Bororo	brr	Macro-Ge	-16	-57	1.3900889	-1.5544112	-0.7687792	-0.311033824	bor	850	26133.02
Bru (Western)	brw	Austro-Asiatic	16.75	104.75	1.3900889	0.12048546	-0.7687792	0.247265066	brv	20000	11699.31
Bashkir	bsk	Altaic	53	58	1.3900889	0.9579338	-0.7687792	0.526414511	bak	1871383	7516.704
Basque	bsq	Basque	43	-3	-0.4846364	0.12048546	-0.7687792	-0.377643382	eus	588108	8024.965
Batak (Toba)	bto	Austronesian	2.5	99	-0.4846364	-0.7169629	-0.7687792	-0.656792827	bbc	2000000	11905.76

Burarra	bua	Australian	-12.25	134.58	-0.4846364	-0.7169629	-0.7687792	-0.656792827	bvr	400	16186.07
Bulgarian	bul	Indo-European	42.5	25	-0.4846364	1.79538213	-0.7687792	0.180655509	bul	8954811	5760.137
Burushaski	bur	Burushaski	36.5	74.5	-0.4846364	1.79538213	-0.7687792	0.180655509	bsk	87049	8225.202
Bandjalang (Yugumbir)	byu	Australian	-27.92	153	-1.2345266	-1.5544112	-0.7687792	-1.185905651	bdy	10	18758.94
Cacua	cac	Cacua-Nukak	1.08	-70	-0.4846364	-1.5544112	0.54663194	-0.497471906	cbv	150	23771.88
Caddo	cad	Caddoan	33.33	-93.5	-1.2345266	0.12048546	0.54663194	-0.189136395	cad	25	19389.69
Cahuilla	cah	Uto-Aztecan	33.5	-116.25	-1.2345266	0.12048546	-0.7687792	-0.627606761	chl	7	18359.56
Cams?°	cam	Cams?°	1.17	-77	-0.4846364	0.12048546	-0.7687792	-0.377643382	kbh	4022	23401.18
Carib	car	Cariban	5.5	-56	-0.4846364	-0.7169629	-0.7687792	-0.656792827	car	10226	25028.63
Campa (Axininca)	cax	Arawakan	-12	-74	-1.2345266	-0.7169629	-0.7687792	-0.906756206	cni	23750	24896.08
Chickasaw	cck	Muskogean	34	-88	-1.2345266	-0.7169629	-0.7687792	-0.906756206	cic	1000	19571.84
Cocopa	ccp	Hokan	32.33	-115	-1.2345266	0.12048546	-0.7687792	-0.627606761	coc	350	18528.64
Chamorro	cha	Austronesian	13.45	144.75	-0.4846364	0.12048546	-0.7687792	-0.377643382	cha	76705	16303.07
Cherokee	che	Iroquoian	35.5	-83.5	-0.4846364	-1.5544112	0.54663194	-0.497471906	chr	15000	19625.88
Chukchi	chk	Chukotko-Kamchatkan	67	-173	-0.4846364	-0.7169629	-0.7687792	-0.656792827	ckt	10000	13188.8
Chipewyan	chp	Na-Dene	59	-106	-0.4846364	1.79538213	0.54663194	0.619125875	chp	4000	16557
Chinantec (Quiotepec)	chq	Oto-Manguean	17.58	-96.67	1.3900889	0.9579338	1.86204304	1.403355244	chq	8000	20808.09
Chulup??	chu	Matacoan	-23.5	-60.5	-1.2345266	0.12048546	-0.7687792	-0.627606761	cag	18200	26597.79
Chuvash	chv	Altaic	55.5	47.5	1.3900889	0.12048546	-0.7687792	0.247265066	chv	1834394	7272.561
Cham (Western)	chw	Austronesian	12	105.5	1.3900889	0.12048546	0.54663194	0.685735432	cja	253100	12011.21
CiLuba	cil	Niger-Congo	-6	22	-0.4846364	0.12048546	0.54663194	0.060826985	lua	6300000	1482.99
Canela-Krah?¥	ckr	Macro-Ge	-6	-45	1.3900889	-1.5544112	-0.7687792	-0.311033824	ram xra	2620	26563.74
Chinantec (Lealao)	cle	Oto-Manguean	17.33	-95.92	-0.4846364	0.12048546	1.86204304	0.499297351	cle	2000	20866.87
Comanche	cmn	Uto-Aztecan	33.5	-101.5	-0.4846364	-1.5544112	-0.7687792	-0.935942272	com	200	19011.85
Cantonese	cnt	Sino-Tibetan	23	113	1.3900889	0.12048546	1.86204304	1.124205799	yue	54810598	12172.55
Coos (Hanis)	coo	Oregon Coast	43.5	-124.17	-0.4846364	1.79538213	-0.7687792	0.180655509	csz	1	17054.48
Cree (Plains)	cre	Algic	54	-110	-1.2345266	-1.5544112	-0.7687792	-1.185905651	crk	34100	16764.96
Chatino (Sierra Occidental	cso	Oto-Manguean	16.25	-97.33	-0.4846364	-0.7169629	1.86204304	0.220147906	ctp	12000	20912.69
Chin (Tiddim)	cti	Sino-Tibetan	23.33	93.67	-0.4846364	0.12048546	1.86204304	0.499297351	ctd	344100	10346.32
Catalan	ctl	Indo-European	41.75	2	1.3900889	0.12048546	-0.7687792	0.247265066	cat	6667328	7632.806
Cubeo	cub	Tucanoan	1.33	-70.5	-0.4846364	-1.5544112	0.54663194	-0.497471906	cub	6150	23712.46
Dadibi	dad	Teberan-Pawaian	-6.55	144.58	-0.4846364	-1.5544112	0.54663194	-0.497471906	mps	10000	16802.56
Dahalo	dah	Afro-Asiatic	-2.33	40.5	-0.4846364	1.79538213	0.54663194	0.619125875	dal	400	3445.195
Dan	dan	Niger-Congo	7.5	-8	1.3900889	0.12048546	1.86204304	1.124205799	daf	951600	2169.916
Darai	dar	Indo-European	24	84	-0.4846364	0.9579338	-0.7687792	-0.098493936	dry	10210	9398.07
Daju (Dar Fur)	ddf	Nilo-Saharan	12.25	25.25	-0.4846364	0.12048546	-0.7687792	-0.377643382	daj	143053	2295.878
Dera	der	Senagi	-3.58	141	-0.4846364	-1.5544112	-0.7687792	-0.935942272	kbv	1687	16306.48
Deti	det	Khoisan	-20.5	24.5	-0.4846364	1.79538213	0.54663194	0.619125875	shg	6000	2688.293
Dagbani	dgb	Niger-Congo	9.58	-0.5	-0.4846364	0.12048546	0.54663194	0.060826985	dag	800000	1634.933
Dagur	dgr	Altaic	48	124	1.3900889	0.12048546	-0.7687792	0.247265066	dta	96085	11937.46
Diegue?±o (Mesa Grande)	die	Hokan	32.67	-116.17	-0.4846364	0.9579338	-0.7687792	-0.098493936	dih	295	18444.9
Dinka	din	Nilo-Saharan	8.5	28	1.3900889	0.12048546	1.86204304	1.124205799	dip	320000	2317.959
Diola-Fogny	dio	Niger-Congo	13	-16	1.3900889	0.12048546	-0.7687792	0.247265066	dyo	358276	3226.359

