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2014

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IEGULDĪJUMS TAVĀ NĀKOTNĒ

## PAPER-BASED AND COMPUTER-BASED VERSIONS OF A VISUAL SEARCH TASK IN SCHOOL-AGE CHILDREN

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11.04.2014.

ESF project Nr.2013/0021/1DPI/1.1.2.0/13/APIA/VIAA/001

- Visual search task is often used to study attention, although different symbols are used (*Cheal&Lyon, 1992*)

STIMULI CHOSEN TO REPRESENT PARTICULAR FEATURES														
COLOR			LINE ORIENTATION			CURVATURE			L'S ENDINGS			NO SINGLE FEATURE		
Rg	Ry	Gy	Li	Sl	Ys	Oy	Cu		Es	Ms	Ws	Ts	Ot	
+	+	+				\	/	\	C	∩	m	m	+	+
+	+	+				\	/	\	<	S	U	W	+	+

Red —  
Yellow —  
Green —

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STIMULI CHOSEN TO REPRESENT PARTICULAR FEATURES														
COLOR			LINE ORIENTATION			CURVATURE			L'S ENDINGS			NO SINGLE FEATURE		
Rg	Ry	Gy	Li	Sl	Ys	Oy	Cu		Es	Ms	Ws	Ts	Ot	
+	+	+				\	/	\	C	∩	m	m	+	+
+	+	+				\	/	\	<	S	U	W	+	+

- Different letters are found in a different speed (*Timrote et al, under review*)

Time per letter, seconds

Letter

- Attention system appear to mature completely by the age of 15 (*Baranov-Krylov et al., 2009*)
- Some individuals with low vision experience difficulties when performing a computer-based reading task (*Douglas et al., 2001*)
- As far as paper-based and computer-based version of a test demands different visual load, it is essential to understand it's possible effect on attention and visual search task

SYMBOLS CONSISTING OF LANDOLT SQUARE  
STIMULUS IN 4 DIRECTIONS: 14 pt

VISUAL SEARCH TASK PERFORMANCE:

Visual search task consisting of 100 elements

Introduction to the test (a set of 25 elements)

### METHODS:

PARTICIPANTS – SCHOOL-AGE CHILDREN FROM THREE SCHOOLS IN RIGA, LATVIA:

