

Language ecology and contact-induced language change

J. Clancy Clements
Indiana University
clements@indiana.edu

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Preface

News in physics:

"Rydberg molecules" have been created!

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Preface

- The Rydberg molecules were formed from two atoms - one a Rydberg atom, and one a "normal" atom.
- A Rydberg atom is special because it has one electron alone in an outermost orbit - very far, in atomic terms, from its nucleus.
- The electron of the Rydberg atom weakly bonds to the normal molecule, but only under extreme conditions and for very little time.

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Preface

The conditions: Near absolute zero - minus 273C, a critical distance of about 100nm (one millionth of a millimetre) is reached between the Rydberg atom and the normal atom. At this distance, the bond is created by adding energy from a lazer.

Time of existence: The longest-lived Rydberg molecule survived for just 18 microseconds (18 millionths of a second).

(BBC: 'World First for Strange Molecule,' 23 April 2009
<http://news.bbc.co.uk/2/hi/science/nature/8013343.stm>

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Preface

Relevance for Language Change:

Extraordinary outcomes happen under extreme circumstances.

Example: pidgins and creoles

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Preface

James Flynn (U. of Otago, NZ) compared IQ data from dozens of countries over 70 years.

Result: IQ scores have increased roughly .3% per year, and more in some countries.

In very little time, substantial increases in IQ scores cannot be attributed to evolution, but to the environment (changes in the acculturation process).

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1978: the male-female ratio in the top .01% of U.S. math scores was 13 to 1.

2008: the male-female ratio in the top .01% of U.S. math scores was 2.8 to 1.

Conclusions:

1. the plasticity of the brain is probably underestimated.
2. the environment plays a bigger role than once thought.

(Newsweek, April 20, 2009, p. 53)

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Overview

1. Introduction
2. Patterns and structure
3. Emergent Grammar and Copula Selection in contact varieties
 - perceptual salience
 - frequency of input
4. Predictions regarding copula selection
5. Representative data sample
6. Conclusions regarding copula selection
7. Predictions regarding selection of object pronoun system
8. Representative data sample
9. Conclusions regarding object pronoun selection
10. General conclusions

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Introduction

Ecology: scientific study of the distribution and abundance of living organisms and how their distribution and abundance affect and are affected by interactions between the organisms and their environment.

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Introduction

- **Language Ecology:** scientific study of the distribution and abundance of language speakers and how their distribution and abundance affect and are affected by communicative interactions among language speakers, on the one hand, and on the other, between language speakers and their *environment*.

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Introduction

The environment of organisms includes properties such as:

- light,
- climate,
- geology,
- other organisms that share the same habitat,
- constrained by the nature of the organisms.

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Introduction

The environment of language speakers includes properties such as:

- social structures,
- political structures,
- environment (linguistic and otherwise)
- constrained by human cognitive structures, among other things

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Introduction

Human Cognitive Structure for Language Language Production

→ Language Processing:

In this study, language processing refers to cognitive processes involved in creating and understanding meaning and structure (i.e. patterns) of language and cultural correlates in the broad sense of the term.

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Introduction

- Language Processing (creation): perceptually more salient forms are more easily selected than perceptually less salient forms.
- Ecology (linguistic environment) frequency of lexical and grammatical features from discourse affects intake.

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Introduction

Broader Ecology around the Emergence of the Languages Selected

The language varieties to be discussed here emerged in situations of considerable social upheaval and/or in situations with varying degrees of restricted access to the target language.

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Introduction

Phenomena to be examined:

Verb Phrase: Copulas (discussion restricted to present tense)

Noun Phrase: Object pronoun system (discussion restricted to 3rd-person pronouns)

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Patterns and Structure

Pattern Recognition

–Visual

–Auditory

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Patterns and Structure

- Tsao (in Svoboda 2007) notes: groups of cells in three regions of the brain's temporal lobe seemed to be strongly attuned to faces.

