

Comparative study of selective visual objects recognition in urban and rural 6-7- year-old children

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Introduction

Selective visual recognition requires a multi-modal analysis of stimulus and attention processes consolidation. Children selective attention for complicated visual stimuli has been investigated from different perspectives, within the most important are found the studies of the cognitive psychology, (Dukette, 2001; Mondloch, 2003; Rueda et al., 2004) and neuroscience (Posner, 1998; Dimoska, 2003; Moses, 2002, Machinskaya, 2006) and studies that define the attention as a historical-cultural develop entity (Vygotsky, 1926; Akhutina et al., 2003; Quintanar, Solovieva, Bonilla, 2006). In this context it is interesting to analyze how social factors can effect the formation of visual objects recognition in young school children. The objective of the present work was to characterize the kind of responses in situation of visual selective attention and decision making in urban and rural 1st grade elementary school children aged 6-7.

Methods

The subjects of this study were 60 children aged 6-7 from urban (n = 30: 16 boys, 14 girls) and rural (n=30: 16 boys, 14 girls) public schools without a history of pronounced neurological disease. Selective visual recognition was estimated by use of hierarchical letters paradigm (Navon, 1977). The "Hierarchical letter test" consisted of two series. Tree variants of stimuli were used: congruent, incongruent and neutral. During every series 20 stimuli of each type were presented. In the first series (global) the children were asked to identify the big letter (global aspect). In this series we used a big "E" (6.4 x 2.4 angular degree) made up of smaller "E"'s or an "H" made up of smaller "H"'s as congruent stimuli, a big "E" made up of smaller "H"'s or an "H" made up of smaller "E"'s as incongruent stimuli. And big a "E" and an "H" made up of "O"'s as a neutral stimuli. In the second series (local) of the test the child had to identify the local aspect of the hierarchical letter. For this part we used the same stimuli except the neutral ones. Here we used big a "O" made up of "E"'s or "H"'s as neutral stimuli.

Characteristics of responses - reaction time and response accuracy (correct or incorrect) were analyzed. Responses were registered and those long (more than 1500 ms) were eliminated, as well as those short (less than 100ms). Responses data were processed by Word Excel (Microsoft, Windows Office, 2003) and were averaged individually. The averaged data were statistically processed by RM ANOVA and nonparametric procedures (Friedman Test and Wilcoxon Signed Ranks Test) in SPSS 12.0.

Results

Independently of social conditions all children aged 6-7 showed low efficiency of attention in situations of local aspect recognition, especially for conflict tasks. At the same time the results testified substantial differences of executive characteristics and visual-spatial perception features between urban and rural groups: rural school children had more pronounced difficulties in all experimental situations; and significantly lower level of global features recognition was found in this group compared to urban children. The latter can be considered as immaturity of visuo-spatial functions in rural group. Nevertheless the educational program that these children receive is the same, as well as the qualification methods used to determine school success, the characteristics of perceptual, attentional, and executive development are different between urban and rural groups.

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