

Exploring the Corresponding Words Among the Subgroupings, Revising Swadesh List, Compared with Chinese

Ke Luo

Beijing Institute of Spacecraft Environment Engineering, Beijing, China

Email address:

1438829559@qq.com

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Abstract: In 1647, the Dutch linguist Marcus Zuerius van Boxhorn noted the similarity among certain Asian and European languages and first theorized that they were derived from a primitive common language which he called Scythian (proto-language). For hundreds of years, many scholars have been studying the cognate of the subgroupings of Indo-European languages. This paper with the Swadesh list compares several subgroupings of Indo-European languages and finds out that their cognate correspondence is closer. It is inferred that the Proto-Indo-European was a language with very rich vocabulary and should be contained independently in the subgroupings at the beginning of its dissemination. This paper proposes a revised Swadesh list which can be used to assess language homology degree in high or low, and compares English with Chinese. The result shows that Chinese and English have the same origin.

Keywords: Indo-European Languages, Swadesh List, English, Chinese, Cognate

1. Introduction

The U.S. linguist Morris Swadesh put forward the Swadesh list [1-3] (column English of Table 2) in the middle of 20th century to identify the interrelatedness of languages. The words in the Swadesh list were chosen for their universal, culturally independent availability in as many languages as possible while regardless of their "stability". Swadesh determined by calculation that the change rate of core vocabulary ranged from 14% to 19% for every 1000 years [4].

We can further assess the change rate relatedness by Table 1:

Table 1. Language comparing factors: in different area, in different eras, or been fused by foreign language.

	eras ₁	eras ₂	fusion (eras ₂)
area ₁	L _{a1e1}	L _{a1e2}	L _{a1e2f}
area ₂	L _{a2e1}	L _{a2e2}	L _{a2e2f}

(1) In a area, a language has been used for at least one thousand years without being fused by foreign languages. Then the rate of language change in the two eras: L_{a1e1}: L_{a1e2}, should be the lowest, or even not in line with Swadesh

conclusion. For example, although Hakka [5] distributed throughout China, have been separated for a thousand of years, they can communicate with each other [6-7] now. It is against Swadesh's views that if more than 10% of the core vocabulary in the two dialects are different, people will not be able to talk to each other.

(2) In a area with original language, there was at least one kind of foreign language had been fused. The relationship between the two languages is: L_{a1e1}: L_{a1e2f}. For example, Old English/Modern English, Old Chinese/Mandarin Chinese. Swadesh's conclusion of language change rate corresponds to this situation, in line with the "core vocabulary change rate of 14% to 19% every 1000 years" [2]. In the so-called millennium, people's tone change may be in a very short time and drastic after language inputted.

(3) A language was inputted into the original language of different areas. A few years later, the divergence between the two languages is: L_{a1e2f}: L_{a2e2f}. For example, the change rate in Italian and French accounts for 23%[2]. The two inputted languages are from the Proto-Indo-European [8]. Language change rate is the highest under this condition.

(4) There's another kind of language comparison. A

language was spread in two regions at the same time. After several years late, the change rate of the two languages is compared: $L_{a1e2}:L_{a2e2}$. The hypothesis is that the two regions had no language before (in fact, it was not exist). It could be approximated that their original language was very different from the inputted language (non-cognating language). For example, English (or French, etc.) was imported into remote tribes and it became their official language later. This rate of change is currently difficult to be assessed, because the history of world exchanges is not long after all.

At present, it is generally believed that the Indo-European language family [9-10] is derived from a so-called "Proto-Indo-European ", subgroupings: Germanic languages, Romance languages, Celtic group and so on.

What this paper will study is that such as Germanic

languages or Romance languages, a few years later, the core vocabulary in the Swadesh list has changed from 14% to 19%. Although these core words have disappeared in the Swadesh list, do they still remain in their respective languages, and have the original semantics?

2. Method

2.1. Comparing Subgroupings

According to the core vocabulary of the Swadesh list, we select Greek, Latin and French, with similar pronunciation and same semantics to form Table 2.

The result shows that the Swadesh list words correspond to 98 (except louse and swim). Several languages have a very high cognate.

