Understanding Language Evolution Using an Event-Based Model
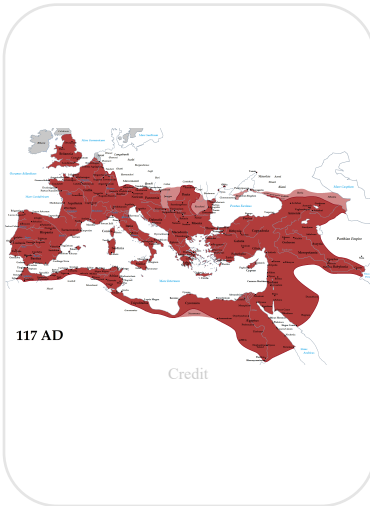
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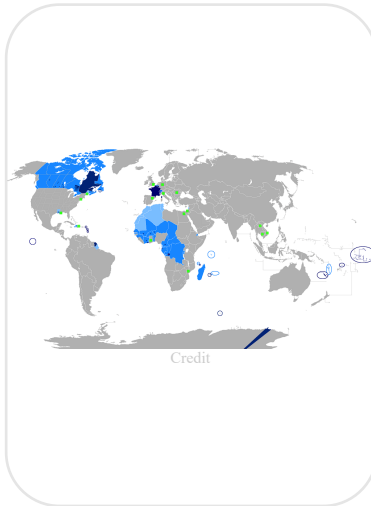# Introduction

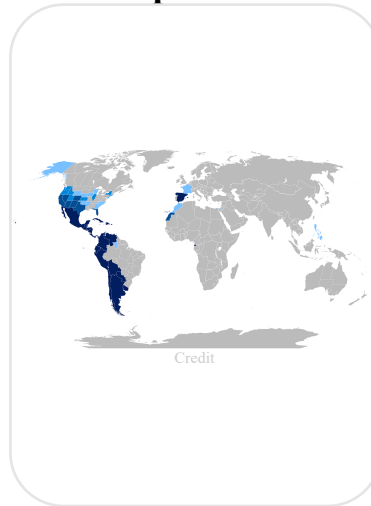In this paper, we attempt to do the impossible!
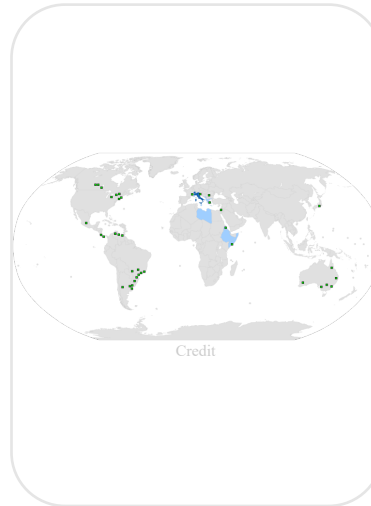
Languages

Latin

117 AD

French

Spanish

Italian

Brazilian Portuguese

Portuguese

Catalan

Walloon

Friulian

Fr3

Fr2

Fr1

Fr1
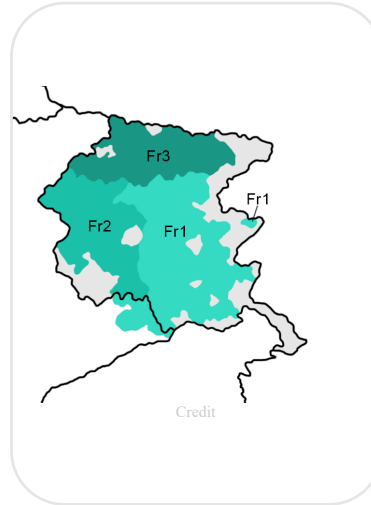
Romanian

	I	We	YouPlural	YouSingular	YouSingular-VostramMercedem	Woman
Latin	- e g oː	n oː - s -	w oː - s	t uː		f eː - m i - n - a
French	ʒ ə - -	n u - - -	v u - -	t y		f a - m - - n - a
Spanish	j i - - o	n o - s -	b o - s	t u	- u s t e d	- e - m - b ɾ - a a
Italian	i - - o	n oː i -	v oː i -	t u		f e m m i - n - a a
PortugueseBrazi	- e - w	n ɔ j - s	v ɔ j s	t u	v o s - e -	f e - m e - - - - ɐ
Portuguese	- e - w	n ɔ - ʃ -	v o - ʃ	t u	v ɔ s - e -	f e - m j - - - ɐ
Catalan	ʒ - - ɔ		b u - s	t u	v o s t e -	f e - m - b ɾ - a
Walloon	dʒ ɪ - -	n o - - -	v o - s	t y		f œ - m - - - - -
Friulian	j - - o	n oː - - -	v oː - -	t u		f ɛ - m i - n - ɛ
Romanian	j e - w	n oj - - -	v oj - -	t u		f e - m e - - j e

	Woman-Mulier	Woman-Domina	ManHumanBeing	ManHumanBeing-Homo	Child	Child-Ninnus
Latin	m u l i e r e m	d o m i n a	h o m i - n e m	- h o m oː	i n f a n t e m	
French		d a m - - -	- ɔ m - - - - - -	- ɔ̃ - - -	ɑ̃ - f ɑ̃ - - - - -	
Spanish	m u x - e ɾ - -	d o - - ɲ a	o m - b ɾ e - -		i n f a n t e -	n i ɲ o
Italian	m o ʎ ʎ e - - -	d ɔ n - n a		w ɔ m o -	- - f a n t e -	n i n o
PortugueseBrazi	m u ʎ - e ʁ - -	d o - - n ɐ	o m ẽj - - - - -		ĩ - f ẽ - tʃ i -	n e n ẽj
Portuguese	m u ʎ - e ɾ - -	d o - - n ɐ	ɔ m ẽj - - - - -		ĩ - f ẽ - t i -	n e n ẽj
Catalan	m u ʎ - e - - -	d ɔ - - n ə	- ɔ m ə - - - -			n e n -
Walloon		d œ m - - -	- ɔ m - - - -		ɛ - f ã - - - -	
Friulian	m u - - iː r - -	d ɔ - - n e	- ɔ m - - - -			
Romanian	m u - j e r e -	d o̯am - n ə	- o m - - - -			

