Understanding Language Evolution Using an Event-Based Model

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Introduction

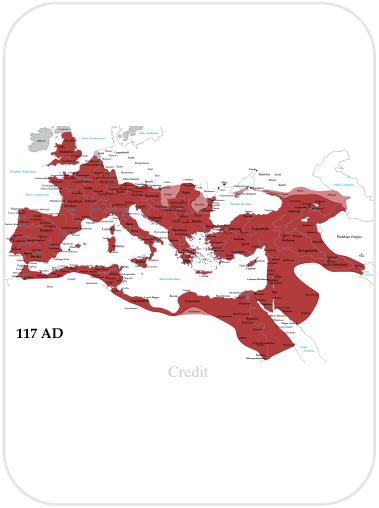
Modern languages are related to one another through a complicated history of divergence and word borrowing. The divergence of languages is caused by the slow change in spoken language as it is passed from parents to offspring. Over time, divergence causes languages to become increasingly different from one another, ultimately to the point where they are mutually unintelligible. Languages that were spoken by the same human group more recently in time are considered to be more closely related to each other than they are to groups that spoke the language more distantly in time; this relatedness information can be depicted by a tree-like diagram called a 'phylogeny.' Linguistic borrowing, by contrast, causes languages to become more similar to one another.

Language	IPA	Coding
English	/hænd/	0
German	/hant/	0
French	/mẽ/	1
Spanish	/mano/	1
Italian	/maːno/	1
Russian	/rʊka/	2
Polish	/rɛŋka/	2

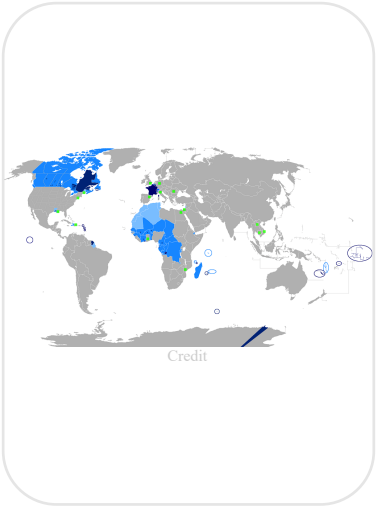
Table 1. Coding of lexical cognates for the word *hand*.

Languages

Latin

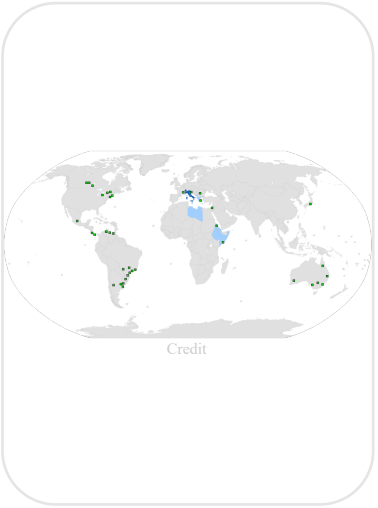


French



Spanish

Italian



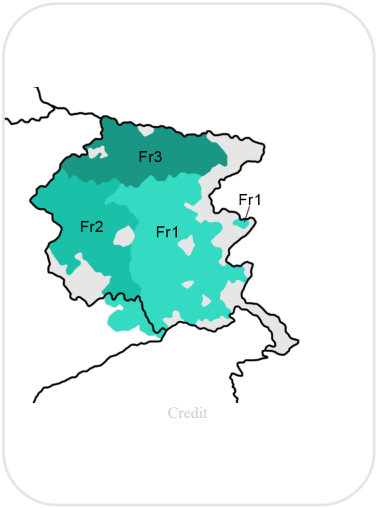
Brazilian Portuguese

Portuguese

Catalan

Walloon

Friulian



Romanian

Concepts Used

	I	We	YouPlural	YouSingular	YouSingular-VostramMerc	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 - - - - -
Spanish	ɟ - - o	n o - s -	b o - s	t u	- u s t e d	- e - m - b ɾ - a
Italian	i - - o	n oː i - -	v oː i -	t u		f e m m i - n - 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	ʤ 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 ẽ ʃ - - - - -		ĩ - f ɐ̃ - ʧ i -	n e n ẽ ʃ
Portuguese	m u ʎ - e ɾ - -	d o - - n ɐ	ɔ m ẽ ʃ - - - - -		ĩ - f ɐ̃ - t ɨ -	n e n ẽ ʃ
Catalan	m u ʎ - e - - -	d ɔ - - n ə	- ɔ m ə - - - -			n e n -
Walloon		d œ m - - -	- ɔ m - - - - -		ɛ - f ɑ̃ - - - -	
Friulian	m u - - iː r - -	d ɔ - - n e	- ɔ m - - - - -			
Romanian	m u - j e r e -	d o̯ a m - 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 r iː 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 ʧ - 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 ɐ̃ ʃ - - - -
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 ɐ̃ ʃ - - - -
Catalan	ə s p ɔ - z ə	m u ʎ - e - -	m a ɾ i t - -	ə s p ɔ - s - -		m a - ɾ ə -
Walloon						m e - ʀ - -
Friulian		m u - iː r - -	m a r iː t - -	- s p oː - s - -		m a - r i -
Romanian		m u - j e r e	m ə r i t - -		s o ʦ - - -	

	Father	Father-Tata	Animal	Animal-Bestia	Fish-Piskem	Fish-Pescion
Latin	p a t r e	t a t a	a n i m a l i a	b eː s t i a	p i s k e m	
French	p e - ʁ -		o - - - m a - j			p w a s õ
Spanish	p a ð ɾ e	t a t a	a l i m a ɲ - a		p e θ - - -	
Italian	p aː d r e	t a t a		b i ʃ ʃ - a	p e ʃ ʃ e -	
PortugueseBrazi	p aj - - -	t a t a		b i - ʃ - ɐ	p ej ʃ - i -	
Portuguese	p aj - - -	t a t a		b i - ʃ - ɐ	p ɐj ʃ - i -	
Catalan	p a - ɾ ə				p e ʃ - - -	
Walloon	p ɛː - r -					p - ɛ h õ
Friulian	p a - r i		n e m aː l - - -	b i s - - -	p ɛ s - - -	
Romanian		t a t ə	- n ə m a - j e		p e ʃ t e -	

	Bird-Avem	Bird-Avicellum	Bird-Passerem	Louse	Fruit	Flower
Latin	a w e m	- a w i - k - e l l u m	p a s s e r e m	p - e d u - k l u s	f r uː - k t u s	f l oː r e m
French		w a - - - z - o - - - -		p - u - - - - - - -	f ʁ ɥ i - - - -	f l œ ʁ - -
Spanish	a b e -		p a - x a ɾ o -	p j o - - x - o - -	f ɾ u - - t o -	f l o ɾ - -
Italian		- - u - t ʧ - ɛ l l o -	p a s s e r o -	p - i d ɔ k k j o -	f r u - t t o -	f j oː ɾ e -
PortugueseBrazi	a v i -		p a - s ɐ ɾ u -	p - i - o - ʎ u - -	f ɾ u - - t ɐ -	f l o ʁ - -
Portuguese	a v ɨ -		p a - s ɐ ɾ u -	p - i - o - ʎ u - -	f ɾ u - - t ɐ -	f l o ɾ - -
Catalan	a w - -	- - u - - s - e - ʎ - -		p - o - - - ʎ - - -	f ɾ u j - t - -	f l ɔ - - -
Walloon		- - uː - - h - ɛː - - - -		p j u - - - - - - -	f ʁ y - - - - -	f l øː ʁ - -
Friulian		- - u - - ʧ j ɛ - l - -		p - e d o - l i - -	f r u - - t - -	f l oː r - -
Romanian			p a - s ə ɾ e -	p - ə d u k - j e -	f r u - k t - -	f l o̯a ɾ e -

