

## Choosing a Referring Expression: Intra-sentential Ambiguity Avoidance in Romanian

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Much work shows that ambiguity avoidance guides speakers' choice of referring expression when these forms refer to discourse antecedents introduced in previous clauses [1,2,3,4,5,8]. Here we investigate whether similar pressures apply to pronouns which have clausemate antecedents. We test this in four experiments in Romanian, a language which allows both reflexives (complex *el însuși* 'him himself', simplex *sine* 'self') and regular pronouns (*el/ea* 'him/her') to refer to syntactically local antecedents. We test whether the production and interpretation of these two forms is influenced by ambiguity avoidance both for *referential* (Exp 1 & 3) and *quantificational* (Exp 2 & 4) antecedents (see (1) and (2)). The semantic processes responsible for co-valuing a pronominal with a referential antecedent engage discourse information that is not exploited in co-valuing a pronominal with a quantificational antecedent. Some proposals reserve ambiguity avoidance effects to just those processes that involve discourse information [7, 10, 11]. Our findings do not support this view. We test (i) whether speakers produce pronouns *el/ea* 'him/her' less frequently in contexts in which they are ambiguous between a reflexive and a non-reflexive reading (Exp 1/2), and (ii) whether listeners interpret *el/ea* as non-reflexive more often when listening to speakers who regularly use reflexive pronouns (Exp 3/4). Our data support (i) and (ii).

**Production (Exp 1, 2):** We manipulated contextual ambiguity by providing contexts where all characters had matching or mismatching gender [4,5]. Participants continued a sentence fragment with a visually-provided context (Fig. 1). **Participants:** 68 native speakers of Romanian participated in each experiment. **Materials:** 16 items in 4 conditions: PICTURE TYPE (*Reflexive/Disjoint*) x AMBIGUITY (*Gender Match / Mismatch*) and 20 fillers. **Results:** The rate of production for all response types for each condition is given in Table 1 and Table 2. Regular pronouns *el/ea* were preferred in unambiguous *Gender Mismatch* scenarios for all reference relations. Logistic mixed-effects regression revealed a clear effect of AMBIGUITY (Exp 1 (*Referential DPs*):  $z=5.13, p<0.001$ , Exp 2 (*Quantified DPs*):  $z=6.654, p<0.001$ ), and a main effect of PICTURE TYPE (Exp 1:  $z=-2.68, p<0.01$ , Exp 2:  $z=-3.1, p<0.01$ ). **Speakers used unambiguous reflexives more often in ambiguous contexts.**

**Comprehension: Exp 3, 4** test whether the interpretation of an ambiguous pronoun is sensitive to the availability of alternative referring expressions [1,2,3,4,5,6,8,9]. We gave participants a picture-matching task with the within-subjects factor of AMBIGUITY (*Ambiguous/Reflexive/Disjoint*). We manipulated the availability of unambiguous reflexive forms in the experiment in a between-subjects GROUP factor: the *Gender* group of subjects only heard sentences with regular pronouns *el/ea* (gender cues disambiguated), while the *Form* group heard sentences with unambiguous reflexives and demonstratives (referring expression form disambiguated). In both groups, the critical ambiguous stimuli were identical. **Participants:** 68 native speakers of Romanian per experiment. **Materials:** 15 items and 20 fillers per experiment. **Results:** The rate of choosing a reflexive interpretation, i.e. the dependent variable, is given by condition in Tables 3 and 4. Logistic mixed-effects regression revealed the rate of reflexive interpretation in the *Ambiguous* condition was significantly different from the rate of reflexive interpretation in the *Reflexive* (Exp 3 (*Referential DPs*):  $z = 5.98, p<0.001$ , Exp 4 (*Quantified DPs*):  $z=5.16, p<0.001$ ) and the *Disjoint* (Exp 3:  $z = -8.18, p<0.001$ , Exp 4:  $z = -6.07, p<0.001$ ) conditions. Nested mixed-effects regression models revealed no significant effect of GROUP on the rate of reflexive interpretation in the *Ambiguous* condition in Exp 3 ( $z = -1.72, p=0.08$ ), but a significant effect in Exp 4 ( $z = -1.98, p<0.05$ ). **Listeners interpreted ambiguous pronouns as reflexive less often when speakers regularly used unambiguous reflexives.**

**Discussion.** Our results provide some evidence of ambiguity avoidance in production and comprehension for local coreference and bound variables alike. Broadly, our results support the hypothesis that ambiguity avoidance is a general (but not the only) constraint on reference. Contra [7, 10, 12], coreference and binding dependencies may be similarly affected by discourse context.

