# Some universals of reflexive construction markers and a possible efficiency-based explanation

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### I. Take-home message

• to understand Human Language, I think that we must look at **universals**, because most phenomena in languages are conventional and historically accidental

• to understand the general behaviour of **reflexive forms** and **nonreflexive anaphoric forms**, we need to look at what is general about them in the world's languages

• three striking universals refer to the **length** of anaphoric forms, in cases of asymmetric coding:

- reflexive forms for extroverted actions tend to be longer than for introverted actions
  - (cf. Russian myt'-sja 'wash (onself)' vs. nenavidet' sebja 'hate oneself')
- reflexive pronouns tend to be longer than nonreflexive anaphoric pronouns (cf. English her-self vs. her)
- reflexive pronouns in **object** function tend to be longer than in adnominal possessive function

• these universals are more general than all "binding theories", which are often very detailed, but which have been studied thoroughly only for a few languages

• the length universals can probably be explained by a general **principle of efficient coding**: frequent and predictable information is coded by short forms or zero

## 2. Types of reflexive construction markers

Many languages have special reflexive construction markers – two main types (Faltz 1977):

- verbal REFLEXIVE VOICE MARKERS

e.g. Finnish	riisu-a	'undress (someone)'
	riisu-utu-a	'undress (onself)'

- REFLEXIVE NOMINALS (often called "reflexive pronouns" or "anaphors").

e.g. Persian xod 'self'

u xod-râ košt he self-ACC killed 'he killed himself' Almost all research on these forms has been on particular languages, focusing on language-particular analyses, especially:

general meanings of ("polysmous") reflexive voice markers that coexpress a variety of individual functions (e.g. Geniušienė 1987; Kemmer 1993; Beavers & Udayana 2019)

syntactic conditions on reflexive nominals ("anaphors") (e.g. Reinhart 1983; Lust et al. 2000; Büring 2005; Reuland 2011)

Some earlier research on **universals of coexpression patterns** (or multifunctionality patterns), especially Kemmer (1993):



See also Schladt (1999) and König et al. (2005) for reflexive nominals derived from body-part terms and self-intensifiers.

# 3. The present study: forms of reflexive markers worldwide

The present paper reports on a study of reflexive construction markers in 50 languages worldwide, from 50 unrelated language families (in order to minimize genealogical bias).

Coptic, Ganj, Koyra Chiini, Krongo, Ma'di<sup>\*</sup>, Mandinka<sup>\*</sup>, Nzadi, Sandawe, Ts'ixa, Bininj Gun-wok, Kayardild, Martuthunira, Wambaya, Bardi, Basque<sup>\*</sup>, Burushaski, Icelandic<sup>\*</sup>, Korean, DGS<sup>\*</sup>, Lezgian, Mandarin Chinese, Kannada, Yukaghir Kolyma, Musqueam Halkomelem, Itzaj, Kalaallisut, Keres (Laguna), Maricopa, Ute, Wappo, Zoque (Chiapas), Creek, Indonesian<sup>\*</sup>, Komnzo, Lavukaleve, Mauwake, Motuna, Coastal Marind, Teiwa, Ulwa, Cavineña, Hup, Karajá, Mapudungun, Garifuna, Panare<sup>\*</sup>, Quechua (Yauyos), Yurakaré, Aguaruna



## 4. A semantic-role universal

A first universal concerns reflexive voice markers, i.e. affixes that occur on verbs:

(1) If a language has a reflexive voice marker, one of its uses is for agent-patient coreference.

26 languages with a reflexive voice marker in my sample of 50 languages:



This finding is not surprising, and it is not very certain, because the descriptions rarely say specifically which kinds of semantic-role combinations are possible with reflexive voice.

Often they give only one or a few examples, e.g.

- (2) a. Garifuna (Arawakan)
   n-asafura-gu-nya
   ISG-save-REFL-PROG I.SG-to-REFL
   'I am saving myself.' (Haurholm-Jensen 2020: 142)
  - b. Kolyma Yukaghir (Russian Far East) tudel met-juø-j he REFL-see-3SG:INTR 'He sees himself.' (Maslova 2003: 227)
  - c. Hup (Nadahup) t*ih* hup-k*it-iy*3sG REFL-cut-DYNM
    'He cut himself.' (Epps 2008: 479)
  - d. Motuna (South Bougainville) monomono-roo look.at-2SG.MIDDLE.IMP 'Look at yourself carefully.' (Onishi 2012: 269)

# 5. Three length universals

More interesting are three length universals.