	Wife	Wife-Mulier	Husband	Husband-Sponsus	Husband-Socius	Mother
Latin	- s p o n s a	m u l i e r -	m a riː t u s	- s p o n s u s	s o k i u s	m aː t r e m
French	e - p u - z -		m a ʁ i - - -	e - p u - - - -		m e - ʁ - - -
Spanish	e s p o - s a	m u x - e ɾ -	m a ɾ i ð o -	e s p o - s o -		m a ð ɾ e -
Italian	- s p ɔ - z a	m o ʎ ʎ e - -	m a r i t o -	- s p ɔ - z o -	s ɔ tʃ - o -	m aː d r e -
PortugueseBrazi	i s p o - z a	m u ʎ - e ʁ -	m a ɾ i d u -	i s p o - z u -		m ẽj - - - -
Portuguese	ɨ ʃ p o - z ɐ	m u ʎ - e ɾ -	m ɐ ɾ i ð u -	ɨ ʃ p o - z u -		m ẽj - - - -
Catalan	ə s p ɔ - z ə	m u ʎ - e - -	m a r i t - -	ə s p ɔ - s - -		m a - ɾ ə -
Walloon						m e - ʁ - -
Friulian		m u - - iː r - -	m a riː t - -	- s p oː - s - -		m ɒ - r i -
Romanian		m u - j e r e	m ə r i t - -		s o ts - - -	

	Fish-Piskem	Fish-Pescion	Bird-Avem	Bird-Avicellum	Bird-Passerem	Fruit
Latin	p i s k e m		a w e m	- a w i - k - e l l u m	p a s s e r e m	f r u: - k t u s
French		p w a s õ		w a - - - z - o - - - -		f ʁ ɥ i - - - -
Spanish	p e θ - - -		a b e -		p a - x a ɾ o -	f ɾ u - - t o -
Italian	p e ʃ ʃ e -			- - u - t ʧ - ɛ l l o -	p a s s e r o -	f r u - t t o -
PortugueseBrazi	p ej ʃ - i -		a v i -		p a - s ɐ r u -	f ɾ u - - t ɐ
Portuguese	p ɐj ʃ - ɨ -		a v ɨ -		p a - s ɐ r u -	f ɾ u - - t ɐ
Catalan	p e ʃ - - -		a w - -	- - u - s - e - ʎ - - -		f ɾ u j - t - -
Walloon		p - ɛ h õ		- - u: - - h - ɛ: - -		f ʁ y - - - -
Friulian	p ɛ s - - -			- - u - - ʧ j ɛ - l -		f r u - - t - -
Romanian	p e ʃ t e -				p a - s ə r e -	f r u - k t - -

	Flower	Nose	Nose-Nares	Sun	Sun-Soliculus	Moon
Latin	f l o: r e m	n a: s u s		s o: l e m	s o l i c u l u s	l u: n a
French	f l œ ʁ - - -	n e - - -			s ɔ l ɛj - - - - -	l y n -
Spanish	f l o ɾ - -	n a s o -	n a ɾ i θ -	s o l - -		l u n a
Italian	f j o: ɾ e -	n a: s o -	n a r i ʧ e	s o l e -		l u n a
PortugueseBrazi	f l o ʁ - -		n a ɾ i s -	s ɔ w - -		l u - ɐ
Portuguese	f l o ɾ - -		n ɐ ɾ i ʃ -	s ɔ ɫ - -		l u - ɐ
Catalan	f l ɔ - - -	n a s - -	n a: r ɪ s -	s ɔ l - -		ʎ u n ə
Walloon	f l ø: ʁ - -	n e - -		s ɔ l ɔ -		l ø n -
Friulian	f l o: r - -	n a: s - -			s o r e - - l i -	l u n e
Romanian	f l ɔa ɾ e -	n a s - ə		s ɔa ɾ e -		l u n ə

	Star	Water	Rain	Lake	Sea	Salt
Latin	- s t - e: l l a	a - kʷ - a	p l u - w i a	l a k u m	m a r e	s a: l e m
French	e - t w a - l -	o - - - - - -	p l ɥ - - i -	l a k - - -	m ɛ ʁ - -	s ɛ l - -
Spanish	e s t ɾ e - j a	a - ɣ w a	j - u - b j a	l a g o -	m a ɾ - -	s a l - -
Italian	- s t - e l l a	a k k w a	p j o d ʤ - a	l a g o -	m a r e	s a l e -
PortugueseBrazi	i s t ɾ e - l ɐ	a - g w ɐ	ʃ - u - v - ɐ	l a g u -	m a ʁ -	s a w - -
Portuguese	ɨ ʃ t ɾ e - l ɐ	a - g w ɐ	ʃ - u - v - ɐ	l a ɣ u -	m a ɾ - -	s a l - -
Catalan	ə s t - ɛ - l -	aj - ɣ w ə	p l u - ʒ - ə	ʎ a k - -	m a r - -	s a l - -
Walloon	- s t - ø: - l -	ɛ: - - w -	p l u: - ʁ -	l a k - -	m e ʁ - -	s e - - -
Friulian	- s t - ɛ - l e	a - g - e	p l o - - j e	l a: t -	m a: r - -	s a: l - -
Romanian	- s t - ea - - -	a - p - ə	p l ɔa - - j e	l a k - -	m a r e	s a r e -

Language	Earth	Fog	Fog-Nebula	Fog-Tenebrae	Fog-Tenebras	Fog-Fumata
Latin	t e r r a	k aː liː g i n e m	n e b u l a	t e n eː b r aj	t e n eː b r aː s	f u m aː t a
French	t e ʁ		n j ɔ l y		t e n ɛ b ʁ	f y m e
Spanish	t j e r a	k a l i n a	n j e b l a		t i n j e b l a s	f u m a t a
Italian	t ɛ r r a	k a l i dʒ i n e	n e b b j a	t ɛ n e b r e	t ɛː n e b r e	f u m aː t a
PortugueseBrazi	t e ʁ ɐ	k a l i ʒ ẽj	n ɛ v w ɐ			f u m a s ɐ
Portuguese	t ɛ ʁ ɐ	k ɐ l i ʒ ẽj	n ɛ v w ɐ		t r ɛ v ɐ ʃ	f u m a s ɐ
Catalan	t ɛ r ə		n e w l ə		t ə n e b ɾ ə s	
Walloon	t ɛː ʁ					
Friulian	t j ɛ r e					f u m a t e
Romanian	ts a r ə		n e g u r ə			

Language	Fog-Caecia	Sky	Wind	Fire-Focus	Year	Name-Nomen
Latin	k aj k i a	k aj l u m	w e n t u m	f o k u m	a n n u m	n oː m e n
French		s j ɛ	v ã	f ø	ã	n õ
Spanish		θ j e l o	b j e n t o	f w e g o	a ɲ o	
Italian		tʃ ɛ l o	v ɛ n t o	f w ɔ k o	a n n o	n o m e
PortugueseBrazi		s ɛ w	v ẽ t u	f o g u	ɐ n u	n o m i
Portuguese		s ɛ w	v ẽ t u	f o ɣ u	ɐ n u	n o m ɨ
Catalan		s ɛ l	b e n	f ɔ k	a ɲ	n ɔ m
Walloon		s iː ʁ	v ẽ	f øː	ã	n õ
Friulian		tʃ iː l	v i n t	f uː k	a ŋ	n ɔ ɲ
Romanian	tʃ ɛa tʃ ə	tʃ e r	v i n t	f o k	a n	n u m e

