

Split screen exploration in sign language users: An eye-tracking study

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THE PROBLEM

No standards have been set on split-screen configuration for Sign Language split screens (examples obtained from SignLangtv.org, Redón 2013)



Sign Language Interpreter split screens from Portugal Switzerland, Latvia, Russia, Italy & Korea (left to right, Top to bottom)

Previous work at UAB with focus groups of professional SLI and users set up 2 preferred sizes: Small (1/8 of screen width) and Medium (1/3 of screen width) (Bosch, Soler, Orero, in prep)



Tested screen sizes in Bosch, Soler, Orero (in prep). Small, Medium and Big size of SLI sub-screen. Small and Medium were chosen as ideal.

THE EXPERIMENT



Screen configuration: Small left/right (up) and Medium left/right

Task: Participants watch 4 different clips extracted from Romero Fresco (2012). Eye movements are recorded. After watching each clip, participants fill up two questionnaires: Visual information recall and Linguistic information recall.

Participants: 28 (12 ♀ - 16 ♂); 17 to 74 y.o. All of them deaf signers.

Stimuli: 4 excerpts from Romero Fresco (2012), translated and interpreted to Catalan Sign Language and edited in 4 different configurations (see left).

Apparatus: Eye tracker Tobii 60, controlled by a Toshiba Portable personal computer. MacBook Air personal computer to administer and record users' questionnaires.

Design and data analysis:

Eye Tracker data analyses: 3x3 design, GLM with repeated measures.

Size, Position, Area of Interest by Fixation Count, Fixation Duration, Total Visit Duration.

Questionnaires: Paired Samples T-test to compare Linguistic and Visual recall in each screen configuration.

RESULTS

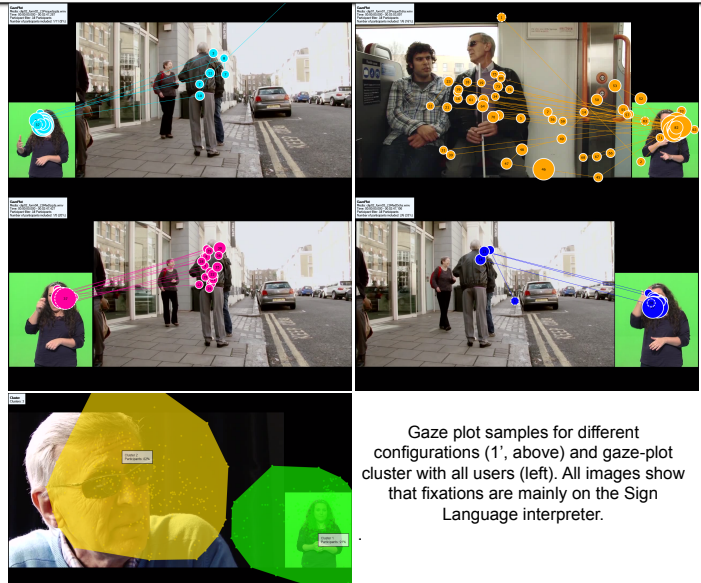
General Linear Model with Repeated Measures to analyze E.T. data:

- No effects of Size and Position, only **Area of Interest** shows effects as users focused on Sign Language Interpreter sub-screen.

AREA OF INTEREST	Total Visit Duration (s)	Fixation Duration mean (s)	Fixation Count
SIGN LANGUAGE INTERPRETER	98.3	.522	156.8
GENERAL SCREEN	50	.231	124.5
<i>p</i>	.000	.000	.062

Paired Samples T-test

- Visual and Linguistic recall do not differ for 3 configurations.
- Better Linguistic recall for Small size/Left position.



Gaze plot samples for different configurations (1', above) and gaze-plot cluster with all users (left). All images show that fixations are mainly on the Sign Language interpreter.

CONCLUSIONS

Position and size of SLI subscreen do not seem to be important for Sign Language users' information recall. The fact that visual recall does not differ significantly from linguistic recall, even if users tend to make longer visits with longer fixations durations on the SLI sub-screen, could indicate that deaf SL users collect peripheral visual information, as suggested earlier (Dye, Seymour, Hauser 2016; Siple 1978).

References:
Dye, M.W.G., Seymour, J.L. & Hauser, P.C. (2016). Response bias reveals enhanced attention to inferior visual field in signers of American Sign Language. *Experimental Brain Research*, 234: 1067-1076. DOI: 10.1007/s00221-015-4530-3
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Siple, P. (1978). Visual constraints for Sign Language Communication. *Sign Language Studies*, 19: 95-110. DOI: 10.1353/sls.1978.0010

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