(3) In all languages, the usual coding of **disjoint anaphoric reference** is at least as short as the usual coding of **agent-patient coreference** (cf. Haspelmath 2008: 48).

#### Some languages with reflexive nominals:

	reflexive nominal	disjoint object pronoun
Basque	burua	(indexing)
Ganja (Atlantic)	bgC	(indexing)
Indonesian	diri	dia, -nya
Itzaj (Mayan)	-b'aj	(indexing)
Kalallisut	immi-	(indexing)
Krongo	òonó	ì?ìŋ, àakù, àay
Lezgian (Dagestanian)	wič	am
Kannada	tann-annu	ad-annu
Korean	caki	(Ø)

Mandarin Chinese	(tā) zìji	$(t\bar{a})$	
Nzadi (Bantu)	ndé-ŋgizyâ	ndé	
Teiwa (Alor-Pantar)	exan		(indexing)
Ulwa (Ulmapo)	ambï		(indexing)
Wappo	may'	te	

When there is a reflexive nominal, the object pronouns or object indexes are usually shorter than the reflexive nominal, and **never longer**.

### Some languages with reflexive voice markers:

Bardi (Nyulnyulan)	ma-V-inyji	(Ø)
Creek (Muskogean)	i:-V	ca-/ci-/Ø-
Garifuna (Arawakan)	V-gwa	-i/-u/-nya
Kolyma Yukaghir	met-V	(Ø)
Maricopa (Yuman)	mat-V	(Ø)
Motuna	V-mor/-ror	-m/-r
Quechua	V-ku	-ma/-yki/-Ø
Sandawe	V <b>-</b> ts'i	(Ø)
Wambaya (Mirndi)	V-ngg	V-ng/V-ny/V-Ø
Yurakaré	V-të	ti-/mi-/Ø-

When there is a reflexive voice marker, the language either has object indexes (which are not longer than the voice marker) or optional object pronouns which are limited to contrastive uses.

(4)	If a language uses different constructions for agent-patient coreference for
	different verb types, then it uses shorter markers for introverted verbs than for
	extroverted verbs (cf. Kemmer 1993: König & Vezzosi 2004).

Introverted verbs: – grooming verbs like 'wash (oneself)', 'dress (onself)' – body motion verbs like 'turn (onself)', 'sit (onself) down'

Kemmer (1993: §2.2): "light forms" vs. "heavy forms":

	light/short	heavy/long
Russian	-sja	sebja
Dutch	zich	zichzelf
Djola	-D	-ЭrЭ
Latin	-r	se
Turkish	-In	kendi
Djola Latin Turkish	-Ə -r -In	-ƏrƏ se kendi

For seven of the 50 languages of my sample, two different constructions were found:

	shor	t	long			
Ma'di	ru		ani			
Mandinka	ŋĺí		fáŋ-o			
Basque	Ø		burua			
Icelandic	-st		sig			
DGS		Ø		(like c	lisjoint)	
Indonesian	ber-		diri			
Panare	Vs-V		-nkën			
Panare	i'nampa o'nama ïnaamï	ʻadorn' ʻmove' ʻhide'			ïs-i'nampa as-o'nama ït-ïnaamï (Payne & Pay	'adorn oneself 'move (onself)' 'hide (onself)' ne 2013: 339)
Indonesian	(men-)dandan (men-)cukur (men-)jemur	'dress' 'shave' 'dry in	the sun	,	ber-dandan ber-cukur ber-jemur (Beavers & L	ʻget dressed' ʻshave (onself) ʻsunbathe' Jdayana 2019)
Mandinka	kuu nukuŋ	'wash' 'hide'			í kuu í nukuŋ (Creissels 20	'wash (onself)' 'hide (oneself)' 15: 238)

By contrast, the longer forms are not lexically restricted in these languages, it seems.