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Patterns and Structure

- Watanabe (in Svoboda 2007) notes that because faces make up such a significant part of the visual backdrop of life, people have gotten so used to seeing faces everywhere that sensitivity to them is high enough to produce constant false positives.
- **This tendency to become hyperattuned to common stimuli may represent a survival advantage. “If you lived in primeval times, for instance, it would be good to be very sensitized to tigers.”**

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Patterns and Structure

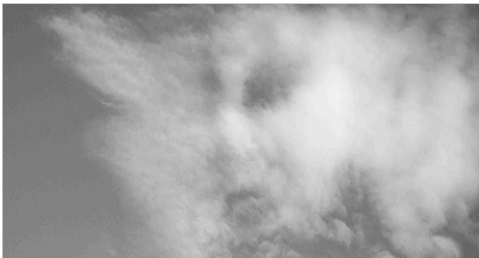
- Pawan Sinha (MIT)
“It’s extremely beneficial for the brain to become good at the task of face recognition and not to be very strict in its inclusion criteria. The cost of missing a face is higher than the cost of declaring a nonface to be a face” (in Svoboda 2007).

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Patterns and Structure

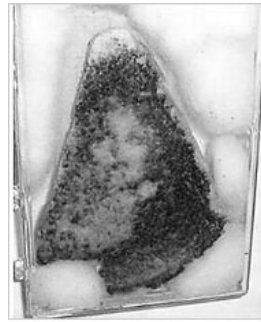


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Patterns and Structure



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Patterns and Structure



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Patterns and Structure



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Patterns and Structure



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Patterns and Structure



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Patterns and Structure

- Gomez & Gerken (1999)
One-year old infants can identify novel sequences of nonsense words generated by an artificial grammar based on only 2 minutes of input

Grammatical

What are you doing?

Vot pel jic rud tam

Ungrammatical

What doing you are?

Vot pel rud jic tam

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Patterns and Structure

- In four experiments, infants showed they were able to generalize to new structure by discriminating new 'grammatical' strings from 'ungrammatical' ones after less than 2 minutes of exposure to the grammar.
- In one of the experiments, infants abstracted beyond specific word order as demonstrated by the ability to discriminate new strings produced by their training grammar from strings produced by another grammar despite a change in vocabulary between training & test.

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Emergent Grammar

Structures form by way of conventionalization or routinization of patterns through repeated use in discourse (part of linguistic ecology)

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Emergent Grammar

Language is ... structured by the emergent patterns that come and go as the forms that carry them are found useful for their speakers. It consists of **different kinds of repetition, some of which concern the lexical, some idiomatic, and some grammatical** (Hopper 1998:158, 172).

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Input Frequency and Perceptual Salience

- Lexical and structural features that are most frequently used tend to make their way into a language given the appropriate circumstances (e.g. language contact)
- Lexical and structural features that are **most easily perceived** make their way into a language given the appropriate circumstances (e.g. language contact)

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Input Frequency and Perceptual Salience

Lexical Connections and Perceptually Salient Forms

Linguistic structure affects paradigms and/or default forms (**lexical strength** and **lexical connections** in Bybee 1985:123-27).

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Input Frequency and Perceptual Salience Definitions

Frequency:

more > less

Perceptual Salience:

$C_i V_j > V_j C_i, V_j$

stressed syllable > unstressed syllable

free morpheme > clitic

clitic > affix

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Input Frequency and Perceptual Salience Definitions

Weak claim:

$C_i V_j > V_j C_i, V_j$

t a > a t, a

w a > a w, a

Stronger claim:

CV > VC, V (any consonant or vowel)

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Input Frequency and Perceptual Salience Definitions

Research in this area provides evidence:

In general, consonants are best perceived when they are released into vowels (and the reason for the strong tendency for CV syllables).

(There are exceptions: e.g. retroflex consonants.)

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Local vs. Universal

language-specific account of a trait

>

universal account of a trait

(These are not mutually exclusive.)

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Copula

The copula(s) in:

- Chinese Immigrant Spanish
- 19th c. Chinese Coolie Spanish
- 19th c. Bozal Spanish in Cuba
- Koralai Creole Portuguese
- Daman Creole Portuguese
- Macau Creole Portuguese
- Papiamentu
- Palenquero

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Input Frequency and Perceptual Salience

<u>C</u> V(C)	<u>V</u> (C)	<u>CV</u> (C)	<u>V</u> (C)
soy	eres	sou	és
somos	e (s)	somos	é
(sois)			
		\	
son		saõ	

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Input Frequency and Perceptual Salience Spanish Portuguese

<u>CC</u> - <u>CV</u> (C/G)	<u>CC</u> - <u>CV</u> (C/G)
estoy	estou
estás	estas
está	esta
estamos	estamos
estáis	
están	estão

