Complexity and Distance in the Acquisition of the English Resultative Construction by Spanish Speakers of EFL

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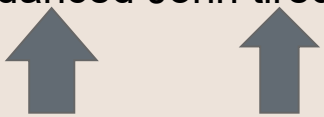
In this presentation we present two experimental studies on the acquisition of the the English Resultative Construction (**ERC**) by Spanish native speakers learning English as a Foreign Language (EFL): A sentence comprehension task and an acceptability judgement task.
The English Resultative Construction or **ERC** (Goldberg & Jackendoff 2004; París 2019) is exemplified in (1)

(1) Mary danced John tired.



Manner **CS** Result

CS= CAUSE

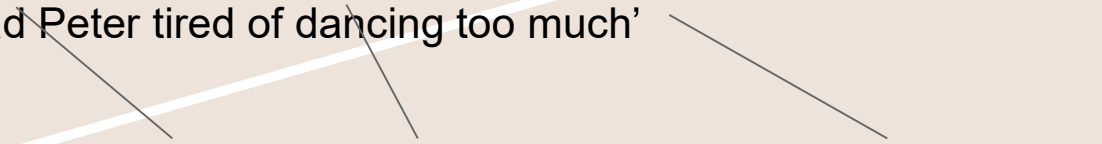
Notice that without the AP, the sentence is ungrammatical: the matrix verb is intransitive and the direct object is licensed only by the construction.
(2) *Mary danced John
Formally, ERC contains two predicates joined by a nuclear juncture with a cosubordinate nexus (VV2005:239).

ERC cannot be mirrored in Spanish. The same [event] cannot be expressed in a comparable syntax as shown in (3)

(3) *Mary bailó a Peter cansado.
Mary danced to Peter tired

The most accurate translation resorts to a causative matrix verb with an intrinsic result AP and a PP that describes Manner.

(4) Mary **dejó** a Peter **cansado** de tanto **bailar**.
María had to Peter tired of so-much dance
'Mary had Peter tired of dancing too much'



The syntax-semantics interface of ERC is consistent with the **satellite-framed language status** of English whereas Spanish is v**erb-framed** (Talmy 2000).

Given the same event in the world
[[professor walks and enters a classroom]]
The English syntax-semantics interface: Manner → matrix verb &
Result → Peripheral satellite
(5) The teacher walked into the classroom.

Spanish expresses Result in the matrix verb and cannot express Manner

(6) El profesor entró al aula. ?caminando
The teacher entered to-the classroom walking

unless is unpredictable:
(7) El profesor entró al aula corriendo
'The teacher ran into the classroom'

The different encodings mean a different way of processing information, that is, a different thinking process (Slobin 2004).

First, the same participant is view as Actor in English whereas as Undergoer in Spanish.

(7) The teacher walked into the classroom.
x= Actor <--> inergative encoding

(8) El profesor entró al aula.
x = Undergoer <--> inaccusative encoding

Second, Manner is processed first in English whereas it comes later in Spanish (if expressed at all).

Objectives:

General: to determine how Spanish speakers acquire ERC, that is, to correlate different degrees of mastery of ERC with proficiency levels.

Specific:

a. Since there are different subtypes of ERC, we aim at identifying the degree to which each ERC is comprehended at different proficiency levels (is there a sequence of acquisition?).

b. If this sequential correlation does exist, to attempt to explain it.

a. To assess whether the knowledge of L1 (Spanish) as any bearing on ‘b’.

1. The ERC subtypes

ERC-Path
(9) John walked to the store.

ERC-Property
(10) John drank the pub dry.

ERC-Fake Reflexive
(11) Mary laughed herself silly
Mary rió sí misma tonta
'Mary quedó tonta de tanto reírse'

2. One hypothesis and two alternative explanations

2.1. There is a sequence in the acquisition of ERC that correlates with proficiency

ERC-Path > ERC-Property > ERC-Fake Reflexive
less > more proficiency

2. 2. Explanatory hypotheses:

2.2.1. The sequence correlates with the degree of **intrinsic complexity** of each subtype: **ERC-Path > ERC-Property > ERC-Fake Reflexive**

2.2.2. The sequence correlates with the length of the **interlinguistic distance** separating each subtype to the Spanish grammar: **ERC-Path > ERC-Property > ERC-Fake Reflexive**

Since the two hypotheses make the same predictions we incorporated the **English Depictive Construction** in (12), which has an exact Spanish correlate in (13).

