

Antecedent Frequency Effects on Pronoun Resolution in Spanish:

An eye-tracking study

Nerea Egusquiza, Kepa Erdocia, Adam Zawiszewski

University of the Basque Country, Vitoria-Gasteiz, Spain

negusquiza003@ikasle.ehu.es



Introduction

Low-frequency (LF) nouns take longer to be read or named than high-frequency (HF) nouns [1,2], due to the investment of more attentional resources on the LF word during the early phase of encoding [3].

Pronoun processing highly depends on the accessibility of potential referents, the grammatical role of the antecedent and its saliency in a given context [4], but it **could also be a language-specific process** [5].

How does the lexical frequency of the antecedent affect pronoun processing? [6]

- (1) FULL REACCESS HYPOTHESIS: longer reading times for pronouns referring to LF antecedents
- (2) LEMMA REACCESS ACCOUNT: no antecedent frequency effects during pronoun processing
- (3) SALIENCY ACCOUNT: longer reading times for pronouns referring to HF antecedents

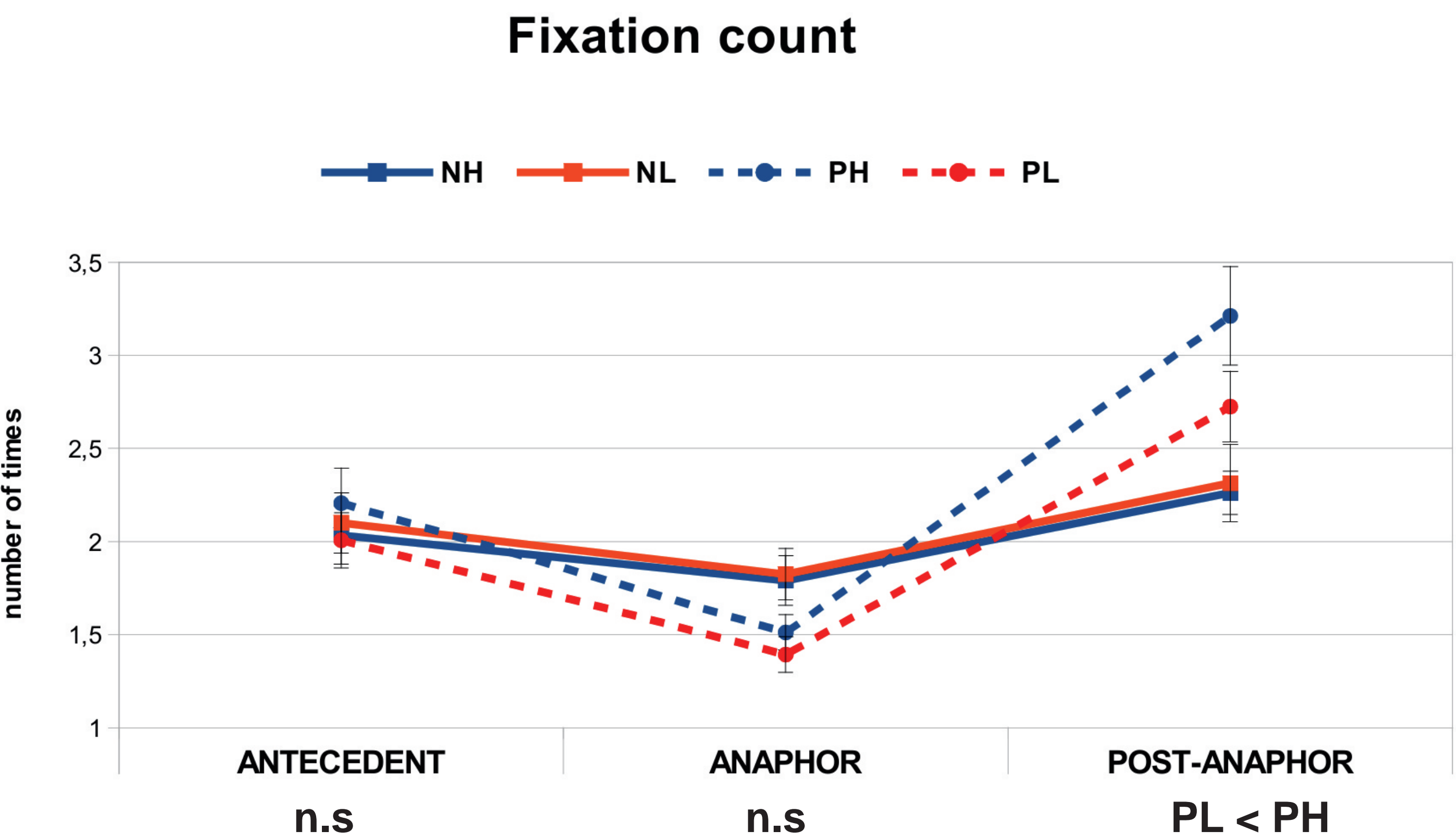
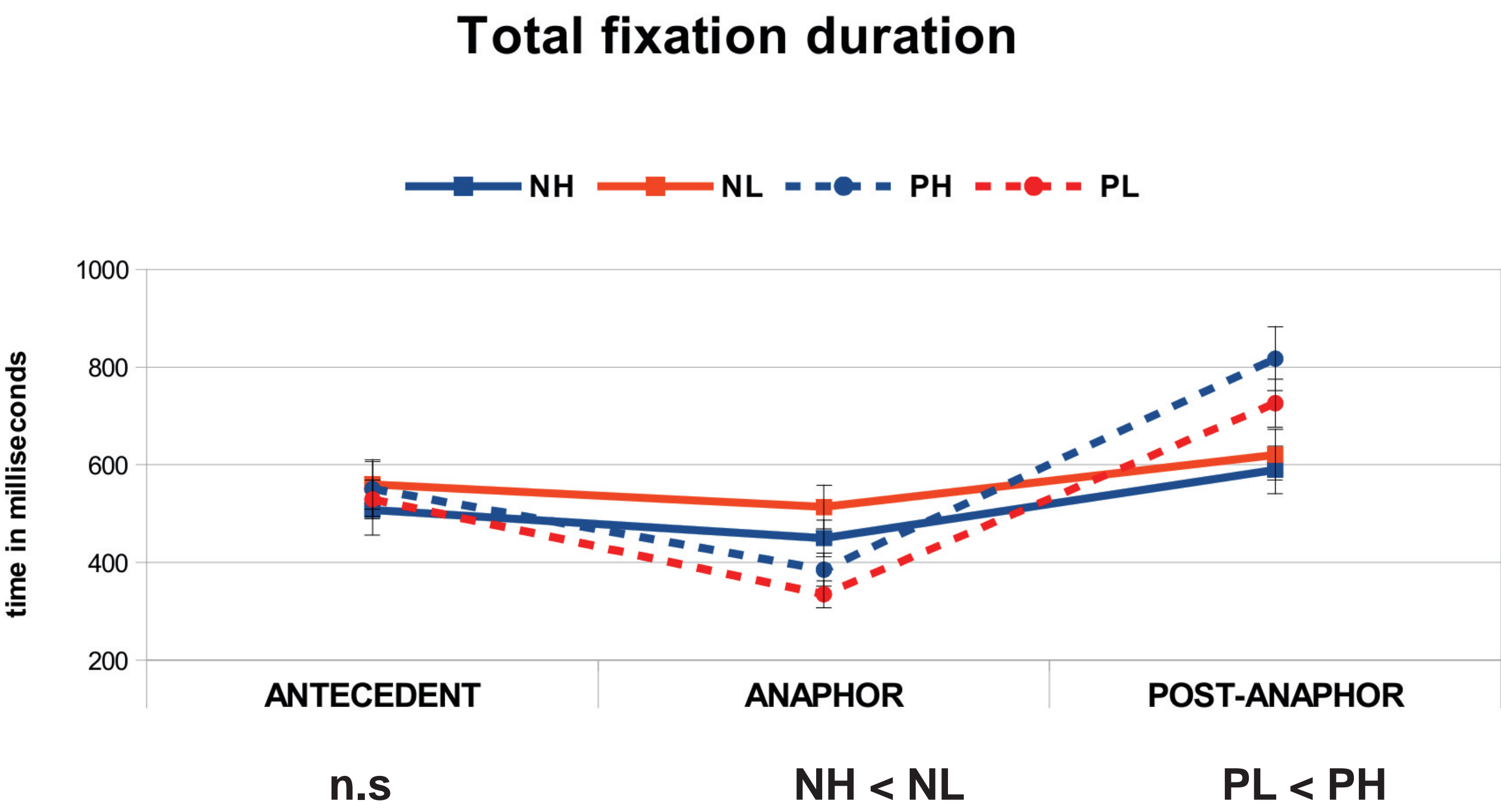
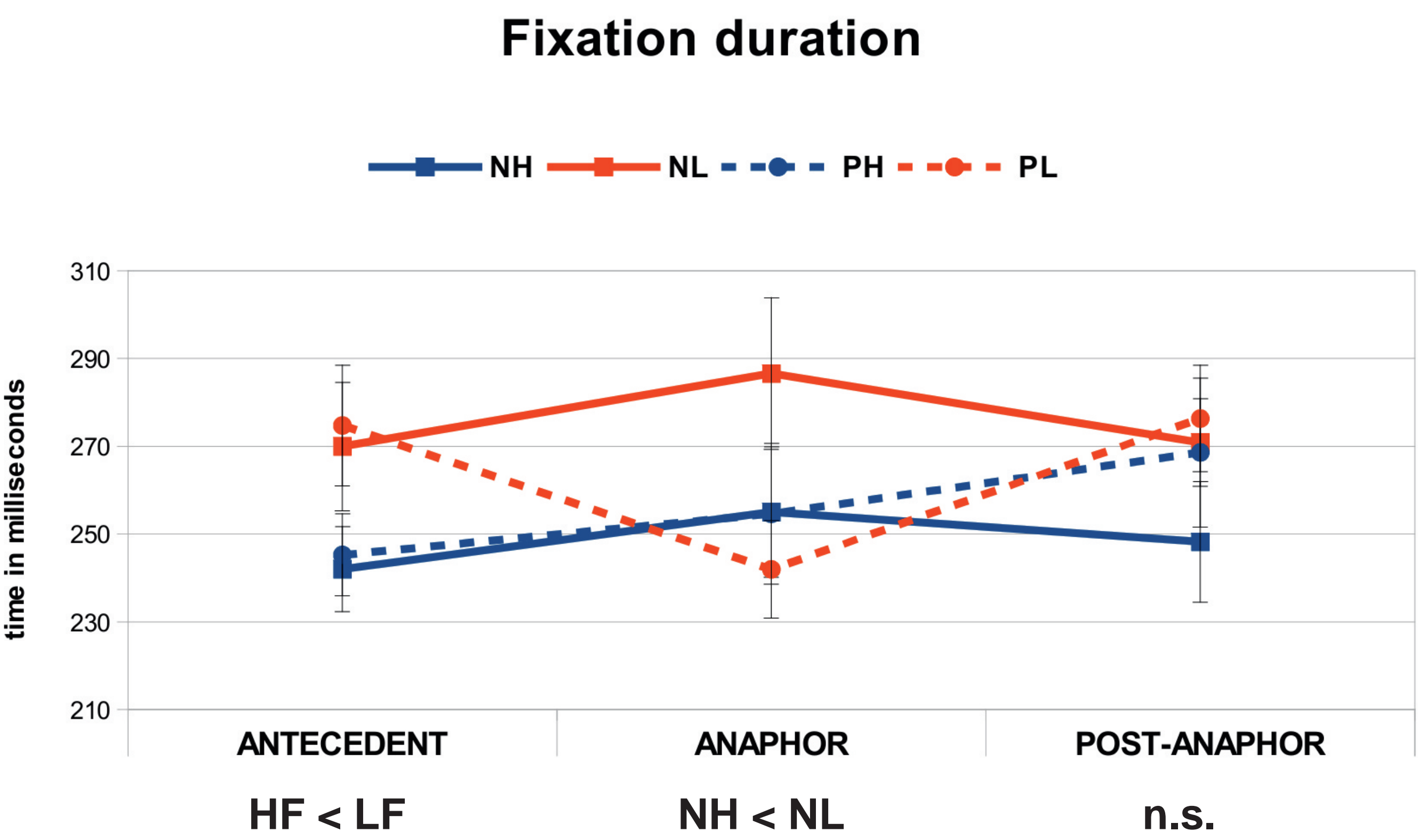
QUESTION: Does the lexical frequency of the antecedent affect pronoun resolution in Spanish?