Dizi	diz	Afro-Asiatic	6.17	36.5	-0.4846364	0.12048546	1.86204304	0.499297351	mdx	21075	3106.859
Djapu	djp	Australian	-12.67	136	-1.2345266	0.12048546	-0.7687792	-0.627606761	duj	500	16336.86
Dani (Lower Grand Valley)	dni	Trans-New Guinea	-4.33	138.83	1.3900889	-1.5544112	-0.7687792	-0.311033824	dni	20000	16121.84
Dangal?©at (Western)	dnw	Afro-Asiatic	12.17	18.33	1.3900889	0.12048546	0.54663194	0.685735432	daa	45000	1781.452
Doyayo	doy	Niger-Congo	8.67	13.08	1.3900889	0.12048546	1.86204304	1.124205799	dow	18000	1171.497
Drehu	dre	Austronesian	-21	167.25	1.3900889	0.9579338	-0.7687792	0.526414511	dhv	11338	19683.04
Dogon (Toro So)	dts	Niger-Congo	14.5	-3.33	1.3900889	-0.7169629	0.54663194	0.406585987	dts	50000	2248.478
Dumo	dum	Skou	-2.68	141.3	1.3900889	-1.5544112	1.86204304	0.565906908	vam	2667	16298.52
Dyirbal	dyi	Australian	-17.83	145.58	-1.2345266	-1.5544112	-0.7687792	-1.185905651	dbl	40	17506.48
Efik	efi	Niger-Congo	4.92	8.5	1.3900889	-1.5544112	0.54663194	0.127436542	efi	400000	694.5711
Ejagham	eja	Niger-Congo	5.42	8.67	1.3900889	0.12048546	1.86204304	1.124205799	etu	116675	746.9072
Ekari	eka	Trans-New Guinea	-3.83	135.5	-0.4846364	-1.5544112	0.54663194	-0.497471906	ekg	100000	15766.37
English	eng	Indo-European	52	0	1.3900889	0.12048546	-0.7687792	0.247265066	eng	309582484	7897.817
Epena Pedee	epe	Choco	3	-77	1.3900889	-0.7169629	-0.7687792	-0.031884379	sja	8050	23198.55
Evenki	eve	Altaic	56	125	-0.4846364	-0.7169629	-0.7687792	-0.656792827	evn	29000	11667.79
Even	evn	Altaic	68	130	-0.4846364	-0.7169629	-0.7687792	-0.656792827	eve	7543	11445.09
Ewe	ewe	Niger-Congo	6.33	0.42	1.3900889	0.9579338	0.54663194	0.964884878	ewe	3112400	1313.063
Ewondo	ewo	Niger-Congo	4	12	1.3900889	0.9579338	1.86204304	1.403355244	ewo	577700	646.0998
Eyak	eya	Na-Dene	60.5	-145	-1.2345266	0.9579338	-0.7687792	-0.348457316	eya	1	14717.15
Fasu	fas	Trans-New Guinea	-6.58	143.33	-0.4846364	-1.5544112	0.54663194	-0.497471906	faa	1200	16678.73
Fe'fe'	fef	Niger-Congo	5.25	10.17	1.3900889	-0.7169629	1.86204304	0.845056353	fmp	123700	726.1316
Fijian	fij	Austronesian	-17.83	178	-0.4846364	0.12048546	-0.7687792	-0.377643382	fij	334061	20632.27
Finnish	fin	Uralic	62	25	1.3900889	-0.7169629	-0.7687792	-0.031884379	fin	5232728	7737.948
French	fre	Indo-European	48	2	1.3900889	0.12048546	-0.7687792	0.247265066	fra	64858311	7651.918
Fulni?¥	ful	Macro-Ge	-8	-37.5	1.3900889	0.12048546	0.54663194	0.685735432	fun	2788	27414.04
Fur	fur	Nilo-Saharan	13.5	25	-0.4846364	-0.7169629	0.54663194	-0.218322461	fvr	501800	2366.992
Fuzhou	fuz	Sino-Tibetan	26	119.5	1.3900889	-1.5544112	1.86204304	0.565906908	cdo	9103157	12614.44
Fyem	fye	Niger-Congo	9.58	9.33	-0.4846364	1.79538213	0.54663194	0.619125875	pym	3000	1203.632
G?£	ga	Niger-Congo	5.67	-0.17	1.3900889	0.9579338	1.86204304	1.403355244	gaa	600000	1320.201
Great Andamanese	gan	Great Andamanese	12	92.67	1.3900889	-1.5544112	-0.7687792	-0.311033824	apq	24	10777.14
Garo	gar	Sino-Tibetan	25.67	90.5	-0.4846364	-0.7169629	-0.7687792	-0.656792827	grt	677000	9955.409
Gbeya Bossangoa	gbb	Niger-Congo	6.67	17.5	1.3900889	0.9579338	0.54663194	0.964884878	gbp	176000	1249.753
Gadsup	gds	Trans-New Guinea	-6.25	146	-1.2345266	-1.5544112	1.86204304	-0.308964919	gaj	22061	16932.33
Georgian	geo	Kartvelian	42	44	-0.4846364	0.9579338	-0.7687792	-0.098493936	kat	4178604	5922.392
German	ger	Indo-European	52	10	1.3900889	0.12048546	-0.7687792	0.247265066	deu	95392978	7277.99
Gelao	gla	Tai-Kadai	22.92	105.5	1.3900889	0.9579338	1.86204304	1.403355244	gio	3000	11479.69
Gooniyandi	goo	Australian	-18.33	126.33	-1.2345266	0.12048546	-0.7687792	-0.627606761	gni	100	16045.97
Grebo	grb	Niger-Congo	5	-8	1.3900889	0.12048546	1.86204304	1.124205799	gry	23700	2063.092
Greek (Modern)	grk	Indo-European	39	22	-0.4846364	0.12048546	-0.7687792	-0.377643382	ell	12258540	6024.787
Garrwa	grr	Australian	-17.08	137.17	-1.2345266	0.12048546	-0.7687792	-0.627606761	gbc	200	16739.59
Greenlandic (West)	grw	Eskimo-Aleut	64	-51	-1.2345266	0.12048546	-0.7687792	-0.627606761	kal	54800	18085.53
Guaran??	gua	Tupian	-26	-56	-0.4846364	0.12048546	-0.7687792	-0.377643382	gug	4848000	27074.66
Gwari	gwa	Niger-Congo	9.5	7	-0.4846364	0.12048546	1.86204304	0.499297351	gbr gby	1050000	1226.217

Hadza	had	Hadza	-3.75	35.17	-0.4846364	1.79538213	0.54663194	0.619125875	hts	800	2863.102
Haida	hai	Haida	53	-132	-1.2345266	1.79538213	-0.7687792	-0.06930787	hdn hax	55	15861.48
Hakka	hak	Sino-Tibetan	25	116	-0.4846364	-0.7169629	1.86204304	0.220147906	hak	29937959	12349.67
Hamtai	ham	Trans-New Guinea	-7.5	146.25	1.3900889	-1.5544112	0.54663194	0.127436542	hmt	45000	17013.93
Hausa	hau	Afro-Asiatic	12	7	-0.4846364	0.9579338	0.54663194	0.33997643	hau	24162000	1498.044
Hawaiian	haw	Austronesian	19.58	-155.5	-0.4846364	-1.5544112	-0.7687792	-0.935942272	haw	1000	22535.9
Hebrew (Modern Ashkena	hba	Afro-Asiatic	31.75	35.17	-0.4846364	-0.7169629	-0.7687792	-0.656792827	heb	5055000	4596.115
Hindi	hin	Indo-European	25	77	-0.4846364	1.79538213	-0.7687792	0.180655509	hin	180764791	8691.814
Hixkaryana	hix	Cariban	-1	-59	-0.4846364	-0.7169629	-0.7687792	-0.656792827	hix	600	24920.96
Hmong Njua	hmo	Hmong-Mien	28	105	-0.4846364	1.79538213	1.86204304	1.057596241	blu	1290600	11214.83
Hamer	hmr	Afro-Asiatic	5	36.5	-0.4846364	0.9579338	0.54663194	0.33997643	amf	42838	3076.661
Hopi	hop	Uto-Aztecan	36	-110	-0.4846364	0.12048546	0.54663194	0.060826985	hop	5264	18388.91
Huastec	htc	Mayan	22.08	-99.33	-0.4846364	0.12048546	-0.7687792	-0.377643382	hsf	1749	20237.17
Huitoto (Murui)	hum	Huitotoan	-1	-73.5	-0.4846364	-0.7169629	-0.7687792	-0.656792827	huu	2900	23734.11
Hungarian	hun	Uralic	47	20	1.3900889	0.9579338	-0.7687792	0.526414511	hun	13611600	6368.741
Hupa	hup	Na-Dene	41.08	-123.67	-1.2345266	0.9579338	-0.7687792	-0.348457316	hup	8	17305.97
Huave (San Mateo del Ma	hve	Huavean	16.22	-95	-0.4846364	0.12048546	0.54663194	0.060826985	huv	12000	21019.99
Hunzib	hzb	Nakh-Daghestanian	42.17	46.25	1.3900889	0.9579338	-0.7687792	0.526414511	huz	2000	6072.393
Iaai	iaa	Austronesian	-20.42	166.58	1.3900889	1.79538213	-0.7687792	0.805563957	iai	1562	19594.32
Iban	iba	Austronesian	2	112	-0.4846364	0.12048546	-0.7687792	-0.377643382	iba	415000	13296.74
Igbo	igb	Niger-Congo	6	7.33	1.3900889	1.79538213	0.54663194	1.244034323	ibo	18000000	840.8655
Ingessana	igs	Nilo-Saharan	11.5	34	-0.4846364	-0.7169629	0.54663194	-0.218322461	tbi	67166	3054.267
Ijo (Kolokuma)	ijo	Niger-Congo	4.92	5.67	1.3900889	0.12048546	0.54663194	0.685735432	ijc	1000000	806.7756
Ik	ik	Nilo-Saharan	3.75	34.17	1.3900889	0.9579338	0.54663194	0.964884878	ikx	2000	2795.69
Ika	ika	Chibchan	10.67	-73.75	1.3900889	-0.7169629	-0.7687792	-0.031884379	arh	14301	23147.22
Imonda	imo	Border	-3.33	141.17	1.3900889	-1.5544112	-0.7687792	-0.311033824	imn	250	16312.9
Indonesian	ind	Austronesian	0	106	-0.4846364	0.12048546	-0.7687792	-0.377643382	ind	23143354	13271.85
Ingush	ing	Nakh-Daghestanian	43.17	45.08	-0.4846364	1.79538213	-0.7687792	0.180655509	inh	230315	6076.723
Irish (Donegal)	ird	Indo-European	55	-8	-0.4846364	1.79538213	-0.7687792	0.180655509	gle	355000	8498.085
Iraqw	irq	Afro-Asiatic	-4	35.5	-0.4846364	0.9579338	0.54663194	0.33997643	irk	462000	2902.023
Irarutu	irr	Austronesian	-3	133.5	1.3900889	-1.5544112	-0.7687792	-0.311033824	irh	4000	15526.95
Iranxe	irx	Arawakan	-13	-58	-0.4846364	0.12048546	-0.7687792	-0.377643382	irn	191	25814.99
Isoko	iso	Niger-Congo	5.5	6.25	1.3900889	0.9579338	0.54663194	0.964884878	iso	423000	832.3132
Ivatan (Southern)	ivs	Austronesian	20.33	121.83	-1.2345266	0.12048546	-0.7687792	-0.627606761	ivv	35000	13119.01
Jakaltek	jak	Mayan	15.67	-91.67	-0.4846364	0.9579338	-0.7687792	-0.098493936	jac jai	99000	21225.21
Jaqaru	jaq	Aymaran	-13	-76	-1.2345266	1.79538213	-0.7687792	-0.06930787	jqr	736	24979.68
Javanese	jav	Austronesian	-7	111	1.3900889	0.12048546	-0.7687792	0.247265066	jav	75508300	14149.33
Jeh	jeh	Austro-Asiatic	15.17	107.83	1.3900889	1.79538213	-0.7687792	0.805563957	jeh	23256	12072.16
Jingpho	jng	Sino-Tibetan	25.42	97	-0.4846364	0.9579338	1.86204304	0.778446796	kac	940000	10577.3
Jomang	jom	Niger-Congo	10.58	30.5	1.3900889	-1.5544112	0.54663194	0.127436542	tlo	1500	2667.944
Japanese	jpn	Japanese	37	140	-0.4846364	-0.7169629	0.54663194	-0.218322461	jpn	122433899	13672.06
Japreria	jpr	Cariban	10.5	-73	-0.4846364	-1.5544112	-0.7687792	-0.935942272	jru	90	23206.52
Ju|'hoan	juh	Khoisan	-19	21	-0.4846364	1.79538213	1.86204304	1.057596241	ktz	5000	2336.498