- (1) *Referential DP Subject (Experiments 1 & 3): 2 character context*  
 Acasă la Mihai, **Andrei**a vorbit despre el / **el însuși** / acesta  
 home at Mihai, Andrei has talked about him / him himself / this one  
 'At Mihai's house, Andrei talked about him(self) / himself / this one.'
- (2) *Quantified DP Subject (Experiments 2 & 4): 4 character context*  
 Acasă la bunicul Radu, **fiecare băiat** a vorbit despre el / **el însuși** / acesta  
 home at grandpa Radu, every boy has talked about him / him himself / this one  
 'At grandpa Radu's house, every boy talked about him(self) / himself / this one.'

Figure 1. Sample Item by Condition in Production Experiment 1. (Exp. 2 has 4 characters)



Table 1. Exp. 1: Referential DPs (2 characters)

RESPONSE TYPE	PRON.	REFLEXIVE		OTHER	
	<i>el</i>	<i>el însuși</i>	<i>sine</i>	<i>acesta</i>	NAME
REFL. MISMATCH	54.5%	34%	5%	0%	4%
REFL. MATCH	38.8%	49.3%	6.6%	0.5%	3.5%
DISJ. MISMATCH	50%	0%	0%	4.4%	45.5%
DISJ. MATCH	24%	0%	0%	3.7%	72.3%

Table 2. Exp. 2: Quantified DPs (4 characters)

RESPONSE TYPE	PRON.	REFLEXIVE		OTHER	
	<i>el</i>	<i>el însuși</i>	<i>sine</i>	<i>acesta</i>	NAME
REFL. MISMATCH	52.6%	35.6%	11%	0%	0%
REFL. MATCH	32.5%	48.7%	16.5%	0%	0%
DISJ. MISMATCH	34.2%	0%	0%	11.8%	54%
DISJ. MATCH	16.6%	0%	0%	13.3%	70.1%

Figure 2. Sample Item by Condition in Comprehension Experiment 3. (Exp. 4 has 4 characters)

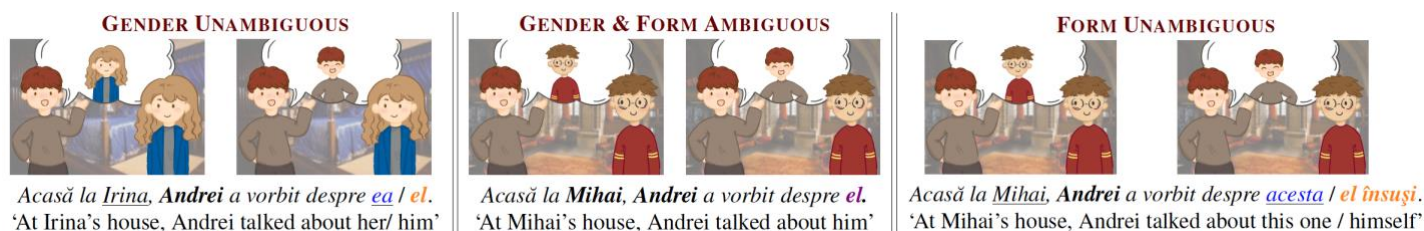


Table 3. Exp. 3: Referential DPs (2 characters)  
 Rate of Reflexive Interpretation by Condition.

	FORM		GENDER	
	%Refl.	Pronoun	%Refl.	Pronoun
AMBIGUOUS	52.2%	<i>el / ea</i>	62.1%	<i>el / ea</i>
REFLEXIVE	95.7%	<i>el însuși / ea însași</i>	96.5%	<i>el / ea</i>
DISJOINT	15.9%	<i>acesta / aceasta</i>	3.5%	<i>el / ea</i>

Table 4. Exp. 4: Quantified DPs (4 characters)  
 Rate of Reflexive Interpretation by Condition.

	FORM		GENDER	
	%Refl.	Pronoun	%Refl.	Pronoun
AMBIGUOUS	42%	<i>el / ea</i>	59.5%	<i>el / ea</i>
REFLEXIVE	100%	<i>el însuși / ea însași</i>	99.3%	<i>el / ea</i>
DISJOINT	14.6%	<i>acesta / aceasta</i>	0.6%	<i>el / ea</i>

[1] Ariel, M., 1990. Accessing NP antecedents [2] Ariel, M., 2001. Accessibility theory [3] Arnold, J.E., 1998. PhD Thesis. [4] Arnold, J.E., 2010. Lng. & Ling. Compass 4 [5] Arnold, J.E., Griffin, Z.M., 2007. JML 56 [6] Dowty, D., 1980. CLS [7] Grodzinsky, Y., Reinhart, T., 1993. LI 24 [8] Gundel, J.K., Hedberg, N., Zaczarski, R., 1993. Language 69. [9] Levinson, S.C., 1987. Journal of Linguistics 23 [10] Reinhart, T., 1983. Ling. & Phil 6 [11] Reinhart, T., 2006. Interface Strategies [12] Reuland, E., 2011. MIT Press.