(12) Mary came home tired.
(13) Mary vino a casa cansada.

Now Complexity and Distance make different predictions:

Complexity: **ERC-Path > EDC > ERC-Property > ERC-Fake Reflexive**

Distance: **EDC > ERC-Path > ERC-Property > ERC-Fake Reflexive**

Complexity:

→ Complex Predication (two predicates on the same participant): +/-

→ Direct object non-lexically licenced: +/-

→ Marked use of a form: +/-

→ Semantic entropy: < entropy ⟶ < complexity

1. **Complex predication:**

ERC-Property (15) John hammered the metal flat
actividad cambio de estado

ERC-FR (16) John sang himself hoarse.
actividad cambio de estado

EDC (17) Peter left the room angry.
cambio de lugar estado

*ERC-Path (18) Peter run to the store.
actividad

Complex predication → solve correferential values; event relations (causality/incidentality); scope of operators.

2. Non-lexically introduced direct objects.

ERC-Property	Mary danced John tired.
ERC-Fake Reflexive	Mary sang herself hoarse.
*ERC-Path	*John run the city to the docks.
* EDC	*Sam sang people worried.

3. Deviant use of a form

ERC-FR

(19) The baby cried himself asleep.
it is not a reflexive use of the the pronoun

*ERC-Path
*ERC-Property
*EDC

4. Entropy: ¿how predictable is the result of the activity?

ERC-Path: (15) John walked to the store.
Low entropy = “walk → reach a destination”

ERC-Property (19) Mary watered the plants flat.
low prediction from “water plants → flat plants” = High entropy

ERC-Fake Reflexive (20) Ron yawned himself awake.
“yawning→waking up” = high entropy

EDC (21) Peter called Mary furious/nervous/tired
“call somebody → be furious” = High entropy

Features	ERC-Path	ERC-Property	ERC-Fake Refl	EDC
Complex predication	-	+	+	+
Non-lexically introduced DO	-	+	+	-
High entropy	-	+	+	+
Marked use of a form	-	-	+	-

Interlinguistic Distance:

EDC = Spanish DC

ERC-Path

(23) Mi hijo caminó a la escuela.
My son walked to the school.
'My son walked to school'

(23) is possible for some Spanish speakers (Mexican) less acceptable for others (Argentinians), in any case, it is not a colloquial form.

ERC-Property
Some ERC-Property can be mirrored, those that are ‘weak resultatives’ (Washio)
(24) Pedro pintó la silla blanca.
‘Pedro painted the chair white’

but most of them cannot be mirrored:
(25) María danced Peter tired
(26) *María bailó a Pedro cansado.

ERC-Fake Reflexives cannot be mirrored in any case.

(25) Pedro caughed himself hoarse.
(25) *Pedro tosió a sí mismo ronco.

Different predictions:

Complexity: **ERC-Path > EDC > ERC-Property > ERC-Fake Reflexive**

Distance: **EDC > ERC-Path > ERC-Property > ERC-Fake Reflexive**

4. Two experiments designed, first, if there is a sequence and, second, if that sequence follows complexity and distance:

A sentence comprehension task
An acceptability judgement task.

Procedure

Task 1: Sentence Comprehension

Task 2: Acceptability Judgement Task

- online questionnaire
- self reported proficiency questionnaire
- vocabulary LexTALE Test (Lemhöfer, K & Broersma, M., 2011)
- frequency of use and immersion in L2 questionnaire Language History Test (Li, Zhang, Tsai & Puls, 2014).

Task 1: Sentence Comprehension

- 285 Spanish native speakers
- Different levels of proficiency in EFL (low, intermediate and hight) according to LexTALE scores (n = 285, mean = 46.8, sd = 6.98, range: 28 to 60)
- 36 stimuli
- 24 target sentences: (6 ERC-Property, ERC-Path, ERC-Fake Reflexive, and EDC) + 12 distractors
- 3 possible interpretations (plausible and correct, plausible but incorrect, implausible and incorrect)

"Choose the option that better describes their meaning. If you don't know the answer, chose "d"