Kabardian	kab	Northwest Caucasian	43.5	43.5	-1.2345266	1.79538213	-0.7687792	-0.06930787	kbd	1012000	6016.822
Kadugli	kad	Kadugli	11	29.67	-0.4846364	0.12048546	1.86204304	0.499297351	xtc	81500	2611.667
Kalami	kal	Indo-European	35.5	72.5	-0.4846364	-0.7169629	0.54663194	-0.218322461	gwc	40000	8051.176
Kashmiri	kas	Indo-European	34	76	1.3900889	0.9579338	-0.7687792	0.526414511	kas	4611000	8383.788
Kayardild	kay	Australian	-17.05	139.5	-1.2345266	-0.7169629	-0.7687792	-0.906756206	gyd	6	16930.76
Koyra Chiini	kch	Nilo-Saharan	17	-3	-0.4846364	-0.7169629	-0.7687792	-0.656792827	khq	200000	2447.26
Kedang	ked	Austronesian	-8.25	123.75	-0.4846364	0.12048546	-0.7687792	-0.377643382	ksx	30000	15007.67
Kefa	kef	Afro-Asiatic	7.25	36.25	-0.4846364	0.12048546	0.54663194	0.060826985	kbr	569626	3112.478
Kera	ker	Afro-Asiatic	9.83	15.08	-0.4846364	-0.7169629	1.86204304	0.220147906	ker	50523	1377.37
Ket	ket	Yeniseian	64	87	1.3900889	-0.7169629	-0.7687792	-0.031884379	ket	550	9550.919
Kewa	kew	Trans-New Guinea	-6.5	143.83	-0.4846364	0.12048546	0.54663194	0.060826985	kew kjs	90000	16724.99
Koromfe	kfe	Niger-Congo	14.25	-0.92	1.3900889	-0.7169629	-0.7687792	-0.031884379	kfz	196100	2069.288
Kirghiz	kgz	Altaic	42	75	1.3900889	0.12048546	-0.7687792	0.247265066	kir	3136733	8276.863
Khalkha	kha	Altaic	47	105	1.3900889	0.12048546	-0.7687792	0.247265066	khk	2337095	10609.53
Khmer	khm	Austro-Asiatic	12.5	105	1.3900889	0.12048546	-0.7687792	0.247265066	khm	13276639	11937.28
Khoekhoe	kho	Khoisan	-25.5	18	-0.4846364	0.9579338	1.86204304	0.778446796	naq	233701	2844.541
Kharia	khr	Austro-Asiatic	22.5	84.33	-0.4846364	0.9579338	-0.7687792	-0.098493936	khr	293575	9487.132
Khasi	khs	Austro-Asiatic	25.5	92	-0.4846364	0.12048546	-0.7687792	-0.377643382	kha	865000	10103.47
Kiowa	kio	Kiowa-Tanoan	37	-99	-0.4846364	0.12048546	0.54663194	0.060826985	kio	1092	18787.47
Kiwai	kiw	Kiwaian	-8	143.5	-0.4846364	-1.5544112	0.54663194	-0.497471906	kiw kjd	14100	16764.42
Konkani	kkn	Indo-European	15.25	74	1.3900889	0.12048546	-0.7687792	0.247265066	knn	4000000	8826.033
Kaliai-Kove	kkv	Austronesian	-5.58	149.67	-0.4846364	0.12048546	-0.7687792	-0.377643382	khl kvc	8750	17279.57
Klao	kla	Niger-Congo	4.75	-8.75	1.3900889	-1.5544112	1.86204304	0.565906908	klu	192000	2133.034
Klamath	klm	Penutian	42.5	-121.5	-1.2345266	0.9579338	-0.7687792	-0.348457316	kla	1	17263.44
Kilivila	klv	Austronesian	-8.5	151.08	-0.4846364	0.12048546	-0.7687792	-0.377643382	kij	20000	17545.36
Kala Lagaw Ya	kly	Australian	-10.12	142.12	-0.4846364	-0.7169629	-0.7687792	-0.656792827	mwp	3000	16741.11
Kunimaipa	kmp	Trans-New Guinea	-8	146.83	-0.4846364	-0.7169629	-0.7687792	-0.656792827	kup	11000	17095.09
Khmu'	kmu	Austro-Asiatic	21	102	1.3900889	0.12048546	0.54663194	0.685735432	kjg	479739	11236.83
Kannada	knd	Dravidian	14	76	-0.4846364	0.12048546	-0.7687792	-0.377643382	kan	35346000	9081.292
Kaingang	kng	Macro-Ge	-26	-52	1.3900889	-1.5544112	-0.7687792	-0.311033824	kgp	18000	27315.15
Kanakuru	knk	Afro-Asiatic	10	12	-0.4846364	0.9579338	0.54663194	0.33997643	kna	20000	1280.38
Kunama	knm	Nilo-Saharan	14.5	37	-0.4846364	0.12048546	0.54663194	0.060826985	kun	108883	3494.943
Kanuri	knr	Nilo-Saharan	12	13	1.3900889	0.9579338	0.54663194	0.964884878	knc	3425138	1522.249
Koasati	koa	Muskogean	34.83	-85.17	-1.2345266	-1.5544112	1.86204304	-0.308964919	cku	200	19617.2
Kobon	kob	Trans-New Guinea	-5.17	144.33	1.3900889	0.12048546	-0.7687792	0.247265066	kpw	6000	16715.23
Kohumono	koh	Niger-Congo	6	8.12	1.3900889	0.9579338	1.86204304	1.403355244	bcs	30000	820.0783
Koiari	koi	Trans-New Guinea	-9.5	147.33	-0.4846364	-1.5544112	0.54663194	-0.497471906	kbk	1700	17215.53
Komo	kom	Nilo-Saharan	8.75	33.75	1.3900889	0.12048546	1.86204304	1.124205799	xom	11500	2906.295
Korean	kor	Korean	37.5	128	1.3900889	0.12048546	-0.7687792	0.247265066	kor	67019690	12738.18
Kota	kot	Dravidian	11.5	77.17	-0.4846364	0.12048546	-0.7687792	-0.377643382	kfe	2000	9329.268
Koya	koy	Dravidian	17.5	81.33	-0.4846364	0.12048546	-0.7687792	-0.377643382	kff	330000	9414.456
Kpan	kpa	Niger-Congo	7.58	10.17	-0.4846364	0.12048546	1.86204304	0.499297351	kpk	11386	984.0412
Kpelle	kpe	Niger-Congo	7	-10	1.3900889	0.12048546	1.86204304	1.124205799	xpe	487400	2348.62

