

## Sign language background, reading habits and eye movements in exploring a written text

The present research aims to investigate the eye movements involved in a text reading, performed by deaf people with different Sign Language (SL) background. A non-intrusive hardware tool, TOBII® 1750 (TOBII, 2008), able to record the eye movements of computer users has been used.

The research sample group consisted of 48 participants, 18 - 35 years old,  $IQ \geq 85$ , affected by severe or profound deafness, with no deafness-related deficits and no cochlear implant.

The 48 participants were chosen according to their SL background:

- 12 deaf native signers (with at least one deaf native signer parent ) who learned Italian Sign Language (LIS) at home not later than 3 years of age;
- 12 deaf late signers (with either hearing or non-signing deaf parents) who did not learn LIS at home and who learned LIS between 6 and 18 years of age;
- 12 deaf non-signers who were never exposed to LIS under 19 years of age; only someone came in contact with LIS sporadically in adulthood; do not use LIS for their daily communication;
- 12 hearing non-signers (control group).

Each of these 4 groups was further divided into occasional readers (ORs, 6 participants for each group) and habitual readers (HRs, 6 participants for each group). Each participant was given a knowledge questionnaire in order to obtain the “reading habits” data.

Reading habits and the time of exposition to written texts, and not the knowledge of LIS, is expected to be the discriminant variable driving the oculomotor mechanisms implied in reading. Hence, HR deaf participants are expected to be more similar to the hearing control group (reading regularity being equal) in their reading approach and timing.

Every participant has been asked to read a text by Gianni Rodari (1993) and has been asked to answer to questions aimed to check their attention in reading.

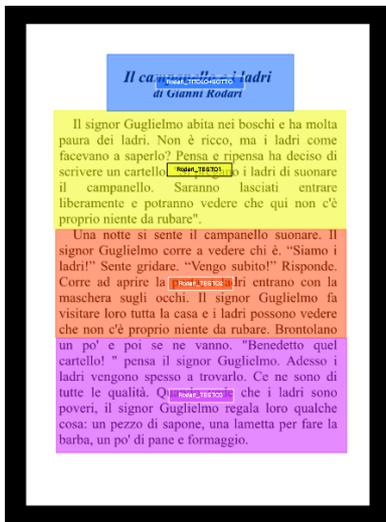
The eye-tracking data analysis confirmed our hypothesis: results show that the *Total Visit Duration* variable does not vary significantly among the groups (i.e. LIS background is not concerned), while *Reading habits* revealed to be the only significant variable. HRs take a shorter time to read the text (46,53 seconds) with respect to ORs (61,61 seconds), with a statistically-significant difference of 15 seconds (tab. 1).

In a successive phase, the text was divided into 4 areas of interest (TITLE, INITIAL PART, CENTRAL PART, FINAL PART) (fig. 1). When analyzing *Time to first fixation* variable, which describes the time required for each reader to enter one area of interest, the results show that each experimental group first looks at INITIAL PART, then at TITLE, then at INITIAL PART (again), at CENTRAL PART and at FINAL PART. The only statistically-significant difference was observed in the six OR late-signers group, who look at the screen starting indifferently from one or the other of the four areas of interest (fig. 2).

**Tab. 1:** Total visit duration in HR and OR in seconds.

Total	HR	46.5300 sec
	OR	61.6122 sec
	Total	54.0711 sec

**Fig. 1:** 4 areas of interest in the text



**Fig. 2:** Time to first fixation in deaf native signers, deaf late signers, deaf non-signers and hearing non-signers.