Language	Name-Nominem	Tongue	ToDrink	ToEat	ToEat-Manducare	ToBite
Latin	n oː m i n e m	l i n gʷ a	b i b e r e	k o m e d e r e	m a n d u k aː r e	m o r d eː r e
French		l ã g	b w ɑ ʁ		m ã ʒ e	m o ʁ d ʁ
Spanish	n o m b ɾ e	l e ŋ g w a	b e b e ɾ	k o m e ɾ	m a n d u k a ɾ	m o ɾ ð e ɾ
Italian		l i n g w a	b e r e		m a n dʒ a r e	m ɔ r d e r e
PortugueseBrazi		l ĩ g w ɐ	b e b e ʁ	k o m e	m ẽ ʒ a ʁ	m o ʁ d e ʁ
Portuguese		l ĩ g w ɐ	b ɨ β e ɾ	k u m e ɾ	m ẽ ʒ a ɾ	m u ɾ ð e ɾ
Catalan			b ɛ w ɾ ə		m ə ɲ ʒ a i	
Walloon		l ẽy	b øː ʁ		m a ɲ iː	
Friulian		l ɛ n g ɛ	b e v i		m a ŋ ɟ aː	m w a r d i
Romanian		l i m b ə	b ɛa		m i n k a	

Block 1

Language	ToBite-Morsicare	ToSuck	ToSpit	ToSpit-Exconspuere	ToSpit-Sputare	ToKnow
Latin	morsikaːre	suːgere	konspuere		sputere	skiːre
French		syse	kɛ̃spye			
Spanish	mos-kaɾ			eskupiɾ	esputaɾ	
Italian	morsikaɾe				sputaɾe	
PortugueseBrazi	mu-səga	sugaʁ	kuspiʁ			
Portuguese	mu-səgar	sugaɾ	kuʃpiɾ			
Catalan	mu-səɣa			əskupi		
Walloon		sysiː				
Friulian		cucaː			spudaː	
Romanian	murseka	suʤe	skujpa			ʃti

Block 2

Language	ToKnow-Sapere	ToKnow-Cognoscere	ToThink	ToThink-Pensare	ToFear	ToFear-Tremere
Latin	sap-ere	kognoːskere	k-oːgitaːre	peːnsaːre	timeːre	trem-ere
French	savwaʁ	kɔ-nɛ-tʁ	kɥ-ide	pɑ̃-se		kʁẽ-d-ʁ
Spanish	sab-eɾ	ko-noθeɾ	kw-idaɾ	pensaɾ	temeɾ	tɾem-eɾ
Italian	sap-ere	ko-noʃʃere	k-oʤitare	pensaɾe	temere	trem-are
PortugueseBrazi	sab-eʁ	ko-ɲes-eʁ	k-uʒitaʁ	pẽ-saʁ	temeʁ	tɾem-eʁ
Portuguese	sɐb-eɾ	ku-ɲis-eɾ	k-uʒitar	pẽ-saɾ	timeɾ	tɾim-eɾ
Catalan	sə β-ɛ	ku-nɛʃ-ə	k-u-jda	pənsa	temə	
Walloon	sav-øːʁ	ki-nɔh		pɛ̃-se		
Friulian	sav-eː	ko-ɲos-i		peŋsaː	temi	tɾim-aː
Romanian		ku-noaʃte	k-uʤeta	pə-sa	teme	

Block 3

Language	ToSleep	ToLive	ToDie	ToKill	ToKill-Adnecare	ToKill-Tutari
Latin	d-ormiːre	wiːwere		nekaːre		tuː-tari
French	d-ɔʁmiʁ	viv-ʁ	muʁiʁ	nwaje		t-ɥ-e
Spanish	d-ormiɾ	bibiɾ	moɾiɾ		a-negaɾ	
Italian	d-ormire	vivere	morire		annegare	
PortugueseBrazi	d-oʁmiʁ	viveʁ	moʁeʁ			
Portuguese	d-uɾmiɾ	viveɾ	muʁeɾ			
Catalan	d-urmi	biw-ɾə	muɾi	n-əga		
Walloon	dwaʁmi		mɔri			tuw-e
Friulian	d-urmiː	vivi	muriː			
Romanian	d-ormi	vi-a	muri	n-eka		

	ToKill-Mactare	ToKill-Occidere	ToFight	ToFight-Battuere	ToHunt-Captiare	ToHit
Latin	mactaːre	okkiːdere	pugnaːre	battuere	kaptiaːre	pulsaːre
French	mate--	ɔksi-ʁ-		bat--ʁ--	ʃa-s-e--	pu-se--
Spanish	ma-taɾ		pu-ɲaɾ	ba-t-iɾ	ka-θ-aɾ	pu-xaɾ
Italian		utʃidere	puɲɲare	batt-ere	katʃ-are	pulsare
PortugueseBrazi	ma-taʁ			ba-t-eʁ	ka-s-aʁ	pu-ʃaʁ
Portuguese	mɐ-taɾ			bɐ-t-eɾ	kɐ-s-aɾ	pu-ʃaɾ
Catalan	mə-ta	uksi---	pu-ɲa	ba-t--ɾə	kə-s-a	
Walloon				bat-e	tʃɛ-s-iː	
Friulian	matʃ-aː--			bat-i	ca-tʃ-aː--	pulsaː
Romanian		u-tʃide--		bat-e		pulsa

	ToCut	ToCut-Curtare	ToCut-Excurtare	ToCut-Taliare	ToSplit	ToSplit-Scindere
Latin	sekaːre	kurtaːre	ekskurtaːre	taːliaːre	diːwidere	skindere
French	sje-		e--kuʁte--	taj--e-		s-ɛ̃-de--
Spanish	s-egaɾ	kortaɾ-		ta-x-aɾ	dibidiɾ	
Italian	s-egare		--scortare	ta-ʎʎaːre	dividere	ʃ-indere
PortugueseBrazi	s-egaʁ	koʁtaʁ		ta-ʎ-aʁ	dʒividʒiʁ	
Portuguese	s-iɣaɾ	kurtaɾ		tɐ-ʎ-aɾ	diviðiɾ	
Catalan	s-əɣa			tə-ʎ-a	dibidi-	
Walloon				tɛ--jiː		
Friulian	s-e-aː--		scurtaː--	ta--ja	dividi-	
Romanian			skurta--	tə--ja	divide-	