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Input Frequency and Perceptual Salience

	<u>Portugal</u>		<u>Brazil</u>	
	<u>CRPC</u>	<u>CETEMPúblico</u>	<u>PORCUFORT</u>	
3sg é	1,581 (90%)	5136 (81.1%)	12,104 (88.4%)	
3pl são	146 (8.3%)	1101 (17.4%)	1245 (9%)	
1sg sou	22 (1.2%)	62 (1%)	271 (2%)	
1pl somos	9 (.5%)	32 (.5%)	81 (.6%)	

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Input Frequency and Perceptual Salience

Spanish forms in CREA (a database of contemporary Spanish [oral, Spain]) are comparable.

	Form	Distribution	
3sg	es	47489 (83.4%)	
3pl	son	6166 (10.8%)	
1sg	soy	1621 (2.8%)	
2sg	eres	798 (1.4%)	
1pl	somos	750 (1.3%)	
2pl	sois	117 (0.3%)	
TOTAL		56941 (100%)	(INF ser 5362)

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Input Frequency and Perceptual Salience

Spanish forms in CREA (a database of contemporary Spanish [oral, Spain]) are comparable.

	Form	Distribution	
3sg	está	10535 (52.9%)	
3pl	están	3432 (17.2%)	
1sg	estoy	2408 (12.1%)	
1pl	estamos	2269 (11.4%)	
2sg	estás	1090 (5.5%)	
2pl	estáis	166 (0.9%)	
TOTAL		19,900 (100%)	(INF estar 1994)

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Predictions concerning copula selection

If the source of the (present) copula is from *ser*:

- If frequency dominates, we expect to find the most frequent form (*es*) to be selected as the invariable form or the default form.
- If perceptual salience dominates and interacts with frequency, we expect to find the most frequently occurring perceptually salient form (*son*) to be selected as the invariable copula or the default copula.

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Predictions concerning copula selection

If the source of the (present) copula is from *estar*:

- If frequency dominates, we expect to find the most frequent form (*está*) to be selected as the invariable form or the default form.
- If perceptual salience dominates and interacts with frequency, we expect to find the most frequently occurring perceptually salient form (*está* or *ta*) to be selected as the invariable copula or the default copula.

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Predictions concerning copula selection

If the source of the (present) copula is from elsewhere:

We expect CV structure and/or the most frequently used form in a paradigm.

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Chinese Immigrant Spanish

Mi mujer la padre casi **son**
mi wife the.fem father almost are.3sg-pres

la año noventa y cuatro,
the.fem year ninety and four

ya mueto. (Luis)
already dead

'My wife's father was almost ninety four years old [when] he died.'

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Chinese Immigrant Spanish

Solamente ahora papá-mamá
only now mom-dad

está Sanghay. (Jenny)
is Shanghai

'Only my parents are in Shanghai now.'

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Chinese Immigrant Spanish

Está China, pobre, no pasa nada
is China poor NEG occur nothing
(Jenny)

'If you're in China and poor, there's no problem.'

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Chinese Immigrant Spanish

Mi, yo llegá Madrid, antes
my I arrive-INF Madrid before

mi tío también está pin ... pintura.
my uncle also is pain painting
(Jenny)

'Before I got to Madrid, my uncle was a painter.'

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Chinese Immigrant Spanish

Pora noche es cadera
at night is career

estudio... casi... dos año... (Jenny)
study almost two year

'At night it was for my career. I studied almost two years.'

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Chinese Coolie Spanish

Captain: Mira, Achón; a los oficiales les está prohibido usar armas largas.

'Look, Achon; the officials are prohibited from using long rifles.'

Achón: ¿Qui cosa usa Ficiá?
(St. Sp: ¿Qué usan los oficiales?)
'What do officials use?'

Captain: Machete y revólver. Es una orden superior. . . .
'Machete and revolver. It's an order from above.'

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Chinese Coolie Spanish

Achón: Londi ta Ginilá Maceo, que yo va pleguntá si son velá esi cosa?

(St. Sp. ¿Dónde está General Maceo?, que (yo) voy a preguntar si es verdad esa cosa.)

'Where is General Maceo? I'm going to ask him if that is true.'

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19th C. Bozal Spanish

Commentary by José de la Luz Caballero (19th c. linguist) in correspondence with Francis Lieber:

"Es muy frecuente en ellos emplear el plural por singular en los verbos, particularmente en el verbo ser: exemplo en la linea siguiente Son verdad en lugar de és."