Tom watered the plants flat

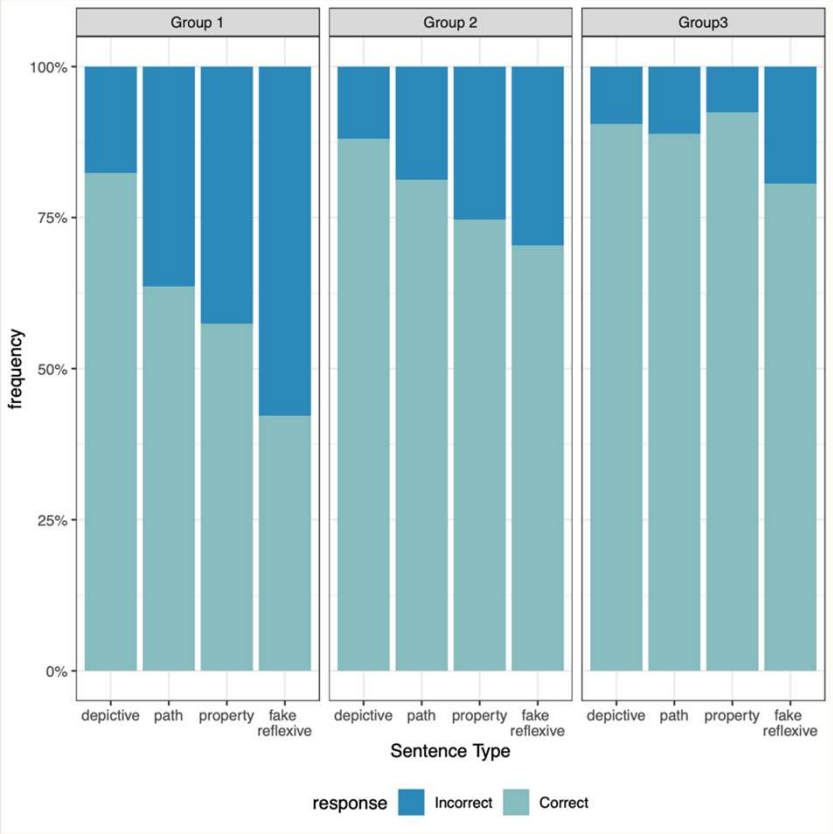
a) The plants became flat because Tom watered them

b) The plants were already flat when Tom watered them.

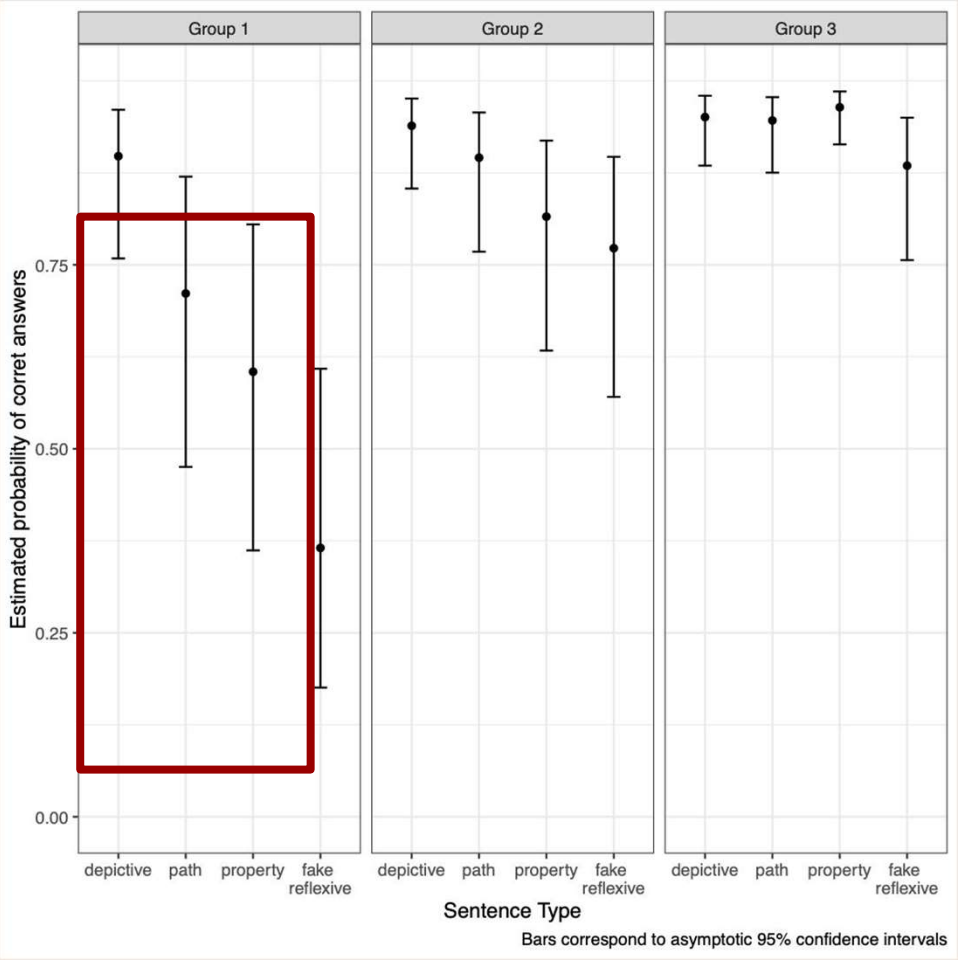
c) Tom was feeling flat when he watered the plants