(5) If a language uses different reflexive construction markers for **object** function and **adnominal possessor** function, then the adnominal possessor marker is shorter than the object marker.

This generalization is hard to test, because grammars do not often contain explicit information on subject-coreferential adnominal possessor forms. But I have not seen counterevidence to the claim that there are three types of languages:

#### (I) languages with a reflexive adnominal possessor form

- with the **same shape** as the object form

#### (6) Japanese

- a.  $Jon_1$  wa  $Marii_2$  to **zibun**<sub>1/\*2</sub> no ie de hanasi o si-ta. John TOP Marywith self GEN house in talk ACC do-PAST 'John had a talk with Mary in his/\*her house.'
- b. Ken wa **zibun** o seme-ta. Ken TOP self ACC blame-PAST 'Ken blamed himself.'

- with a different form, of the **same length** as the nonreflexive form

(7) Evenki (Nedjalkov 1997: 144, 109)

- a. Nungan oro-r-vi etejet-chere-n. he reindeer-PL-REFL.POSS guar-PRS-3SG 'He<sub>1</sub> guards his<sub>1</sub> reindeer.'
- b. ... oro-r-**in** ... reindeer-PL-3SG 'his<sub>2</sub> reindeer'
- c. Asatkan ichevun-du me:nmi iche-re-n. girl mirror-DAT self see-NONFUT-3SG 'The gitl saw herself in the mirror.'

(II) languages with **no special reflexive** form (also in English)

(8) Akan (Faltz 1977:170-81)

- a. John praa **nẽ** 'fie. John sweep.PAST 3sG.POSS house 'John<sub>1</sub> swept his<sub>1/2</sub> house.'
- b. Mary hũũ **nẽ hõ**. Mary see.PAST 35G.POSS REFL 'Mary saw herself.'

What we don't find:

- languages that have reflexive forms only for adnominal possession
- languages with adnominal reflexive forms longer than nonreflexive (the opposite of the object function!)
- languages with adnominal reflexive forms longer than object form

# 6. An explanation in terms of coding efficiency

Universals may be explainable in a variety of ways (cf. Schmidtke-Bode at el. 2019), including an innate grammar blueprint ("UG"), diachronic tendencies, and efficiency principles (Gibson et al. 2019).

I suggest the hypothesis that universals (3)-(5) can be explained by a general Zipfian principle of efficient coding: **Greater predictability results in shorter forms.** 

- **disjoint reference is more expected** than coreference in agent-patient contexts, because coreference is rare in language use

e.g. The girl saw her is much more frequent than The girl saw herself.

(see Ariel 2008; Hendriks et al. 2008)

- coreference is more expected with introverted verbs (grooming verbs and body motion verbs) than with extroverted verbs

e.g. The boy hid (himself) is much more frequent than The boy saw himself.

(see Haspelmath 2008)

#### - coreference is more expected with adnominal possessors than with patients

e.g. She<sub>1</sub> took her<sub>1</sub> umbrella is much more frequent than She<sub>1</sub> took his<sub>2</sub> umbrella.

(see Haspelmath 2008)

These frequency differences lead to predictability differences, and these make it more efficient to have shorter forms in the contexts where we often see them (cf. Comrie 1999; Ariel 2008; Haspelmath 2008).

context predictability — shortness of coding frequency

Figure 1: The causal chain leading to shortness of coding

## 7. Against a mutational explanation

One might suggest that the explanation for some of these universal tendencies lies in **constraints on possible language changes** (cf. Cristofaro & Zúñiga 2018; Cristofaro 2019).

After all, all current patterns have arisen through language change, and change is not teleological – speakers do not know which systems are beneficial to them, and they do not consciously change languages. Language change happens unintentionally through mechanisms like reanalysis and grammaticalization.

Can grammaticalization explain some of the patterns? cf. the change from a full reflexive pronoun to a reduced one (e.g. Latin se > Italian si, Proto-Germanic sik > Icelandic -st).