	Nose	Nose-Nares	Mouth	Mouth-Gula	Sun	Sun-Soliculus
Latin	n aː s u s		b u k k a	g u l a	s oː l e m	s o l i k u l u s
French	n e - - -		b u - ʃ -			s ɔ l ɛj - - - - -
Spanish	n a s o -	n a ɾ i θ -	b o - k a		s o l - -	
Italian	n aː s o -	n a r i ʧ e	b o k k a		s o l e -	
PortugueseBrazi		n a ɾ i s -	b o - k ɐ		s ɔ w - -	
Portuguese		n ɐ ɾ i ʃ -	b o - k ɐ		s ɔ ɬ - -	
Catalan	n a s - -	n aː r ɪ s -	b o - k ə		s ɔ l - -	
Walloon	n e - - -		b ɔ k - -		s ɔ l ɔ -	
Friulian	n aː s - -		b ɔ - c ɛ			s o r e - - l i -
Romanian	n a s - -		b u - k ə	g u ɾ ə	s o̯a ɾ e -	

	Moon	Star	Water	Rain	Lake	Sea
Latin	l uː n a	– s t – eː l l a	a – kʷ – a	p l u – w i a	l a k u m	m a r e
French	l y n –	e – t w a – l –	o – – – –	p l ɥ – – i –	l a k – –	m ɛ ʁ –
Spanish	l u n a	e s t ɾ e – ɟ a	a – ɣ w a	ɟ – u – b j a	l a g o –	m a ɾ –
Italian	l u n a	– 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
PortugueseBrazi	l u – ɐ	i s t ɾ e – l ɐ	a – g w ɐ	ʃ – u – v – ɐ	l a g u –	m a ʁ –
Portuguese	l u – ɐ	ɨ ʃ t ɾ e – l ɐ	a – g w ɐ	ʃ – u – v – ɐ	l a ɣ u –	m a ɾ –
Catalan	ʎ u n ə	ə s t – ɛ – l –	aj – ɣ w ə	p l u – ʒ – ə	ʎ a k – –	m a r
Walloon	l ø n –	– s t – øː – l –	ɛː – – w –	p l uː – ʁ – –	l a k – –	m e ʁ
Friulian	l u n e	– s t – ɛ – l e	a – g – e	p l o – – j e	l aː t – –	m aː r –
Romanian	l u n ə	– s t – e̯a – – –	a – p – ə	p l o̯a – – j e	l a k – –	m a r e
	Salt	Earth	Fog	Fog-Nebula	Fog-Tenebrae	Fog-Tenebras
Latin	s aː l e m	t – e r r a	k aː l iː 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
French	s ɛ l – –	t – e – ʁ –		n j ɔ – – – l y		t – e n – ɛ b ʁ – –
Spanish	s a l – –	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
Italian	s a l e –	t – ɛ r r a	k a l i ʤ i n e –	n – e b b – j a	t ɛː n e b r e	t – ɛː n – e b r e –
PortugueseBrazi	s a w – –	t – e – ʁ ɐ	k a l i ʒ ɐ̃j – – –	n – ɛ – v w – ɐ		
Portuguese	s a l – –	t – ɛ – ʁ ɐ	k ɐ l i ʒ ɐ̃j – – –	n – ɛ – v w – ɐ		t ɾ – – – ɛ v – ɐ ʃ
Catalan	s a l – –	t – ɛ – r ə		n – e – – w l ə		t – ə n – e b ɾ ə s
Walloon	s e – – –	t – ɛː – ʁ –				
Friulian	s aː l – –	t j ɛ – r e				
Romanian	s a r e –	ʦ – a – r ə		n e g u r ə – –		
	Fog-Fumata	Fog-Caecia	Sky	Wind	Fire-Focus	Year
Latin	f uː m aː t a	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
French	f y m e – –		s j ɛ l – –	v – ɑ̃ – – –	f – ø – – –	ɑ̃ – – – –
Spanish	f u m a t a		θ j e l o –	b j e n t o –	f w e g o –	a – ɲ o –
Italian	f u m aː t a		ʧ – ɛ l o –	v – ɛ n t o –	f w ɔ k o –	a n n o –
PortugueseBrazi	f u m a s ɐ		s – ɛ w – –	v – ẽ – t u –	f – o g u –	ɐ – n u –
Portuguese	f u m a s ɐ		s – ɛ w – –	v – ẽ – t u –	f – o ɣ u –	ɐ – n u –
Catalan			s – ɛ l – –	b – e n – – –	f – ɔ k – –	a – ɲ – –
Walloon			s – iː ʁ – –	v – ẽ – – – –	f – øː – – –	ɑ̃ – – – –
Friulian	f u m a t e		ʧ – iː l – –	v – i n t – –	f – uː k – –	a – ŋ – –
Romanian		ʧ e̯a ʧ – ə	ʧ – e ɾ – –	v – ɨ n t – –	f – o k – –	a n – – –

	Name-Nomen	Name-Nominem	Tongue	ToDrink	ToEat	ToEat-Manducare
Latin	n oː m e n	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
French	n ɔ̃ - - -		l ɑ̃ - g - -	b - - w ɑ ʁ -		m ɑ̃ - ʒ - - e - -
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 -
Italian	n oː m e -		l i n g w a	b e - - - ɾ e		m a n ʤ - - a ɾ e
PortugueseBrazi	n o m i -		l ĩ - g w ɐ	b e b - e ʁ -	k o m e - - - -	m ẽ - ʒ - - a ʁ -
Portuguese	n o m ɨ -		l ĩ - g w ɐ	b ɨ β - e ɾ -	k u m - - e ɾ -	m ɐ̃ - ʒ - - a ɾ -
Catalan	n ɔ m - -			b ɛ w - - ɾ ə		m ə ɲ ʒ - - a - -
Walloon	n õ - - -		l ẽu̯ - - - -	b - - - øː ʁ -		m a ɲ - - - iː - -
Friulian	n ɔ ŋ - -		l ɛ n g - ɛ	b e v i - - -		m a ŋ ɟ - - aː - -
Romanian	n u m e -		l i m b - ə	b - - - e̯a - -		m ɨ n - - k a - -

	ToBite	ToBite-Morsicare	ToSuck	ToSpit	ToSpit-Exconspuere	ToSpit-Sputare
Latin	m - o r d eː r e	m o r s i k aː r e	s uː g e r e	k o n s p u e r e		- s p u t e r e
French	m - o ʁ d - ʁ -		s y s e - -	k ɔ̃ - s p y e - -		
Spanish	m - o ɾ ð e ɾ -	m o - s - k a ɾ -			e s k u - p i ɾ	e s p u t a ɾ -
Italian	m - ɔ r d e r e	m o r s i k a ɾ e				- s p u t a ɾ e
PortugueseBrazi	m - o ʁ d e ʁ -	m u - s ə g a - -	s u g a ʁ -	k u - s p i ʁ - -		
Portuguese	m - u ɾ ð e ɾ -	m u - s ə g a r -	s u g a ɾ -	k u - ʃ p i ɾ - -		
Catalan		m u - s ə ɣ a - -			ə s k u - p i -	
Walloon			s y s iː - -			
Friulian	m w a r d i - -		c u c aː - -			s p u d aː - - -
Romanian		m u r s e k a - -	s u ʤ e - -		- s k u j p a -	