d) Do not know/ Do not answer

Results: Self reported proficiency x Construction Type



- A mixed regression model with accuracy of response (correct/incorrect) was carried out to evaluate the interaction between Sentence Type and Proficiency in L2, which turned out significant ($\chi 2$ (3) = 68.246, $p < 0.0001$).

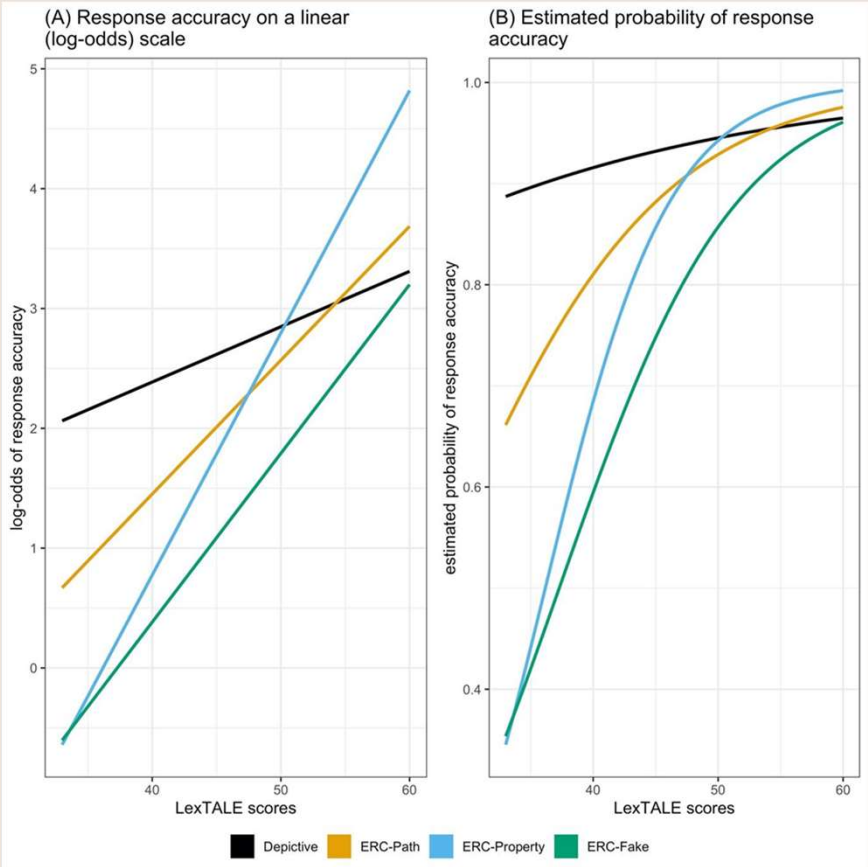


Only low proficient subjects showed significative differences between conditions: better performance for **EDC** in contrast to **ERC-Property** ($p = 0.04$) and **ERC-FR** ($p < 0.001$).

No significative differences found between DC and ERC-Path at all proficiency levels

Within each construction, response accuracy increases as proficiency level increases in all ERC (z's < -3.360, p's < 0.0008). On the contrary, within **EDC**, the performance only improves when comparing low and advanced level ($p = 0.04$).