Kiribati	krb	Austronesian	1.33	173	-0.4846364	-1.5544112	-0.7687792	-0.935942272	gil	67790	19566.19
Kurdish (Central)	krd	Indo-European	36	44	1.3900889	0.9579338	-0.7687792	0.526414511	kmr	9113505	5534.577
Karok	krk	Karok	41.67	-123	-0.4846364	0.9579338	0.54663194	0.33997643	kyh	10	17277.92
Krongo	kro	Kadugli	10.5	30	1.3900889	0.12048546	0.54663194	0.685735432	kgo	21688	2615.703
Koryak	kry	Chukotko-Kamchatkan	61	167	-0.4846364	-0.7169629	-0.7687792	-0.656792827	kpy	3500	13290.66
Karen (Sgaw)	ksg	Sino-Tibetan	18	97	1.3900889	-0.7169629	1.86204304	0.845056353	ksw	1584700	10897.79
Kisi (Southern)	kss	Niger-Congo	8.5	-10.25	1.3900889	-0.7169629	0.54663194	0.406585987	kss	200000	2441.211
Kotoko	ktk	Afro-Asiatic	11.33	15.33	1.3900889	0.9579338	0.54663194	0.964884878	aal	30000	1539.169
Khanty	kty	Uralic	65	65	-0.4846364	-0.7169629	-0.7687792	-0.656792827	kca	12000	8691.389
Kullo	kul	Afro-Asiatic	6.75	37.08	-0.4846364	0.12048546	0.54663194	0.060826985	gmo	1236637	3185.289
Kuna	kun	Chibchan	8	-77.33	-0.4846364	-0.7169629	-0.7687792	-0.656792827	kvn	1576	22658.89
Kutenai	kut	Kutenai	49.5	-116	-1.2345266	0.9579338	-0.7687792	-0.348457316	kut	12	16871.28
Kwaio	kwa	Austronesian	-8.95	161	-0.4846364	-0.7169629	-0.7687792	-0.656792827	kwd	13249	18580.83
Kwakw'ala	kwk	Wakashan	51	-127	-0.4846364	1.79538213	-0.7687792	0.180655509	kwk	235	16250.85
Kawaiisu	kws	Uto-Aztecan	36	-117.5	-0.4846364	0.12048546	-0.7687792	-0.377643382	xaw	8	18060.71
Kuku-Yalanji	kya	Australian	-16	145	-1.2345266	-1.5544112	-0.7687792	-1.185905651	gvn	700	17344.53
Kayah Li (Eastern)	kyl	Sino-Tibetan	19	97.5	1.3900889	-0.7169629	1.86204304	0.845056353	eky	360220	10899.36
Kam (Zhanglu)	kzh	Tai-Kadai	26	108.5	1.3900889	0.12048546	1.86204304	1.124205799	doc	463000	11620.07
Komi-Zyrian	kzy	Uralic	65	55	1.3900889	0.9579338	-0.7687792	0.526414511	kpv	262200	8381.375
Ladakhi	lad	Sino-Tibetan	34	78	-0.4846364	0.9579338	-0.7687792	-0.098493936	lbj	114000	8566.608
Lahu	lah	Sino-Tibetan	20	98.17	1.3900889	0.9579338	1.86204304	1.403355244	lhu	577178	10917.85
Lak	lak	Nakh-Daghestanian	42.17	47.17	-1.2345266	1.79538213	-0.7687792	-0.06930787	lbe	119512	6131.37
Lam?©	lam	Afro-Asiatic	9	14.5	-0.4846364	0.9579338	1.86204304	0.778446796	lme	35720	1266.441
Lango	lan	Nilo-Saharan	2.17	33	1.3900889	0.9579338	0.54663194	0.964884878	laj	977680	2638.481
Latvian	lat	Indo-European	57	24	-0.4846364	-0.7169629	0.54663194	-0.218322461	lav	1543844	7202.816
Lavukaleve	lav	Lavukaleve	-9.08	159.2	-0.4846364	0.9579338	-0.7687792	-0.098493936	lvk	1783	18399.45
Lenakel	len	Austronesian	-19.45	169.25	-0.4846364	-0.7169629	-0.7687792	-0.656792827	tnl	6500	19815.13
Lezgian	lez	Nakh-Daghestanian	41.67	47.83	-0.4846364	1.79538213	-0.7687792	0.180655509	lez	451112	6142.042
Lakkia	lkk	Tai-Kadai	24.08	110.17	-0.4846364	1.79538213	1.86204304	1.057596241	lbc	12000	11860.59
Lakhota	lkt	Siouan	43.83	-101.83	-0.4846364	0.9579338	-0.7687792	-0.098493936	lkt	6000	18018.4
Lelemi	llm	Niger-Congo	7.33	0.5	1.3900889	0.12048546	0.54663194	0.685735432	lef	48900	1380.082
L?º	lu	Tai-Kadai	22	100.67	1.3900889	0.12048546	1.86204304	1.124205799	khb	672064	11066.23
Lua	lua	Niger-Congo	9.75	17.75	1.3900889	0.12048546	1.86204304	1.124205799	nie	5157	1525.6
Lugbara	lug	Nilo-Saharan	3.08	30.92	1.3900889	0.9579338	1.86204304	1.403355244	lgg	1040000	2427.589
Luise?±o	lui	Uto-Aztecan	33.33	-117.17	-0.4846364	0.12048546	-0.7687792	-0.377643382	lui	30	18337.04
Luo	luo	Nilo-Saharan	-0.5	34.75	1.3900889	0.12048546	0.54663194	0.685735432	luo	3465000	2806.794
Lushootseed	lus	Salishan	48	-122	-1.2345266	1.79538213	-0.7687792	-0.06930787	lut	60	16735.08
Luvale	luv	Niger-Congo	-12	22	-0.4846364	-0.7169629	0.54663194	-0.218322461	lue	669000	1823.445
Maasai	maa	Nilo-Saharan	-3	36	1.3900889	0.12048546	0.54663194	0.685735432	mas	883000	2949.057
Maba	mab	Nilo-Saharan	13.75	20.83	1.3900889	0.12048546	0.54663194	0.685735432	mde	250000	2082.197
Malagasy	mal	Austronesian	-20	47	-1.2345266	0.12048546	-0.7687792	-0.627606761	plt	5948700	19232.24
Maori	mao	Austronesian	-40	176	-0.4846364	-1.5544112	-0.7687792	-0.935942272	mri	50000	21248.63
Mapudungun	map	Araucanian	-38	-72	-0.4846364	0.12048546	-0.7687792	-0.377643382	arn	300000	27783.66

Maricopa	mar	Hokan	33.17	-113.17	-0.4846364	0.12048546	-0.7687792	-0.377643382	mrc	181	18525.07
Maung	mau	Australian	-11.92	133.5	-0.4846364	-0.7169629	-0.7687792	-0.656792827	mph	200	16071.17
Maxakal??	max	Macro-Ge	-18	-40	-0.4846364	-1.5544112	-0.7687792	-0.935942272	mbl	728	27667.17
Maybrat	may	West Papuan	-1.33	132.5	-0.4846364	-1.5544112	-0.7687792	-0.935942272	ayz	20000	15344.28
Mazahua	maz	Oto-Manguean	19.42	-99.92	-1.2345266	1.79538213	0.54663194	0.369162496	maz mmc	365000	20477.8
Mba	mba	Niger-Congo	1	25	1.3900889	0.12048546	1.86204304	1.124205799	mfc	36087	1740.378
Meithei	mei	Sino-Tibetan	24.75	94	-0.4846364	0.9579338	0.54663194	0.33997643	mni	1261000	10321.07
Mangghuer	mgg	Altaic	36	102	-0.4846364	0.12048546	-0.7687792	-0.377643382	mjg	152000	10658.02
Mien	mie	Hmong-Mien	25	111	1.3900889	0.9579338	1.86204304	1.403355244	ium	818685	11894.33
Maranungku	mku	Australian	-13.67	130	-0.4846364	-1.5544112	-0.7687792	-0.935942272	zmr	15	15915.16
Mambila	mla	Niger-Congo	6.75	11.5	1.3900889	0.12048546	1.86204304	1.124205799	mcu mzk	129000	916.2551
Malakmalak	mlk	Australian	-13.42	130.42	-0.4846364	-1.5544112	-0.7687792	-0.935942272	mpb	9	15928.6
Mandarin	mnd	Sino-Tibetan	34	110	-0.4846364	0.9579338	1.86204304	0.778446796	cmn	873014298	11418.85
Maidu (Northeast)	mne	Penutian	40	-120.67	-0.4846364	-0.7169629	-0.7687792	-0.656792827	nmu	1	17537.29
Moghol	mog	Altaic	35	62	-0.4846364	0.12048546	-0.7687792	-0.377643382	mhj	200	7099.201
Mor	mor	Austronesian	-2.95	135.75	-0.4846364	-1.5544112	0.54663194	-0.497471906	mhz	700	15747.56
Movima	mov	Movima	-13.83	-65.67	-0.4846364	-0.7169629	-0.7687792	-0.656792827	mzp	1452	25394.71
Murrinh-Patha	mpa	Australian	-14.67	129.67	-1.2345266	0.12048546	-0.7687792	-0.627606761	mwf	900	15968.52
Marind	mrd	Marind	-7.83	140.17	-0.4846364	-0.7169629	-0.7687792	-0.656792827	mrz	7000	16430.57
Murle	mrl	Nilo-Saharan	6.5	33.5	1.3900889	0.12048546	0.54663194	0.685735432	mur	60200	2797.952
Maranao	mrn	Austronesian	7.83	124.25	-1.2345266	-1.5544112	-0.7687792	-1.185905651	mrw	776169	14136.36
Moro	mro	Niger-Congo	11	30.17	1.3900889	0.12048546	0.54663194	0.685735432	mor	30000	2658.971
Martuthunira	mrt	Australian	-20.83	116.5	-1.2345266	0.12048546	-0.7687792	-0.627606761	vma	5	15795.13
Miwok (Southern Sierra)	mss	Penutian	37.5	-120	-0.4846364	-0.7169629	-0.7687792	-0.656792827	skd	7	17807.63
Mixe (Totontepec)	mtp	Mixe-Zoque	17.25	-96	1.3900889	-1.5544112	-0.7687792	-0.311033824	mto	5200	20871.34
Muinane	mui	Huitotoan	-1	-72.5	-0.4846364	0.12048546	0.54663194	0.060826985	bmr	150	23783.5
Mumuye	mum	Niger-Congo	9	11.67	-0.4846364	0.12048546	1.86204304	0.499297351	mzm	400000	1164.097
Mundari	mun	Austro-Asiatic	23	84.67	-0.4846364	0.9579338	-0.7687792	-0.098493936	muw	2074700	9500.179
Mixtec (Chalcatongo)	mxc	Oto-Manguean	17.05	-97.58	-0.4846364	-0.7169629	1.86204304	0.220147906	mig	14453	20820.82
Mixtec (Molinos)	mxm	Oto-Manguean	17	-97.58	-0.4846364	-0.7169629	1.86204304	0.220147906	mig	14453	20825.86
Ma'ya	mya	Austronesian	-1.25	130.92	-0.4846364	-1.5544112	1.86204304	-0.05900154	slz	4000	15183.16
Mangarrayi	myi	Australian	-14.67	133.5	-0.4846364	-0.7169629	-0.7687792	-0.656792827	mpc	50	16267.45
Mazatec (Chiquihuitl?°n)	mzc	Oto-Manguean	17.75	-96.92	-0.4846364	0.12048546	1.86204304	0.499297351	maq	2500	20779.78
Nanai	nai	Altaic	49.5	137	-0.4846364	-0.7169629	-0.7687792	-0.656792827	gld	5772	12708.62
Nandi	nan	Nilo-Saharan	0.25	35	1.3900889	-1.5544112	0.54663194	0.127436542	kln	2458123	2838.398
Neo-Aramaic (Persian Aze	nap	Afro-Asiatic	38	47	-0.4846364	0.12048546	-0.7687792	-0.377643382	trg	4378	5871.083
Nara (in Ethiopia)	nar	Nilo-Saharan	15.08	37.58	-0.4846364	-0.7169629	0.54663194	-0.218322461	nrb	80000	3580.178
Navajo	nav	Na-Dene	36.17	-108	-1.2345266	0.9579338	0.54663194	0.090013051	nav	148530	18461.67
Naxi	nax	Sino-Tibetan	27.5	100	1.3900889	1.79538213	1.86204304	1.682504689	nbf	308839	10775.54
Ndut	ndt	Niger-Congo	14.92	-16.92	1.3900889	0.9579338	1.86204304	1.403355244	ndv	35000	3415.417
Nenets	nen	Uralic	69	72	-0.4846364	0.9579338	-0.7687792	-0.098493936	yrk	26730	9208.659
Nepali	nep	Indo-European	28	85	-0.4846364	0.9579338	-0.7687792	-0.098493936	nep	17209255	9357.227
Newari (Kathmandu)	new	Sino-Tibetan	27.67	85.5	-1.2345266	0.12048546	-0.7687792	-0.627606761	new	825458	9414.689