	ToSplit-Findere	ToSplit-Partire	ToSplit-Separare	ToStab	ToStab-Iugulare	ToScratch
Latin	findere	partiːre	separaːre-	pungere	jugulaːre	radere
French	fɑ̃-d-ʁ-	paʁtiʁ-	sə-v---ʁe	pwɛ̃-d-ʁ-	ʒygyle---	
Spanish	-endeɾ	partiɾ-	separaɾ-			ra-eɾ-
Italian	fɛndere	partire	separare-	p-undʒere	jugulaːre	radere
PortugueseBrazi	fẽ-deʁ	paʁtʃiʁ-	separaʁ-	p-ũ-ʒiʁ-		ʁa-eʁ-
Portuguese	fẽ-deɾ	pɐrtiɾ-	sipɐraɾ-	p-ũ-ʒiɾ-		ʁɐ-eɾ-
Catalan	fɛnd-ɾə	pərti--	səpəra--	p-uɲ-i--		raw-ɾə
Walloon	fɛ̃-t---	pɔːrti--				
Friulian		partiː--	separaː---			radaː--
Romanian			separa---	pundʒe---		rade--

	ToScratch-Rasare	ToScratch-Rasicare	ToScratch-Coctiare	ToDig	ToDig-Cavare	ToDig-Excavare
Latin				f o d e r e	k a w aː r e	e k s k a w aː r e
French	ʁ ɑ z e			f w i ʁ		
Spanish	r a s a ɾ	r a s k a ɾ			k a b a ɾ	e s k a b a ɾ
Italian	r a s a r e				k a v a r e	s k a v a r e
PortugueseBrazi	ʁ a z a ʁ	ʁ a ʃ k a ʁ	k o s a ɻ		k ɐ v a ʁ	i ʃ k ɐ v a ʁ
Portuguese	ʁ ɐ z a ɾ	ʁ ɐ ʃ k a ɾ	k u s a ɾ		k ɐ v a ɾ	i ʃ k ɐ v a ɾ
Catalan	r ə z a	r ə s k a			k ə b a	
Walloon					ç ɑː v l e	
Friulian	r a s aː				ɟ a v aː	z ɟ a v aː
Romanian						

	ToSwim	ToSwim-Navigare	ToFly	ToFly-Exvolare	ToWalk	ToWalk-Marcher
Latin	n a t aː r e	n a v i g aː r e	w o l aː r e			
French		n a ʒ e	v o l e		ʃ ə m i n e	m a ʁ ʃ e
Spanish	n a d a ɾ	n a b e g a ɾ	b o l a ɾ		k a m i n a ɾ	
Italian	n w o t a ɾ e	n a v i g a r e	v o l a ɾ e	z v o l a ɾ e	k a m m i n a ɾ e	
PortugueseBrazi	n a d a ʁ	n a v i ɣ a ʁ	v o a ʁ		k ɐ m i ɲ a ʁ	
Portuguese	n ɐ ð a ɾ	n ɐ v i ɣ a ɾ	v w a ɾ		k ɐ m i ɲ a ɾ	
Catalan	n ə ð a	n ə b ə g a	b u l a		k ə m i n a	
Walloon		n ɛ dʒ iː	v ɔ l e		tʃ i m i n e	m aː ʁ tʃ iː
Friulian	n a d aː	n a v i g aː		z v o l aː	tʃ j a m i n a	
Romanian		n a v i g a		z b u ɾ a		

	ToWalk-Mergere	ToWalk-Ambitare	ToCome	ToLieAsInABed	ToLieAsInABed-Iacere	ToSit
Latin	m e r g e r e	a m b i t aː r e	w e n iː r e	e k s t e n d e r e	j a k e r e	s e d eː r e
French			v ə n i ʁ	e t ã d ʁ	ʒ e z i ʁ	s w a ʁ
Spanish		a n d a ɾ	b e n i ɾ	e k s t e n d e ɾ	j a θ e ɾ	s e ɾ
Italian	m e r dʒ e r e	a n d a r e	v e n i ɾ e	e s t ɛ n d e r e	dʒ a tʃ eː r e	s e d e r e
PortugueseBrazi		ẽ d a ʁ	v i ʁ	i s t ẽ d e ʁ	ʒ ɐ z e ʁ	s e ʁ
Portuguese		ẽ d a ɾ	v i ɾ	i ʃ t ẽ d e ɾ	ʒ ɐ z e ɾ	s e ɾ
Catalan			b ə n i	ə s t e n d ɾ ə	ʒ a w ɾ ə	
Walloon			v i n i		dʒ e r e	
Friulian			v i ɲ iː		j e s i	
Romanian	m e r dʒ e		v e n i	e k s t i n d e	z ə tʃ ḁ	ʃ e d ḁ

	ToSit-Sedentare	ToStand	ToStand-Levare	ToStand-Altiare	ToTurnIntransitive	ToTurnIntransitive-Gyrare
Latin	sedenta:re	sta:re	leva:re	altia:re	torna:re	gyra:re
French	ɛ-t-ʁ	lɔve	o-s-e	tuʁne		ʒiʁe
Spanish	se-ntaɾ	estaɾ	jebaɾ	alθaɾ	tornaɾ	xiɾaɾ
Italian		stare	levare	altsare	tornare	dʒiɾaɾe
PortugueseBrazi	sẽ-taɾ	iʃtaɾ	levaʁ	aɫs-a	toʁnaʁ	ʒiɾaɾ
Portuguese	sẽ-taɾ	iʃtaɾ	livaɾ	aɫs-aɾ	tuɾnaɾ	ʒiɾaɾ
Catalan	əsta	ʎəba	əls-a	turna		ʒiɾa
Walloon	ɛs	lɔve	hɔ:-s-i:	tu:rne		
Friulian	se-nta:	sta:	leva:	altʃ-a:	torna:	dʒiɾa:
Romanian		sta	lua		turna	

	ToTurnIntransitive -AncestralClass3	ToTurnIntransitive -Torquere	ToFall	ToFall-Tumbare	ToHold	ToHold-Segurar
Latin		torkʷe:re	kadere		tene:re	
French	viʁe	tɔʁd-ʁ	ʃwa-ʁ	tõ-be	tən-iʁ	
Spanish	biɾaɾ	torθer	ka-eɾ	tumbaɾ	tener	seguɾaɾ
Italian	viɾaɾe	tɔrtʃere	kadeɾe		tenere	
PortugueseBrazi	viɾaɾ	turser	kɐ-iɾ	tõ-baʁ	te-ʁ	siguɾaʁ
Portuguese	ʒiɾaɾ	turser	kɐ-iɾ	tõ-baɾ	te-ɾ	siɣuɾaɾ
Catalan	biɾa	tɔrsə	kaw-ɾə	tumba	tən-i	
Walloon	viʁe		tʃɛ:-ʁ	tum-e	tin-i	
Friulian	dʒiɾa:		tʃjade		tinji	
Romanian		tɔartʃe	kədʒa	tumba	tsin-e	