LexTALE x Construction Type



- LexTALE scores were analyzed in a similar logistic regression model as a continuum variable.
- The interaction between LexTALE x Construction was significative ($\chi2(3) = 72.33$, $p < 0.0001$).
- LexTALE scores were better predictors of the comprehension performance within all conditions ($p's < 0.003$).
- Post-hoc analysis show that this effect was lower por EDC than for ERC ($p's < 0.001$)
- Between conditions, the vocabulary effect on ERC performance was greater for ERC-Property ($p's <$ 0,002), with no differences observed for ERC-Path and ERC-FR

In sum

Comprehension accuracy of all ERC increases as proficiency increases

Low proficient subjects performed better in the comprehension of EDC than ERC

EDC > ERC-Property - ERC -FR

The comprehension of ERC-Path was in a middle ground and showed no differences with EDC at all proficiency levels

EDC - ERC-Path

Proficiency level and vocabulary had a greater effect in ERC (specially in ERC-Property) than in EDC

Task 2: Acceptability Judgement

- AJT Likert scale de 1-7
- 2 forms
- 90 subjects with different proficiency level in EFL (low and high) (mean = 46.65, sd = 7.49, range: 29 to 60)
- 64 stimuli
- 48 target sentences in 3 conditions: (ERC-Property, ERC-FR, EDC) + fillers
- 16 sentences per condition (8 licensed + 8 with semantic violations)
- 2 separate analysis on licensed and unlicensed items

"How acceptable would the following sentences sound to a native speaker of English? Please respond as fast as you can in a scale from 1-7

CRI of Property

- Robert danced his feet sore at the party
- *Robert danced his feet painful at the party

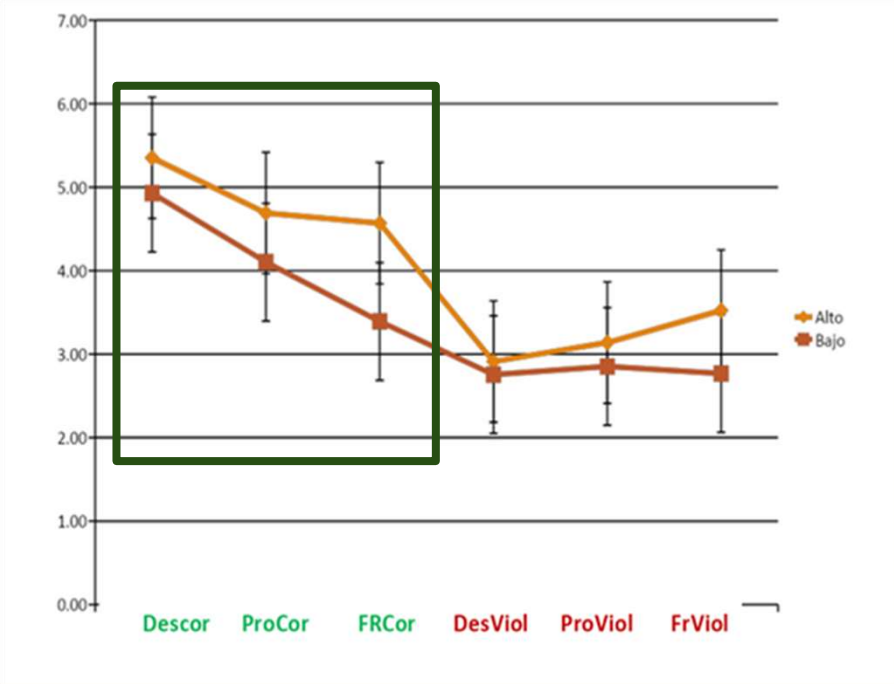
CRI of Fake Reflexive

- We yelled ourselves hoarse at the football match
- *We yelled ourselves loud at the football match