	ToKnow	ToKnow-Sapere	ToKnow-Cognoscere	ToThink	ToThink-Pensare	ToFear
Latin	s k iː r e	s a p - e r e	k o g n oː s k e r e	k - oː g i t aː r e	p eː n s aː r e	t i m eː r e
French		s a v w a ʁ -	k ɔ - n ɛ - t ʁ - -	k ɥ - - i d e - -	p ɑ̃ - s e - -	
Spanish		s a b - e ɾ -	k o - n o θ e ɾ - -	k w - - i d a ɾ -	p e n s a ɾ -	t e m e ɾ -
Italian		s a p - e r e	k o - n o ʃ ʃ e r e	k - o ʤ i t a r e	p e n s a ɾ e	t e m e r e
PortugueseBrazi		s a b - e ʁ -	k o - ɲ e s - e ʁ -	k - u ʒ i t a ʁ -	p ẽ - s a ʁ -	t e m e ʁ -
Portuguese		s ɐ b - e ɾ -	k u - ɲ ɨ s - e ɾ -	k - u ʒ i t a ɾ -	p ẽ - s a ɾ -	t ɨ m e ɾ -
Catalan		s ə β - ɛ - -	k u - n ɛ ʃ - ə - -	k - u - j d a - -	p ə n s a - -	t e m ə - -
Walloon		s a v - øː ʁ -	k i - n ɔ h - - - -		p ɛ̃ - s e - -	
Friulian		s a v - eː - -	k o - ɲ o s - i - -		p e ŋ s aː - -	t e m i - -
Romanian	ʃ t i - -		k u - n o̯a ʃ t e - -	k - u ʤ e t a - -	p ə - s a - -	t e m e - -

	ToFear-Tremere	ToSleep	ToLive	ToDie	ToKill	ToKill-Adnecare
Latin	t r e m - e r e	d - o r m iː r e	w iː w e r e		n - e k aː r e	
French	k ʁ ẽ - d - ʁ -	d - ɔ ʁ m i ʁ -	v i v - ʁ -	m u ʁ i ʁ -	n w aj e - - -	
Spanish	t ɾ e m - e ɾ -	d - o ɾ m i ɾ -	b i b i ɾ -	m o ɾ i ɾ -		a - n e g a ɾ -
Italian	t r e m - a r e	d - o r m i r e	v i v e r e	m o r i r e		a n n e g a r e
PortugueseBrazi	t ɾ e m - e ʁ -	d - o ʁ m i ʁ -	v i v e ʁ -	m o ʁ e ʁ -		
Portuguese	t ɾ ɨ m - e ɾ -	d - u ɾ m i ɾ -	v i v e ɾ -	m u ʁ e ɾ -		
Catalan		d - u r m i - -	b i w - ɾ ə	m u ɾ i - -	n - ə g a - -	
Walloon		d w a ʁ m i - -		m ɔ ʁ i - -		
Friulian	t r i m - aː - -	d - u r m iː - -	v i v i - -	m u r iː - -		
Romanian		d - o r m i - -	v i - a - -	m u r i - -	n - e k a - -	

	ToKill-Tutari	ToKill-Mactare	ToKill-Occidere	ToFight	ToFight-Battuere	ToHunt-Captiare
Latin	t uː - t aː r i	m a k t aː r e	o k k iː d e r e	p u g n aː r e	b a t t u e r e	k a p t i aː r e
French	t - ɥ - e - -	m a - t e - -	ɔ k s i - - ʁ -		b a t - - ʁ - -	ʃ a - s - e - -
Spanish		m a - t a ɾ -		p u - ɲ a ɾ -	b a - t - i ɾ -	k a - θ - a ɾ -
Italian			u t ʧ i d e ɾ e	p u ɲ ɲ a r e	b a t t - e r e	k a t ʧ - a r e
PortugueseBrazi		m a - t a ʁ -			b a - t - e ʁ -	k a - s - a ʁ -
Portuguese		m ɐ - t a ɾ -			b ɐ - t - e ɾ -	k ɐ - s - a ɾ -
Catalan		m ə - t a - -	u k s i - - - -	p u - ɲ a - -	b a - t - - ɾ ə	k ə - s - a - -
Walloon	t u w - e - -				b a t - e - - -	ʧ ɛ - s - iː - -
Friulian		m a ʧ - aː - -			b a t - i - - -	c a - ʧ - aː - -
Romanian			u - ʧ i d e - -		b a t - e - - -	

	ToHit	ToCut	ToCut-Curtare	ToCut-Excurtare	ToCut-Taliare	ToSplit
Latin	p u l s aː r e	s - e k aː r e	k u r t aː r e	e k s k u r t aː r e	t aː - l i aː r e	d iː w i d e r e
French	p u - s e - -	s j e - - - -		e - - k u ʁ t e - -	t ɑ j - - e - -	
Spanish	p u - x a ɾ -	s - e g a ɾ -	k o ɾ t a ɾ -		t a - x - a ɾ -	d i b i d i ɾ -
Italian	p u l s a r e	s - e g a r e		- - s k o r t a r e	t a - ɟ ɟ aː r e	d i v i d e r e
PortugueseBrazi	p u - ʃ a ʁ -	s - e g a ʁ -	k o ʁ t a ʁ -		t a - ɟ - a ʁ -	ʤ i v i ʤ i ʁ -
Portuguese	p u - ʃ a ɾ -	s - i ɣ a ɾ -	k u ɾ t a ɾ -		t ɐ - ɟ - a ɾ -	d i v i ð i ɾ -
Catalan		s - ə ɣ a - -			t ə - ɟ - a - -	d i b i d i - -
Walloon					t ɛ - - j iː - -	
Friulian	p u l s aː - -	s - e - aː - -		- - s k u r t aː - -	t a - - j aː - -	d i v i d i - -
Romanian	p u l s a - -			- - s k u r t a - -	t ə - - j a - -	d i v i d e - -

	ToSplit-Scindere	ToSplit-Findere	ToSplit-Partire	ToSplit-Separare	ToStab	ToStab-Iugulare
Latin	skindere	findere	partiːre	seːparaːre	p-ungere	jugulaːre
French	s-ɛ̃-de--	fɑ̃-d-ʁ-	paʁtiʁ-	sə-v---ʁe	pwɛ̃-d-ʁ-	ʒygyle--
Spanish		-endeɾ-	paɾtiɾ-	sepaɾaɾ--		
Italian	ʃ-indere	fɛndere	partire	separare-	p-undʒere	jugulaːre
PortugueseBrazi		fẽ-deʁ-	paʁʧiʁ-	sepaɾaʁ--	p-ũ-ʒiʁ-	
Portuguese		fẽ-deɾ-	pɐɾtiɾ-	sɨpɐɾaɾ--	p-ũ-ʒiɾ-	
Catalan		fɛnd-ɾə	pərti--	səpəɾa---	p-uɲ-i--	
Walloon		fɛ̃-t---	pɔːʁti--			
Friulian			partiː--	sepaːr---		
Romanian				separa---	pundʒe---	

