MAPPING PRONOUN PROCESSING DIFFICULTIES IN ITALIAN ADULTS AND CHILDREN

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Pronouns are referring expressions that can be used to refer back to entities previously mentioned in the discourse. In contrast to speakers of English, speakers of the pro-drop language Italian can use either an overt pronoun (e.g., lui ‘he’) or a null pronoun (Ø) as a subject anaphor. In Italian, null pronouns generally refer to the discourse topic, whereas overt pronouns refer to a non-topic referent (Carminati, 2002). However, this is merely a preference and interpretations of null as well as overt pronouns can vary, for example on the basis of pragmatic plausibility (Carminati, 2002) or recency of the non-topic referent (Sorace & Filiaci, 2006).

In this presentation, we set out to map the interpretation and processing difficulties of Italian subject anaphora. Results of a comprehension study with Italian adults (including eye-tracking measures) as well as a comprehension study with Italian children will be discussed. How consistent are adults in their interpretations of null and overt subject pronouns? Which processing difficulties do adults show when processing subject anaphora? And how adult-like are Italian children in their interpretations of null and overt subject pronouns?

As stated, null pronouns are generally interpreted as referring to the discourse topic, whereas overt pronouns are interpreted as referring to a non-topic referent (Carminati, 2002). Importantly, the interpretation preference of overt pronouns is weaker than that of null pronouns (Carminati, 2002), indicating that overt pronouns, in certain conditions, could also refer to the previous discourse topic. From these varying possible interpretations, interpretation and processing difficulties could arise, especially for young children who might not have learned the interpretation preferences of the different Italian subject pronouns in different contexts yet.

In two experiments, we tested 40 Italian adults and 52 Italian children (age 6;0 – 8;9). The participants heard short stories containing one of three different (unstressed) subject anaphora: A full NP such as the hedgehog as an unambiguous baseline condition, a null subject pronoun, and the overt subject pronouns lui (‘he’) and lei (‘she’). We determined participants’ final interpretations to a referent selection question, in which they could choose between the previous discourse topic and a non-topic antecedent as the referent of the subject anaphor. Additionally, the adults’ pupil size (dilation) was measured during processing with an Eyelink eye-tracker.

![Figure 1: Adults’ interpretations](image1)

![Figure 2: Children’s interpretations per age category](image2)
The offline interpretations of the adults are shown in Figure 1. Analysis of the adults’ interpretations showed that, in line with Carminati (2002), null pronouns were mostly interpreted as referring to the discourse topic, whereas overt pronouns were typically interpreted as referring to a non-topic referent (p < 0.001). Moreover, the interpretation preference for overt pronouns was weaker than for null pronouns (resp. 61% vs. 86%; p < 0.001).

The offline interpretations of the children are shown in Figure 2. The children were split up into three age categories: 6-, 7-, and 8-year-olds. The analyses of the interpretations indicated an effect of age, with 8-year-olds interpreting the unambiguous NP more often correctly as a topic continuation than 6-year-olds (p = 0.02). Additionally, learning trends of 6-, 7- and 8-year-olds can be seen with a subject NP and with an overt subject pronoun. No difference in interpretation of null pronouns was found between the different age categories.

For the adult participants, the experiment used eye-tracking to measure pupil dilation as an indication of cognitive effort during language processing (Engelhardt, Ferreira, & Patsenko, 2010). The proportional pupil dilation over time is plotted in Figure 3. An analysis of the pupil dilation data over time with Generalized Additive Models (GAMs; Wood, 2006) revealed that null and overt pronouns evoked more pupil dilation than full NPs (both p < 0.001), and that overt pronouns evoked more pupil dilation than null pronouns (p < 0.001).

From these results we conclude that the adults’ interpretations were in line with Carminati (2002); null subject pronouns refer to the previous topic and overt subject pronouns indicate a topic shift. Moreover, null subject pronouns showed a stronger interpretation bias than overt subject pronouns. Importantly, the overt subject pronoun is only interpreted as a topic shift 61% of the time, and therefore the interpretation of this pronoun is not straightforward. Children generally show difficulties with the interpretation of null as well as overt subject pronouns, although for overt subject pronouns they become more adult-like with age. This is partially in line with the online pupil dilation results of the adults, which show that an overt subject pronoun is more difficult to process than a null subject pronoun and an NP. However, children, contrary to adults, also show difficulties with the interpretation of null pronouns. Some ideas about why this may be will be discussed.

References
Carminati, M. N. (2002). The Processing of Italian Subject Pronouns (Doctoral dissertation). University of Massachusetts, Amherst, USA.