

# Production and comprehension of subject referring expressions in Chilean Spanish

Nicolás Stindt

## Introduction

(1) The boy is hitting the girl



In an experiment conducted by Chapman and Miller (1975), children (1;8-2;8) where asked to represent the meaning of sentence (1) using toys. Only 66% of the answers were correct. Frequently, what children showed was the girl hitting the boy. Production was significantly better: when children saw the scene represented, they produced sentences like “Boy hits girl” or “hit girl” around 84% of the time. Examples like this one represent a problem for standard generative theories: within the system of rules of the grammar, no asymmetries between production and comprehension are expected. However, Optimality Theory (Prince and Smolensky 1993) offers a plausible way of explaining them.

## Optimality theory

In OT, the grammar is viewed as a set of ranked, violable constraints. Production and comprehension can be modeled as different directions of use of this grammar.

### Unidirectional optimization

From a speaker perspective, the grammar takes a meaning input and evaluates possible candidate output forms over the set of constraints. The optimal output is the form that satisfies best the total set of constraints. From a hearer’s perspective, the same constraints provide a mapping of an input form to an output meaning.

While some constraints promote symmetry (faithfulness constraints), others may be effective only in production or only in comprehension (markedness constraints). The result of this is an asymmetrical grammar that can yield different form-meaning pairings depending on the direction of optimization: a speaker might understand a form but be incapable of producing it. Or she might produce a form correctly, but have troubles with its interpretation.

During language acquisition, constraints are re-ranked and asymmetries tend to disappear.

### Bidirectional optimization

According to Hendriks et al (2008), some asymmetries are still present in the adult grammar, though mature hearers/speakers are supposed to overcome them by considering the perspective of the other part into account (bidirectional optimization). This takes place online and requires working memory resources that are present in young adults but that children around the age of 5 (who have already acquired the adult grammar) might lack. Since working memory diminishes with age, this kind of asymmetries are also expected to show up in elderly adults.

## Spanish subject pronouns

When telling stories, children around the age of 5 (Karmiloff-Smith 1981) and elderly adults (Hendriks et al 2008) tend to produce unrecoverable pronouns:

(2) She wants a vanilla ice-cream. So she gives her one and she walks off licking it.

If paired with good comprehension, what we get is a kind of asymmetry. Wubs et al. (2009) argue that this is what happens in Dutch. But in Spanish -a null subject language-, things seem to be more complicated, since null and overt subject pronouns co-exist in the grammar and may receive different interpretations:

(3) a. Un monstruo fue a dar un paseo.  
*A monster went out for a walk.*

b. Encontró a un fantasma.  
*ø met a ghost.*

c. Entonces salió corriendo asustado.  
*Then ø run away scared.*

c’ Entonces **él** salió corriendo asustado.  
*Then he run away scared.*

Null pronoun = monster → most salient antecedent: the topic is continued.  
Overt pronoun = ghost → less salient antecedent: a topic shift takes place.

## Possible asymmetries

According to Shin and Smith (2009), children under 7 years old are not expected to be sensitive to the contrast between null and overt Spanish pronouns. If this is the case, children might intend to refer to both antecedents using the same form and/or interpret both forms as having the same antecedent.

## Working hypotheses

On the absence of evidence, I assume a grammar that favors the most economical form in production (null) and the most economical meaning in comprehension (salient antecedent), irrespective of the input.

1. Children and elderly adults:

(a) will tend to produce null pronouns for salient and less salient antecedents.

(b) will tend to interpret null and overt pronouns as referring to the most salient antecedent.

2. Low working memory will correlate with deficiencies in children and elderly adults performance.

## Planned experiments

Participants: native speakers of Chilean Spanish  
25 children (range age 5-6), 25 young adults (20-30), 25 elderly adults (65-85)

### Comprehension task

Participants hear four-sentence stories with two characters of the same gender. Then they answer a question about the referent of the last sentence.