CDI object oriented

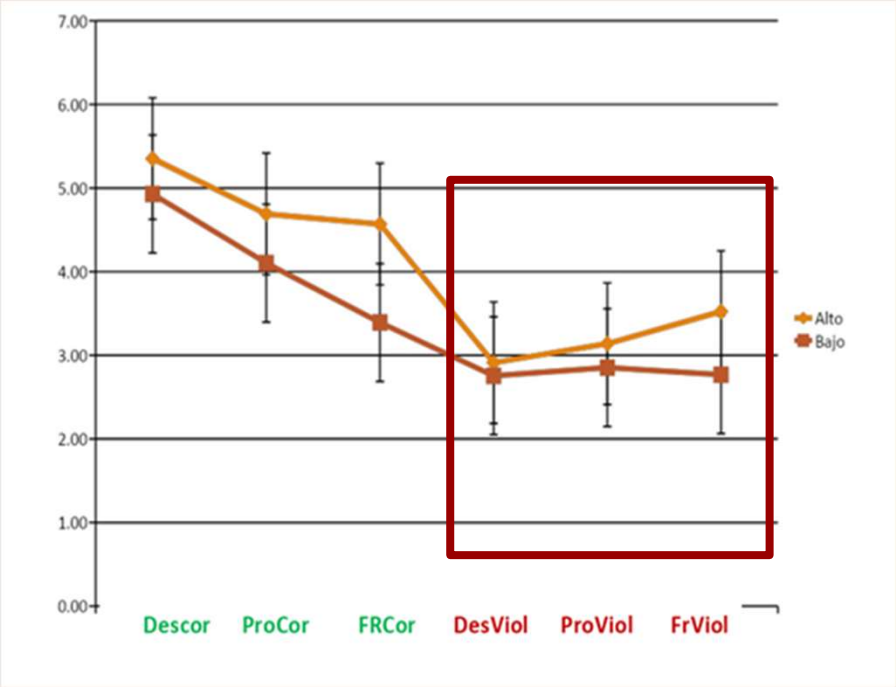
- John returned the book damaged yesterday
- *John returned the book old yesterday

Licensed Items: Self reported proficiency x Construction Type



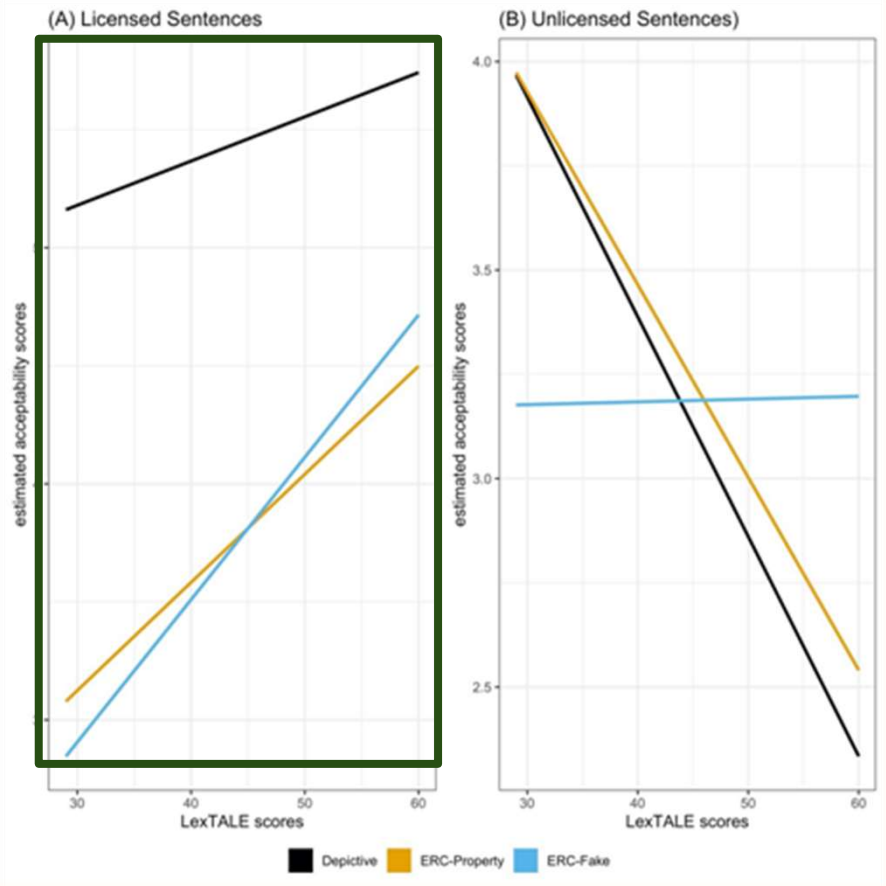
- Mixed –effects linear regression model as a continuous predictor were conducted on correct and incorrect items separately. Both models turned out significant ($\chi 2$ (2)'s > 8.340, p's < 0.015).
- the interaction between proficiency level x Construction type was significant ($\chi 2(2) = 8.5913$, p =0.013).
- Greater acceptability for EDC than for ERC at low (p's < 0.003) and high proficiency level (p's < 0.0001).
- No differences found between ERC-Property and ERC-FR
- The **acceptability of ERC increases with proficiency** (p's < 0,04), but this effect does not take place for **EDC**

