Brain signature of morphosyntactic change in the gender system of a southern Italo-Romance dialect

Valentina Bambini* (School of Advanced Studies, IUSS, Pavia), Paolo Canal* (Scuola Normale Superiore, Pisa), Federica Breimaier, Domenico Meo, Diego Pescarini and Michele Loporcaro (Universität Zürich)
* co-first authors
valentina.bambini@iusspavia.it

Italo-Romance dialects—sister languages to Standard Italian and the other Romance languages—display more complex gender systems and agreement patterns than found in the most investigated standard languages. Like most dialects of Central-Southern Italy, Agnonese, spoken by 5000 inhabitants in Agnone (Molise), has a four-gender system with three distinct target genders [1]. On definite articles, the Agnonese paradigm features a neuter form (*lə* DEF.N), contrasting with masculine (*ru* DEF.M.SG) and feminine (*la* DEF.F.SG). The neuter, contrary to the other genders, only hosts mass nouns, denoting unbounded substances. While some scholars consider the neuter as an autonomous value of the Agnonese system [2], others view the neuter vs. masculine contrast as a distinction of 'two semantically based subclasses' within the masculine [3]. Interestingly, Agnonese gender system is undergoing a change, enhanced by the pressure of Standard Italian, by which the mass neuter is slowly merging into the masculine. When blending dialectology and neurolinguistics, Agnonese offers an interesting test ground to investigate: a) the status of the neuter as reflected in agreement, compared to feminine and masculine, and b) whether it is possible to find a brain signature of the ongoing change merging the neuter into the masculine.

We used a determiner-noun agreement violation paradigm [4] and recorded the ERPs while 30 speakers of Agnonese listened to sentences. In a full 3 X 3 design, Noun Gender and Determiner Gender were crossed, determining one Agreement and two Disagreement conditions for each Gender value of the noun (N, M, F). Data were analyzed with linear mixed models in the two time-windows of interest (LAN and P600), accounting on a single trial base for the joint influence of Agreement and Gender. In addition, we assessed the role of individual proficiency.

Results showed a prominent P600 effect for Agreement [$\Delta\chi^2(1df)=26.63$, $p<0.001$] (Fig.1), whereas the LAN was only marginally affected by Agreement [$\Delta\chi^2(1df)=3.15$, $p=0.07$]. No interactions with Gender were observed. The further analysis of Agreement asymmetries with neuter nouns revealed that both MN and FN violations elicited larger P600 components compared to the Agreement (NN) condition, and that the P600 for FN [$+2.56\mu V$, $t=4.23$, $p<0.001$] was larger than the P600 for MN [$+1.11\mu V$, $t=1.78$, $p=0.08$]. Proficiency was a reliable predictor of the P600: the difference between FN and MN violations was reduced for more proficient speakers [$\Delta\beta=+1.05$, $t=3.17$, $p<0.01$].

These results support the view of neuter as an autonomous value of the gender system [2] rather than a merely semantic subdivision of the masculine, since agreement with neuter nouns does not qualitatively differ from masculine and feminine. Moreover, the ERP response reflects the ongoing change from a three- to a two-way gender contrast: more proficient speakers show similar P600 amplitude for FN and MN violations, whereas less proficient and thus less conservative ones show P600 effects for FN only, suggesting that they spent more effort in repairing gender anomalies when consistent with the Italian system. Our results show that modulations of the P600 can provide evidence for ongoing morphosyntactic change.

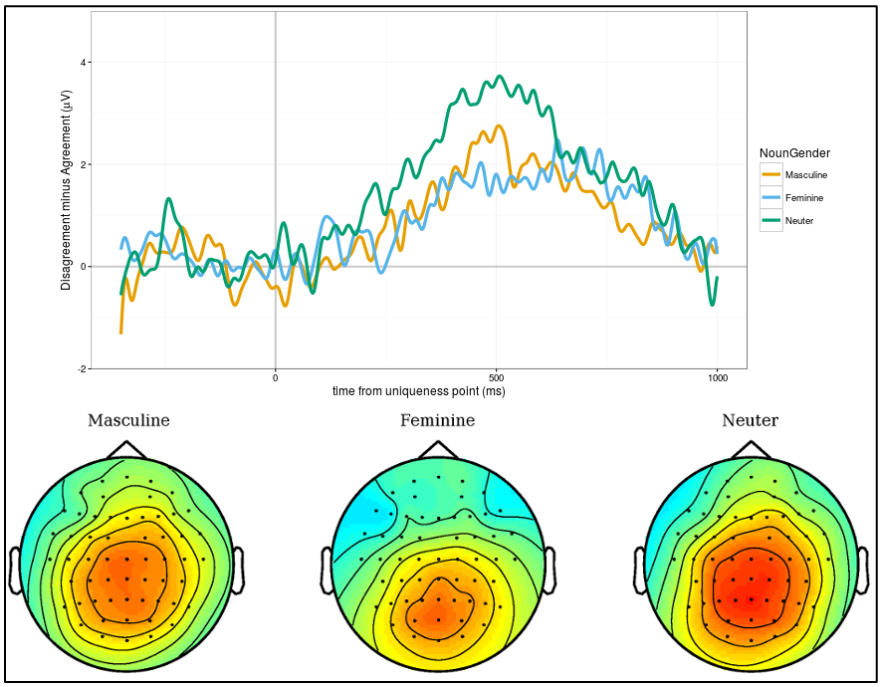

Figure 1. ERP effects associated to Agreement violations (Disagreement minus Agreement) for each level of Noun Gender: difference waves on the upper panel and scalp maps of the differences (between 500 and 800 ms) on the lower panel.

References

[1] Corbett, G. 1991. *Gender*. Cambridge: Cambridge University Press.
[2] Loporcaro, M. & T. Paciaroni. 2011. Four gender-systems in Indo-European. *Folia Linguistica 45*(2), 389-434.
[3] Maiden, M. 2011. Morphological persistence. In M. Maiden, J.C. Smith & A. Ledgeway (eds.). *The Cambridge History of the Romance Languages*. Vol. 1. Structures. Cambridge: Cambridge University Press, 155–215, 699–706.
[4] Molinaro, N., Barber, H. A., & Carreiras, M. (2011). Grammatical agreement processing in reading: ERP findings and future directions. *Cortex, 47*(8), 908-930.