	ToScratch	ToScratch-Rasare	ToScratch-Rasicare	ToScratch-Coctiare	ToDig	ToDig-Cavare
Latin	raːdere				fodere	kawaːre
French		ʁɑzə--			fwiʁ--	
Spanish	ra-eɾ-	rasaɾ-	raskaɾ			kabaɾ-
Italian	radere	rasare				kavare
PortugueseBrazi	ʁa-eʁ-	ʁazaʁ-	ʁaʃkaʁ	kosaɻ		kɐvaʁ-
Portuguese	ʁɐ-eɾ-	ʁɐzaɾ-	ʁɐʃkaɾ	kusaɾ		kɐvaɾ-
Catalan	rawɾə	rəzaɾ-	rəska-			kəba--
Walloon						çɑːv-le
Friulian	radaː--	rasaː--				ɟavaː--
Romanian	rade--					

	ToDig-Excavare	ToSwim	ToSwim-Navigare	ToFly	ToFly-Exvolare	ToWalk
Latin	ekskawaːre	natːaːre	navigaːre	wolaːre		
French			naʒe--	vole--		ʃəmine---
Spanish	eskabaɾ--	n-adaɾ-	nabeɡaɾ-	bolaɾ-		kaminaɾ--
Italian	--skavare	nwotaɾe	navigare	volaɾe	zvolaɾe	kamminaɾe
PortugueseBrazi	i-ʃkɐvaʁ-	n-adaʁ-	naviɣaʁ-	vo-aʁ-		kɐmiɲaʁ--
Portuguese	i-ʃkɐvaɾ-	n-ɐðaɾ-	nɐviɣaɾ-	vw-aɾ-		kɐmiɲaɾ--
Catalan		n-ədaː--	nəbəɡa--	bula--		kəmina---
Walloon			nɛ--ʤiː--	vɔle--		ʧimine---
Friulian	--zɟavaː--	n-adaː--	navigaː--		zvolaː--	caminaː---
Romanian			navigaː--		zburaː--	

	ToWalk-Marcher	ToWalk-Mergere	ToWalk-Ambitare	ToCome	ToLieAsInABed	ToLieAsInABed-Iacere
Latin		m e r g e r e	a m b i t a: r e	w e n i: r e	e k s t e n d e r e	j a - k e: r e
French	m a ʁ ʃ e			v ə n i ʁ -	e - t ɑ̃ - d - ʁ - -	ʒ e - z i ʁ -
Spanish			a n d - - a ɾ -	b e n i ɾ -	e k s t e n d e ɾ -	ɟ a - θ e ɾ -
Italian		m ɛ r ʤ e r e	a n d - - a r e	v e n i ɾ e	e - s t ɛ n d e r e	ʤ a - ʧ e: ɾ e
PortugueseBrazi			ẽ - d - - a ʁ -	v - - i ʁ -	i s t ẽ - d e ʁ - -	ʒ ɐ - z e ʁ -
Portuguese			ẽ - d - - a ɾ -	v - - i ɾ -	i ʃ t ẽ - d e ɾ - -	ʒ ɐ - z e ɾ -
Catalan				b ə n i - -	ə - s t e n d - ɾ ə	ʒ a w - - ɾ ə
Walloon	m a: ʁ ʧ i:			v i n i - -		ʤ e - - r e -
Friulian				v i ɲ i: - -		j e - s i - -
Romanian		m e r ʤ e - -		v e n i - -	e k s t i n d e - -	z ə - ʧ e̯a - -
	ToSit	ToSit-Sedentare	ToStand	ToStand-Levare	ToStand-Altiare	ToTurnIntransitive
Latin	s - e d e: r e	s e d e n t a: r e	- s t a: r e	l e v a: r e	- a l t i a: r e	t o r n a: r e
French	s w a - - ʁ -		ɛ - t - ʁ -	l ə v e - -	- o - s - e - -	t u ʁ n e - -
Spanish	s - e - - ɾ -	s e - - n t a ɾ -	e s t a ɾ -	ɟ e b a ɾ -	- a l θ - a ɾ -	t o ɾ n a ɾ -
Italian	s - e d e r e		- s t a r e	l e v a r e	- a l ʦ a r e -	t o r n a r e
PortugueseBrazi	s - e - - ʁ -	s ẽ - - - t a ɾ -	i ʃ t a ɾ -	l e v a ʁ -	- a ɬ s - a - -	t o ʁ n a ʁ -
Portuguese	s - e - - ɾ -	s ẽ - - - t a ɾ -	i ʃ t a ɾ -	l ɨ v a ɾ -	- a ɬ s - a ɾ -	t u ɾ n a ɾ -
Catalan			ə s t a - -	ʎ ə b a - -	- ə l s - a - -	t u r n a - -
Walloon			ɛ s - - - -	l ə v e - -	h ɔ: - s - i: - -	t u: r n e - -
Friulian		s e - - n t a: - -	- s t a: - -	l e v a: - -	- a l t ʃ - a: -	t o r n a: - -
Romanian	ʃ - e d e̯a - -		- s t a - -	l - u a - -		t u r n a - -
	ToTurnIntransitive-Gyrare	ToTurnIntransitive-Ancestr	ToTurnIntransitive-Torquer	ToFall	ToFall-Tumbare	ToHold
Latin	g y r a: r e		t o r kʷ e: r e	k - a d e r e		t e n - e: r e
French	ʒ i ʁ e - -	v i ʁ e - -	t ɔ ʁ d - ʁ -	ʃ w a - - ʁ -	t õ - b e -	t ə n - i ʁ -
Spanish	x i ɾ a ɾ -	b i ɾ a ɾ -	t o ɾ θ e ɾ -	k - a - e ɾ -	t u m b a ɾ	t e n - e ɾ -
Italian	ʤ i r a ɾ e	v i r a ɾ e	t ɔ r ʧ e r e	k - a d e ɾ e		t e n - e ɾ e
PortugueseBrazi	ʒ i ɾ a ɾ -	v i ɾ a ɾ -	t u r s e r -	k - ɐ - i ɾ -	t õ - b a ʁ	t e - - - ʁ -
Portuguese	ʒ i ɾ a ɾ -	ʒ i ɾ a ɾ -	t u r s e r -	k - ɐ - i ɾ -	t õ - b a ɾ	t e - - - ɾ -
Catalan	ʒ i ɾ a - -	b i ɾ a - -	t ɔ r s ə - -	k - a w - r ə	t u m b a -	t ə n - i - -
Walloon		v i ʁ e - -		ʧ - ɛ: - - ʁ -	t u m - e -	t i n - i - -
Friulian	ʤ i r a: - -	ʤ i r a: - -		ʧ j a d e - -		t i n j i - -
Romanian			t o̯a r ʧ e - -	k ə d e̯a - - -		ʦ i n - e - -

