

The contribution of phonology to the recognition of cognate words in children and adult bilinguals

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INTRODUCTION

The role of phonology in cognate word recognition has been neglected in bilingualism research, especially research involving children. Most studies conducted with adults bilinguals have revealed an advantage for cognate words over noncognates in naming and word-recognition tasks. Several theoretical accounts have been proposed to account for this differential processing. The lexical-morphological proposal developed by Rosa Sánchez-Casas and colleagues (Davis et al., 2010; Sánchez-Casas & García-Albea, 2005) claims that cognates are differently processed because they share the same morphological representation in bilingual memory. However, a recent study with non-identical cognate words (circus in English and circo in Portuguese) that varied in the degree of orthographic and phonological overlap have revealed an effect of inhibition rather than facilitation (Comesaña et al., 2012), a datum that does not fit well with the lexical-morphological hypothesis. Specifically, the effect of inhibition due to phonological overlap was greater when the orthographic similarity of cognates was low. The aim of the present study was to further explore the locus of the cognate effects by manipulating the orthographic and phonological overlap of cognate words not only in adults but also in children bilinguals. The comparison of data between adults and children allowed us to assess the role of phonology in visual cognate word recognition over time. As the access to phonological codes weakens as age or reading ability increases (e.g., Doctor & Colheart, 1980; Newman, 2012) we expected to observe a greater influence of phonology in children.

MATERIALS

192 English target words (96 cognates [CG] + 96 noncognates [NCG]) were selected and matched in frequency, length, and orthographic and phonological neighborhood. Cognates were assigned to each of four experimental conditions attending to their orthographic (O) and phonological (P) overlap:

- 24 O+P+ (filme-FILM)
- 24 O+P- (poema-POEM)
- 24 O-P+ (fruta-FRUIT)
- 24 O-P- (lago-LAKE).

These conditions did not statistically differ in frequency, length, bigram frequency, O and P neighborhood.

192 Portuguese CG and NCG prime words: related (equivalent translations) vs. unrelated (neither in form or meaning). Both groups were matched in frequency, length, and O neighbors taken from P-PAL dataset (Soares, et al. in press).

192 pseudowords were created by replacing one letter in the initial position of English words. The manipulation for the nonword targets was the same as that for the word targets.

PARTICIPANTS

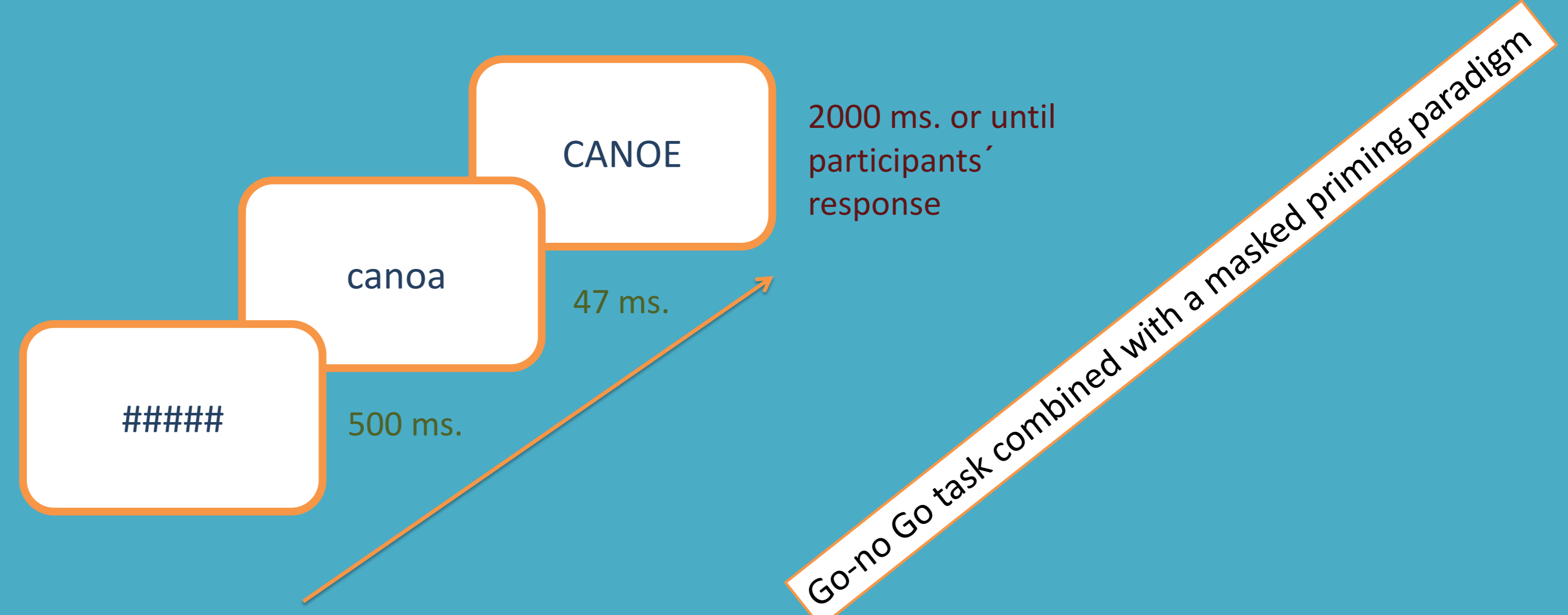
Adults: Twenty-three Portuguese-English proficient bilinguals (15 females; $M_{age} = 21.74$, $SD=3.83$) participated in this experiment. All of them were college students at the University of Minho.

