

# The Agglutination Hypothesis: A belated empirical investigation

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## 1. Agglutination and fusion: An ambiguous success story

FRIEDRICH VON SCHLEGEL (1808), AUGUST WILHELM VON SCHLEGEL (1818),  
WILHELM VON HUMBOLDT (1822):

**isolating** ( analytic) / **agglutinating** / **fusional** ( flexive) /  
**incorporating**

conflates three different parameters (SAPIR 1921):

- **degree of synthesis** (isolating vs. non-isolating/ /analytic vs. synthetic)
- **degree of stem combination** (incorporating vs. non-incorporating)
- **degree of agglutination** (agglutinating vs. fusional/flexive)

**Success:** Almost every introduction to linguistics mentions the terms, and they are frequently used in the technical literature:

EVANS (1995:1): “Kayardild is a dependent-marking, **agglutinating**, entirely suffixing language with a free order of phrasal constituents and a rich system of case-marking...”

SLOBIN (1997:281): “... On this account, **agglutinating** languages like Turkish and Japanese have no closed-class morphemes...”

HYMAN (2000): “... In other words, a highly developed paradigmatic system of tonal oppositions appears not to be very compatible with a highly developed syntagmatic system of **agglutinative** morphology”

**Failure:** Little “official recognition” by general theorists

(but cf. SKALIC 1951/1979, PLANK 1991, (to appear), PLUNGAN 2000, TESTELETS 2000):

BAUER (1988:170): “Basically, a typology is not of much value unless it predicts other things about the various types of languages... Now ... a typology in terms of isolating, agglutinative and fusional **does not [seem to] correlate with anything else** in the morphology at all... The value of the typology *qua* typology **is thus very much in doubt.**”

ANDERSON (1985:10): “... **nothing much seems to follow from this classification:** it has never been shown, for example, that languages with agglutinative properties share other features of a non-accidental sort that are not shared with non-agglutinating languages as well. For these reasons, the traditional terms **do not seem to constitute any significant typology.**”

However, both **degree of synthesis** (cf. GREENBERG 1954) and **incorporation** (cf. BAKER 1996) have been shown to be of great typological interest.

## 2. The Agglutination Hypothesis: Implicit claims made explicit

(cf. PLANK (to appear): "Strong Homogeneity Hypothesis")

Whole languages are usually classified as agglutination/fusional, not just small subsystems! Hence:

### First Prediction: Correlation among parts of the morphology

If a language is agglutinating/fusional in one area of its morphology (e.g. in nouns, or in the future tense), it tends to show the same type elsewhere.

Moreover, agglutination/fusion is not a primitive feature. But what are the component features?

BLOOMFIELD 1933:207: "*Inflectional* languages show a merging of semantically distinct features either in a single bound form or in closely united bound forms, as when the suffix *-o* in a Latin form like *amo* 'love' expresses the meanings 1ST, SG, PRES, IND."

HJELMSLEV 1963[1968:109]: "... *flektierenden* Typ, bei dem die Grenze zwischen Wurzel und Suffix nicht klar ist, bei dem jedes Suffix oftmals gleichzeitig mehrere verschiedene grammatische Verhältnisse ausdrückt, und bei dem die Wurzel selbst bei der Flexion Veränderungen erfahren kann."

ANDERSON 1985:9: "(*in*)*flexional* languages have internally complex words which cannot easily be segmented into an exhaustive and non-overlapping string of formatives"

WHALEY 1997:134: "A language is *fusional* if the boundaries between its morphemes are hard to determine. The effect is as if the morphemes were blending, or fusing, together."