	ToSqueeze	ToSqueeze-Serrere	ToSqueeze-Serare	ToSqueeze-Appectorare	ToSqueeze-Stringere	ToRub
Latin	eksprim-ere	serrere	se-rare	appektora:re	stringere	frika:re
French	e-pʁɛ̃-d-ʁ		se-ʁe		e-tʁɛ̃-d-ʁ	fʁɛje
Spanish	eksprem-iɾ	se-raɾ	θe-raɾ	a-p-ɾetaɾ	estreɲ-iɾ	fregaɾ
Italian	sprɛm-ere		serrare		strindʒere	fregare
PortugueseBrazi	i-ʃprəm-eʁ	se-ʁa	sɨ-ʁaɾ	ʁ-pi-ɾ-taɾ	əʃtrĩ-ʒir	
Portuguese	i-ʃprəm-er	sə-ʁaɾ	sɨ-ʁaɾ	ʁ-pi-ɾ-taɾ	əʃtrĩʒir	
Catalan	ə-sprem-ə	sə-ra			əstrɛɲə	fɾəga
Walloon			sɛ-ʁe		stringe	froj
Friulian	e-sprim-i				strɛngi:	fre-a
Romanian	sk-reme				strindʒe	freka

	ToRub-Exfricare	ToRub-Frictare	ToRub-Frictiare	ToWash	ToWipe	ToWipe-Extergere
Latin		f r i k t a: r e		l a w a: r e	t e r g e r e	e k s t e r g e r e
French		f ʁ o t e - - -		l a v e - -		
Spanish		f r o t a ɾ - -	f r i s a ɾ	l a β a ɾ -		e - s t a ɾ s i ɾ -
Italian		f r e t t a r e		l a v a r e	t ɛ r dʒ e r e	
PortugueseBrazi	ɨ ʃ f ɾ i g a ɾ			l ɐ v a ɾ		
Portuguese	ɨ ʃ f ɾ i ɣ a ɾ			l ɐ v a ɾ -		
Catalan			f ɾ ə s a -	ʎ ə b a -		ə - s t ə r ʒ i - -
Walloon		f ʁ o t e - - -		l a v e -		
Friulian				l a v a: -		
Romanian				l a - - - -		- - ʃ t e r dʒ e - -

	ToWipe-Exsucare	ToWipe-Limpidare	ToPull	ToPull-Pulsare	ToPull-Trahere	ToPush
Latin	e k s - u: k - a: r e	l i m p i d a: r e	t i r a: r e	p u l s a: r e	t r a h e r e	i m p i n g e r e
French	e - s ɥ i - j e -		t i ʁ e - -	p u - s e - -	t ʁ - - ɛ ʁ	
Spanish	e n x - u g - a ɾ -	l i m p j - a ɾ -	t i r a ɾ -	p u - x a ɾ -		
Italian	a ʃ ʃ - u g - a r e		t i r a r e	p u l s a r e	t r a r - r e	i m p i n dʒ e r e
PortugueseBrazi	ẽ - ʃ - u g - a ɾ	l ĩ - p - a ɾ -	tʃ i r a	p u - ʃ a ɾ	t r a z e -	
Portuguese	ẽ - ʃ - u ɣ - a ɾ	l ĩ - p - a ɾ -	t i r a ɾ	p u - ʃ a ɾ -	t ɾ ɐ z e ɾ -	
Catalan	ə - ʃ - u g a -		t i r a		t ɾ ɛ w - r ə	ə m p ɛ ɲ - ə - -
Walloon	- - s - u - w e -		t i r e	p u: s i: -		
Friulian	- - s - u - j a: -		t i r a: -	p u l s a: -	t r a j - - -	
Romanian	u - s - - k - a - -			p u l s a -	t r a dʒ e - -	ɨ m p i n dʒ e - -

	ToThrow	ToThrow-Lanceare	ToThrow-Eruncare	ToTie	ToTie-Aptare	ToSew
Latin	j a k t a: r e	l a n k e a: r e	e: - r u n k a: r e	l i g a: r e	a p t a: r e	k o n - s u e r e
French	ʒ ə - t e - -	l ɑ̃ - s - e - -		l i - e - -		k u - d - - - ʁ
Spanish	- e - tʃ a ɾ -	l a n θ - a ɾ -	a - r a n k a ɾ -	l e g a ɾ -	a - t a ɾ -	k o - - s - e ɾ -
Italian	dʒ e t t a r e	l a n tʃ a r e	a r r o n tʃ a r e	l e g a r e		k u - - tʃ - i r e
PortugueseBrazi	ʒ ej t a ɾ - -	l ɐ̃ - s - a - -			ʁ - t a ɾ -	k u - - z - e ɾ -
Portuguese	ʒ ej t a ɾ - -	l ɐ̃ - s - a ɾ -			ʁ - t a ɾ -	k u - - z - e ɾ -
Catalan	x i t a - - -	ʎ ə n s - a - -		ʎ i ɣ a - -		k u - - z - i - -
Walloon	dʒ ɛ t e - -	l a n c - i: -		l o j i: - -		k ø: - - z - - -
Friulian		l a n tʃ a: -		l e - a: -		k u - - z i - -
Romanian			a - ɾ u ŋ k a - -	l e g a - -		c o̯a - - s - e - -

ToCount / ToCount-Enumerare / ToSay / ToSay-Exponere / ToSing-AncestralClass / ToPlay-Ludere

	ToCount	ToCount-Enumerare	ToSay	ToSay-Exponere	ToSing-AncestralClass	ToPlay-Ludere
Latin	komputaːre	eːnumeraːre	diːkere	ekspoːnere	kantaːre	luːdere
French	kõ---te--	enumeʁe--	di-ʁ		ʃɑ̃-te--	
Spanish	kon---taɾ-	enumeraɾ-	deθiɾ		kantaɾ-	ludiɾ-
Italian	kon--tare	enumerare	di--re	-|-spor-re	kantare	ludiɾ-
PortugueseBrazi	kõ---taɾ-	enumeraɾ-	diz-eɾ		kɐ̃-taɾ-	
Portuguese	kõ---taɾ	enumeraɾ	diz-eɾ		kɐ̃-taɾ	
Catalan	kum--ta--	enumera--	di----		kənta--	
Walloon	kõ---te-		diː--ʁ		ʧɑ̃-te-	
Friulian	kon--taː--		diː---		cantaː--	
Romanian		-numara--	ziʧe--	-|-spune-|-	kinta--	