Table 2. Comparing the Swadesh list (English) with several subgroupings.

No.	English	Latin	Greek	France
1	I	ego		
2	you		Greek: hymeis	French: vous
3	we	ego		
4	this	cis-		
5	that	Latin: istud	Greek: tó	
6	who	qua		
7	what	Latin: quod		
8	not	Latin: ne "that not"	Greek: ne- "not"	
9	all	Latin: alius	Greek: allo-	
10	many	multi-	Greek: mala "very much"	
11	one	Latin: unus	Greek: -ōnē	
12	two	Latin: duo	Greek: duo	
13	big	Latin: būbōn-	bubonic	
14	long	longus		
15	small		(cf. Greek:) melon	
16	woman	uxorial		
17	man		masculine	
18	person	Latin: persōna		
19	fish	Latin: piscis		
20	bird			poultry
21	dog			(e.g. French:) dogue
22	louse			
23	tree		Greek: drýs	
24	seed	Latin: sēmen		
25	leaf	lamina		
26	root	radix		
27	bark	Latin: barca		
28	skin	stratum		
29	flesh	Latin: porcus hog, pig		
30	blood		phlebo-	
31	bone	femur		
32	grease	Latin: crassus		
33	egg	Latin: ovum	Greek: oon	
34	horn		-gon	
35	tail	Latin: tāliāre		
36	feather	ptero-		
37	hair	coma		
38	head	Latin: caput		
39	ear	Latin: auris		
40	eye	Latin: oculus	Greek: okkos	
41	nose	Latin: nasus		
42	mouth	cf. Latin: mentum "chin"		mortise
43	tooth	Latin: dens	Greek: odontos	
44	tongue	OldLatin: dingua		

No.	English	Latin	Greek	France
45	claw	chela		
46	foot	ped-	pod-	
47	knee		polygonum (poly- + -gonon)	
48	hand		chiro-	
49	belly	paunch		
50	neck	nuchal		
51	breasts	pectoral		
52	heart		cardi-	
53	liver (lobe)		Greek: liparós (fat)	
54	drink	Latin: sugere "to suck"		
55	eat	Latin: edere "to eat"		
56	bite	Latin: findere "to split"		
57	see		scope	
58	hear		acoustic	
59	know		Greek: *gno-	
60	sleep		somnus	
61	die		thanato-	
62	kill	extinguish		
63	swim			
64	fly			flush
65	walk	Latin: vadum "ford"		
66	come			OldFrench: recovrer "come back"
67	lie		Greek: lekhesthai "to lie down"	
68	sit	sedentary		
69	stand	Latin: stāre "to stand"		
70	give	corban		
71	say		suasion	
72	sun	solar		
73	moon		Greek: ménē "moon"	
74	star	Latin: stella		
75	water	aqua		
76	rain	Latin: rigare "to wet"		
77	stone	saxifrage		
78	sand	Latin: sabulum "coarse sand"		
79	earth	Africa		
80	cloud	cube		
81	smoke		Greek: smykhein "to burn with smoldering flame"	
82	fire	Greek: pyr		
83	ash	Medieval Latin: alkali		
84	burn	pyre-		
85	path			passage
86	mountain	Latin: montanus		
87	red	ruber		
88	green	Greek: chlōrós "light green"		
89	yellow	icterus		
90	white	alb		
91	black	flame		
92	night		Greek: nuks "a night"	
93	hot	ardor		
94	cold	gelid		
95	full	Latin: plēnus		
96	new		Greek: neos	
97	good			copacetic
98	round	Latin: rotundus		
99	dry		xero-	
100	name		Greek: onoma	

2.2. Comparing Conclusions

(1) The Proto-Indo-European was a rich language, and the subgroupings (Germanic languages, Roman, Greek, etc.) have a large of corresponding words.

Another example of correspondence, it is generally believed that in 597 AD, the priest St. Augustine of Canterbury [11-12] introduced some Latin words into English, but some corresponding cognate words can also be found in the Germanic languages

(Table 3).

Table 3. Words from Latin into English to compare words from (or of) Germanic languages.