- **Cumulation (vs. separation)** (cf. Bloomfield, Hjelmslev):  
the expression of several morphological subcategories in one affix
- **Stem alternation (vs. stem uniformity)** (cf. Hjelmslev, F. v. Schlegel):  
the (co-)expression of morphological subcategories by changing, rather than adding to, the stem
- **Affix alternation (vs. affix uniformity)**  
different morphophonemic variants of affixes, resulting in lack of one-to-one correspondence between meaning and form

(1) Hungarian			'house'	'table'	'river'
	SG	NOM	<i>ház</i>	<i>asztal</i>	<i> folyó</i>
		ACC	<i>házat</i>	<i>asztalt</i>	<i> folyót</i>
	PL	NOM	<i>házak</i>	<i>asztalok</i>	<i> folyók</i>
		ACC	<i>házakat</i>	<i>asztalokat</i>	<i> folyókat</i>

- **Affix suppletion (vs. affix invariance)** (esp. Skalicka)
  - different variants of affixes that cannot be described morpho-phonologically; they can be conditioned lexically, morphologically, or phonologically

(2) <u>lex. conditioning:</u>	<u>morph. conditioning:</u>	<u>phonol. conditioning:</u>
Kannada	Latin	Lezgian
Pl. -aru /humans	1sg. -o /Present	Aor. Part. -r /high V
-galu /inanimates	-m /Imperfect	-ji /low V

### Second Prediction: Correlation among different component features

If a language is agglutinating/fusional w.r.t. one of the component features (cumulation, (stem/affix) alternation, affix suppletion), it will to behave similarly w.r.t. the other features.

(3) further claimed correlates (SKALIC & 1951, PLANK (to appear), et al.):

#### agglutinating

affixes distinct  
always zero exponence  
only local exponence  
repeatable affixes  
large paradigm size  
loose bonding  
optionality

#### fusional

affixes often homonymous  
no/sporadic zero exponence  
also extended exponence  
unrepeatable affixes  
small paradigm size (cf. PLANK 1986)  
tight bonding  
obligatoriness

### 3. Difficulties for an empirical test

(i) Different languages show **different morphological categories** and vary significantly in morphological complexity

=> I only looked at languages with a reasonable amount of inflection, and took into account only the core of nominal and verbal inflection

(ii) **Cumulation** occurs very commonly with person/number affixes in all languages, e.g.

(4)	Hungarian	'O'odham	Tauya	Lango
SG	1 kez-em	ñ-kakkio	ya-neme	pàlà-ná
	2 kez-ed	m-kakkio	na-neme	pàl ʸí
	3 kez-e	kakkio-j	∅-neme	pàlà-mEʸfi
PL	1 kez-ünk	t-kakkio	se-neme	pàlà-wá
	2 kez-etek	'em-kakkio	te-neme	pàl ʸwú
	3 kez-ük	ha-kakkio	ne-neme	pàlà-gí
	'my hand etc.'	'my legs etc.'	'my head etc.'	'my knife etc.'

=> I regarded "person-number(-gender)" as a single supercategory, so that these cases do not count as cumulation

(iii) In tense-aspect-mood, **cumulation** also seems to be common, but it is extremely difficult to identify the categories that are cumulated, and to distinguish cumulation from semantic complexity, cf.

(5)	Italian	Lezgian	Pipil	vs.	M. Greek
past + perfective	port-ai	qac&na	chiw-ki		é-Vrap-s-e
past + imperfective	port-avo	qac&zwa-j	chiwa-ya		e-Vraf-∅-e
	'carried'	'took'	'did'		'wrote'

=> I regarded "tense-aspect-mood" as a single supercategory, unless there were very good reasons to separate them

(iv) In most languages, only a subset of lexical items show **stem alternations** (e.g. in German, only strong verbs alternate, and these are a small minority)

=> For each supercategory separately, I assigned scores depending on the (estimated) absolute number of lexemes that exhibit stem alternations:

1 score:	< 10 lexemes with stem alternation
4 scores:	> 10 lexemes
7 scores	> 50 lexemes
10 scores	the majority of (or all) lexemes

(v) Morpho-phonological **affix alternations** are very difficult to distinguish from purely phonologically conditioned alternations; cf. German plural suffix *-n/-en* (*Straße-n*, *Partikel-n*)

=> I excluded the feature “affix alternation” from consideration -- too difficult!

