

# How to turn Brazilians into Europeans: Global and Local exposure effects on co-reference in European and Brazilian Portuguese

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## Background

- ▶ Carminati (2002): Division of labor in Null Subject languages where Null pronouns are preferentially interpreted as retrieving a Subject antecedent, while Overt pronouns preferentially co-refer with non-subject (e.g., Object) antecedents
- ▶ Cross-linguistic (Filiaci et al., 2013) as well as cross-variety (Luegi, 2012) differences have been attested: the Overt pronoun preference for the Object is reduced (or absent) in Spanish and in Brazilian Portuguese (BP), when compared to Italian and European Portuguese (EP)
- ▶ In BP the relative frequency of Null and Overt forms appears to be changing, with higher proportions of Overt forms (0.7 vs. 0.3) (e.g. Duarte, 1995)
- ▶ Co-reference may be affected by the relative frequency of pronominal forms in an experiment (e.g. de la Fuente & Hemforth, 2013)
- ▶ Hypothesis: Can differences in BP vs. EP be explained by relative frequency of pronominal forms?

## Our Study

- ▶ We tested Global (in the language, contrasting BP vs. EP) and Local (in the experimental context) exposure effects on Overt and Null pronoun resolution in Portuguese:
  - ▶ Global Exposure effects should arise from contrasting BP and EP
  - ▶ Local exposure effects should come from the relative amount of Null and Overt pronouns manipulated in the experiment

### If the processor is sensitive to pronouns' relative frequency

- ▶ In the language: Overt pronouns prefer Object antecedents in EP, but not in BP
- ▶ In the experiment: skewing local exposure towards Null forms should elicit in BP the EP pattern

## Methods

- ▶ 24 native speakers of EP (mean age 23.5±7.1)
- ▶ 20 native speakers of BP (mean age 21.0±3.6)
- ▶ 32 experimental sentences in 4 conditions (in each Variety)
  - Exposure: 50%<sub>(Null)</sub>/50%<sub>(Overt)</sub> vs. 75%<sub>(Null)</sub>/25%<sub>(Overt)</sub>
  - Pronoun: Null vs. Overt
- (1) *O atleta consultou o ortopedista no hospital quando Ø regressou da viagem a Itália.*  
'The athlete consulted the orthopedist at the hospital when he returned from the journey to Italy.'
- (2) *O atleta consultou o ortopedista no hospital quando ele regressou da viagem a Itália.*  
'The athlete consulted the orthopedist at the hospital when he returned from the journey to Italy.'
- ▶ 64 filler sentences
- ▶ Off-line internet based questionnaire (IbexFarm)
- ▶ Interpretation question (e.g., *Who returned from the journey?*) with two possible answers (*the athlete or the orthopedist*).
- ▶ Analysis:
  - ▶ Mixed logit regression model with a 'logit' link function (e.g. Jaeger, 2008) in R was used for the analysis
  - ▶ Model included all main effects and interactions with a maximal-random structure (Barr et al., 2013): Pronoun, Exposure and Variety as fixed effects and Participant and Item as random intercept (plus uncorrelated slopes of the fixed predictors)

## Results

- ▶ Pronoun x Exposure interaction effect in BP: more Object choices with Overt pronoun in Unequal exposure condition
- ▶ Main effect of Pronoun across varieties: more Object choices in Overt pronoun condition
- ▶ Main effect of Variety: more Object choices in EP
- ▶ Pronoun x Variety interaction: more Object choices with Overt pronoun in EP

