



## Abstracts

# Pronoun processing in gracefully ageing adults and individuals with primary progressive aphasia: a case-control study

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## Introduction and aims

Pronouns are often reduced in primary progressive aphasia (PPA) logopenic variant (Henry & Gorno-Tempini, 2010) but intact in the non-fluent variant (Thompson & Mack, 2014). Importantly, the latter variant presents difficulty interpreting complex sentences (Charles et al., 2014). However, less has been understood about the time course of pronoun interpretation in PPA. The aim of this study is to examine how far pronoun processing is impaired in two individuals with PPA compared to groups of controls.

## Methods

Two individuals with PPA participated (A01, 84-years-old, non-fluent variant; A02, 69-years-old, logopenic variant). 31 healthy ageing individuals (age mean=68.8yrs,  $sd=13.8$ ) and 32 younger adults (mean=19.0yrs,  $sd=4.1$ ) participated. An eye-tracking-during-listening experiment investigated interpretation of reflexive versus (non-reflexive) object pronouns in English sentences ("The barista untangles himself/him."). While listening to sentences, participants' eye-movements were monitored, and they selected the correct picture from a choice of two (see Figure 1/E).

## Results

Controls' accuracy was close to ceiling, younger adults performed with 98% accuracy in both pronouns and reflexives while the older adults performed with 97% accuracy in pronouns but with 99% accuracy in reflexives. Linear mixed effect models showed no fixed-effect of age ( $\beta=0.51$ ,  $z=1.01$ ,  $p=0.31$ ), but overall, slightly lower accuracy to non-reflexive-pronouns (97%) than reflexives (99%).

Figure 1 demonstrates end-of-sentence response accuracies (Fig.1/F) and eye-movement patterns (Fig.1A/D) across the control groups, two cases and our conditions. The A01 performed significantly more poorly than older controls on reflexives (85%,  $t = -9.86$ ,  $df = 30$ ,  $p<0.001$ ) but not non-reflexive-pronouns (86%,  $t = -1.18$ ,  $df=30$ ,  $p=0.24$ ), but with no significant difference between the two ( $X^2 = 0.005$ ,  $p = 0.93$ ). A02 performed within control

norms in both reflexives (98%,  $t = 0.03$ ,  $df = 30$ ,  $p=0.96$ ) and non-reflexive-pronouns (88%,  $t = -0.99$ ,  $df = 30$ ,  $p = 0.32$ ) without significant differences between two conditions ( $X^2 = 0.43$ ,  $p = 0.51$ ). Eye-movement data demonstrated that older adults have reduced target fixations than younger adults for non-reflexive-pronouns but not in the reflexive condition. Individuals with PPA showed rather atypical and reduced fixations overall.

## Discussion

Little was known about the comprehension of pronouns in PPA. We demonstrate that PPA individuals can present with relatively unimpaired accuracy, but pronoun processing is poorer in non-fluent PPA consistent with the overall grammatical impairment.

Furthermore, older adults might be susceptible to online processing limitations for object pronouns.

## References

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