No.	words from Latin into English	words from (or of) Germanic languages
1	creed	glaub
2	pope	father
3	organ	music
4	punch	bore (Proto-Germanic buron)
5	candle	glow
6	shrine	Schrein (German), cognate chaitya (Sanskrit)
7	altar	altāri (Old High German)

The etyma of macro- is from Latin, but it has the same cognate with micel "big" (now mickle), as well as terra: chamotte.

Although there are some differences in pronunciation among cognate words, these differences should be adapt to the pronunciation physiological structure of the local people to form a new spelling structure after the fusion of old language.

In the process of rapid dissemination of language, it is difficult for people (non-native speakers) of local area to accurately grasp the tone of the incoming language. For example, American immigrants from the world differ in their pronunciation of English [13]. With the rapid popularization of mandarin in China [14], there are differences in pronunciation among different areas. In turn, it can be inferred that the Proto-Indo-European once had a historical process of rapid dissemination.

(2) Another linguistic phenomenon that exists in the Indo-European language family is that the same semantics has different expressions, namely synonym, such as: all: per-, two: other, big: giant (great) [15]. They all exist in several subgroupings, which shows that the Proto-Indo-European had

a variety of expressions for the same semantics.

It can be assumed that the Proto-Indo-European already has had the carrier of character, because only the carrier of character can carry the richness of language expression.

We take advantage of above features to revise the Swadesh list as follows to better reflect the degree of cognate among languages.

2.3. Revision of the Swadesh List

The specific approach considered in this paper acknowledges that the Proto-Indo-European was a language rich in synonym, which had been integrated into different subgroupings. Therefore, we keep the original basic Swadesh list (Table 4 grey background items), and add synonyms to the list to define a new list as "Swadesh-synonym-list". These synonyms are no longer confined to the Germanic family. They may come from the ancient Indo-European language family such as Latin and Greek. For example, we add collie (canine) to the corresponding synonym dog, ichthyo- to fish. The results are shown in Table 4.

Table 4. Swadesh-synonym-list [2].

No.	word	value	No.	English	value	No.	word	value
1	I	0.6	35.1	rear	0.4	68	sit	0.6
1.1	self	0.4	36	feather	0.6	68.1	akathisia	0.4
2	you	0.6	36.1	plumage	0.2	69	stand	0.6
2.1	thee	0.4	36.2	mane	0.2	69.1	rear	0.4
3	we	1	37	hair	0.6	70	give	0.6
4	this	0.6	37.1	pilar	0.2	70.1	furnish	0.4
4.1	here	0.2	37.2	thrix	0.2	71	say	0.6
4.2	cis-	0.2	38	head	0.6	71.1	phrase	0.4
5	that	0.6	38.1	top	0.4	72	sun	0.6
5.1	yon	0.4	39	ear	1	72.1	helio-	0.4
6	who	1	40	eye	0.6	73	moon	0.6
7	what	0.6	40.1	mydriasis	0.4	73.1	seleno-	0.4
7.1	qua	0.4	41	nose	0.6	74	star	0.6
8	not	0.6	41.1	beak (boko)	0.4	74.1	Etoile	0.4
8.1	un-	0.4	42	mouth	0.6	75	water	0.6
9	all	0.6	42.1	ostium	0.4	75.1	sero-	0.2
9.1	per-	0.4	43	tooth	0.6	75.2	hydro-	0.2
10	many	0.6	43.1	odont-	0.4	76	rain	0.6
10.1	lot	0.4	44	tongue	0.6	76.1	hyeto-	0.4
11	one	0.6	44.1	sotol	0.4	77	stone	0.6
11.1	each	0.4	45	claw	0.6	77.1	lapis	0.4
12	two	0.6	45.1	paw	0.4	78	sand	0.6
12.1	other	0.4	46	foot	0.6	78.1	gravel	0.4
13	big	0.6	46.1	hoof	0.4	79	earth	0.6
13.1	macro-	0.2	47	knee	0.6	79.1	terrene	0.2