## 4. The test

4.1. **Data:** 30 sample languages, not all unrelated, but each from a different genus:

TABLE 1: THE 30 LANGUAGES OF THE SAMPLE

Niger-Congo	<b>Swahili</b>	Nivkh	<b>Amur Nivkh</b>
Nilotic	<b>Lango</b>	Dravidian	<b>Kannada</b>
Kordofanian	<b>Krongo</b>	TIBETO-BURMAN	
AFRO-ASIATIC		Bodic	<b>Classical Tibetan</b>
Semitic	<b>Arabic</b>	Newaric	<b>Dolakha Newari</b>
Egyptian	<b>Coptic</b>	TRANS-NEW GUINEA	
INDO-EUROPEAN		Adelbert R.	<b>Tauya</b>
Germanic	<b>German</b>	Madang	<b>Amele</b>
Italic	<b>Latin</b>	Oceanic	<b>Ponapean</b>
Iranian	<b>Ossetic</b>	Pama-Nyungan	<b>Martuthunira</b>
Indic	<b>Hindi/Urdu</b>	Yuman	<b>Maricopa</b>
URALIC		UTO-AZTECAN	
Finnic	<b>Finnish</b>	Numic	<b>Tümpisa Shoshone</b>
Ugric	<b>Hungarian</b>	Aztecan	<b>Pipil</b>
Lezgian	<b>Lezgian</b>	Mayan	<b>Tzutujil</b>
Turkic	<b>Turkish</b>	Cariban	<b>Hixkaryana</b>
Tungusic	<b>Evenki</b>	Paezan	<b>Páez</b>
Yukaghir	<b>Kolyma Yukaghir</b>	Quechua	<b>Huallaga Quechua</b>

- I looked at (1) cumulation/separation, (2) stem alternation/uniformity, and (3) affix suppletion/invariance in each of these languages
- I determined a Cumulation index, an Alternation index, and a Suppletion index for each language, separately for nominal and for verbal inflection. Value: between 0 (maximal agglutination) and 100 (maximal fusion)
- **Cumulation index** (roughly):  
percentage of inflected forms that exhibit cumulation
- **Alternation index:** average alternation score (cf. §3, (iv)) per supercategory
- **Suppletion index:** percentage of subcategories that exhibit affix suppletion

#### 4.2. Testing the Second Prediction: Correlation among the three indices?

TABLE 2: INDEX VALUES AND LANGUAGE RANKING FOR EACH INDEX

Ranking by Cumulation index:		Ranking by Alternation index:		Ranking by Suppletion index:		
1.	Krongo	0	1.	Hindi/Urdu	0	
	Lango	0		Hixkaryana	0	
	Lezgian	0		Martuthunira	0	
	Newari	0		Nivkh	0	
	Pipil	0		Páez	0	
	Ponapean	0		Swahili	0	
	Shoshone	0		Tauya	0	
	Tibetan	0		Turkish	0	
	Turkish	0	9.	Evenki	2	
	Tzutujil	0	10.	Coptic	5	
11.	Swahili	0.1	11.	Latin	7	
12.	Amele	0.2	12.	Tibetan	9	
13.	Maricopa	0.4	13.	Krongo	12	
14.	Tauya	0.5	14.	Yukaghir	13	
15.	Coptic	1.8	15.	Maricopa	14	
16.	German	2		Quechua	14	
17.	Quechua	2.5	17.	Lango	17	
18.	Yukaghir	4	18.	Newari	18	
19.	Hixkaryana	4.5	19.	Tzutujil	24	
20.	Evenki	5	20.	Amele	25	
21.	Ossetic	6	21.	Ossetic	26	
22.	Nivkh	7	22.	Shoshone	27	
23.	Arabic	8	23.	Finnish	30	
24.	Finnish	13	24.	Hungarian	36	
25.	Kannada	14	25.	Arabic	42	
26.	Hungarian	18	26.	Kannada	43	
27.	Martuthunira	18	27.	Lezgian	46	
28.	Páez	30	28.	Pipil	50	
29.	Hindi/Urdu	50	29.	German	52	
30.	Latin	66	30.	Ponapean	75	
				1.	Nivkh	0
				2.	Tauya	3
				3.	Ponapean	4
				4.	Quechua	10
				5.	Páez	12
				6.	Lezgian	12
				7.	Tibetan	14
				8.	Coptic	15
					Krongo	15
				10.	Pipil	16
				11.	Finnish	18
				12.	Maricopa	19
				13.	Hixkaryana	22
				14.	Hungarian	23
					Turkish	23
				16.	Swahili	28
				17.	Martuthunira	29
				18.	Lango	37
				19.	Shoshone	38
				20.	Evenki	39
				21.	Yukaghir	40
				22.	Newari	41
				23.	Hindi/Urdu	50
				24.	Kannada	51
					Ossetic	51
				26.	German	56
				27.	Arabic	62
				28.	Amele	69
				29.	Tzutujil	77
				30.	Latin	84