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Korlai Creole Portuguese (< *tem* 'has'/'*têm* 'they have')

Mi irmã su nom te Adel.
My sister GEN name COP Adel

'My sister's name is Adel.'

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Korlai Creole Portuguese

(< *tem* 'has'/*têm* 'they have')

Lorents də kadz **tɛ**.
Lorents LOC house COP
'Lorenz is at home.'

Use, kile **tɛ**?
you-FORMAL how COP
'How are you?'

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Daman Creole Portuguese

(< *tem* 'has'/*têm* 'they have'; é 'is')

Joyce **te/*e** kaz.
Joyce COP house
'Joyce is (at) home.' (location)

Joyce **te/*e** durmid.
Joyce COP asleep
'Joyce is asleep.' (event-related, transitory state)

Prat **te/*e** kebrad.
plate COP broken
'The plate is broken.' (event-related, resultant state)

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Daman Creole Portuguese

(< *tem/tinha* 'has/had'/*têm/tinham* 'they have/had';
é/era 'is/was')

Pay **e/te** vel.
father COPold
'Father is old.'

El kən **tin/er** now, el **er** alt.
he when COP young he COP tall
'He when was young he was tall.'

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Macau Creole Portuguese

san (< Ptg. *são* 'they are')
(**e** < Ptg. *é* 's/he/it is')

(presence of *e* in MCP is due to
decreolization. Alan Baxter, p.c.)

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Papiamentu

E **ta** un mohé chikito.
she COP a woman small
'She's a small woman.'

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Papiamentu

Mi **ta** loko pa sa kon
I COP anxious for know how

e faks aki lo yega.
DEF fax here FUT arrive.

'I'm answer to know when the fax will get
here.'

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Palenquero

Ese **fue/sendá/é** un ombe riko.
I COP a man rich
'This is a rich man.'

Akí nu **ta** nu.
here NEG COP NEG
'It is not here.'

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Copula Summary Remarks

In situations of language formation, heterogenous input has as a result that speakers creating the language will zero in on what is most frequently heard and most easily perceived for mapping meaning/function from source to target language.

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Copula Summary Remarks

For copula formation with Spanish or Portuguese as the lexifier language, this means the following:

- 3sg form (most frequently occurring form)
- most frequently occurring form with CV structure

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Copula Summary Remarks

CIS	son, está, (es)
CCS	son
BS	son
KCP	tɛ
DCP	tɛ/e
MCP	saŋ, (e)
PMT	ta
PLQ	fwe, sendá, é

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Copula Summary Remarks

- In all 8 languages, we find copulas with CV structure, in all cases the most frequently occurring form containing a CV structure in the present copula present-tense paradigm.
- In 4 cases, we find V structure, as well. In one case (CIS), it is sporadic. In 2 of other three cases (DCP and MCP), it is due to presence of the lexifier and/or decreolization.
- In PL, V structure would not be predicted.

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Object Pronouns

3rd Person Object Pronouns

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Rationale

Free forms with VC(V(C)) structure:

Spanish

él, ella, ellos, ellas
suyo(s) / -a(s)

Portuguese

ele, ela, eles, elas
seu(s) / sua(s)

Clitic forms with CV(C) structure:

lo, la, los, las, se
le, les

o, a, os, as, se
lhe, lhes

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Object Pronoun Systems

3rd-person object pronouns:

- Chinese Immigrant Spanish
- Korlai Creole Portuguese
- Daman Creole Portuguese
- Papiamentu
- Palenquero
- Andean Spanish

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Predictions concerning 3rd-person pronoun selection

Free forms > clitics:

That is, we expect free forms to be selected over clitics.

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Predictions concerning 3rd-person pronoun selection

If the language distinguishes object pronouns and the source of the pronoun system involves free morphemes:

- If perceptual salience dominates and interacts with frequency, we expect to find a frequently occurring free pronominal form containing at least a CV structure to be selected.
- If there is an object 'case' marker, we expect to find a subsequent relation-marking free form (e.g. *para*).

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Predictions concerning 3rd-person pronoun selection

If the language distinguishes object pronouns and the source of the pronoun system involves Spanish/Portuguese clitics:

- If frequency dominates, we expect to find the most frequent form for each person to be selected. E.g., for 3SG, **lo** would be selected as the invariable form or the default form.