No.	word	value	No.	English	value	No.	word	value
13.2	giant	0.2	47.1	patella	0.4	79.2	soil	0.2
14	long	0.6	48	hand	0.6	80	cloud	0.6
14.1	tall	0.4	48.1	surgeon	0.4	80.1	rack	0.2
15	small	0.6	49	belly	0.6	80.2	nebula	0.2
15.1	wee	0.4	49.1	tummy	0.2	81	smoke	0.6
16	woman	0.6	49.2	stomach	0.2	81.1	wraith	0.4
16.1	female	0.4	50	neck	0.6	82	fire	0.6
17	man	0.6	50.1	collar	0.4	82.1	hot	0.4
17.1	andro-	0.4	51	breasts	0.6	83	ash	0.6
18	person	0.6	51.1	thoraco-	0.4	83.1	calc-	0.4
18.1	anthropo-	0.4	52	heart	0.6	84	burn	0.6
19	fish	0.6	52.1	cardi-	0.4	84.1	ether	0.4
19.1	ichthyo-	0.4	53	liver (lobe)	0.6	85	path	0.6
20	bird	0.6	53.1	hepato-	0.4	85.1	way	0.4
20.1	phoenix	0.4	54	drink	0.6	86	mountain	0.6
21	dog	0.6	54.1	suck	0.4	86.1	cordillera	0.4
21.1	collie	0.4	55	eat	0.6	87	red	0.6
22	louse	0.6	55.1	chew	0.4	87.1	pyrrhotite	0.4
22.1	pediculus	0.4	56	bite	0.6	88	green	0.6
23	tree	0.6	56.1	rodent	0.4	88.1	chlor-	0.4
23.1	motte	0.4	57	see	0.6	89	yellow	0.6
24	seed	0.6	57.1	watch	0.2	89.1	blonde	0.4
24.1	hilum	0.4	57.2	look	0.2	90	white	0.6
25	leaf	0.6	58	hear	0.6	90.1	blanch	0.4
25.1	folio	0.4	58.1	listen	0.4	91	black	0.6
26	root	0.6	59	know	0.6	91.1	melanin	0.4
26.1	whisker	0.4	59.1	ware	0.4	92	night	0.6
27	bark	0.6	60	sleep	0.6	92.1	evening	0.4
27.1	rind	0.4	60.1	doss	0.4	93	hot	0.6
28	skin	0.6	61	die	0.6	93.1	fever	0.4
28.1	leather	0.2	61.1	moribund	0.2	94	cold	0.6
28.2	kip	0.2	61.2	thanato-	0.2	94.1	algid	0.4
29	flesh	0.6	62	kill	0.6	95	full	0.6
29.1	raw	0.4	62.1	-cide	0.4	95.1	plump	0.4
30	blood	0.6	63	swim	0.6	96	new	0.6
30.1	sangui-	0.4	63.1	natant	0.2	96.1	ceno-	0.4
31	bone	0.6	63.2	float	0.2	97	good	0.6
31.1	ossi-	0.4	64	fly	0.6	97.1	fine	0.4
32	grease	0.6	64.1	wing	0.4	98	round	0.6
32.1	oil	0.4	65	walk	0.6	98.1	circle	0.4
33	egg	0.6	65.1	dromo-	0.4	99	dry	0.6
33.1	lecithin	0.4	66	come	0.6	99.1	arid	0.4
34	horn	0.6	66.1	fro	0.4	100	name	0.6
34.1	-gon	0.4	67	lie	0.6	100.1	-onym	0.4
35	tail	0.6	67.1	cubicle	0.4			

With the Swadesh-synonym-list, we can compare two languages (as Table 5). If the Swadesh list comparison method is regarded as "additive principle", that is to add similar words in the corresponding language, then the comparison method of "Swadesh-synonym-list" is the "principle of subtraction", which assumes that the two comparative languages contain corresponding similar pronunciation synonyms. If they can't be found, they should be treated as "missing" items so as to determine the degree of cognate between the two languages. The benefits of doing so are:

(1) It avoids the Swadesh list being judged inaccurately by human factors to affect the evaluation result. For example, the compared with the Swadesh list have been made as many as 118 [16]. The choice of words is mostly based on spoken language, which lacks the consideration of the written language. The use of "Swadesh-synonym-list" can include

more relevant words, Needless to think too much about the way of expression or the reasons of the times.