Unlicensed Items: Self reported proficiency x Construction Type



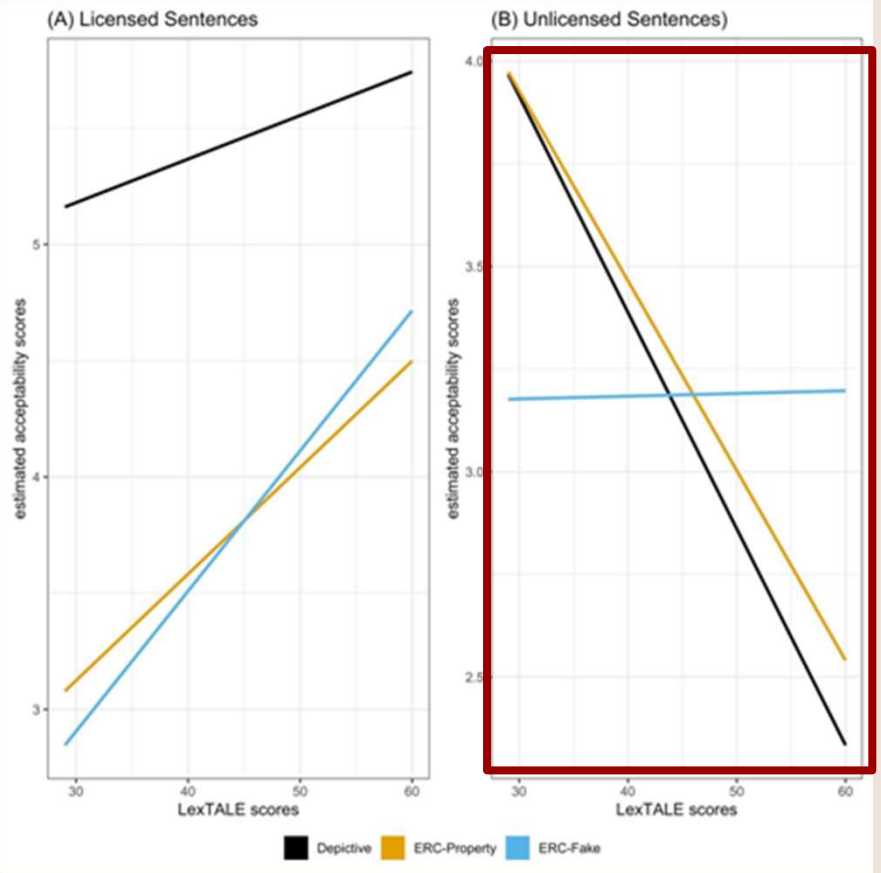
- Post-hoc analysis indicate that unlicensed ERC-FR were ranked as more acceptable than ERC-Property and EDC (p´s < 0.001).

Licensed Items: LexTALE x Construction Type



- Acceptability of licensed items increased with LexTALE scores for **ERC-Property** (b = 0.4, p = 0.01) and **ERC-FR** (b = 0.6, p = 0.0008), but not for **EDC** (b = 0.01,p = 0.28).
- Post-hoc analysis between Lextale scores showed that the three levels of vocabulary proficiency (35, 45 and 55) displayed the same pattern: **higher acceptability ratings for EDC** compared to both **ERC-Property and ERC-FR** (p's < 0,0001).

Unlicensed Items: LexTALE x Construction Type



- Acceptability of unlicensed items **decreases** with LexTALE for **EDC** (Estimate: 0.526, std error: 0.193, T = 2.733, p = 0.019) and **ERC-Property** (Estimate: 0.462, std error: 0.193, T = 2.398, p = 0.047)
- **No significant changes are observed for Fake Reflexives.**

In Sum

Licensed EDC are better recognized as acceptable than ERC
EDC > ERC-Property - ERC -FR (licensed)

Proficiency and vocabulary scores had a greater effect for ERC than for EDC
→ a ceiling effect for EDC?