Method & Materials

20 Spanish native speakers read 40 experimental sentences (10 per condition), 80 filler sentences and answered some comprehension questions. An eye-tracking experiment was conducted (Tobii X120). Prior to the analysis, we set three areas of interest: antecedent, anaphor and post-anaphor. Linear Mixed Effects Regression (LMER) models were applied to our eye-movement data.

NOUN, HIGH FREQ:	La senadora criticó /a un ministro/ ant y a una parlamentaria durante el discurso de ayer. Luego arremetió /contra el ministro/ aph /en los medios/ post nacionales y europeos. The senator FEM criticized a secretary MASC and a MP FEM during the speech of yesterday. Then, attacked against the secretary MASC on the media national and European. 'The senator criticized a secretary and a MP during yesterday's speech. Then, (she) attacked the secretary on the national and European media.'
PRONOUN, HIGH-FREQ:	La senadora criticó /a un ministro/ ant y a una parlamentaria durante el discurso de ayer. Luego arremetió /contra él/ aph /en los medios/ post nacionales y europeos. Then, attacked against him PRON-MASC on the media 'The senator criticized a secretary and a MP during yesterday's speech. Then, (she) attacked him on the national and European Media.'
NOUN, LOW-FREQ:	La senadora criticó /a un banquero/ ant y a una alcaldesa durante el discurso de ayer. Luego arremetió /contra el banquero/ aph /en los medios/ post nacionales y europeos. The senator FEM criticized banker MASC and a mayoress during the speech of yesterday. Then, attacked against the banker MASC on the media 'The senator criticized a banker and a mayoress during yesterday's speech. Then, (she) attacked the banker on the national and European media.'
PRONOUN, LOW-FREQ:	La senadora criticó /a un banquero/ ant y a una alcaldesa durante el discurso de ayer. Luego arremetió /contra él/ aph /en los medios/ post nacionales y europeos. Then, attacked against him PRON-MASC on the media 'The senator criticized a banker and a mayoress during yesterday's speech. Then, (she) attacked him on the national and European media.'

Results



Discussion & Conclusions

To date, the lexical frequency of the antecedent has been proven to influence pronoun resolution in English and German [6] and, according to our data, it also affects pronoun processing in Spanish. In our eye-tracking study, pronouns referring to HF antecedents took longer to be interpreted than those referring to LF pronouns, thus supporting the saliency account.

References

[1] Rayner, K. & Duffy, S. A. (1986). Lexical complexity and fixation times in reading. Effects of word frequency, verb complexity, and lexical ambiguity. *Memory and Cognition*, 14 (3): 191-201.
[2] Schilling, H. H., Rayner, K. & Chumbley, J. I. (1998). Comparing naming, lexical decision, and eye fixation times: Word frequency effects and individual differences. *Memory and Cognition*, 26 (6): 1270-1281.
[3] Malmberg, K. J. & Nelson, T. O. (2003). The word frequency effect for recognition memory and the elevated-attention hypothesis. *Memory and Cognition*, 31 (1):35-43.
[4] Arnold, J. E. (2001). The Effect of Thematic Roles on Pronoun Use and Frequency of Reference Continuation. *Discourse Processes*, 31 (2):137-162.
[5] Meyer, A. S. & Bock, J. K. (1999). Representations and Processes in the Production of Pronouns: Some Perspectives from Dutch. *Journal of Memory and Language*, 41: 281-301.
[6] Van Gompel, R. G. P. & Majid, A. (2004). Antecedent frequency effects during the processing of pronouns. *Cognition*, 90: 255-264.

Acknowledgements

Spanish Ministry of Education and Science (BRAINGLOT, CSD2007-00012/CONSOLIDER-INGENIO 2010), Ministry of Science and Innovation (FFI2009-09695/FILO, FFI2010-20472/FILO), Basque Government (IT414-10), University of the Basque Country (EHUA13/39), predoctoral grant from the Basque Government (BFI-2012-219) to Egusquiza, Juan de la Cierva Fellowship to Zawiszewski (JCI-2010-07692) and a Ramón y Cajal Fellowship to Erdocia (RYC-2010-06520).