(2) It has a guiding role to directly seek for the similar semantics and pronunciation. It also acknowledges the established historical fact that the comparison is under the premise of the same language family, such as the Sino-Tibetan, Indo-European and Altaic language families, which can further find out the interrelatedness after divergence, the degree of retention of the original words, and the degree of frequency of use, so as to lay a good foundation for subsequent research work.

(3) It can also be used to compare two languages with great differences. If there are two languages in the world, whose origins are absolutely different, and they have not been fused, then we can confirm the complete differences by comparing a large number of synonyms to increase the persuasion of the

lexicostatistics.

2.4. The Value of "Swadesh-Synonym-List"

The items of synonyms in the "Swadesh-synonym-list" may be increased or decreased according to the number of synonyms in the language. A set of mathematical models with statistical significance can be created to assess the cognate. Users may design their own model to increase the list's initiative and flexibility.

In this paper, we define that the score of each semantics of Swadesh-synonym-list is equal to 1 (Table 2), expressed in S, S=1. According to the number of synonyms, the ratio of S value is allocated (Table 4), such as fish: S=0.6, ichthyo-: S=0.4; skin: S=0.6, leather: S=0.2; kip: S=0.2.

Ultimately, we need to calculate the overall evaluation value after comparing two languages, which is defined as R, called "cognate value".

$$R = \sum K_i * S_i \quad (i=1, 2, 3, \dots, 100) \quad (1)$$

In the comparison process, we introduce a weighted coefficient K (K<1). K value reflects the degree of cognate of two compared words. K's value is based on the similarity of pronunciation, the difference of character, and the degree of cognate between the two languages obtained from historical materials and archaeology. If the cognate of the two languages is clear and the correspondence of synonyms is accurate, then K=1.

Next, based on the Swadesh-synonym-list, we will examine the cognate value R between English and Chinese.

3. Result

3.1. Chinese

The Chinese Characters was formed at least 3600 years ago [17] (represented by Oracle Bone inscriptions). The development of Chinese is clear. Its historical materials are complete. Its own evolution is slow. The pronunciation of some Chinese words has not changed for thousands of years. Chinese is basically a word with a semantics, a character.

3.2. K Value and Result

Because of the monosyllabic characteristics of the Chinese characters, we only compare the initial pronunciation of the "Swadesh-synonym-list" words with the Chinese synonyms to finish Table 5. The value S of each word is shown in Table 4.

The Indo-European language family is alphabetic and multi-syllable. Chinese is from hieroglyphics and it is monosyllable. There is no historical and archaeological data to show that they are cognate. Therefore, the value of weighted coefficient K should be set lowly, setting K=0.4 (credibility less than 50%). If we continue to analyze the historical occurrence times and frequency of each vocabulary, the difference of two languages synonyms correspondence will be greater, and the value of K will be lower. The corresponding relationship between the final "Swadesh-synonym-list" and Chinese is shown in Table 5.

Comprehensively, According to formula (1), the cognate value R equals 40.

Table 5. Swadesh-synonym-list compared with Chinese.

No.	English	Chinese	No.	English	Chinese
1	I	俺[ǎn]	52	heart	怀[huái]
1.1	self	私[sī]	52.1	cardi-	宫[gōng]
2	you	汝[rǔ]	53	liver (lobe)	腴[yú]
2.1	thee	子[zǐ]	53.1	hepato-	捍[hàn]
3	we	吾[wú]	54	drink	饌[zhuàn]
4	this	底[dǐ]	54.1	suck	吮[shǔn]
4.1	here	行[háng]	55	eat	饵[ěr]
4.2	cis-	斯[sī]	55.1	chew	齧[chú]
5	that	搭[dā]	56	bite	(齒尊)[bó]
5.1	yon	遥[yáo]	56.1	rodent	咬[yǎo]
6	who	胡[hú]	57	see	视[shì]
7	what	乌[wū]	57.1	watch	望[wàng]
7.1	qua	个[gè]	57.2	look	瞭[liào]
8	not	逆[nì]	58	hear	聒[hào]
8.1	un-	无[wú]	58.1	listen	聆[líng]
9	all	完[wán]	59	know	谙[ān]
9.1	per-	平[píng]	59.1	ware	悟[wù]
10	many	漫沚[màn mǐ]	60	sleep	睡[shuì]
10.1	lot	隆[lóng]	60.1	doss	倒[dǎo]
11	one	唯[wéi]	61	die	殚[dān]
11.1	each	一[yī]	61.1	moribund	歿[mò]
12	two	陶[táo]	61.2	thanato-	丧[sàng]
12.1	other	二[èr]	62	kill	克[kè]
13	big	丕觥[pī gōng]	62.1	-cide	肆[sì]
13.1	macro-	茂[mào]	63	swim	水[shuǐ]
13.2	giant	杰[jié]	63.1	natant	休[ni]