ToPlay-Jiocare / ToFloat / ToFloat-Fluitare / ToFlow / ToFlow-Colare / ToFlow-Excurrere

	ToPlay-Jiocare	ToFloat	ToFloat-Fluitare	ToFlow	ToFlow-Colare	ToFlow-Excurrere
Latin	jo-kaːre	fluːktuaːre	fluitaːre	fluere	koːlaːre	ekskurrere
French	ʒ-w-e-	flyktɥe-		flye-	kule-	
Spanish	xu-gaɾ-	flugtwaɾ		fluiɾ-	kolaɾ-	e-skuriɾ--
Italian	ʤo-kare	fluttuare	fluitare	fluire	kolare	--skorrere
PortugueseBrazi	ʒo-gaʁ-	flu-tuaʁ-		flwiʁ-	ko-aʁ-	i-ʃko-ʁeʁ-
Portuguese	ʒu-ɣaɾ	flu-tuaɾ		flwiɾ-	ku-aɾ	i-ʃku-ʁeɾ
Catalan	ʒu-ga-	fluktua-		flui--	kuɫa-	ə-sko-rə--
Walloon	ʤuw-e-				kɔle-	
Friulian	ʤuj-aː-					--sko-riː--
Romanian	ʒu-ka-	fluktua--				--skuɾʤe-

ToFlow-Currere / ToFreeze / ToFreeze-Glaciare / ToFreeze-Inglaciare / ToBurn-Brojan / ToBurn-Cremare

	ToFlow-Currere	ToFreeze	ToFreeze-Glaciare	ToFreeze-Inglaciare	ToBurn-Brojan	ToBurn-Cremare
Latin	kurrere	gelaːre	gla-kiaːre	inglakiaːre		kremaːre
French	ku-ʁiʁ	ʒəle-	gla-s-e-		bʁyle--	kʁame--
Spanish	ko-reɾ	-elaɾ-				k-emaɾ-
Italian	korrere	ʤelare	gjatʧjare		bruʧare	kremare
PortugueseBrazi	ko-ʁeʁ	ʒilaɾ-				k-ɐjmaɾe
Portuguese	ku-ʁeɾ	ʒilaɾ-				k-ejmaʁe
Catalan	ko-rə--	ʒəla--	glə-s-a-|-		bʁule--	krəma--
Walloon		ʤale--			bʁuːle--	
Friulian	ko-ri--		gla-ʧ-aː-|-		bruzaː--	
Romanian	kuɾʤe--			ɨng-ets-a-|-		

	ToBurn-Flammare	ToBurn-Ardere	ToBurn-Flagrare	ToBurn-Incendere	ToBurn-AncestralClass8	All
Latin	f l a mma ː r e	a r d e ː r e	f l a g r a ː r e	i n k e n d - e r e	u s t u l a ː r e	o m n e ː s
French	f l ɑ̃ - b e - -	a ʁ d - ʁ	f l a g ʁ e - -	ɛ̃ - s ɑ̃ - d j e - -		
Spanish	f l a - m e a ɾ	a r d e r -	f l a g r a ɾ -	e n θ e n d - e r -		
Italian	f j a mma r e	a r d e r e	f l a g r a r e	i n tʃ ɛ n d j a r e	u s t o l a r e	o ɲ ɲ i -
PortugueseBrazi		a ʁ d e ʁ -	f l a g ʁ a ʁ -	ĩ - s e n dʒ ɪ a ɾ -		
Portuguese		ɐ r d e ɾ -	f l a g r a ɾ -	ĩ - s ẽ - d j a ɾ -		
Catalan	f ɬ a m a -|-|-			ə n s e n d - - ɾ ə		
Walloon						
Friulian						
Romanian		a r d e -|-		i n tʃ i n d ʒ e -|-	u s t u r a -|-	

	All-Totus	Many	Many-Tantus	Some	Few	Other
Latin	t oː - t u s	m u l t u s	t a n t u s		p au̯ k u s	a l t e r -
French	t u -	m u -		o - k œ̃ - -	p ø	o - t - ʁ -
Spanish	t o - d o -	m u - tʃ o	t a n t o -	a l g u n o	p o k o -	o - t - r o
Italian	t u t t o -	m o l t o -	t a n t o -	a l k u n o	p ɔ k o -	a l t - r o
PortugueseBrazi	t o - d u -	m ũ j - t u	t ẽ - t u -	a w g ũ -|-	p o w k u	o w t - ɾ u
Portuguese	t o - ð u -	m ũ j - t u	t ẽ - t u -	a ɬ g ũ -	p o w k u	o w t - ɾ u
Catalan	t o - t -	m o l -|-	t a n t -	ə l g u -|-	p ɔ k -	a l t - ɾ ə
Walloon	t ɔ - -				p õ -	õ - t -|-|-
Friulian	d u - t -	m o l c -	t a n c -		p oː k -	a l t - r i
Romanian	t o - t -	m u l t - -				a l t -|-

	Other-Alius	Big	Big-Grandem	Big-Majjorem	Long-Longum	Long-Largum
Latin	a l i u s	m a g n u m	g r a n d e m	m a j j o r e m	l o - n g u m	l a r g u m
French			g ʁ ã -|-|- m		l õ -|-|-|-	l a ʁ ʒ - -
Spanish		m a - ɲ o -	g r a n d e -		l o - n g o -	l a r ɣ o -
Italian		m a ɲ ɲ o -	g r a n d e -		l u - n g o -	l a r g o -
PortugueseBrazi	a w -|-|-		g r ẽ - dʒ i		l õ - g u -|-	l a ʁ g u -
Portuguese	a ɬ -|-|-		g r ẽ - d ɨ		l õ - g u -	l a r g u -
Catalan			g r a n -|-		ʎ o - ŋ -|-	ʎ a r k - -
Walloon			g ʁ ã -|-		l õ -|-	
Friulian			g r a n t -|-		l u n k -|-	l a r k - -
Romanian				m a -|- ɾ e	l u n g -|-	l a r g -|-

Wide / Heavy / Small

	Wide	Wide-Amplum	Heavy	Heavy-Lurdus	Heavy-Pesant	Small
Latin	laːtum	amplum	grawis	lurdus	peːsant	pittitus
French	le	ɑ̃-pl	gʁav	luʁ	pəzɑ̃	pə-ti
Spanish	lato	antʃo	grabe	lerdo	pesa-ðo	
Italian	lato	ampjo	grɛve	lordo	pesante	
PortugueseBrazi	latu	ẽ-ʃ-u	gravi	lerdo	peza-du	
Portuguese	latu	ẽ-ʃ-u	gravɨ	lerdo	pɨza-ðu	
Catalan		amplə	grew		pəza-t	pətit
Walloon			grav			pi-ti
Friulian			grɛvi		pezant	
Romanian	lat		grew			