Nez Perce	nez	Penutian	46	-116	-0.4846364	0.9579338	-0.7687792	-0.098493936	nez	100	17181.91
Nganasan	nga	Uralic	71	93	1.3900889	-0.7169629	-0.7687792	-0.031884379	nio	500	10016.63
Ngizim	ngz	Afro-Asiatic	12.08	10.92	-0.4846364	0.9579338	0.54663194	0.33997643	ngi	80000	1489.566
Nahuatl (North Puebla)	nhn	Uto-Aztecan	20	-98.25	-1.2345266	-0.7169629	-0.7687792	-0.906756206	ncj	60000	20494.01
Nahuatl (Tetelcingo)	nht	Uto-Aztecan	19.67	-99	-0.4846364	-0.7169629	-0.7687792	-0.656792827	nhg	3500	20493.66
Nishi	nis	Sino-Tibetan	27.5	93.5	1.3900889	-0.7169629	0.54663194	0.406585987	dap	261000	10171.56
Nivkh	niv	Nivkh	53.33	142	-0.4846364	0.9579338	0.54663194	0.33997643	niv	1089	12770.47
Nkore-Kiga	nko	Niger-Congo	-0.92	29.83	-0.4846364	0.12048546	0.54663194	0.060826985	cgg	1391442	2259.059
Nyah Kur (Tha Pong)	nkt	Austro-Asiatic	15.67	101.67	1.3900889	0.9579338	0.54663194	0.964884878	cbn	10000	11457.57
Nambiku?°ra	nmb	Nambikuaran	-13	-59	-0.4846364	0.9579338	1.86204304	0.778446796	nab	1150	25741.21
Nancowry	nnc	Austro-Asiatic	8.05	93.5	1.3900889	-0.7169629	-0.7687792	-0.031884379	ncb	2200	11068.46
Nobiin	nob	Nilo-Saharan	21	31	-0.4846364	-0.7169629	0.54663194	-0.218322461	fia	495000	3402.265
Noni	non	Niger-Congo	6.42	10.58	1.3900889	0.12048546	1.86204304	1.124205799	nhu	25000	860.7081
Norwegian	nor	Indo-European	61	8	1.3900889	0.12048546	0.54663194	0.685735432	nor	4640000	8027.009
Ngiti	nti	Nilo-Saharan	1.33	30.25	1.3900889	1.79538213	1.86204304	1.682504689	niy	100000	2323.407
Nunggubuyu	nug	Australian	-13.75	135.67	-1.2345266	0.12048546	-0.7687792	-0.627606761	nuy	300	16381.74
Nung (in Vietnam)	nun	Tai-Kadai	21.92	106.42	-0.4846364	0.12048546	1.86204304	0.499297351	nut	856412	11611.48
Nuuchahnulth	nuu	Wakashan	49.67	-126.67	-1.2345266	1.79538213	-0.7687792	-0.06930787	noo	200	16381.58
Nyimang	nyi	Nilo-Saharan	12.17	29.33	1.3900889	-0.7169629	1.86204304	0.845056353	nyi	70000	2648.169
Ocaina	oca	Huitotoan	-2.75	-71.75	-0.4846364	0.9579338	0.54663194	0.33997643	oca	66	23994.17
Ogbia	ogb	Niger-Congo	4.67	6.25	1.3900889	0.12048546	0.54663194	0.685735432	ogb	200000	750.3215
Ojibwa (Eastern)	oji	Algic	46	-80	-1.2345266	-0.7169629	-0.7687792	-0.906756206	ojg	25885	18773.89
Oneida	ond	Iroquoian	43	-75.67	-1.2345266	0.9579338	0.54663194	0.090013051	one	250	19237.46
O'odham	ood	Uto-Aztecan	32	-112	-0.4846364	0.12048546	-0.7687792	-0.377643382	ood	11819	18691.13
Oromo (Harar)	orh	Afro-Asiatic	9	42	-0.4846364	0.9579338	1.86204304	0.778446796	hae	4526000	3774.159
Ormuri	orm	Indo-European	32.5	69.75	-0.4846364	-1.5544112	-0.7687792	-0.935942272	oru	1050	7825.179
Otom?? (Mezquital)	otm	Oto-Manguean	20.17	-99.17	1.3900889	0.12048546	0.54663194	0.685735432	ote	100000	20435.83
Pacoh	pac	Austro-Asiatic	16.42	107.08	1.3900889	-0.7169629	-0.7687792	-0.031884379	pac	29224	11937.9
P?°ez	pae	P?°ezan	2.67	-76	-1.2345266	1.79538213	-0.7687792	-0.06930787	pbb	71400	23255.28
Paiwan	pai	Austronesian	22.5	120.83	-1.2345266	0.12048546	-0.7687792	-0.627606761	pwn	66084	12913.47
Paumar??	pau	Arauan	-6	-64	-1.2345266	0.12048546	-0.7687792	-0.627606761	pad	700	24798.66
Pawaian	paw	Teberan-Pawaian	-7	145.08	-0.4846364	-0.7169629	0.54663194	-0.218322461	pwa	4000	16873.52
Pech	pec	Chibchan	15	-85.5	-0.4846364	0.9579338	0.54663194	0.33997643	pay	994	21571.42
Phlong	phl	Sino-Tibetan	15	99	-0.4846364	-1.5544112	1.86204304	-0.05900154	pww	60000	11234.22
Pitjantjatjara	pit	Australian	-26	130	-1.2345266	0.12048546	-0.7687792	-0.627606761	pjt	2500	16956.14
Paamese	pms	Austronesian	-16.5	168.25	-0.4846364	-0.7169629	-0.7687792	-0.656792827	pma	6000	19602.77
Panare	pnr	Cariban	6.5	-66	1.3900889	-1.5544112	-0.7687792	-0.311033824	pbh	1200	23918.74
Po-Ai	poa	Austronesian	-20.67	164.83	1.3900889	-0.7169629	1.86204304	0.845056353	fwa	1131	19436.81
Pohnpeian	poh	Austronesian	6.88	158.25	1.3900889	-1.5544112	-0.7687792	-0.311033824	pon	29000	17845.57
Polish	pol	Indo-European	52	20	-0.4846364	0.9579338	-0.7687792	-0.098493936	pol	42708133	6789.507
Pirah?£	prh	Mura	-7	-62	-1.2345266	-0.7169629	0.54663194	-0.46828584	myp	150	25033.52
Persian	prs	Indo-European	32	54	-0.4846364	0.12048546	-0.7687792	-0.377643382	pes	24316121	6351.344
Pashto	psh	Indo-European	33	67	-0.4846364	0.9579338	-0.7687792	-0.098493936	pst	7922657	7564.181