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Object Pronoun System

The frequency of the present-tense forms of the transitive verbs *hacer* 'do, make', *ver* 'see', and *querer* 'want, love' from the CREA data base (spoken language).

Obj clitic	<i>hacer</i>	<i>ver</i>	<i>querer</i>	TOTAL
Lo	1010 (57%)	563 (51%)	221 (41%)	1794 (53%)
Los	79 (5%)	135 (12%)	50 (9%)	264 (8%)
La	153 (9%)	183 (17%)	90 (16%)	426 (12%)
Las	80 (5%)	46 (4%)	24 (4%)	150 (4%)
Le	323 (18%)	156 (14%)	117 (21%)	596 (18%)
Les	101 (6%)	19 (2%)	47 (9%)	176 (5%)
TOTAL	1746 (100%)	1102 (100%)	549 (100%)	3397 (100%)

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Predictions concerning 3rd-person pronoun selection

If the source of the 3rd-person pronouns is from elsewhere:

We expect a free form with CV structure

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Chinese Immigrant Spanish

	Singular	Plural
1	mío	nosotros
2	tuyo	-----
3	él / ella	ellos / ellas

free forms are preferred

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Chinese Immigrant Spanish

EI no sabe mio
 he NEG knows mine
 'He doesn't know me.'

yo no sabe **el.**
 I NEG knows he
 'I don't know him.'

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Chinese Immigrant Spanish

Quien ayuda **tuyo**?
 who helps yours
 'Who is going to help you?'

Puede ayudá **mio** para solisidá fuera.
 can(3sg) help mine for apply outside
 'He can help me to apply for [a passport] to leave.'

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Chinese Immigrant Spanish

Un gente presenta una presona **para mi.**
 a people introduce a person for me
 'A person introduced me to a person.'

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Korlai Creole Portuguese

	Singular	Plural
1	p ari	p ono
2	p oro	p udzo
3	p el (< para ele/-a)	p elo (< para eles outros)

3 el elo
 (free forms are preferred)

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Daman Creole Portuguese

	Singular		Plural	
	(basil.)	(acrol.)	(basil.)	(acrol.)
	DCP1	DCP2	DCP1	DCP2
1	pa(r)mi	ami	penos	anos
2	peros	-----	pusez	awsez
3	pirel/	ayil/	pilot	ayi(l)z
	pirel	ayel		

(free forms are preferred, with the exception of a in acrolectal DCP)

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Papiamentu

Subject and Object

	Singular	Plural
1	mi	nos
2	bo (-bu)	boso(nan)
3	e/el (ele)	nan

(Free forms are preferred)

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Palenquero

(Subject and) Object

	Singular	Plural
1	mi	suto
		(ma) hende
2	bo/-o	utere
	uté	enú
3	ele/-e/-lo/-o	ané/-lo/-o

(With the exception of *lo* and its variant *o*, free forms are preferred. NB: *-lo* > *-o*, and *e/e* > *-e*)

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Andean Spanish

Monolingual areas of:

Mantaro Valley (Perú)

Salta (Argentina)

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Andean Spanish

General Neutralization of Spanish Object Clitics

Direct Object:	Lo	→	[lu]
	La	→	[lu]
	Los	→	[lu]
	Las	→	[lu]
Indirect Object:	Le	→	[lu]
	Les	→	[lu]

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Andean Spanish

Neutralization – Mantaro Valley

This reduction of in the pronominal system is not mentioned in Cerrón-Palomino (2003). However, Anna María Escobar (2000) has mentioned this reduction in Perú.

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Andean Spanish

Neutralization - Salta

- a. La plantita tiene una flor y hay que apretarlo.
(cf. apretarla) [la => lo]
- b. Che, ha parío otra doh yegua, andá veu voh.
(cf. verlas vos [las => lo [u]])
- c. ... pa loh potroh. Despuéh lo hacih castrar, lo hacih domesticar.
(cf. los hacis castrar, los hacis domesticar) [los => lo]

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Andean Spanish

Neutralization - Salta

- d. Bueno, lo dice el zorro al cordero.
(cf. le dice ... al cordero) [le => lo]
- e. Entonceh lo dijo el chanco a la cabra... (cf. ...
le dijo...) [le => lo]
- f. Lo ha dicho a los viejitoj que ...
(cf. Les ha dicho ...) [les => lo]

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Andean Spanish

Why *lo*?