Small / Short / Narrow

	Small-Pittinus	Small-Pitulus	Short	Short-Brevis	Narrow	Narrow-Strictus
Latin	pittinus	pitulus	kurtus	brewis	angustus	striktus
French			kuʁ	bʁɛf		e-tʁwa
Spanish	pe-keɲo		korto	brebe	angosto	estre-tʃo
Italian	pitʃino	pikkolo	korto	brɛve	angusto	str-e-tto
PortugueseBrazi	pe-kenu		kuʁtu	brɛvi		istr-ej-tu
Portuguese	pɨ-kenu		kurtu	brɛvɨ		iʃtr-ɐj-tu
Catalan			kurt	brew		əstr-ɛ-t
Walloon			kuːʁ	bʁɛf		stʁ-ø
Friulian		pi-tʃul	kurt			str-ɛ-t
Romanian	pu-tsin				ɨŋgust	str-im-t

Thin / Red

	Thin	Thin-Delicatus	Thin-Subtilis	Red	Red-Russus	Red-Vermiculus
Latin	minuː-tus	deːlikaːtus	subtiːlem	ruber	russus	vermikulus
French	məny	duː-ʒeː		ʁu	ʁu	vɛʁmɛj
Spanish	menu-do	del-ɣaðo	su-til		ro-xo	bermexo
Italian	minu-to	delikato	sottile	rub-ro	rosso	vermiʎ-ʎo
PortugueseBrazi	mi-u-du	dew-gadu	su-tʃiw		ʁo-ʃʊ	vɐʁme-ʎu
Portuguese	mi-u-ðu	dɛɫ-ɣaðu	su-tʃiw		ʁo-ʃu	virmɐj-ʎu
Catalan	mənu-t	dəlikat	suptil		ro-s	bərmɛ-ʎ
Walloon	minu		suː-ti			
Friulian	minuː-t		su-tiː-l		rɔ-s	
Romanian	mərunt		subtsire		ro-ʃu	

	Red-Rubeus	Green	One	Two-Duos	Two-Duae	Two-Duas
Latin	r u - b e u s	w i r i d e m	uː n u m	d u oː s	d u - aj	d u a s
French	ʁ u - ʒ	v e ʁ	œ̃	d - ø		
Spanish	r u - b j o	b e ɾ - d e	u n o	d - o s		
Italian	r ɔ b b j o	v e r - d e	u n o		d u - e	
PortugueseBrazi	r u - b e o	v e ɾ - d ɨ	ũ	d - oj s		d u ɐ s
Portuguese	r u - b e o	v e ɾ - d ɨ	ũ	d - oj ʃ		d u ɐ ʃ
Catalan	r u - dʒ e	v ɛ r - t	u n	d - o s		
Walloon	r ɔ - tʃ	v ɛ ʁ	õ	d - øː		
Friulian		v ɛ r - t	u ŋ	d - oj		
Romanian	r oj - b	v e r - d e	u n u	d - oj	d o w ə	

	Three	Four	Five	Here	There	There-Ibi
Latin	t r - eː s	kʷ - a t t w o r	kʷ - i n kʷ - e	e k k u m h iː k	i l l aː k	i b iː
French	t ʁ w ɑ	k - a - t - ʁ	s ẽ - k	i - s - i	l a	
Spanish	t ɾ - e s	k w a - t - ɾ o	θ i n k - o	a - k - i	a - j a	
Italian	t r - e s	k w a t t - ɾ o	tʃ i ŋ k w e	k w - i	l a	v i
PortugueseBrazi	t ɾ - e s	k w a - t - ɾ u	s ĩ - k - u	a - k - i	l a	
Portuguese	t ɾ - e ʃ	k w a - t - ɾ u	s ĩ - k - u	ɐ - k - i	l a	
Catalan	t r - ɛ s	k w a - t - ɾ ə	s i ŋ k	a - k - i	ə - ʎ a	
Walloon	t r - øː	k w a - t	s ẽ - k		l a	
Friulian	t r - eː	k w a - t - r i	tʃ i ŋ k	a - k - i	l a	
Romanian	t r - ej	p - a - t - r u	tʃ i n tʃ		l a	

	There-AdIbi	Who-Qui	Who-Quem	What	When-Quando	How-Quomodo
Latin		kʷ - i s	kʷ - e m	kʷ - i d	kʷ - a n d oː	kʷ oː m o d o
French		k - i		k w a	k - ã	k ɔ m
Spanish	a i		k j e n	k - e	k w a n d o	k o m o
Italian		k - i		k - e	k w a n d o	k o m e
PortugueseBrazi	a i		k - ẽj	k - i	k w ẽ - d u	k o m u
Portuguese	ɐ i		k - ɐ̃j	k - ɨ	k w ẽ - d u	k o m u
Catalan		k - i		k - ɛ	k w a n	k ɔ m
Walloon		k - iː		k w ɛː	k w a n d	k ɔ m ɛ̃
Friulian		k w i		tʃ - e	k w a n t	tʃ e m uː t
Romanian			tʃ - i n e	tʃ - e	k - ɨ n d	k u m

	Not			Not-Nec			And-Et		And-Si		
Latin	n	o:	n	n	e	k	e	t	s	i:	k
French	n	ɔ̃	-	n	i	-	e	-			
Spanish	n	o	-	n	i	-	i	-			
Italian	n	o	n	n	e	-	e	-			
PortugueseBrazi	n	ẽw̃		n	ẽj	-	i	-			
Portuguese	n	ẽw̃	-	n	ẽj	-	i	-			
Catalan	n	o	-	n	i	-	i	-			
Walloon				n	ẽ	-	ɛ	-			
Friulian	n	o	-				e	-			
Romanian	n	u	-				e	-	ʃ	i	-

Character Assignments

Each segment gets a different number

1	e	2	g	3	oː	4	ʒ	5	ə	6	ɟ	7	o	8	i	9	w	10	ɔ	11	ʤ	12	ɪ	13	j	14	n	15	s	16	u	17	ʃ
18	oj	19	v	20	b	21	t	22	uː	23	y	24	d	25	f	26	eː	27	m	28	a	29	ɾ	30	ɐ	31	œ	32	ɛ
33	l	34	r	35	x	36	ʎ	37	ʁ	38	iː	39	ɲ	40	o̯a	41	h	42	ẽj̃	43	ɔ̃	44	ɑ̃	45	ĩ	46	ɛ̃	47	ʧ
48	ɨ	49	ã	50	p	51	z	52	ð	53	k	54	ts	55	aː	56	ẽj̃	57	ʀ	58	ɒ	59	θ	60	ej	61	ɐj	62	õ
63	ɛː	64	ɥ	65	øː	66	ɫ	67	c	68	ɛj	69	ø	70	e̯a	71	kʷ	72	ɣ	73	aj	74	g	75	ẽ	76	ŋ	77	gʷ
78	ẽɥ̃	79	ɑ	80	β	81	ɟ	82	ɛ̃	83	ʧ	84	ɔː	85	ũ	86	ɹ	87	ç	88	ɑː	89	ȷ̃	90	œ̃	91	aɥ̃	92	ʊ
93	ẽw̃																															