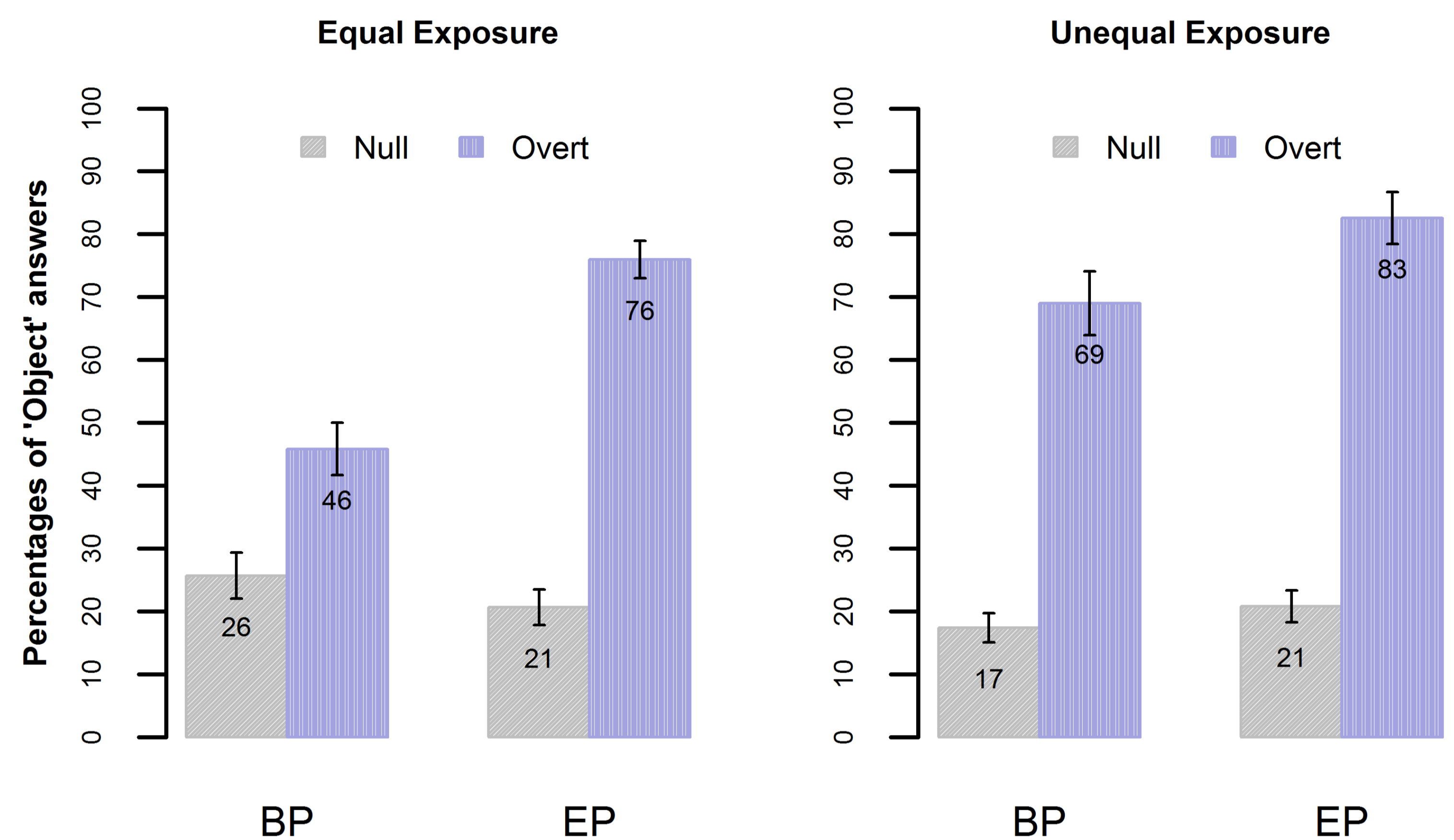


Table: Probability of selecting "Object" (Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1).

	BP vs. EP				BP				EP					
	Est	SE	z value	Pr(>  z )	Est	SE	z value	Pr(>  z )	Est	SE	z value	Pr(>  z )		
(Intercept)	-0.60	0.15	-3.94	< 0.001	***	-0.90	0.20	-4.42	< 0.001	***	-0.37	0.19	-1.96	0.05
Pronoun [N,-0.4; O,0.6]	2.77	0.31	8.96	< 0.001	***	2.30	0.52	4.43	< 0.001	***	3.23	0.39	8.29	< 0.001
Exposure [UE,-0.5; EE,0.5]	-0.12	0.25	-0.49	0.62		-0.10	0.38	-0.27	0.79		-0.14	0.32	-0.43	0.66
Pronoun:Exposure	-1.07	0.59	-1.80	0.07	.	-1.98	1.01	-1.97	0.05	*	-0.42	0.73	-0.58	0.57
Variety [BP,-0.5; EP,0.5]	0.46	0.23	2.01	0.04	*									
Pronoun:Variety	1.26	0.59	2.14	0.03	*									
Variety:Exposure	-0.03	0.45	-0.07	0.94										
Pronoun:Variety:Exposure	1.37	1.18	1.16	0.25										

## Conclusions

- ▶ Frequency plays a role in Overt and Null pronouns resolution:
  - (1) Contrary to what happens in EP, the division of labour is not observed on the (more frequent) use of Overt pronouns in BP, when Null and Overt pronouns are equally distributed in an experiment
  - (2) However, this pattern emerges when exposure is skewed towards a higher relative frequency of Null pronouns
- ▶ Our results extend previous evidence of Local Exposure effects (de la Fuente & Hemforth, 2013) and are in line with related evidence for effects of Global availability of different constructions on pronoun resolution (de la Fuente et al., 2016)
- ▶ Crucially, these results provide, for the first time, evidence of a Global and Local Exposure interaction and its effect on pronoun interpretation

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