	ToHold-Segurar	ToSqueeze	ToSqueeze-Serrere	ToSqueeze-Serare	ToSqueeze-Appectorare	ToSqueeze-Stringere
Latin		e k s p r i m - e r e	s e r r e r e	s e - r a r e	a p p e k t o r aː r e	- s t r i n g e r e
French		e - - p ʁ ɛ̃ - d - ʁ -		s e - ʁ e - -		e - t ʁ ɛ̃ - d - ʁ -
Spanish	s e g u ɾ a ɾ	e k s p ɾ e m - i ɾ -	s e - r a ɾ -	θ e - r a ɾ -	a - p - - ɾ e t a ɾ -	e s t ɾ e ɲ - i ɾ -
Italian		- - s p r ɛ m - e r e		s e r r a r e		- s t r i n ʤ e r e
PortugueseBrazi	s ɨ g u ɾ a ʁ	i - ʃ p r ə m - e ʁ -	s e - ʁ a - -	s ɨ - ʁ a ɾ -	ɐ - p ɨ - ɾ - t a ɾ -	ə ʃ t r ĩ - ʒ i r -
Portuguese	s ɨ ɣ u ɾ a ɾ	i - ʃ p r ə m - e r -	s ə - ʁ a ɾ -	s ɨ - ʁ a ɾ -	ɐ - p ɨ - ɾ - t a ɾ -	ə ʃ t r ĩ ʒ i r - -
Catalan		ə - s p ɾ e m - ə - -	s ə - r a - -			ə s t ɾ ɛ ɲ ə - - -
Walloon				s ɛ - ʁ e - -		s t r i n g e - - -
Friulian		e - s p r i m - i - -				s t r ɛ n g iː - - -
Romanian		- s k - r e m e - - -				s t r ɨ n ʤ e - - -

	ToRub	ToRub-Exfricare	ToRub-Frictare	ToRub-Frictiare	ToWash	ToWipe
Latin	f r i k aː r e		f r i k t aː r e		l a w aː r e	t e r g e r e
French	f ʁ ɛj e - - -		f ʁ o t e - - -		l a v e - -	
Spanish	f ɾ e g a ɾ -		f ɾ o t a ɾ - -	f r i s a ɾ	l a β a ɾ -	
Italian	f r e g a r e		f r e t t a r e		l a v a r e	t ɛ r ʤ 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 g a - -			f ɾ ə s a -	ʎ ə b a - -	
Walloon	f r oj - - - -		f ʁ o t e - - -		l a v e - -	
Friulian	f r e - a - -				l a v aː - -	
Romanian	f r e k a - -				l a - - - -	

	ToWipe-Extergere	ToWipe-Exsucare	ToWipe-Limpidare	ToPull	ToPull-Pulsare	ToPull-Trahere
Latin	e k s t e r g e r e	e k s - uː k - aː r e	l i m p i d aː r e	t i r aː r e	p u l s aː r e	t r a h e r e
French		e - s ɥ i - j e - -		t i ʁ e - -	p u - s e - -	t ʁ - - ɛ ʁ -
Spanish	e - s t a ɾ s i ɾ -	e n x - u g - a ɾ -	l i m p j - a ɾ -	t i ɾ 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
PortugueseBrazi		ẽ - ʃ - u g - a ɾ -	l ĩ - p - - a ɾ -	ʧ i ɾ a - -	p u - ʃ a ɾ -	t ɾ a z e - -
Portuguese		ẽ - ʃ - u ɣ - a ɾ -	l ĩ - p - - a ɾ -	t i ɾ a ɾ -	p u - ʃ a ɾ -	t ɾ ɐ z e ɾ -
Catalan	ə - s t ə r ʒ i - -	ə - ʃ - u g a - - -		t i ɾ a - -		t ɾ ɛ w - ɾ ə
Walloon		- - s - u - w e - -		t i r e - -	p uː s iː - - -	
Friulian		- - s - u - j aː - -		t i r aː - -	p u l s aː - -	t r aj - - - -
Romanian	- - ʃ t e r ʤ e - -	u - s - - k - a - -			p u l s a - -	t r a ʤ e - -

	ToPush	ToThrow	ToThrow-Lanceare	ToThrow-Eruncare	ToTie	ToTie-Aptare
Latin	i m p i n g e r e	j a k t aː r e	l a n k e aː r e	eː - r u n k aː r e	l i g aː r e	a p t aː r e
French		ʒ ə - t e - -	l ɑ̃ - s - e - -		l i - e - -	
Spanish		- e - ʧ a ɾ -	l a n θ - a ɾ -	a - r a n k a ɾ -	l e ɡ a ɾ -	a - t a ɾ -
Italian	i m p i n ʤ e r e	ʤ e t t a r e	l a n ʧ a r e -	a r r o n ʧ a r e	l e g a r e	
PortugueseBrazi		ʒ ej t a ɾ - -	l ẽ - s - a - -			ɐ - t a ɾ -
Portuguese		ʒ ej t a ɾ - -	l ẽ - s - a ɾ -			ɐ - t a ɾ -
Catalan	ə m p ɛ ɲ - ə - -	x i t a - - -	ʎ ə n s - a - -		ʎ i ɣ a - -	
Walloon		ʤ ɛ t e - - -	l a n c - iː - -		l ɔ j iː - -	
Friulian			l a n ʧ aː - - -		l e - aː - -	
Romanian	i m p i n ʤ e - -			a - ɾ u ŋ k a - -	l e g a - -	

	ToSew	ToCount	ToCount-Enumerare	ToSay	ToSay-Exponere	ToSing-AncestralClass
Latin	k oː n - s u e r e	k o m p u t aː r e	eː n u m e r aː r e	d iː k e r e	e k s p oː n e r e	k a n t aː r e
French	k u - d - - - ʁ -	k õ - - - t e - -	e n u m e ʁ e - -	d i - - ʁ -		ʃ ɑ̃ - t e - -
Spanish	k o - - s - e ɾ -	k o n - - t a ɾ -	e n u m e ɾ a ɾ -	d e θ i ɾ -		k a n t a ɾ -
Italian	k u - - ʧ - i r e	k o n - - t a r e	e n u m e r a r e	d i - - r e	- - s p o r - r e	k a n t a r e
PortugueseBrazi	k u - - z - e ɾ -	k õ - - - t a ɾ -	e n u m e ɾ a ɾ -	d i z - e ɾ		k ẽ - t a ɾ -
Portuguese	k u - - z - e ɾ -	k õ - - - t a ɾ -	e n u m e ɾ a ɾ -	d i z - e ɾ		k ẽ - t a ɾ -
Catalan	k u - - z - i - -	k u m - - t a - -	e n u m e ɾ a - -	d i - - - -		k ə n t a - -
Walloon	k øː - - z - - - -	k õ - - - t e - -		d iː - - ʁ -		ʧ ɑ̃ - t e - -
Friulian	k u - - z i - - -	k o n - - t aː - -		d iː - - - -		c a n t aː - -
Romanian	c o̯a - - s - e - -		- n u m a r a - -	z i ʧ e - -	- - s p u n e - -	k ɨ n t a - -

	ToPlay-Ludere	ToPlay-Jiocare	ToFloat	ToFloat-Fluitare	ToFlow	ToFlow-Colare
Latin	l uː d e r e	j o - k aː r e	f l uː k t u aː r e	f l u i t aː r e	f l u e r e	k oː l aː r e
French		ʒ - w - e - -	f l y k t ɥ e - -		f l y e - -	k u l e - -
Spanish	l u d i ɾ -	x u - g a ɾ -	f l u ɡ t w a ɾ -		f l u i ɾ -	k o l a ɾ -
Italian		ʤ o - k a r e	f l u t t u a r e	f l u i t a r e	f l u i r e	k o l a r e
PortugueseBrazi		ʒ o - g a ʁ -	f l u - t u a ʁ -		f l w i ʁ -	k o - a ʁ -
Portuguese		ʒ u - ɣ a ɾ -	f l u - t u a ɾ -		f l w i ɾ -	k u - a ɾ -
Catalan		ʒ u - ɡ a - -	f l u k t u a - -		f l u i - -	k u ɬ a - -
Walloon		ʤ u w - e - -				k ɔ l e - -
Friulian		ʤ u j - aː - -				
Romanian		ʒ u - k a - -	f l u c t u a - -			