The answer is: NO

There are **a range of different pathways** through which asymmetric patterns can arise, always leading to the universals that we saw (cf. Kemmer 1993: Ch. 5 on different pathways for "middle voice" systems):

- addition of a self-intensifier to an anaphoric pronoun, e.g. English her her-self vs. Nzadi ndé ndé-ngizyâ VS. - use of a 'body'-type noun, e.g. Ganja bgO 'head' Basque burua 'head' Maricopa mat-< iimaat 'body' (Gordon 1986: 65) - use of multiple strategies at the same time, e.g. Kannada avanu tann-annu hodedu-kond-a he.NOM self-ACC beat-REFL.PST-3 'He beat himself.' (Amritavalli 2000: 53)

- and occasionally even: the use of **anti-reflexive** marking, e.g. in Finnish

(9) Finnish

- a. Hän syö **hän-en** ruoka-nsa. she eats she-GEN food-3SG.POSS 'She<sub>1</sub> eats her<sub>2</sub> food.'
- b. Hän syö ruoka-nsa. she eats food-3SG.POSS 'She<sub>1</sub> eats her<sub>1</sub> food.'

Such cases of convergence of different source constructions toward the same kind of outcome can only be explained by a result-oriented process (cf. Haspelmath's 2019 notion of multi-convergence, forcing a result-oriented explanation).

I have not ruled out an explanation in terms of an innate grammar blueprint ("UG"), but

- I do not know of any clear proposal that would predict the length universals (but see Reinhart & Reuland 1993 for some relevant remarks);
- if a functional-adaptive explanation is available, it has priority, because it is inherently more likely (innate grammatical knowledge is hard to reconcile with Darwin's Problem, cf. Berwick & Chomsky 2016).

(A grammar blueprint explanation may be apropriate for the generalization that the antecedent of a reflexive constuction is always the agent/subject argument or an argument with some other high-ranked role. I am not aware of an efficiency explanation for this generalization.)

# 8. Take-home message

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(cf. Russian myt'-sja 'wash' vs. nenavidet' sebja 'hate oneself')

- reflexive pronouns tend to be longer than nonreflexive anaphoric pronouns (cf. English her-self vs. her)
- reflexive pronouns in **object** function tend to be longer than in adnominal possessive function

• the length universals can probably be explained by a general **principle of efficient coding**: frequent and predictable information is coded by short forms or zero

• In contrast to a widespread view, it is **not necessary to have "in-depth" analyses** of all languages before they can be compared – comparative studies can be based on surveying comprehensive grammatical descriptions in the world's languages.

BUT: These descriptions never answer all the questions that one might have, so other methods for cross-linguistic data collection are needed to complement this method, e.g. expert teams:

Janic, Katarzyna & Haspelmath, Martin (eds.) 2021. Reflexive constuctions in the world's languages. Berlin: Language Science Press

(a planned volume with about 25 contributions on languages from around the world)

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(* = both reflexive	reflexive voice	reflexive nominal	(continuous topic	example
exist)	construction		object)	
Coptic		(identical to ordinary object indexes)		<i>a-lêsous ouonh-f e-ne-f-mathêtês</i> [PST-Jesus reveal-3SG.OBJ to-DEF.PL- 3SG.M.POSS-disciple] 'Jesus revealed himself to his disciplies'
Ganja		<b>bgɔ</b> + prposs (lit. ,his head')	object indexes (single consonant)	À-hâb bgó ní. [G.HA-kill G.B.head POSS.G.HA] 'He killed himself.'
Koyra Chiini		<b>=ŋgu/=ŋgiyo</b> (SG/PL)	object pronouns: <i>=ga/=gi</i>	<i>I warra ŋgi-yo.</i> [3PL.SBJ throw selves- PL] 'They threw themselves.'
Krongo		<b>òonó</b> 'him/her-self'	object pronouns ì?ìŋ 'him', àakù 'her', àay 'it', àay 'them'	<i>áakòbí òonó</i> [dries self] 'He dries himself.'
Ma'di*	<b>rσ</b> ̄ V (e.g. 'wash')	(ordinary object pronouns can be used with some verbs)	ordinary disjoint pronoun +ānɨ (3SG), +àʔɨ (3PL)	<i>``t∫é ká rō dʒè</i> [dog 3 REFL (N)-wash] 'A dog is washing itself.'
Mandinka*	<pre>(short preposed object reflxive forms:</pre>	PRPOSS + <b>fáŋo</b> (lit. 'his self')	object pronouns	Mus-óo ye í kuu. [woman-D PF.POS MID wash] 'The woman washed (herself).' / Ń ŋa dendik-ôo kára ń fáŋ-o ye. [1SG PF.POS dress-D sew 1SG INT-DEF BEN] 'I sewed a dress for myself.'
Nzadi		<i>ndé-<b>ŋgizyâ</b> 'him/her-self'</i>	<i>ndé</i> 'her/him'	<i>mi á diir mí-ńgizyâ kó taltál '</i> l've looked at myself in the mirror'
Sandawe	V-ts′i		object pronouns ( <i>hèwé, hèsè, hèsò)</i> are only used when focused	
Ts'ixa	V-si		object pronouns never omitted?	