But unlicensed ERC-FR recognition as not acceptable do not improve with proficiency and vocabulary scores
EDC - ERC-Property < ERC -FR (unlicensed)

→ the selection restriction of ERC-FR seem harder to acquire than for the other conditions

Patterns of Results:

Comprehension: EDC - ERC-Path > ERC-Property - ERC -FR

Acceptability: EDC > ERC-Property - ERC -FR (licensed)

EDC - ERC-Property < ERC -FR (unlicensed)

1) Low proficient subjects comprehend the structures that are closer to their L1 (EDC) much better than the ones further from Spanish (ERC-Property and ERC-FR).
2) Proficiency shows a greater impact on the comprehension and acceptability of ERC over EDC.
3) Within ERC, proficiency effects on comprehension are higher for ERC-Property
4) The recognition of ERC-FR improved significatively with vocabulary scores.
5) ERC-FR with AP not licensed by the verb are harder to identify as not acceptable and their recognition did not improve with proficiency.

Patterns of Results

Comprehension:

EDC - ERC-Path
(all levels)

EDC-ERC-Path > ERC-Property-ERC -FR
(low level)

Acceptability:

Licensed:

EDC > ERC-Property - ERC-FR

Unlicensed:

EDC - ERC-Property < ERC -FR

EDC - ERC-Path > ERC- Property - ERC-FR

Interlinguistic Distance or Complexity Effects?

The comprehension of ERC is not homogeneous

General Pattern Observed:

EDC - ERC-Path > ERC- Property - ERC-FR

- **Interlinguistic Distance Hypothesis:**

  EDC > ERC-Path > ERC- Property > ERC-FR

- **Complexity Hypothesis:**

  ERC-Path > EDC > ERC- Property > ERC-FR

  - ERC-Path > EDC does not take place: No difference found between EDC and ERC-Path although EDC show syntax-semantic features than ERC-Path

Interlinguistic Distance Hypothesis:

EDC > ERC-Path > ERC-Property > ERC-FR

Pattern Observed:

EDC - ERC-Path > ERC-Property - ERC-FR

- ERC-Property and ERC-FR are more difficult to comprehend than the EDC at low proficiency level and are less acceptable for all levels.
- EDC = ERC-Path: no clear difference
  - Better processing for EDC than ERC
  - ERC-Path as a midpoint not too far from Spanish and not so close to the other ERC to show differences from EDC
  - Further exploration is required to understand the degree of comprehension of ERC-Path

→ Further from L1

→ EDC present in L1

→ ERC-Path are similar but not identical to structures present in L1: intermediate situation

Proficiency Effects:

- Greater proficiency effects in the processing of ERC in contrast to EDC.
  - EDC may show a ceiling effect given its presence in L1
  - Difference between ERC-Path and EDC: the comprehension of ERC-Path improves with proficiency whereas the EDC does not.

- **Comprehension:**
  - Greater proficiency effects for ERC-Property than for the other ERCs
- **Acceptability:**
  - The recognition of unlicensed ERC-FR does not improve with proficiency (observed effect on EDC and ERC-Property)

EDC - ERC-Path > ERC-Property - ERC-FR

EDC > ERC-Path > ERC-Property > ERC-FR

Interlinguistic Distance Hypothesis

In sum

- Roll of ERC in the Spanish-English contrast
- Syntactic-semantic description of the different ERC
- Description of EDC present in both languages
- Explanation of our two experimental tasks
- Synthesis of results
- Exploration of the two Hypothesis
  - Complexity
  - Interlinguistic Distance
- Proficiency effects on L2

Spanish-English Contrast: not only a difference in the form of the two languages but on the way they codify the events of the world

→ Cognitive implications in the processing of each language

→ **Thinking For Speaking Hypothesis** (Slobin, 1996)

→ the progressive acquisition of the ERC implies the acquisition of a **new way of thinking for speaking** or a **way or re-think in order to speak** in the L2

→ the processing of ERC triggers a cognitive representation of events different from the one of the L1, specially with the conditions further away from Spanish

→ a greater performance in the processing of ERC would take place at high proficiency levels

Thank you for you attention!