	ToFlow-Excurrere	ToFlow-Currere	ToFreeze	ToFreeze-Glaciare	ToFreeze-Inglaciare	ToBurn-Brojan
Latin	e k s k u r r e r e	k u r r e r e	g e l a: r e	g l a - k i a: r e	i n g l a k i a: r e	
French		k u - ʁ i ʁ -	ʒ ə l e - -	g l a - s - e - -		b ʁ y l e - -
Spanish	e - s k u r i ɾ - -	k o - r e ɾ -	- e l a ɾ -			
Italian	- - s k o r r e r e	k o r r e r e	ʤ e l a r e	g j a t ʧ j a r e		b r u ʧ a r e
PortugueseBrazi	i - ʃ k o - ʁ e ʁ -	k o - ʁ e ʁ -	ʒ i l a ɾ -			
Portuguese	i - ʃ k u - ʁ e ɾ -	k u - ʁ e ɾ -	ʒ i l a ɾ -			
Catalan	ə - s k o - r ə - -	k o - r ə - -	ʒ ə l a - -	g l ə - s - a - -		
Walloon			ʤ a l e - -			b ʁ u: l e - -
Friulian	- - s k o - r i: - -	k o - r i - -		g l a - ʧ - a: - -		b r u z a: - -
Romanian	- - s k u ɾ ʤ e - -	k u ɾ ʤ e - -			i n g - e ʦ - a - -	

	ToBurn-Cremare	ToBurn-Flammare	ToBurn-Ardere	ToBurn-Flagrare	ToBurn-Incendere	ToBurn-AncestralClass8
Latin	k r e m a: r e	f l a m m a: r e	a r d e: r e	f l a g r a: r e	i n k e n d - e r e	u s t u l a: r e
French	k ʁ a m e - -	f l ɑ̃ - b e - -	a ʁ d - ʁ -	f l a g ʁ e - -	ɛ̃ - s ɑ̃ - d j e - -	
Spanish	k - e m a ɾ -	f l a - m e a ɾ	a ɾ d e ɾ -	f l a g ɾ a ɾ -	e n θ e n d - e ɾ -	
Italian	k r e m a r e	f j a m m a r e	a r d e r e	f l a g r a r e	i n ʧ ɛ n d j a r e	u s t o l a r e
PortugueseBrazi	k - ɐj m a ɾ e		a ʁ d e ʁ -	f l a g ʁ a ʁ -	ĩ - s e n ʤ ɪ a ɾ -	
Portuguese	k - ej m a ʁ e		ɐ ɾ d e ɾ -	f l a g ɾ a ɾ -	ĩ - s ẽ - d j a ɾ -	
Catalan	k r ə m a - -	f ɬ a m a - - -			ə n s e n d - - ɾ ə	
Walloon						
Friulian						
Romanian			a ɾ d e - -		i n ʧ i n d ʒ e - -	u s t u r a - -

	All	All-Totus	Many	Many-Tantus	Some	Few
Latin	o m n e: s	t o: - t u s	m u l t u s	t a n t u s		p au̯ k u s
French		t u - - - -	m u - - - -		o - k œ̃ - -	p ø - - -
Spanish		t o - d o -	m u - ʧ o -	t a n t o -	a l g u n o	p o k o -
Italian	o ɲ ɲ i -	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 -
PortugueseBrazi		t o - d u -	m ũ j̃ - t u	t ẽ - t u -	a w g ũ - -	p o w k u
Portuguese		t o - ð u -	m ũ j̃ - t u	t ẽ - t u -	a ɬ g ũ - -	p o w k u
Catalan		t o - t - -	m o l - - -	t a n t - -	ə l g u - -	p ɔ k - -
Walloon		t ɔ - - - -				p õ - - -
Friulian		d u - t - -	m o l c - -	t a n c - -		p o: k - -
Romanian		t o - t - -	m u l t - -			

	Other	Other-Alius	Big	Big-Grandem	Big-Majjorem	Long-Longum
Latin	a l t e r -	a l i u s	m a g n u m	g r a n d e m	m aj j o r e m	l o - n g u m
French	o - t - ʁ -			g ʁ ɑ̃ - - - -		l ɔ̃ - - - - -
Spanish	o - t - ɾ o		m a - ɲ o -	g ɾ a n d e -		l o - n g o -
Italian	a l t - r o		m a ɲ ɲ o -	g r a n d e -		l u - n g o -
PortugueseBrazi	o w t - ɾ u	a w - - -		g ɾ ẽ - ʤ i -		l õ - g u - -
Portuguese	o w t - ɾ u	a ɬ - - -		g ɾ ẽ - d i -		l õ - g u - -
Catalan	a l t - ɾ ə			g r a n - - -		ʎ o - ŋ - - -
Walloon	õ - t - - -			g ʁ ɑ̃ - - - -		l õ - - - - -
Friulian	a l t - r i			g r a n t - -		l u n k - - -
Romanian	a l t - - -				m a - - - ɾ e	l u n g - - -

	Long-Largum	Wide	Wide-Amplum	Heavy	Heavy-Lurdus	Heavy-Pesant
Latin	l a r g u m	l aː t u m	a m p l u m	g r a w i s	l u r d u s	p eː s a n t -
French	l a ʁ ʒ - -	l e - - -	ɑ̃ - p l - -	g ʁ a v - -	l u ʁ - - -	p ə z ɑ̃ - -
Spanish	l a ɾ ɣ o -	l a t o -	a n ʧ - o -	g ɾ a b e -	l e ɾ d o -	p e s a - ð o
Italian	l a r g o -	l a t o -	a m p j o -	g r ɛ v e -	l o r d o -	p e s a n t e
PortugueseBrazi	l a ʁ g u -	l a t u -	ẽ - ʃ - u -	g ɾ a v i -	l e ɾ d o -	p e z a - d u
Portuguese	l a ɾ g u -	l a t u -	ẽ - ʃ - u -	g ɾ a v i -	l e ɾ d o -	p i z a - ð u
Catalan	ʎ a ɾ k - -		a m p l ə -	g ɾ e w - -		p ə z a - t -
Walloon				g r a v - -		
Friulian	l a r k - -			g r ɛ v i -		p e z a n t -
Romanian	l a r g - -	l a t - -		g ɾ e w - -		

	Small	Small-Pittinus	Small-Pitulus	Short	Short-Brevis	Narrow
Latin	p i t t i t u s	p i t t i n u s	p i - t u l u s	k u r t u s	b r e w i s	a n g u s t u s
French	p ə - t i - - -			k u ʁ - - -	b ʁ ɛ f - -	
Spanish		p e - k e ɲ o -		k o ɾ t o -	b ɾ e b e -	a n g o s t o -
Italian		p i t ʧ i n o -	p i k k o l o -	k o r t o -	b r ɛ v e -	a n g u s t o -
PortugueseBrazi		p e - k e n u -		k u ʁ t u -	b ɾ ɛ v i -	
Portuguese		p i - k e n u -		k u ɾ t u -	b ɾ ɛ v i -	
Catalan	p ə t i t - - -			k u ɾ t - -	b ɾ e w - -	
Walloon	p i - t i - - -			k uː ʁ - - -	b ʁ e f - -	
Friulian			p i - ʧ u l - -	k u r t - -		
Romanian		p u - ʦ i n - -				i ŋ g u s t - -

