

So who's "he" anyway? Differential EEG effects of referential ambiguity and referential failure during spoken language comprehension.

Van Berkum JJA, *Zwitserslood P**, *Bastiaansen MCM***, *Brown CM****, *Hagoort P***
Dept of Psychology, Univ of Amsterdam, Amsterdam, *Westfälische Wilhelms-Universität,
Muenster, Germany, **FC Donders Centre for Cognitive Neuroimaging, Nijmegen,
***Max Planck Institute for Psycholinguistics, Nijmegen

To make language comprehension work, readers and listeners rapidly need to work out to what or whom a particular pronoun refers. We report an EEG experiment in which listeners heard pronouns that were (1) referentially unambiguous, as in "David only noticed Linda when he stood up", (2) referentially ambiguous, as in "David only noticed John when he stood up", or (3) referentially unsuccessful, as in "Anna only noticed Linda when he stood up". Even though the referentially unsuccessful pronouns in (3) were syntactically legitimate ("he" can always refer to an as yet unmentioned third person) they elicited the centroparietal P600/SPS effect that is commonly associated with syntax-related processing problems. This suggests that listeners take a free pronoun to refer to previously mentioned discourse agents only, and use grammaticized pronoun gender to constrain or verify their analysis (cf. Osterhout & Mobley, 1995). The referentially ambiguous pronouns in (2) instead elicited a sustained frontal negative shift, previously observed with referentially ambiguous nouns (van Berkum et al., 1999; 2003), and possibly reflecting an increased working memory load associated with the ambiguity or with attempts to resolve it. Time-frequency spectral analyses with Morlet wavelets revealed that referential status of the pronoun differentially affected non-phaselocked oscillatory aspects of the EEG as well. In all, the results show that listeners very rapidly attempt to establish reference, and that phaselocked as well as non-phaselocked aspects of the EEG can be used to selectively tap into referential failure, ambiguity, and success.

Jos J.A. van Berkum, Department of Psychology (PN), University of Amsterdam,
Roetersstraat 15, 1018 WB Amsterdam, t 020 5256921, e-mail berkum@psy.uva.nl

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