Bininj Gun-wok	V-rr		object indexes (cumulated with subject indexes) – zero in 3rd person?	Ø-gurrme-rr-inj [3-put-RFL-PST] 'he put himself (there)'
Kayardild	V-a			ngada bala-a-ja karwa-wuru [1SG.NOM hit-MID-ACT club-PROP] 'I hit myself with a club.'
Martuthunira		<b>jankul</b> ,self'		Ngayu kuliyanpa-lha-rru jankul. [1SG.NOM think-PST-NOW self] 'I thought about myself now.'
Wambaya	∨- <b>ngg</b> -		object indexes <i>-ng/-ny/-Ø</i>	Janji gini-ngg-a wagardbi. [dog.I(NOM) 3SG.M.A-RR-NF wash] 'The dog is washing himself.'
Bardi	<b>ma</b> -V-i <b>nyji</b> (p. 478)		object pronouns often zero	
Basque*	(intrans.)	PRPOSS + <b>burua</b> (lit. 'his head')	object indexes (cumulated with subject indexes)	Jon-ek bere burua ispiluan ikusi du. [Jon-ERG his head mirror.in see AUX.TR] 'Jon saw himself in the mirror.'
Burushaski		PX- <b>khar</b> (lit. ,his self')	demonstratives used as object pronouns (obligatory??)	<i>khín dasín-e mu-khár e-sqan-umo</i> [DEM girl-ERG 3SG.F-self ABS-kill- 3SG.F.PST] 'This girl killed herself.'
Icelandic*	V-st	sig	hann/hana/það/þá/þeir/þau	<i>hún klæðir sig</i> [she dresses self] ,She dresses herself.'
Korean		caki, tangsin	demonstratives very rarely used as object pronouns	Na nun Tongmini sikyey lul caki cip ese po-ass-e. [I TOP Tongmin watch ACC self house at see-PST-INTIM] 'I saw Tongmin's watch at his house.'
DGS*	(As in English, body care verbs do not require any overt	(identical to ordinary object pronouns)		

	marking as it is assumed that A/S is acting on themselves: 'He washes'.)			
Lezgian		<b>wič, čeb</b> ,self, selves'	object pronouns 3rd person am, abur (= demonstratives)	<i>Ali.di-z wič güzgü.d-a akwa-zwa.</i> [Ali- DAT self mirror-INESS see-IMPF] 'Ali sees himself in the mirror.'
Mandarin Chinese		<b>(tā) zìji</b> ,(her)self'	<i>tā/tāmen</i> ,her/them'	<i>Lìsi zài zébèi (tā) zìji</i> [Lisi DUR blame self] 'Lisi is blaming himself.'
Kannada	V- <b>koḷḷu</b> (plus nominal)	<i>taanu</i> ,self' (plus verbal voice marker)	e.g. <i>ad-annu</i> 'him' (shorter than <i>tann-annu</i> )	avanu tann-annu hoḍedu-koṇḍ-a [he.NOM self-ACC beat-REFL.PST-3] 'He beat himself.' (Amritavalli 2000: 53)
Yukaghir Kolyma	met-V		object pronouns are optional: <i>met (tudel) juø</i> [I he see] 'I saw him.'	<i>tudel met-juø-j</i> [he REFL-see- 3SG:INTR] 'He is looking at himself.'
Musqueam Halkomelem	V-ϑət		object indexes	<i>hi:l-ϑət</i> 'roll oneself' (p. 105)
Itzaj		PX- <b>b'aj</b> 'his self'	object indexes – zero in 3rd person	<i>Tan-u-b'os-ik u-b'aj ti ja'.</i> [DUR-3.ERG-soak-ITS 3.POSS-self in water] 'S/he is soaking herself/himself in the water.'
Kalaallisut		<b>immi-</b> 'self'	object indexes cumulated with subject indexes	<i>immitsinn-nut nirisip-pugut</i> [feed- 1PL.IND] 'we fed ourselves'
Keres (Laguna)	V-a, V-uu		object indexes – always zero in 3rd person	<i>s'-a-ukacha</i> [1ACT.DIR-RFL-see] 'I saw myself.'
Maricopa	mat-V		prefixed object indexes (single consonant)	
Ute		nanoes ,self'		