Basic Rules

1	**Nasal Vowel**

ẽj̃ ɔ̃ ɑ̃ ĩ ɛ̃ ã ɐ̃j̃ õ ẽ ẽṵ ɛ̃ ũ ɑː œ̃ ẽw̃

2	**Vowel**

e oː ə o i ɔ ɪ u oj uː y eː a ɐ œ ɛ iː o̯a ɨ aː ɒ ej ɐj ɛː øː ɛj ø e̯a aj ɑ ɔː au̯ ʊ

3	**Nasal Consonant**

n m ɲ ŋ j̃

4	**Non Sylabic Sonorant**

w j l r

5	**Consonant**

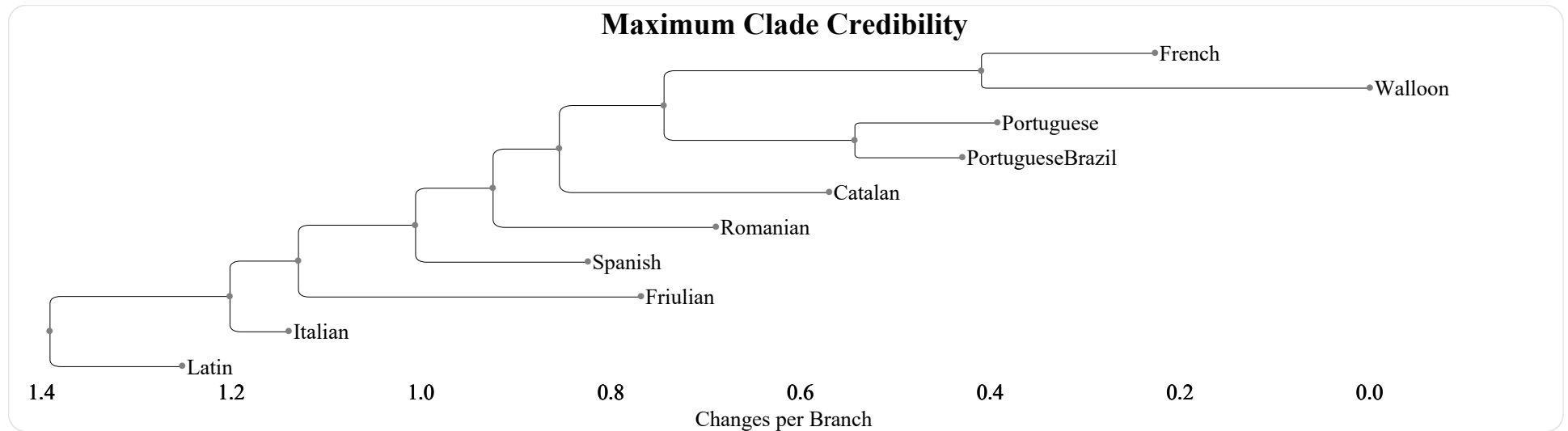g ʒ ɟ ʤ s ʃ v b t d f ɾ x ʎ ʁ h ʧ p z ð k ʦ ʀ θ ɥ ɫ c kʷ ɣ g gʷ β ɟ ʧ ɻ ç
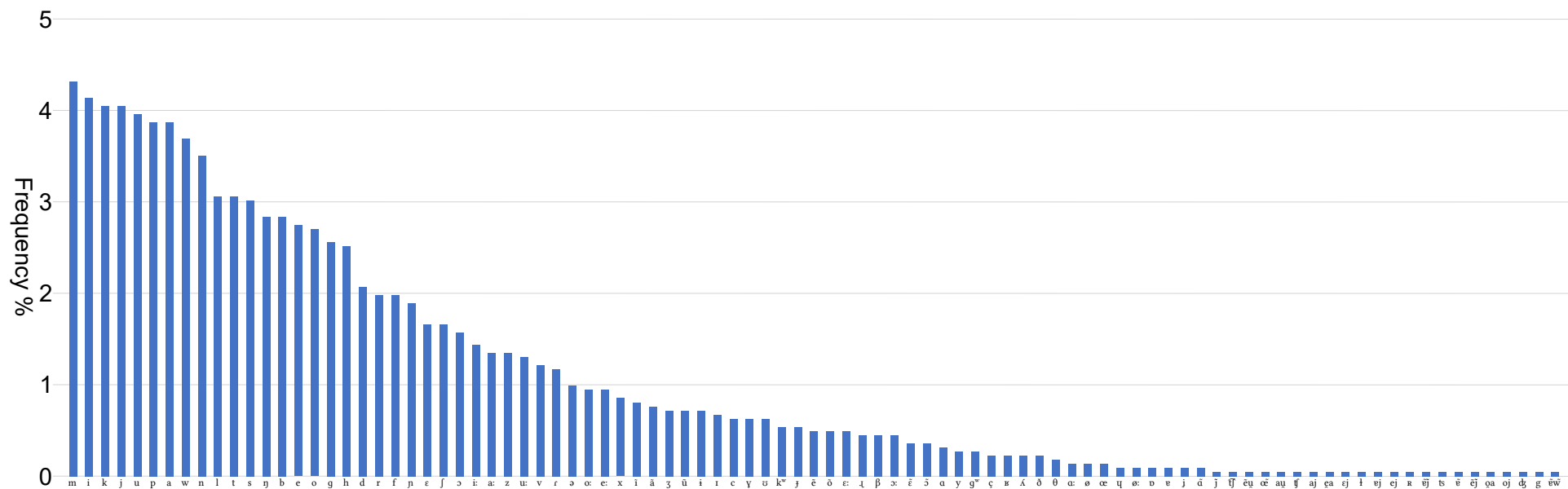
Transition Rates Between Partitions

For the 'Basic Rules' model, states were grouped into five sets: Nasal Vowel (1), Vowel (2), Nasal Consonant (3), Non Sylabic Sonorant (4) and Consonant (5). Here, the area of the circles is proportional to the estimated equilibrium frequencies for each group. The width of the arrows is proportional to the estimated rates. Note that rates are higher for transitions from one word segment to another when the word segments are in the same group.

Maximum Clade Credibility

Questions

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