- Cumulation values tend to be much lower than Alternation and Suppletion values: cumulation is a rare phenomenon outside Indo-European
- Stem alternation is less common than affix suppletion
- the three index values stand for different things, so **only ranks can be compared directly**
- In Table 3 (next page), languages are ordered by **average rank** (conceivable interpretation: Tauya and Turkish are the "most agglutinating languages", Arabic and German are among the "most fusional")

TABLE 3: INDEX VALUES AND RANK NUMBERS FOR EACH LANGUAGE

	Indices			Ranks			(Average Rank)
	Cum	Alt	Sup	Cum	Alt	Sup	
Tauya	0.5	0	3	14	4	2	6.7
*Turkish	0	0	23	5.5	4	14	7.8
Tibetan	0	9	14	5.5	12	7	8.2
Krongo	0	12	15	5.5	13	8.5	9.0
*Nivkh	7	0	0	22	4	1	9.0
*Swahili	0.1	0	28	11	4	16	10.3
Coptic	2	5	15	15	10	8.5	11.2
Hixkaryana	4.5	0	22	19	4	13	12.0
*Quechua	2.5	14	10	17	15.5	4	12.2
Páez	30	0	12	28	4	5	12.3
*Lezgian	0	46	13	5.5	27	6	12.8
Ponapean	0	75	4	5.5	30	3	12.8
Maricopa	0.4	14	19	13	14	12	13.0
Lango	0	17	37	5.5	17	18	13.5
Pipil	0	50	16	5.5	28	10	14.5
Newari	0	18	41	5.5	18	22	15.2
*Shoshone	0	26	38	5.5	22	19	15.5
*Martuthunira	18	0	28	27	4	17	16.0
*Evenki	5	2	39	20	9	20	16.3
*Yukaghir	4	13.5	40	18	14	21	17.7
Tzutujil	0	24	77	5.5	19	29	17.8
Hindi/Urdu	50	0	50	29	4	23	18.7
*Finnish	13	30	18	24	23	11	19.3
Amele	0.2	25	69	12	20	28	20.0
*Hungarian	18	36	23	26	24	14.5	21.5
Ossetic	6	26	51	21	21	24.5	22.2
Latin	66	7	84	30	11	30	23.7
German	2	52	56	16	29	26	23.7
Arabic	8	42	62	23	25	27	25.0
*Kannada	14	42	51	25	26	24.5	25.2

\* = language has been referred to as “agglutinating” in the literature

- there are some "well-behaved languages" showing similar rankings, e.g. Maricopa, Ossetic, Arabic, Kannada
- but too many languages are not "well-behaved" (cf. Nivkh, Páez, Ponapean, Hindi/Urdu)

• no statistically significant correlation among the three rankings:

Kendall coefficient of concordance  $W = 0.37$ ,  $\chi^2 = 32.19$ ,  $p < .35$

- have linguists unconsciously tended to define *agglutinating* as “Turkish-like” and *fusional* as “Latin-like”?