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graph TD
    A[194 School - age children] --> B[126 (6-13 years) Paper-based version]
    A --> C[68 (7-17 years) Computer-based version]
    B --> D[68 boys]
    B --> E[58 girls]
    C --> F[31 boys]
    C --> G[37 girls]
  
```

**Paper-based version:**

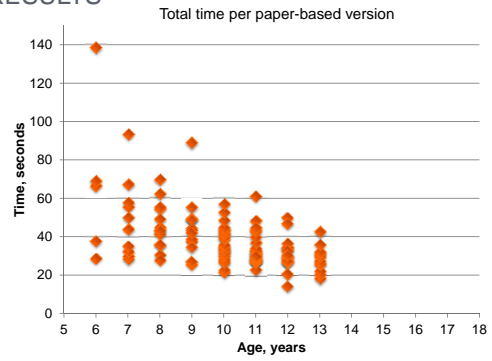
- Performed at 30-40 cm
- Not known:
  - Which elements are omitted
  - Is one and the same element found repeatedly
  - Sequence of the search

**Computer-based version:**

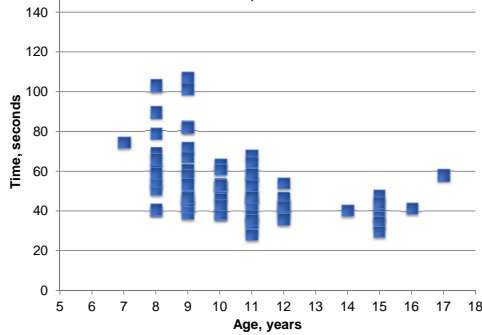
- Performed at 40 cm
- Program records:
  - Time to find each symbol
  - Total time to complete the task
  - Errors and their localizations
  - It is possible to locate omitted elements and analyse them

•We recorded time needed to complete the task, number of counted elements, number of errors (Baranov-Krylov, 2009)  
 •Data analysis using MS Excel un OriginPro 7.0  
 •Data analysis using corrected time (Cheal&Lyon, 1992)

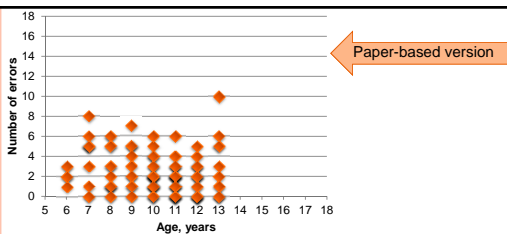
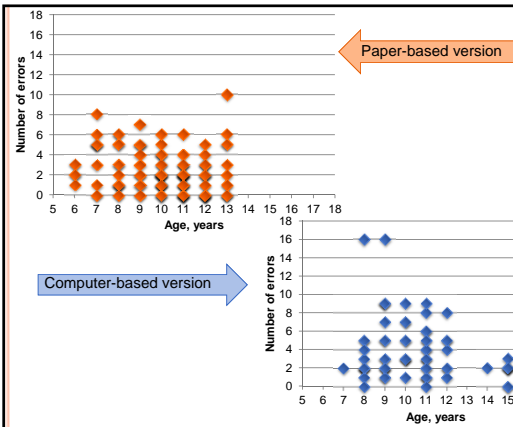
**RESULTS**



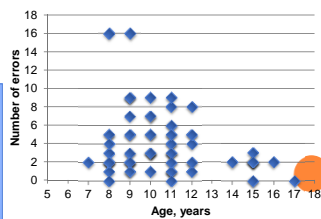
**RESULTS** Total time for a computer-based version



The results demonstrate that paper-based version of a visual search task is completed significantly faster comparing with a computer-based version ( $p < 0.05$ , ANOVA).



**Computer-based version**



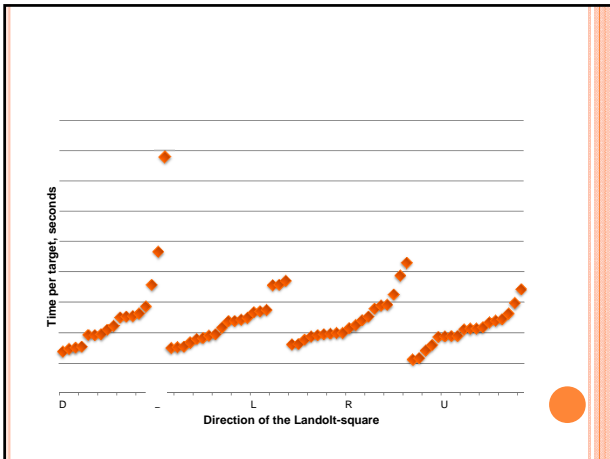
When looking at the errors, there is a tendency for more errors when performing the computer-based version of the test, because more accuracy is needed due to the hand movement involvement.

**A SET OF 25 ELEMENTS**

Direction	Number of errors
D	341
L	188

**A SET OF 100 ELEMENTS**

Direction	Number of errors
D	65
L	76
R	54
U	60



## CONCLUSIONS

- The results demonstrate that paper-based version of a visual search task is completed significantly faster comparing with a computer-based version ( $p < 0.05$ , ANOVA).
- Visual search task is completed faster with age for both computer-based and paper-based version of the test.
- Number of errors do not differ significantly between paper-based and computer-based tests



Thank You for Your attention!

I.Timrote, S.Fomins and G.Krumina are supported by ESF project Nr.2013/0021/1DP/1.1.1.2.0/13/APIA/VIAA/001