The frequency of the present-tense forms of the transitive verbs *hacer* 'do, make', *ver* 'see', and *querer* 'want, love' from the CREA data base (oral speech only).

• <u>Obj clitic</u>	<u>hacer</u>	<u>ver</u>	<u>querer</u>	<u>TOTAL</u>
• <u>Lo</u>	1010 (57%)	563 (51%)	221 (41%)	1794 (53%)
• <u>Los</u>	79 (5%)	135 (12%)	50 (9%)	264 (8%)
• <u>La</u>	153 (9%)	183 (17%)	90 (16%)	426 (12%)
• <u>Las</u>	80 (5%)	46 (4%)	24 (4%)	150 (4%)
• <u>Le</u>	323 (18%)	156 (14%)	117 (21%)	596 (18%)
• <u>Les</u>	101 (6%)	19 (2%)	47 (9%)	176 (5%)
• <u>TOTAL</u>	1746 (100%)	1102 (100%)	549 (100%)	3397 (100%)

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Andean Spanish

'false pronominalization'

Mantaro Valley

- a. Ya lo llegó.
already 3masc.obj arrived-3sg.preterit
'S/he arrived already.'
- b. Ya lo murió.
already 3masc.obj died-3sg.preterit
'S/he already died.'
- c. Lo durmió rápido.
3masc.obj went.to.sleep-3sg.preterit fast
'S/he went to sleep fast.'

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Andean Spanish

'false pronominalization'

Cerrón-Palomino (2003) *lo* in these cases a reanalysis of the masculine pronoun as a marker of immediacy and definitiveness, corresponding to Huanca Quechua *-l?u*, which has this same function.

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Andean Spanish

'false pronominalization'

As to why *lo* was selected for reanalysis by the Mantaro Valley speakers, Cerrón-Palomino points to the sound similarity between Spanish *lo* (lateral + mid back vowel) and Huanca Quechua *-l?u* (lateral + glottal stop + high back vowel).

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Andean Spanish

'false pronominalization'

However, there is an argument that the selection of *lo* may also be related to the frequency of *lo*.

Why? Evidence from Salta

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Andean Spanish

'false pronominalization'

This generates a prediction: if in Salta Spanish we have 'false pronominalization' and the sound similarity is not as strong, this suggests that frequency of *lo* is an even stronger factor than initially thought.

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Andean Spanish

'false pronominalization' in Salta

a. Te **lo** vamos a cortar la sogá.
'We're going to cut the rope for you.'

b. Tócamelo la chacarera.
'Play me the chacarera dance.'

N.B. the verbs are transitive, but there is no agreement.

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Andean Spanish

'false pronominalization' in Salta

- Nardi (1976) notes that the function of *lo* in these examples is a calque of Argentinean Quechua *-pu*, which expresses a malefactive sense.

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Andean Spanish

'false pronominalization' in Salta

- In contrast, Cerrón-Palomino (2003:158-59) notes that *-pu* has three other readings, the first benefactive, the second iterative, and the third, related to iterativity, to express unexpectedness or suddenness of an action, as in *wañu-pu* 'die quickly, definitively'.
- He relates this last reading of *-pu* to that of Huanca Quechua *-l?u*, which marks immediacy or definitiveness of an action.

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Andean Spanish

'false pronominalization' in Salta

- Thus, Salta Spanish has 'false pronominalization', but the corresponding particle in Quechua displays no sound similarity to *lo*.
- Even so, *lo* is selected. Independently, of its exact nature, we attribute the selection of *lo* to its frequency relative to the other object pronouns.

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Conclusions

- Structures in languages are constantly evolving.
- Language structures form through frequency of input, over which humans generalize patterns to create structures.
- The most easily perceived and most easily parsable candidates for mapping meaning/function are chosen before less easily perceived/parsable candidates.

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Conclusions

Copula Development: CV structure takes precedence over frequency.

Object Pronoun System: Free forms take precedence over bound forms. Frequency takes precedence in 3SG.

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Conclusions

The perceptual salience of a form (its syllabic structure, its syntactic autonomy, and its frequency in discourse) is important in the restructuring process during the formation of a new language or variety.

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Conclusions

- In contact-induced language change, examples of emerging structures seem more dramatic but only because of the circumstances surrounding their emergence.

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