Passamaquoddy-Maliseet	psm	Algic	45	-67	-0.4846364	-0.7169629	0.54663194	-0.218322461	pqm	1655	19389.8
Parauk	puk	Austro-Asiatic	23.25	99.5	1.3900889	0.9579338	-0.7687792	0.526414511	prk	528400	10901.56
Pur?©pecha	pur	Tarascan	19.5	-101.67	-0.4846364	0.9579338	-0.7687792	-0.098493936	tsz	120000	20392.09
Qawasqar	qaw	Alacalufan	-49	-75	-1.2345266	0.9579338	-0.7687792	-0.348457316	alc	20	28979.01
Quechua (Cochabamba)	qco	Quechuan	-17.5	-66	-0.4846364	0.9579338	-0.7687792	-0.098493936	quh	3637500	25742.48
Quileute	qui	Chimakuan	47.92	-124.25	-1.2345266	0.9579338	0.54663194	0.090013051	qui	10	16643.32
Rama	ram	Chibchan	11.75	-83.75	-1.2345266	-0.7169629	-0.7687792	-0.906756206	rma	24	21978.58
Rapanui	rap	Austronesian	-27.12	-109.37	-0.4846364	-1.5544112	-0.7687792	-0.935942272	rap	3392	28010.45
Res??garo	res	Arawakan	-2.42	-71.5	-0.4846364	0.9579338	0.54663194	0.33997643	rgr	14	23975.49
Romanian	rom	Indo-European	46	25	1.3900889	0.12048546	-0.7687792	0.247265066	ron	23498367	6031.231
Roro	ror	Austronesian	-8.75	146.58	-0.4846364	-1.5544112	-0.7687792	-0.935942272	rro	15000	17105.38
Romansch (Scharans)	rsc	Indo-European	46.75	9.5	-0.4846364	0.12048546	-0.7687792	-0.377643382	roh	40000	7071.052
Rotokas	rtk	West Bougainville	-6	155.17	-0.4846364	-1.5544112	-0.7687792	-0.935942272	roo	4320	17866.34
Rukai	ruk	Austronesian	22.83	120.83	-1.2345266	0.12048546	-0.7687792	-0.627606761	dru	10543	12896.25
Russian	rus	Indo-European	56	38	-0.4846364	0.9579338	-0.7687792	-0.098493936	rus	145031551	7094.689
Rutul	rut	Nakh-Daghestanian	41.5	47.42	-0.4846364	1.79538213	0.54663194	0.619125875	rut	20111	6103.329
Sango	san	Niger-Congo	5	18	1.3900889	0.9579338	0.54663194	0.964884878	sag	404000	1171.636
S?°liba (in Colombia)	sba	S?°liban	6	-70	-0.4846364	0.12048546	-0.7687792	-0.377643382	slc	1555	23496.69
Saami (Central-South)	scs	Uralic	64.67	16.75	-0.4846364	1.79538213	-0.7687792	0.180655509	sma	600	8133.627
Sindhi	sdh	Indo-European	26	69	1.3900889	1.79538213	-0.7687792	0.805563957	snd	21362000	7891.445
Sandawe	sdw	Khoisan	-5	35	-0.4846364	1.79538213	0.54663194	0.619125875	sad	40000	2859.423
Sedang	sed	Austro-Asiatic	14.83	108	1.3900889	1.79538213	-0.7687792	0.805563957	sed	101434	12105.63
Selknam	sel	Chon	-53	-70	-1.2345266	0.12048546	-0.7687792	-0.627606761	ona	1	29455.87
Shan	sha	Tai-Kadai	22	98	-0.4846364	0.12048546	1.86204304	0.499297351	shn	3260000	10813.25
Shiriana	shi	Yanomam	3.5	-62.83	-0.4846364	-1.5544112	-0.7687792	-0.935942272	shb	566	24337.07
Shipibo-Konibo	shk	Panoan	-7.5	-75	-1.2345266	-0.7169629	-0.7687792	-0.906756206	shp	26000	24384.75
Shuswap	shu	Salishan	52	-120	-0.4846364	1.79538213	-0.7687792	0.180655509	shs	500	16477.86
Slave	sla	Na-Dene	67	-125	-0.4846364	0.9579338	0.54663194	0.33997643	scs xsl	2200	15291.47
Semelai	sml	Austro-Asiatic	3	103	1.3900889	0.9579338	-0.7687792	0.526414511	sza	2932	12258.61
Seneca	snc	Iroquoian	42.5	-77.5	-0.4846364	-1.5544112	-0.7687792	-0.935942272	see	175	19209.35
Senadi	snd	Niger-Congo	9.5	-6.25	1.3900889	0.12048546	1.86204304	1.124205799	sef	862000	2113.121
Sinhala	snh	Indo-European	7	80.5	1.3900889	0.12048546	-0.7687792	0.247265066	sin	13220256	9903.463
Sanuma	snm	Yanomam	4.5	-64.67	1.3900889	-1.5544112	-0.7687792	-0.311033824	xsu	5074	24109.59
Somali	som	Afro-Asiatic	3	45	1.3900889	0.12048546	0.54663194	0.685735432	som	12653480	3971.735
Soqotri	soq	Afro-Asiatic	12.5	54	-0.4846364	0.9579338	-0.7687792	-0.098493936	sqt	64000	7216.364
Sora	sor	Austro-Asiatic	20	84.33	-0.4846364	0.12048546	-0.7687792	-0.377643382	srb	288000	9590.51
Spanish	spa	Indo-European	40	-4	-0.4846364	0.9579338	-0.7687792	-0.098493936	spa	322299171	8163.111
Squamish	squ	Salishan	49.67	-123.17	-1.2345266	0.9579338	-0.7687792	-0.348457316	squ	15	16535.56
Sre	sre	Austro-Asiatic	11.5	108	1.3900889	-1.5544112	0.54663194	0.127436542	kpm	128723	12277.46
Sirion??	srn	Tupian	-15.58	-64	1.3900889	0.12048546	-0.7687792	0.247265066	srq	399	25652.6
Suena	sue	Trans-New Guinea	-7.75	147.55	-0.4846364	1.79538213	0.54663194	0.619125875	sue	3000	17155.9
Sui	sui	Tai-Kadai	26	107.5	1.3900889	0.12048546	1.86204304	1.124205799	swi	200120	11528.36
Supyire	sup	Niger-Congo	11.5	-5.58	1.3900889	-0.7169629	1.86204304	0.845056353	spp	364000	2186.62

Savosavo	svs	Savosavo	-9.13	159.8	-0.4846364	-0.7169629	-0.7687792	-0.656792827	svs	2415	18463.28
Swahili	swa	Niger-Congo	-6.5	39	-0.4846364	0.9579338	-0.7687792	-0.098493936	swh	772642	3321.007
Taba	tab	Austronesian	0	127.5	-0.4846364	0.12048546	-0.7687792	-0.377643382	mky	20000	14781.94
Tacana	tac	Tacanan	-13.5	-68	-1.2345266	-0.7169629	-0.7687792	-0.906756206	tna	1821	25249.2
Tagalog	tag	Austronesian	15	121	-0.4846364	0.12048546	-0.7687792	-0.377643382	tgl	15900098	13328.44
Tamang	tam	Sino-Tibetan	28	85.25	-0.4846364	0.9579338	0.54663194	0.33997643	taj tge	777234	9380.789
Tehuelche	teh	Chon	-48	-68	-1.2345266	0.9579338	-0.7687792	-0.348457316	teh	4	28932.73
Telugu	tel	Dravidian	16	79	-0.4846364	0.9579338	-0.7687792	-0.098493936	tel	69688278	9263.461
Tera	ter	Afro-Asiatic	11	11.83	-0.4846364	1.79538213	1.86204304	1.057596241	ttr	100620	1385.42
Tigak	tgk	Austronesian	-2.72	150.8	-0.4846364	-1.5544112	-0.7687792	-0.935942272	tgc	6000	17290.46
Tigr?©	tgr	Afro-Asiatic	16.5	38.5	-0.4846364	0.9579338	-0.7687792	-0.098493936	tig	800000	3742.01
Thai	tha	Tai-Kadai	16	101	1.3900889	0.12048546	1.86204304	1.124205799	tha	20229987	11377.11
Tibetan (Standard Spoken	tib	Sino-Tibetan	30	91	1.3900889	1.79538213	0.54663194	1.244034323	bod	1261587	9856.141
Ticuna	tic	Ticuna	-4	-70.5	-0.4846364	-0.7169629	1.86204304	0.220147906	tca	41000	24183.02
Tiwi	tiw	Australian	-11.5	131	-1.2345266	0.12048546	-0.7687792	-0.627606761	tiw	1500	15832.01
Teke (Southern)	tks	Niger-Congo	-2.33	14.5	1.3900889	0.12048546	0.54663194	0.685735432	kkw	38787	568.1662
Tlingit	tli	Na-Dene	59	-135	-1.2345266	1.79538213	0.54663194	0.369162496	tli	845	15262.57
Tama	tma	Nilo-Saharan	14.5	22	1.3900889	0.12048546	1.86204304	1.124205799	tma	62931	2225.867
Temein	tmn	Nilo-Saharan	11.92	29.42	1.3900889	-0.7169629	0.54663194	0.406585987	teq	10000	2641.431
Tampulma	tmp	Niger-Congo	10.42	-0.58	1.3900889	-1.5544112	0.54663194	0.127436542	tpm	16000	1709.985
Temne	tne	Niger-Congo	8.67	-13.08	1.3900889	-0.7169629	0.54663194	0.406585987	tem	1200000	2732.891
Toaripi	toa	Eleman	-8.33	146.25	-0.4846364	-1.5544112	-0.7687792	-0.935942272	tqo	23000	17052.65
Tarok	tok	Niger-Congo	9	10.08	-0.4846364	0.9579338	1.86204304	0.778446796	yer	300000	1140.841
Tol	tol	Tol	14.67	-87	-0.4846364	0.12048546	-0.7687792	-0.377643382	jic	350	21536.89
Totonac (Papantla)	tpa	Totonacan	20.33	-97.33	-1.2345266	-0.7169629	-0.7687792	-0.906756206	top	80000	20502.09
Trumai	tru	Trumai	-11.92	-53.58	-0.4846364	0.12048546	-0.7687792	-0.377643382	tpy	78	26087.73
Tiruray	try	Austronesian	6.75	124.17	-0.4846364	-0.7169629	-0.7687792	-0.656792827	tiy	50000	14156.81
Tausug	tsg	Austronesian	6	121	-1.2345266	0.9579338	-0.7687792	-0.348457316	tsg	1022000	13848.91
Tsimshian (Coast)	tsi	Penutian	52.5	-129	-1.2345266	1.79538213	-0.7687792	-0.06930787	tsi	800	16034.73
Tsou	tso	Austronesian	23.5	120.75	-0.4846364	-0.7169629	-0.7687792	-0.656792827	tsu	2127	12854.2
Tetun	ttn	Austronesian	-9	126	-0.4846364	-1.5544112	-0.7687792	-0.935942272	tet	450000	15240.98
Tsova-Tush	ttu	Nakh-Daghestanian	42.5	45.5	-0.4846364	1.79538213	-0.7687792	0.180655509	bbl	3420	6050.101
Tuareg (Ahaggar)	tug	Afro-Asiatic	23	6	1.3900889	0.9579338	-0.7687792	0.526414511	thv	62000	2721.271
Tukang Besi	tuk	Austronesian	-5.5	123.5	-0.4846364	0.12048546	-0.7687792	-0.377643382	bhq khc	250000	14773.44
Tulu	tul	Dravidian	12.75	75.33	1.3900889	0.12048546	-0.7687792	0.247265066	tcy	1949000	9086.559
Turkish	tur	Altaic	39	35	1.3900889	0.12048546	-0.7687792	0.247265066	tur	50625794	5218.225
Tuvan	tuv	Altaic	52	95	1.3900889	0.12048546	-0.7687792	0.247265066	tyv	209400	9833.798
Tiwa (Northern)	twn	Kiowa-Tanoan	36.5	-105.5	-0.4846364	0.9579338	0.54663194	0.33997643	twf	927	18542.03
Tzeltal (Aguacatenango)	tza	Mayan	16.42	-92.5	-0.4846364	0.12048546	-0.7687792	-0.377643382	tzh	90000	21112.25
UMbundu	umb	Niger-Congo	-12.5	15	-0.4846364	0.12048546	0.54663194	0.060826985	umb	4002880	1389.191
Una	una	Trans-New Guinea	-4.67	140	1.3900889	0.12048546	0.54663194	0.685735432	mtg	4000	16255.16
Ungarinjin	ung	Australian	-16.33	126	-0.4846364	0.12048546	-0.7687792	-0.377643382	ung	82	15848.19
Urub??-Kaapor	urk	Tupian	-2.33	-46.5	-0.4846364	-0.7169629	-0.7687792	-0.656792827	urb	500	26262.71