#### Example

a. Una niña juega en el parque.  
*A girl plays in the park.*

b. De repente ve a su abuelita.  
*Suddenly ø sees her grandmother.*

c. Entonces la niña corre a abrazar a la abuelita.  
*Then the girl runs to hug the grandmother.*

#### Condition 1: null subject (topic continuity)

d. Después saca un pedazo de pan para alimentar a las palomas.  
*Afterwards ø takes out a piece of bread to feed the pigeons.*

#### Condition 2: overt subject pronoun (topic shift)

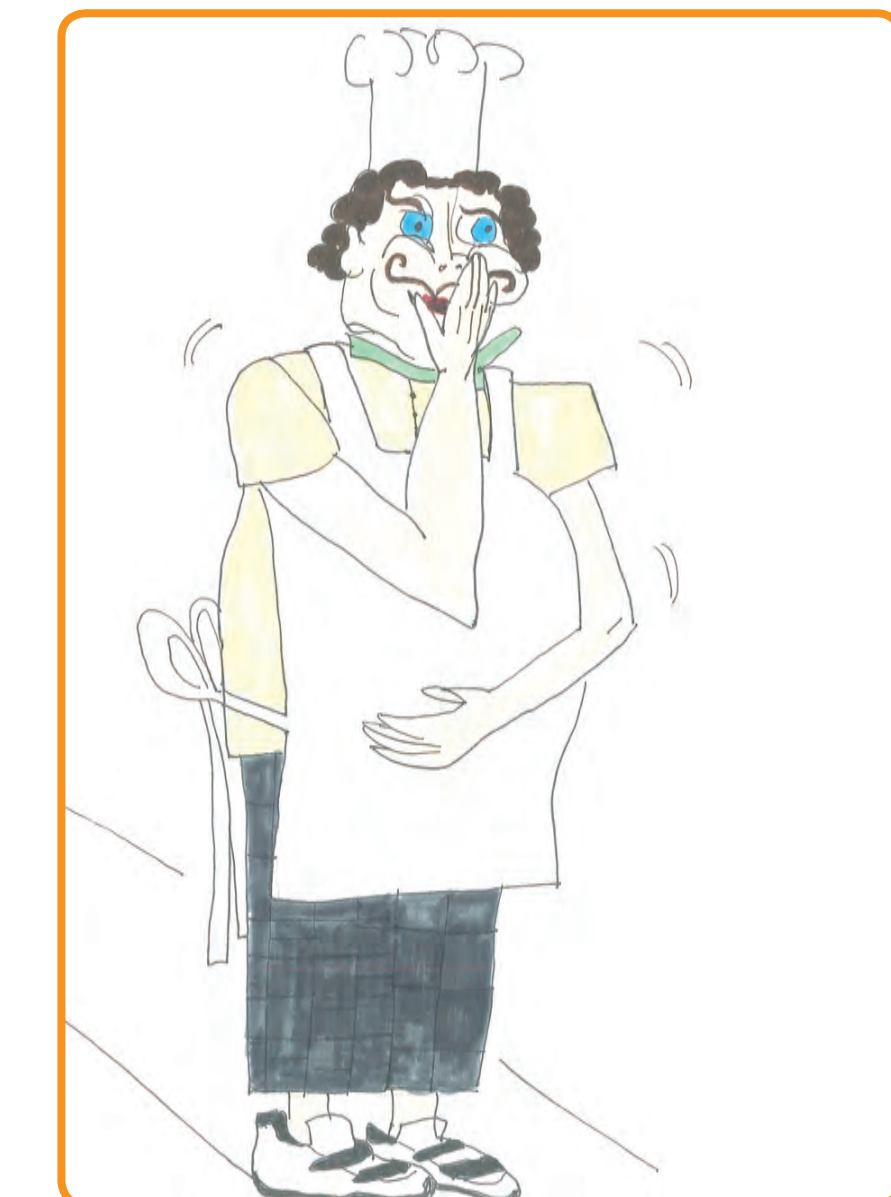
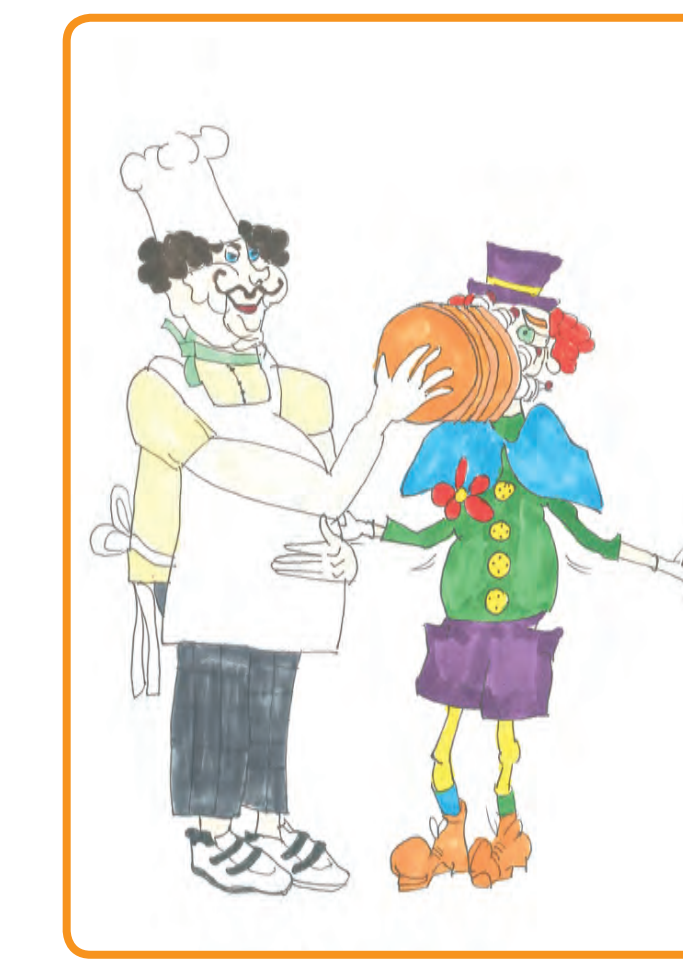
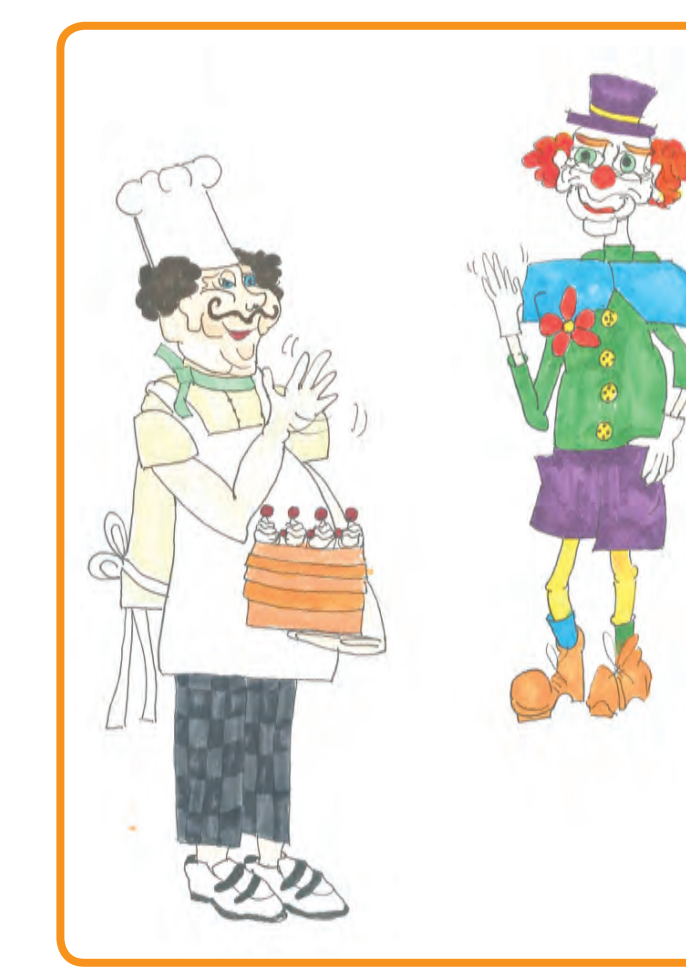
d. Después **ella** saca un pedazo de pan para alimentar a las palomas.  
*Afterwards she takes out a piece of bread to feed the pigeons.*