	Narrow-Strictus	Thin	Thin-Delicatus	Thin-Subtilis	Red	Red-Russus
Latin	- s t r - i - k t u s	m i n uː - t u s	d eː l i k aː t u s	s u b t iː l e m	r u b e r -	r u s s u s
French	e - t ʁ w a - - - - -	m ə n y - - - -	d uː - - ʒ eː - - -			ʁ u - - - -
Spanish	e s t ɾ - e - - ʧ o -	m e n u - d o -	d e l - ɣ a ð o -	s u - t i l - -		r o - x o -
Italian	- s t r - e - t t o -	m i n u - t o -	d e l i k a t o -	s o t t i l e -	r u b - r o	r o s s o -
PortugueseBrazi	i s t ɾ - ej - - t u -	m i - u - d u -	d e w - ɡ a d u -	s u - ʧ i w - -		ʁ o - ʃ ʊ -
Portuguese	ɨ ʃ t ɾ - ɐj - - t u -	m i - u - ð u -	d ɛ ɬ - ɣ a ð u -	s u - ʧ i w - -		ʁ o - ʃ u -
Catalan	ə s t ɾ - ɛ - - t - -	m ə n u - t - -	d ə l i k a t - -	s u p t i l - -		r o - s - -
Walloon	- s t ʁ - øː - - - - -	m i n u - - - -		s uː - t i - - -		
Friulian	- s t r - ɛ - - t - -	m i n uː - t - -		s u - t iː l - -		r ɔ - s - -
Romanian	- s t r - ɨ m - t - -	m ə r u n t - -		s u b ʦ i r e -		ɾ o - ʃ u -

	Red-Vermiculus	Red-Rubeus	Green	One	Two-Duos	Two-Duae
Latin	v e r m i k u l u s	r u - b e u s	w i r i d e m	uː n u m	d u oː s	d u - aj
French	v ɛ ʁ m ɛj - - - - -	ʁ u - ʒ - - -	v e ʁ - - - -	œ̃ - - -	d - ø -	
Spanish	b e ɾ m e x o - - -	r u - b j o -	b e ɾ - d e -	u n o -	d - o s	
Italian	v e r m i ɾ́ - ɾ́ o -	r ɔ b b j o -	v e r - d e -	u n o -		d u - e
PortugueseBrazi	v e ʁ m e - - ɾ́ u -	r u - b e o -	v e ɾ - d ɨ -	ũ - - -	d - oj s	
Portuguese	v ɨ ɾ m ɐj - - ɾ́ u -	r u - b e o -	v e ɾ - d ɨ -	ũ - - -	d - oj ʃ	
Catalan	b ə r m ɛ - - ɾ́ - -	r u - ʤ e - -	v ɛ ɾ - t - -	u n - -	d - o s	
Walloon		r ɔ - ʧ - - -	v ɛ ʁ - - - -	õ - - -	d - øː -	
Friulian			v ɛ r - t - -	u ŋ - -	d - oj -	
Romanian		r oj - b - - -	v e ɾ - d e -	u n u -	d - oj -	d o w ə

	Two-Duas	Three	Four	Five	Here	There
Latin	d u a s	t r - eː s	kʷ - a t t w o r -	kʷ iː n kʷ - e	- e k k u m h iː k	i l l aː k
French		t ʁ w ɑ -	k - a - t - - ʁ -	s ɛ̃ - 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 - ʝ a -
Italian		t r - e -	k w a t t - - r o	ʧ i ŋ k w e	- - - k w - - i -	- - l a -
PortugueseBrazi	d u ɐ s	t ɾ - e s	k w a - t - - ɾ u	s ĩ - k - u	- a - k - - - i -	- - l a -
Portuguese	d u ɐ ʃ	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 - ɾ́ a -
Walloon		t r - øː -	k w a - t - - - -	s ɛ̃ - k - -		- - l a -
Friulian		t r - eː -	k w a - t - - r i	ʧ i ŋ k - -	- a - k - - - i -	
Romanian		t r - ej -	p - a - t - - r u	ʧ i n ʧ - -		- - l a -

	There-Ibi	There-AdIbi	Who-Qui	Who-Quem	What	When-Quando
Latin	i b iː		kʷ - i s	kʷ - e m -	kʷ - i d	kʷ - a n d oː
French			k - i -		k w a -	k - ɑ̃ - - -
Spanish		a i		k j e n -	k - e -	k w a n d o
Italian	- v i		k - i -		k - e -	k w a n d o
PortugueseBrazi		a i		k - ẽj - -	k - i -	k w ɐ̃ - d u
Portuguese		ɐ i		k - ɐ̃j - -	k - ɨ -	k w ɐ̃ - d u
Catalan			k - i -		k - ɛ -	k w a n - -
Walloon			k - iː -		k w ɛː -	k w a n d -
Friulian			k w i -		ʧ - e -	k w a n t -
Romanian				ʧ - i n e	ʧ - e -	k - ɨ n d -

	How-Quomodo	Not	Not-Nec	And-Et	And-Si
Latin	kʷ oː m o d o	n oː n	n e k	e t	s iː k
French	k ɔ m ɑ̃ - -	n ɔ̃ -	n i -	e -	
Spanish	k o m o - -	n o -	n i -	i -	
Italian	k o m e - -	n o n	n e -	e -	
PortugueseBrazi	k o m u - -	n ɐ̃w̃ -	n ẽj -	i -	
Portuguese	k o m u - -	n ɐ̃w̃ -	n ɐ̃j -	i -	
Catalan	k ɔ m - - -	n o -	n i -	i -	
Walloon	k ɔ m ɛ̃ - -		n ẽ -	ɛ -	
Friulian	ʧ e m uː t -	n o -		e -	
Romanian	k u m - - -	n u -		e -	ʃ i -

Character Assignments

Each segment gets a different number

1 e 2 g 3 oː 4 ʒ 5 ə 6 ʝ 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 ɐ̃ 47 ʧ 48 ɨ 49 p 50 z 51 ð 52 k 53 ʦ

54 aː 55 ɐ̃j̃ 56 ʀ 57 aj 58 ɛː 59 θ 60 ej 61 ɐj 62 õ 63 ɥ 64 øː 65 c 66 g 67 ɬ 68 ɛj 69 ø 70 e̯a

71 kʷ 72 ɣ 73 ẽ 74 ŋ 75 gʷ 76 ẽu̯ 77 ɑ 78 β 79 ɟ 80 ɛ̃ 81 ɔː 82 ũ 83 ɻ 84 ç 85 ɑː 86 j̃ 87 œ̃

88 au̯ 89 ʊ 90 ɐ̃w̃

Partition Assignments

Model: “Linguistically Informed”