Children: Twenty-two 4th grade children (13 females; $M_{age} = 9.32$, $SD=0.49$) from a International School in Porto (CLIP) participated in this experiment. All of them were proficient bilinguals of Portuguese-English and did not have any sensory, neurological, or learning disabilities.

PROCEDURE and RESULTS

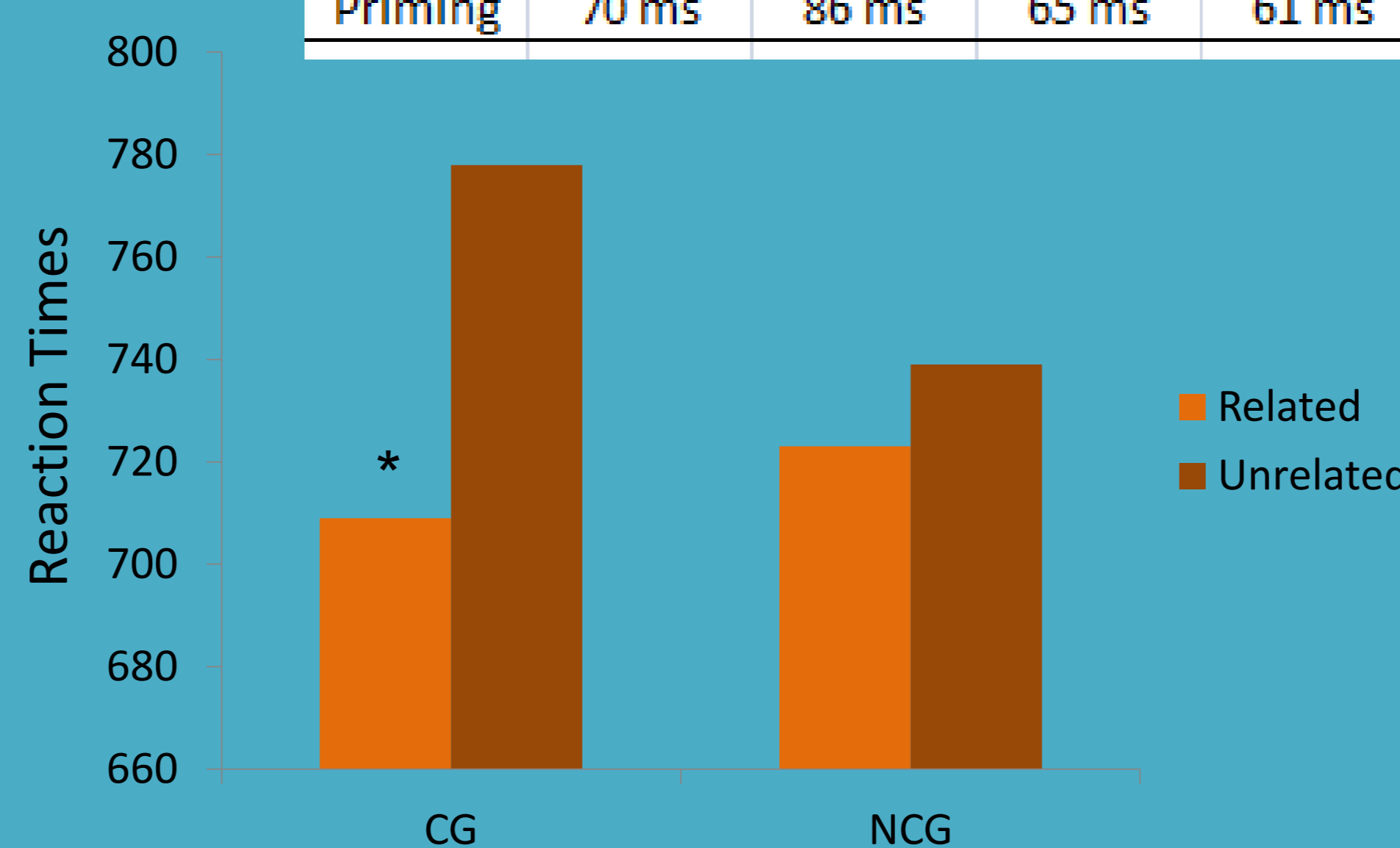
Design:

2 (Word status: CG, NCG) x 2 (Prime: related, unrelated) x 2 (O overlap: O+, O-) x 2 (P overlap: P+, P-)