### 4.3. Testing the First Prediction: Correlation among nominal and verbal inflection?

**TABLE 4: INDEX VALUES AND RANK NUMBERS,  
SEPARATELY FOR NOUNS (N) AND VERBS (V)**

	Cumulation				Alternation				Suppletion			
	index		rank		index		rank		index		rank	
	N	V	N	V	N	V	N	V	N	V	N	V
Amele	0	0.5	11	14	0	50	7.5	28	91	47	28	22.5
Arabic	15	0	25	6.5	33	50	22	28	44	80	24	29
Coptic	0.6	3	22	17	10	0	17	7	6	24	7	13
Evenki	0	10	11	23	3	0	15	7	19	59	14	25
Finnish	19	7	26	20	42	18	24	17.5	21	14	17	9
German	0	4	11	18	35	70	23	30	67	45	26.5	21
Hindi/Urdu	100	0	27.5	6.5	0	0	7.5	7	100	0	29.5	2
Hixkaryana	0	9	11	22	0	0	7.5	7	20	24	15.5	13
Hungarian	1	36	23	28	60	13	28	15	13	33	11	18.5
Kannada	0	27	11	26	50	35	26.5	23.5	25	77	19	28
Krongo	0	0	11	6.5	0	25	7.5	19	20	10	15.5	7.5
Lango	0	0	11	6.5	0	33	7.5	21	27	47	20.5	22.5
Latin	100	33	27.5	27	0	14	7.5	16	100	69	29.5	26
Lezgian	0	0	11	6.5	50	42	26.5	25	8	17	10	10
Maricopa	0	0.7	11	15	17	12	18	14	6	32	7	17
Martuthunira	0	37	11	29	0	0	7.5	7	24	33	18	18.5
Newari	0	0	11	6.5	0	35	7.5	23.5	0	82	3	30
Nivkh	0	14	11	25	0	0	7.5	7	0	0	3	2
Ossetic	0	11	11	24	20	33	19	21	27	75	20.5	27
Páez	4	57	24	30	0	0	7.5	7	17	6	13	4.5
Pipil	0	0	11	6.5	66	33	29	21	7	24	9	13
Ponapean	–	0	–	6.5	100	50	30	28	0	7	3	6
Quechua	0	5	11	19	29	0	21	7	0	20	3	11
Shoshone	0	0	11	6.5	5	47	16	26	67	10	26.5	7.5
Swahili	0	0.1	11	13	0	0	7.5	7	50	6	25	4.5
Tauya	0	1	11	16	0	0	7.5	7	6	0	7	2
Tibetan	–	0	–	6.5	0	18	7.5	17.5	0	27	3	15
Turkish	0	0	11	6.5	0	0	7.5	7	15	31	12	16
Tzutujil	0	0	11	6.5	47	0	25	7	33	44	23	20
Yukaghir	0	8	11	21	27	0	20	7	31	50	22	24

- for Alternation and especially Suppletion,  
**the rankings do correlate significantly**  
(Spearman rank correlation coefficient,  $p < 0.01$  (Suppletion),  $p < 0.05$  (Alternation); but cumulation:  $p < 0.20$ ):

**Languages tend to show (or lack) affix suppletion and stem alternations in both nouns and verbs simultaneously;**  
i.e., languages can be typologized as **AFFIX-SUPPLETING (vs. affix-invariant) languages** and **STEM-ALTERNATING (vs. stem-uniform) languages**

- There is also a significant correlation between the rankings of the average ranks of nouns and verbs (figures not shown here), but this is an artifact of the significance of (two of) the component rankings

## 5. Conclusions

- it is indeed possible, if difficult, to test the Agglutination Hypothesis empirically
- result: no statistically significant correlation between Cumulation, Alternation and Suppletion
- **I have not shown that the Agglutination Hypothesis is wrong; but the burden of proof is now on those who believe that it is correct**
- there are features that can be used to characterize whole languages, e.g. *affix-supplementing* and *stem-alternating*
- think twice before using the term "agglutinative"!

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