1 **Nasal Vowel**

ẽj̃ ɔ̃ ɑ̃ ĩ ɐ̃ ɐ̃j̃ õ ẽ ẽu̯ ɛ̃ ũ œ̃ ɐw̃

2 **Vowel**

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

3 **Nasal Consonant**

n m ɲ ŋ j̃

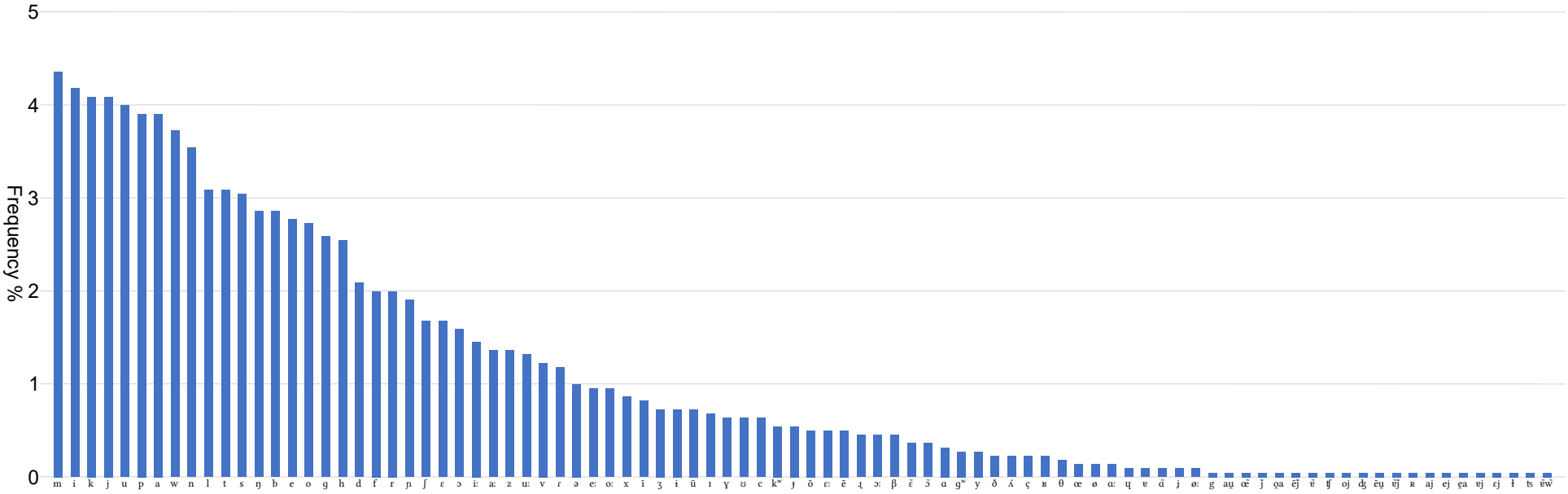
4 **Non Sylabic Sonorant**

w j l r

5 **Consonant**

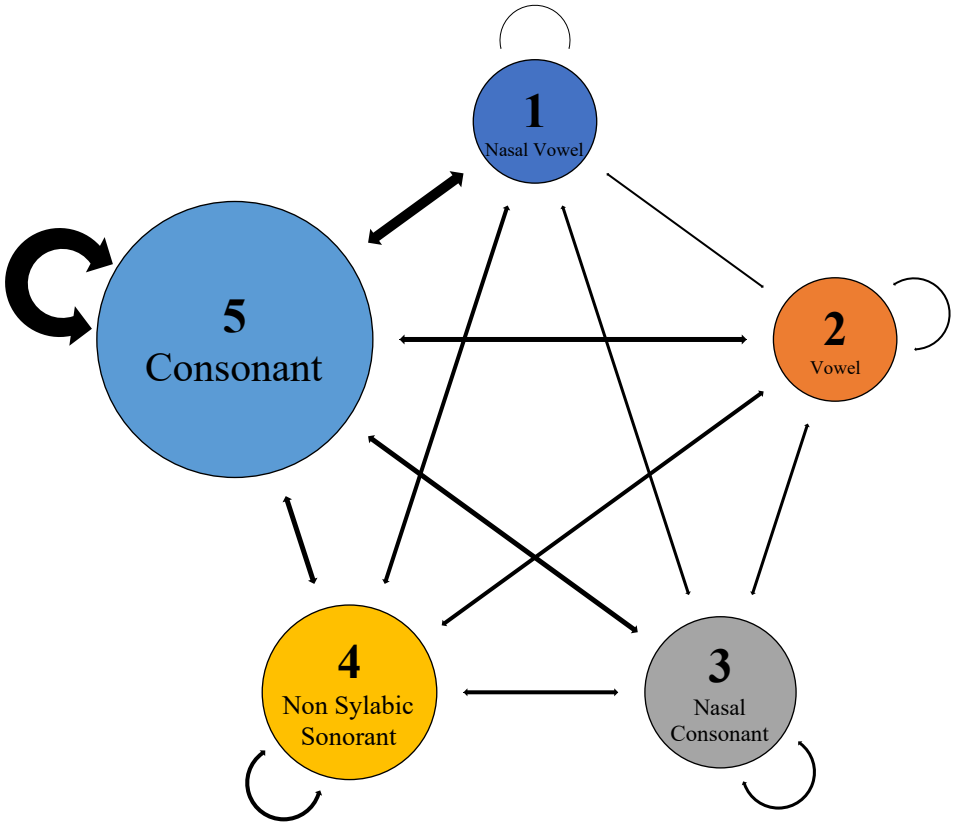
g ʒ ɟ ʤ s ʃ v b t d f ɾ x ʎ ʁ h ʧ p z ð k ʦ ʀ θ ɥ c g ɬ kʷ ɣ gʷ β ɟ ɻ ç

Prior Segment Frequencies

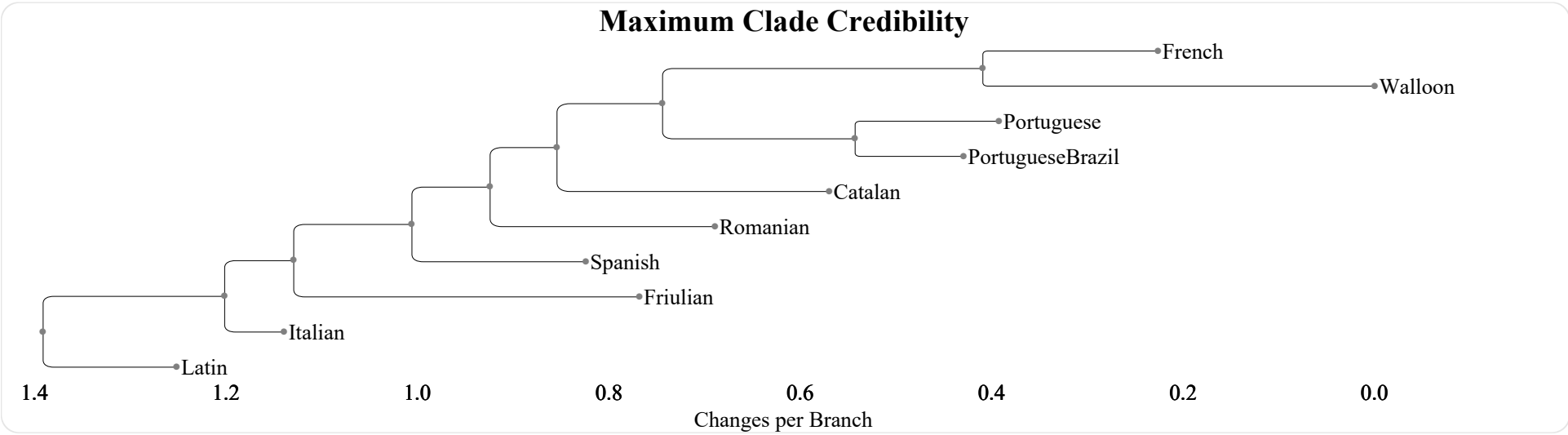


Transition Rates Between Partitions

For the 'Linguistically Informed' 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 of change are much greater from one word segment to another when the change is within the word segment group than it is when the change is between word segments in different groups.



Results


Maximum Clade Credibility
French
Walloon
Portuguese
PortugueseBrazil
Catalan
Romanian
Spanish
Friulian
Italian
Latin
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Changes per Branch

Questions