No.	English	Chinese	No.	English	Chinese
14	long	轮[lún]	63.2	float	浮[fú]
14.1	tall	罩[tán]	64	fly	飞[fēi]
15	small	小渺[xiǎo miǎo]	64.1	wing	翁[wēng]
15.1	wee	微[wēi]	65	walk	武[wù]
16	woman	媪[wù]	65.1	dromo-	走[zǒu]
16.1	female	妇[fù]	66	come	格[gé]
17	man	孟[mèng]	66.1	fro	复[fù]
17.1	andro-	儿[ér]	67	lie	懒[lǎn]
18	person	匹[pǐ]	67.1	cubicle	惫[guō]
18.1	anthropo-	人[rén]	68	sit	席[xí]
19	fish	浮[fú]	68.1	akathisia	跪[guì]
19.1	ichthyo-	鱼[yú]	69	stand	跃挺[shì tǐng]
20	bird	哺[bǔ]	69.1	rear	屹[yì]
20.1	Phoenix	凤[fèng]	70	give	给[gěi]
21	dog	(盾犬)[dùn]	70.1	furnish	付[fù]
21.1	collie	狗[gǒu]	71	say	说[shuì]
22	louse	(虫虫勺)[lǐ]	71.1	phrase	赋[fù]
22.1	pediculus	虬[bī]	72	sun	睨[xiàn]
23	tree	楚[chǔ]	72.1	helio-	毁[huǐ]
23.1	motte	木[mù]	73	moon	明[míng]
24	seed	实[shí]	73.1	seleno-	夕[xī]
24.1	hilum	核[hé]	74	star	星斗[xīng dòu]
25	leaf	绿[lù]	74.1	Etoile	曜[yào]
25.1	folio	芾[fèi]	75	water	窪[wā]
26	root	茹[rú]	75.1	sero-	水[shuǐ]
26.1	whisker	虬[ér]	75.2	hydro-	沆[hàng]
27	bark	朴[pò]	76	rain	润[rùn]
27.1	rind	栊[yuè]	76.1	hyeto-	霭[hán]
28	skin	蛻[shuì]	77	stone	石头[shí tóu]
28.1	leather	庐[lú]	77.1	lapis	砾[lì]
28.2	kip	革[gé]	78	sand	沙[shā]
29	flesh	膳[fàn]	78.1	gravel	矸[gān]
29.1	raw	肉[ròu]	79	earth	岸[àn]
30	blood	衄臍[pēi lù]	79.1	terrene	地[dì]
30.1	sangui-	血[xuè]	79.2	soil	垓[gāi]
31	bone	髓[bó]	80	cloud	块[kuài]
31.1	ossi-	歹[è]	80.1	rack	云[yún]
32	grease	膏[gāo]	80.2	nebula	霓[ní]
32.1	oil	膈[ōu]	81	smoke	熏冒[xūn mào]
33	egg	丸[wán]	81.1	wraith	烟[yān]
33.1	lecithin	卵[luǎn]	82	fire	发[fā]
34	horn	觥[hùn]	82.1	hot	火[huǒ]
34.1	-gon	觥[gé]	83	ash	煨[wēi]
35	tail	獾[dòu]	83.1	calc-	蛤[gé]
35.1	rear	尾[wěi]	84	burn	爆[bào]
36	feather	翡[fěi]	84.1	ether	燃[rán]
36.1	plumage	翮[bào]	85	path	阪[bǎn]
36.2	mane	鬃[máo]	85.1	way	纬[wěi]
37	hair	翰[hàn]	86	mountain	牡[mù]
37.1	pilar	髟[biāo]	86.1	cordillera	岗[gǎng]
37.2	thrix	须[xū]	87	red	殷[yān]
38	head	骸[hái]	87.1	pyrrhotite	爍[biāo]
38.1	top	头[tóu]	88	green	纒[gào]
39	ear	耳[ěr]	88.1	chlor-	枯[kū]
40	eye	眼[yǎn]	89	yellow	熨[yún]
40.1	mydriasis	目[mù]	89.1	blonde	爍[bò]
41	nose	頰[è]	90	white	纨[wán]
41.1	beak (boko)	鼻[bí]	90.1	blanch	白[bái]
42	mouth	门[mén]	91	black	黼[pào]