Usan	usa	Trans-New Guinea	-4.83	145.17	-0.4846364	-1.5544112	-0.7687792	-0.935942272	wnu	1400	16786.23
Uzbek (Northern)	uzn	Altaic	40.67	66.5	-0.4846364	0.12048546	-0.7687792	-0.377643382	uzn	18795591	7555.523
Vietnamese	vie	Austro-Asiatic	10.5	106.5	1.3900889	0.12048546	1.86204304	1.124205799	vie	67439139	12186.95
Wahgi	wah	Trans-New Guinea	-5.83	144.72	-0.4846364	-0.7169629	0.54663194	-0.218322461	wgi whg	86000	16784.02
Wambaya	wam	Australian	-18.67	135.75	-1.2345266	-0.7169629	-0.7687792	-0.906756206	wmb	12	16742.62
Wari'	war	Chapacura-Wanhan	-11.33	-65	-0.4846364	-0.7169629	-0.7687792	-0.656792827	pav	1833	25194.31
Wich??	wch	Matacoan	-22.5	-62.58	-0.4846364	0.12048546	-0.7687792	-0.377643382	mzh	15000	26398.5
Wichita	wic	Caddoan	33.33	-97.33	-1.2345266	0.12048546	-0.7687792	-0.627606761	wic	3	19216.67
Wintu	win	Penutian	41	-122.5	-0.4846364	0.9579338	-0.7687792	-0.098493936	wit	5	17363.24
Wolof	wlf	Niger-Congo	15.25	-16	1.3900889	0.9579338	-0.7687792	0.526414511	wol	3612560	3348.594
West Makian	wma	West Papuan	0.5	127.58	-0.4846364	-0.7169629	-0.7687792	-0.656792827	mqs	12000	14764.19
Wik Munkan	wmu	Australian	-13.92	141.75	-0.4846364	-1.5544112	-0.7687792	-0.935942272	wim	400	16926.06
Wantoat	wnt	Trans-New Guinea	-6.17	146.5	1.3900889	-1.5544112	-0.7687792	-0.311033824	wnc	8201	16979.56
Woisika	woi	Trans-New Guinea	-8.25	124.83	1.3900889	-0.7169629	-0.7687792	-0.031884379	woi	16522	15090.83
Wapishana	wps	Arawakan	2.67	-60	-1.2345266	-0.7169629	-0.7687792	-0.906756206	wap	7500	24664.26
Warao	wra	Warao	9.33	-61.67	-0.4846364	-1.5544112	-0.7687792	-0.935942272	wba	18000	24385.32
Wardaman	wrd	Australian	-15.5	131	-0.4846364	-0.7169629	-0.7687792	-0.656792827	wrr	50	16134.48
Waray (in Australia)	wry	Australian	-13.17	131.25	-0.4846364	-0.7169629	-0.7687792	-0.656792827	wrz	4	15975.44
Wu (Changzhou)	wuc	Sino-Tibetan	31.67	119.92	1.3900889	0.9579338	1.86204304	1.403355244	wuu	77175000	12371.61
Xiamen	xia	Sino-Tibetan	24.5	118.17	-0.4846364	0.12048546	1.86204304	0.499297351	nan	46227965	12570.5
!X???µ	xoo	Khoisan	-24	21.5	-0.4846364	1.79538213	1.86204304	1.057596241	nmn	4200	2838.755
Yagua	yag	Peba-Yaguan	-3.5	-72	-0.4846364	-1.5544112	0.54663194	-0.497471906	yad	5692	24056.11
Yapese	yap	Austronesian	9.58	138.17	1.3900889	0.12048546	-0.7687792	0.247265066	yap	6592	15617.32
Yaqui	yaq	Uto-Aztecan	27.5	-110.25	-0.4846364	-0.7169629	0.54663194	-0.218322461	yaq	16406	19213.52
Yareba	yar	Yareban	-9.5	148.5	-0.4846364	-1.5544112	-0.7687792	-0.935942272	yrb	750	17331.48
Yawa	yaw	Yawa	-1.75	136.25	-0.4846364	-1.5544112	-0.7687792	-0.935942272	yva	6000	15741.91
Yay	yay	Tai-Kadai	22.42	104.75	-0.4846364	0.12048546	1.86204304	0.499297351	pcc	2049203	11431.97
Yucuna	ycn	Arawakan	-0.75	-71	-0.4846364	-0.7169629	-0.7687792	-0.656792827	ycn	1800	23850.17
Yucatec	yct	Mayan	20	-89	-0.4846364	0.12048546	0.54663194	0.060826985	yua	700000	20910.71
Yel?Æ Dnye	yel	Yele	-11.37	154.17	1.3900889	1.79538213	-0.7687792	0.805563957	yle	3750	17981.82
Yessan-Mayo	yes	Sepik	-4.17	142.58	-1.2345266	-0.7169629	-0.7687792	-0.906756206	yss	1988	16493.31
Yeyi	yey	Niger-Congo	-20	23.5	-0.4846364	1.79538213	0.54663194	0.619125875	yey	25200	2579.903
Yagaria	ygr	Trans-New Guinea	-6.33	145.42	-0.4846364	-1.5544112	0.54663194	-0.497471906	ygr	21116	16877.2
Yidiny	yid	Australian	-17	145.75	-1.2345266	-1.5544112	-0.7687792	-1.185905651	yii	12	17471.56
Yimas	yim	Lower Sepik-Ramu	-4.67	143.55	-1.2345266	-1.5544112	-0.7687792	-1.185905651	yee	300	16613.97
Yukaghir (Kolyma)	yko	Yukaghir	65.75	150.83	-0.4846364	0.12048546	-0.7687792	-0.377643382	yux	10	12354.75
Yakut	ykt	Altaic	62	130	1.3900889	0.12048546	-0.7687792	0.247265066	sah	363000	11687.51
Yanyuwa	yny	Australian	-16.42	137.17	-1.2345266	0.9579338	-0.7687792	-0.348457316	jao	70	16692.95
Yoruba	yor	Niger-Congo	8	4.33	1.3900889	-0.7169629	1.86204304	0.845056353	yor	19327000	1176.774
Yukaghir (Tundra)	ytu	Yukaghir	69	155	-0.4846364	0.12048546	-0.7687792	-0.377643382	ykg	30	12259.78
Yuchi	yuc	Yuchi	35.75	-86.75	-0.4846364	1.79538213	-0.7687792	0.180655509	yuc	10	19457.92
Yulu	yul	Nilo-Saharan	8.5	25.25	1.3900889	1.79538213	1.86204304	1.682504689	yul	7000	2053.629
Yurok	yur	Algic	41.33	-124	-0.4846364	0.9579338	-0.7687792	-0.098493936	yur	12	17268.06

Yupik (Siberian)	yus	Eskimo-Aleut	65	-173	-1.2345266	0.9579338	-0.7687792	-0.348457316	ess	1350	13515.31
Zande	zan	Niger-Congo	4	26	1.3900889	0.12048546	0.54663194	0.685735432	zne	1142000	1923.022
Zoque (Copainal?°)	zqc	Mixe-Zoque	17	-93.25	-0.4846364	-0.7169629	-0.7687792	-0.656792827	zoc	10000	21020.07
Zulu	zul	Niger-Congo	-30	30	-0.4846364	0.9579338	0.54663194	0.33997643	zul	9563422	3858.811
Zuni	zun	Zuni	35.08	-108.83	-0.4846364	0.12048546	-0.7687792	-0.377643382	zun	9651	18529.96

Supplementary Information for Atkinson, Q. D. (In prep) Phonemic diversity supports serial founder effect model of language spread from Africa.