Wappo		may'	object pronoun 3rd person	
			te	
Zoque (Chiapas)	wit-∨		object indexing short	
Creek	<i>i:-</i> V		prefixed object indexes, Ø in	
			3rd person	
Indonesian*	ber-V	diri	dia, -nya	Tuan rumah memperkenalkan diri
				<i>kepada kami.</i> [master house
				introduce self to us] ,The host
				introduced himself to us.'
Komnzo	MIDDLE verb			<i>kw-a-mayk-w-é</i> [M.β1-VC-wash.EXT-
	inflection			ND-1sg] 'I washed myself.'
Lavukaleve		PX- <b>muan</b> ,his self'	object indexes	nana o-na nga-muan nga-le fi la-me
				[shadow(f) 3sgfO-in 1sgPOSS-self
				1sgO- see 3sgnFOC 1sg-HAB
				'I see myself in a mirror.'
Mauwake		-ame ,self'		
Motuna	MIDDLE verb		object indexes: - <i>m/-r/-Ø</i>	
	inflection: -mor/-ror/-			
	<i>or</i> (p. 259 <i>,</i> 269)			
Coastal Marind		e.g. <b>wahani</b> ,bodyʻ (not		wahani ah-hwagib [body IMP-hide]
		grammaticalized)		'hide yourself' (Olsson 2017: 387)
Teiwa		exan 'self'	preposed object index ga-	
			/Ø-	
Ulwa		ambï/ambla 'self/selves'	preposed object indexes	Tambana mï ambu-wali-nda
			<i>nï=/u=/ma=</i> 'me/you/him'	[Tambana 3SG REFL.SG-hit-IRR]
				'Tambana wil hit herself.'
Cavineña	ka-∨-ti		object pronouns tu-ke/ri-	Señora ka-peta-ti-wa espejo=ju. [lady
			ke/tuna/rena (obligatory?)	RFL-look.at-RFL-PERF mirror=LOC]
				'The lady looked at herself in the
				mirror.'

Нир	hup-∨		object pronoun t <del>i</del> h-ăn	tih hup-kit-iy [3sg RFLX-cut-DYNM]
			(obligatory? tih-ăn hup kit-iy	'He cut himself.'
			[3sg-OBJ person cut-DYNM]	
			'Someone cut him')	
Karajá	eši-V		object prefixes	
Mapudungun	∨ <b>-(u)w</b> -		object suffix -fi	
Garifuna	V- <b>gwa</b> -		object suffixes -i/-u/-nya (p.	
			98-99)	
Panare*	<i>Vs</i> -∨	-nkën 'self'		p. 334, 340
Quechua	∨- <b>ku</b> -		object indexes -ma, -ki, Ø	kundina-ku- 'condemn oneself' (p.
(Yauyos)			(3rd person)	218)
Yurakaré	V- <i>të-</i>		Chërë-y. [pinch-1SG.S] 'I	Chërë-të-y. [pinch-MID-1SG.S] 'I
			pinch him.'	pinch myself.'
Aguaruna	V- <b>ma-</b>		object indexes, e.g. <i>isa-t-</i>	tsupí-ma-k-mɨ̃ [cut-REFL-PFV-3.DECL]
			katta-wa-i [bite-1sg.OBJ-FUT-	'he has cut himself' (p. 307)
			3-DECL] 'it will bite me' (p.	
			271)	