No.	English	Chinese	No.	English	Chinese
42.1	ostium	吻[wěn]	91.1	melanin	墨[mò]
43	tooth	韶[tiáo]	92	night	暗[àn]
43.1	odont-	齧[ái]	92.1	evening	夜[yè]
44	tongue	聃[dān]	93	hot	火[huǒ]
44.1	sotol	舌[shé]	93.1	fever	烦[fán]
45	claw	跪[guì]	94	cold	况[kuàng]
45.1	paw	采[biàn]	94.1	algid	严[yán]
46	foot	跗[fū]	95	full	福[fù]
46.1	hoof	犛[hú]	95.1	plump	饱[bǎo]
47	knee	髌扭[kē niǔ]	96	new	媿[ní]
47.1	patella	髌[bìn]	96.1	ceno-	新[xīn]
48	hand	升[gǒng]	97	good	姤[gòu]
48.1	surgeon	手[shǒu]	97.1	fine	峰[fēng]
49	belly	腹[bì]	98	round	绕[rào]
49.1	tummy	肚[dù]	98.1	circle	旋[xuán]
49.2	stomach	脰[xián]	99	dry	燥[zào]
50	neck	(豕頁)[nóu]	99.1	arid	焯[ōu]
50.1	collar	颈[gěng]	100	name	娘名[niáng míng]
51	breasts	脯[pú]	100.1	-onym	曰名[yuē míng]
51.1	thoraco-	胸[xiōng]			

3.3. Cognate Conclusion

(1) The Indo-European language family and Chinese are cognate. Yan Fu, a Chinese scholar, proposed this as early as 1935 [18]. Many linguists in China are also looking for the basis of cognate and publishing corresponding papers. The cognate of the two languages is reflected not only in the 100 words. We have done a lot of comparative work and got such conclusion.

(2) There are no archaeological, written or even legendary records to illustrate the cognate of the two languages. We believe that $R=40$, which is a critical small value, belongs to the uncertain relationship. It can be used as a reference value for other language comparison. In the future, more evidence is needed to support it and increase the K value of the weighting coefficient.

(3) The cognate between the Indo-European language family and Chinese is not only reflected in the pronunciation similarity of vocabulary, but also in the law of language change. For example, the Proto-Indo-European p, t, k become Germanic languages f, th, h and b, d, g become p, t, k and f, th, h become b, d, g . These laws are universality in Chinese.

4. Conclusion and Discussion

The language formation can be traced back to 60,000 to 100,000 years ago [19], but the wide spread of language in the world, especially with characters, is a history of 10,000 years [20]. Therefore, a comparative study of languages with cultural backgrounds will be able to better find out the law of language cognate and fusion. Subsequent the refined Swadesh list can be focused on words in different social fields, such as religion, art, tool, thinking, food, clothing, housing and so on, so as to provide more valuable support for the study of language and culture.

The Swadesh list in identifying the interrelatedness of some

languages has become a commonly used method. On this basis, this paper proposes the Swadesh-synonym-list to evaluate the interrelatedness between languages with vague cognate. This is an attempt to study language.

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