Supplementary Table S2 - Data table for all 50 language families of size N>1 from the World Atlas of Langauge Structures (WALS; http://wals.info/) showing the number of sampled languages, mean vowel*, consonant† and tone‡ diversity, mean total phoneme diversity, geometric mena of population size§ and distance from the best fit origin to centroid of each family.

* Normalized vowel diversity based on WALS feature #2 "Vowel Quality Inventories"

† Normalized consonant diversity based on WALS feature #1 "Consonant Inventories"

‡ Normalized tone diversity based on WALS feature #13 "Tone"

§Population size information was taken from - Gordon, Raymond G., Jr. (ed.), Ethnologue: Languages of the World, Fifteenth edition. Dallas, Tex.: SIL International. Online version: http://www.ethnologue.com/ (2005).

Family	Languages	Mean Normalized Vowel Diversity*	Mean Normalized Consonant Diversity†	Mean Normalized Tone Diversity‡	Mean Total Phoneme Diversity	Geometric Mean Speaker Population Size§	Distance from best fit origin to centroid
Afro-Asiatic	27	-0.02637025	0.52370133	0.449194078	0.315508385	281838.29	4145.56045
Algic	4	-0.859581513	-0.5076008	-0.43992639	-0.602369564	2089.3	19445.2832
Altaic	15	0.640198761	0.00882568	-0.76877916	-0.039918239	363078.05	10703.0928
Arawakan	8	-0.765845246	-0.1935577	-0.43992639	-0.466443099	1071.52	26191.4719
Australian	28	-0.966708676	-0.4776919	-0.76877916	-0.737726586	95.5	17921.6738
Austro-Asiatic	16	0.921407562	0.38218807	-0.35771319	0.315294145	165958.69	12634.9164
Austronesian	42	-0.190036748	-0.4577527	-0.58086329	-0.409550905	52480.75	17690.5376
Aymaran	2	-1.234526582	1.37665797	-0.76877916	-0.208882593	40738.03	26671.494
Caddoan	2	-1.234526582	0.12048546	-0.11107361	-0.408371578	10.23	20699.2834
Cariban	6	0.452726227	-1.135687	-0.76877916	-0.483913326	1122.02	26035.4438
Chibchan	4	-0.203427643	-0.2982387	-0.43992639	-0.313864245	870.96	23735.1297
Chon	2	-1.234526582	0.53920963	-0.76877916	-0.488032038	3.16	30590.4007
Chukotko-Kamchatkan	2	-0.484636445	-0.7169629	-0.76877916	-0.656792827	5888.44	14635.8324
Dravidian	6	-0.172182221	0.26006019	-0.76877916	-0.226967066	1380384.26	10364.2008
Eskimo-Aleut	3	-1.234526582	0.67878435	-0.76877916	-0.441507131	3311.31	16806.1904
Hmong-Mien	2	0.452726227	1.37665797	1.862043036	1.230475742	1023292.99	12950.6826
Hokan	3	-0.734599824	0.39963491	-0.76877916	-0.367914693	269.15	19895.6418
Huitotoan	3	-0.484636445	0.12048546	0.108161571	-0.085329804	309.03	25233.3645
Indo-European	30	0.390235382	0.4554648	-0.63723805	0.069487375	6025595.86	9025.31557
Iroquoian	3	-0.734599824	-0.7169629	0.108161571	-0.447800376	870.96	20753.6657
Kadugli	2	0.452726227	0.12048546	1.204337487	0.592516392	41686.94	3536.723
Khoisan	6	-0.484636445	1.23708324	1.204337487	0.652261428	10232.93	1160.73192
Kiowa-Tanoan	2	-0.484636445	0.53920963	0.546631937	0.200401708	1000	20060.8548
Macro-Ge	6	1.077634674	-1.2752618	-0.54954398	-0.249057023	1995.26	28284.5666
Matacoan	2	-0.859581513	0.12048546	-0.76877916	-0.502625072	16595.87	27894.244
Mayan	4	-0.484636445	0.32984755	-0.43992639	-0.198238429	57543.99	22267.4391

Mixe-Zoque	2	0.452726227	-1.135687	-0.76877916	-0.483913326	7244.36	22341.8098
Muskogean	2	-1.234526582	-1.135687	0.546631937	-0.607860562	446.68	20990.6224
Na-Dene	7	-0.913145095	0.83829832	-0.01711568	-0.03065415	398.11	17427.4941
Nakh-Daghestanian	8	-0.344032044	1.58602005	-0.60435278	0.212545077	31622.78	7494.26576
Niger-Congo	62	0.936526315	0.06645654	0.992174406	0.665052419	218776.16	3049.61199
Nilo-Saharan	25	0.790176788	0.12048546	0.862330601	0.590997617	151356.12	3473.24726
Northwest Caucasian	2	-1.234526582	0.12048546	-0.76877916	-0.62760676	331131.12	7332.69492
Oto-Manguean	9	0.056950876	0.02743565	1.569729458	0.551371994	16218.1	22146.3288
Penutian	6	-0.734599824	0.53920963	-0.76877916	-0.321389785	15.85	18594.1437
Salishan	4	-1.047054048	1.37665797	-0.76877916	-0.146391748	56.23	17867.6278
Sepik	2	0.077781158	-0.2982387	-0.76877916	-0.32974557	1737.8	17938.5467
Sino-Tibetan	25	0.3102471	0.08698753	1.230645708	0.542626779	1548816.62	12153.2107
Tacanan	2	-1.234526582	0.53920963	-0.76877916	-0.488032038	389.05	26592.163
Tai-Kadai	9	0.556877634	0.39963491	1.862043036	0.939518526	398107.17	12817.0736
Teberan-Pawaian	2	-0.484636445	-1.135687	0.546631937	-0.357897184	6309.57	18234.1436
Trans-New Guinea	19	0.067914182	-0.5847342	0.062006795	-0.151604404	8317.64	18037.515
Tucanoan	2	-0.484636445	-1.5544112	0.546631937	-0.497471906	2089.3	25157.9016
Tupian	3	0.140272003	-0.158664	-0.76877916	-0.262390381	10000	27726.0915
Uralic	7	0.58663518	0.35975642	-0.76877916	0.059204144	56234.13	9758.7268
Uto-Aztecan	9	-0.651278698	-0.3447636	-0.47646558	-0.490835965	776.25	20401.703
Wakashan	2	-0.859581513	1.79538213	-0.76877916	0.05567382	218.78	17712.3163
West Papuan	2	-0.484636445	-1.135687	-0.76877916	-0.79636755	15488.17	16450.3364
Yanomam	2	0.452726227	-1.5544112	-0.76877916	-0.623488048	1698.24	25619.4304
Yukaghir	2	-0.484636445	0.12048546	-0.76877916	-0.377643382	18.62	13703.3717

Supplementary Information for Atkinson, Q. D. (In prep) Phonemic diversity supports serial founder effect model of language spread from Africa.

Supplementary Table S3 - Summary of Mantel and partial Mantel tests for correlations between phoneme diversity and speaker population size and distance from the best-fit origin in Africa.

Dataset	Diversity Measure	Test	N	partial correlation with distance - r	Determination of diversity by distance	Significance (p-value)
Global	Total	Diversity vs distance from Africa	504	-0.544	0.296	<0.001
Global	Vowel	Diversity vs distance from Africa	504	-0.390	0.152	<0.001
Global	Consonant	Diversity vs distance from Africa	504	-0.265	0.070	<0.001
Global	Tone	Diversity vs distance from Africa	504	-0.389	0.151	<0.001
Global	Total	Diversity vs distance from Africa, partial with logged population size	504	-0.438	0.256	<0.001
Global	Vowel	Diversity vs distance from Africa, partial with logged population size	504	-0.249	0.105	<0.001
Global	Consonant	Diversity vs distance from Africa, partial with logged population size	504	-0.231	0.070	<0.001
Global	Tone	Diversity vs distance from Africa, partial with logged population size	504	-0.325	0.143	<0.001

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Supplementary Table S4 - Waypoints used to calculate pairwise geographic distances between locations on different continents.

Waypoint	Linking	Location	Long.	Lat.
1	Africa and Asia	Cairo	31.0 E	30.0 N
2	Asia and Europe	Istanbul	29.0 E	41.0 N
3	Asia and Oceania	Phnom Penh	105.0 E	11.5 N
4	Asia and North America	Bering Strait	170.0 W	66.0 N
5	North America and South America	Panama	77.5 W	8.0 N

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