ADULT BILINGUALS

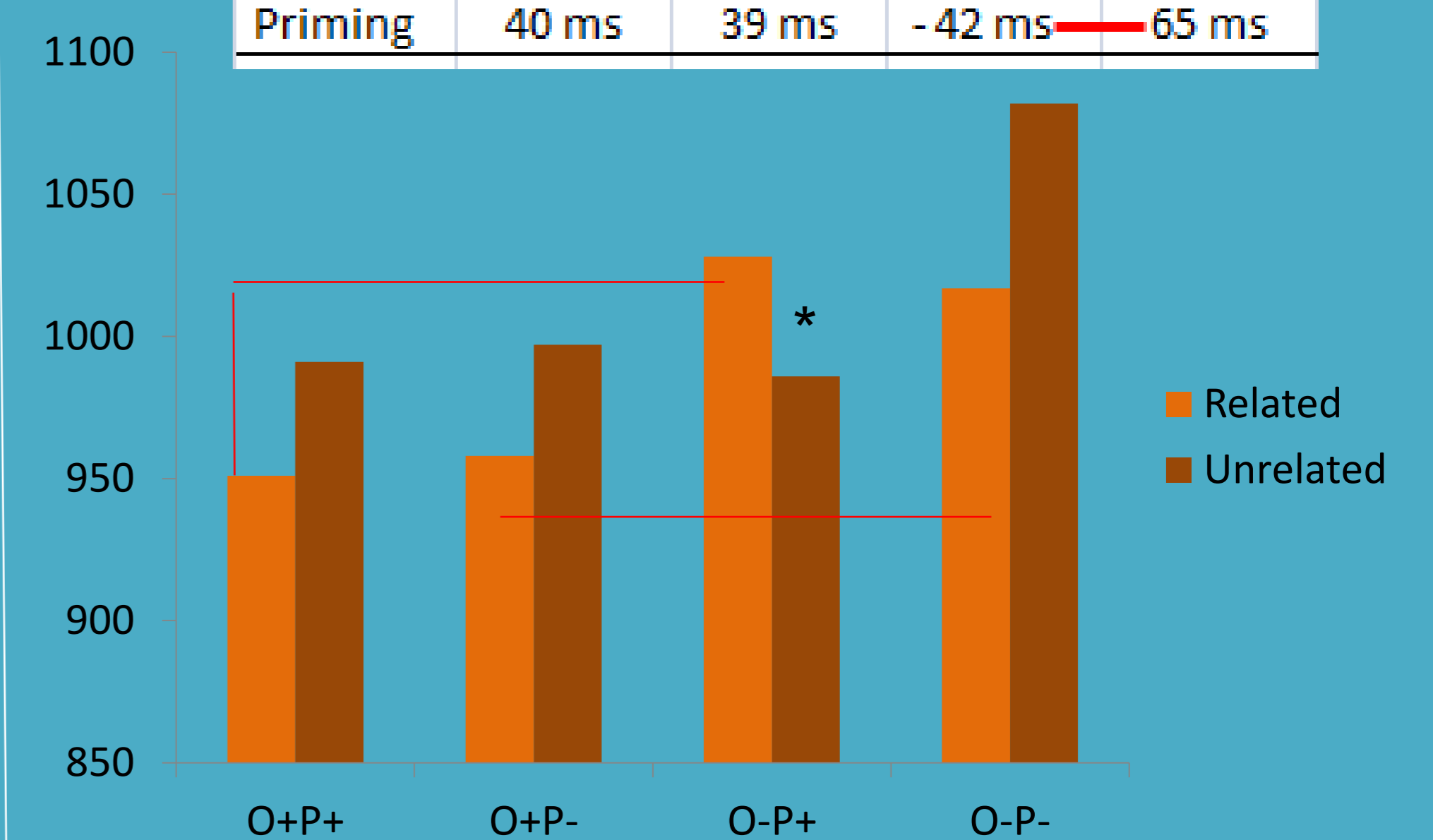
	O+P+	O+P-	O-P+	O-P-
Related	696	691	717	732
Unrelated	767	793	765	788
Priming	70 ms	86 ms	65 ms	61 ms



Status: CG>NCG ($p = .08$) (an inhibition effect for CG)
Prime: Unrelated>Related ($p < .001$) (priming effect)
Status x Prime: priming for CG words ($p < .05$)

CHILDREN BILINGUALS

	O+P+	O+P-	O-P+	O-P-
Related	951	958	1028	1017
Unrelated	991	997	986	1082
Priming	40 ms	39 ms	-42 ms	65 ms



Status: CG>NCG ($p < .001$)
Prime: Unrelated>Related ($p = .08$) (priming effect)
Status x Prime x O x P: priming for O-P- ($p < .05$)

CONCLUSION

- CG words showed slower reaction times than NCG words (an inhibition effect), consistent with previous data (Comesaña et al., 2012).
- Priming effects were restricted to CG words. Interestingly, these effects were modulated by the P and O overlap of CG words but only in children population.
- These results can be accommodate with the localist connectionist account on CG word processing and representation (Dijkstra et al., 2010).