Q: ¿Quién saca un pedazo de pan para alimentar a las palomas?  
*Who takes a piece of bread to feed the pigeons?*

### Production task

Participants describe what happens in 4-picture storybooks with two characters of the same gender.

#### Example



Condition 1: the first character is in the last picture (topic continuity)



Condition 2: the second character is in the last picture (topic shift)

## Expectations

On the basis of the data obtained, the goal is to evaluate the viability of extending existing bidirectional OT accounts to Spanish subject referring expressions. Ideally, this would lead to a system of interacting constraints that reflects the general preferences that children, young and elderly adults show in production and comprehension. At this point of the project, the suggestion is that the goal could be achieved by incorporating insights from Centering Theory (Grosz, Joshi and Weinstein, 1986, 1995; Walker et al. 1998), Beaver (2004) and Blutner (2009).

#### References

- Beaver, D. 2004. “The Optimization of Discourse Anaphora”. *Linguistics and Philosophy* 27 (1): 3-56
- Blutner, R. 2009. “Optimality-Theoretic Pragmatics Meets Experimental Pragmatics”. in Benz, A. and Blutner, R. (eds.), *Papers on Pragmatics*. Berlin, ZASPI 51
- Grosz, B. J., Joshi A.K., and Weinstein, S. 1995. “Centering: A framework for modeling the local coherence of discourse”. *Computational Linguistics*, 21(2): 202-225.
- Hendriks, P., Englert, C., Wubs, E. & Hoeks, J. 2008. “Age differences in adults’ use of referring expressions”. *Journal of Logic, Language and Information* 17:4, 443-466.
- Chapman, R.S. and Miller, J.F. (1975) “Word Order in Early Two and Three Word Utterances: Does Production Precede Comprehension?,” *Journal of Speech and Hearing Research* 18, 346-354.
- Karmiloff-Smith, A. 1981. “The grammatical marking of thematic structure in the development of language production”, in Deutsch, W.(ed.) *The Child’s Construction of Language*. London: Academic Press.
- Prince, A. and Smolensky, P. 1993: *Optimality Theory: Constraint Interaction in Generative Grammar*. Rutgers University Center for Cognitive Science Technical Report 2
- Shin, N.L. and Smith Cairns, H. 2009. “Subject Pronouns in Child Spanish and Continuity of Reference”, in Co-llentine, J. et al. (eds.), *Selected Proceedings of the 11th Hispanic Linguistics Symposium*, 155-164. Somerville, MA: Cascadia Proceedings Project.
- Walker, M.A., Joshi, A.K., Prince, E.F. (Eds.) 1998, *Centering Theory in Discourse*, Oxford: Clarendon Press.
- Wubs, E., Hendriks, P., Hoeks, J. & Koster, C. (2009). “Tell me a story! Children’s capacity for topic shift”. In: Jean Crawford, J., Otake, K & Takahashi, M. (eds), *Proceedings of the 3rd Conference on Generative Approaches to Language Acquisition North America (GALANA 2008)*, Cascadia Proceedings Project, Somerville, MA: 313

### Auditory memory test

Look for correlations between low scores and poor performances in the tasks.