

Dependence of the Manifestation of Processes of Multisensory Integration in Children With Different Levels of Speech Development

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One of the important directions in the study of perception is the definition of mechanisms of multisensory integration, which allow the body to more accurately judge the objects of the surrounding world. Of particular interest in the ontogenetic aspect is the study of the specifics of the formation of mechanisms of multisensory integration in children with speech disorders.

The study involved 62 children (30 children with typical development (TD), mean age 6.7 ± 0.2 years, and 32 children with a diagnosis of “residual-organic-based mental retardation” (MR), the average age was 6.1 ± 0.5 years). Children with MR were characterized by different levels of general speech underdevelopment (GSU): 10 children had GSU level IV-III; 12 children - III, 10 children - III-II. The study used a priming paradigm. As test stimuli, we used animal sounds (kitten and puppy). As prime stimuli, we presented images of these animals combined with the test sound stimuli either congruently or incongruently. The interstimulus interval (ISI) between presentation of the prime and the test stimuli varied from 0 to 500 ms.

In TD children, we found a facilitatory effect of congruence on discrimination latency when ISI was in the range of 50-100 and 200-500 ms. In children with MR the manifestation of facilitating influence depended on the GSU level. In children with IV-III level of GSU the facilitating effect was observed at ISI in the range of 50-150 and 300-500 ms, in children with level III of GSU — 200-500 ms, and in children with III-II level of GSU — 300-500 ms. Thus, in children with MR, the time window of the facilitatory effect was expanded and shifted in comparison with TD children. The degree of change in the effect time window of depended on the level of the GSU.

In studies of the processes of multisensory integration, expansion and shift of the time window of such effects are associated with the slowing down of the processes of multisensory integration. Consequently, it can be assumed that in children with MR there are the deficits un development of multisensory integration processes, the level of which depends on the manifestation of speech defects.

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Does COATS Prime COAST? Masked Priming With Transposed-Letter Noun Forms in Russian

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The role of orthographic neighbors (e.g. trail – trial) in word processing has been discussed in many experimental studies. These studies address the problem of visual word recognition, lexical access in the mental lexicon and a number of other topics that are currently under debate in psycholinguistics. A number of experiments on transposition neighbors (e.g. Christianson et al. 2005; Perea, Carreiras 2006; Duñabeitia et al. 2007; Rueckl, Rimzhim 2011) raised the following question: does it play a role whether the transposition takes place inside one morpheme or across the morphological boundary? This lets us understand whether multimorphemic words are decomposed during word processing and if they are, at what stage. Unlike the majority of earlier studies, our experiment investigates inflected forms rather than derived words.

We conducted a masked priming lexical decision experiment on Russian that examined the relationship between pairs of real words that differed only in two adjacent letters (e.g., klonu ‘cloneDAT.SG’ vs. kloun ‘clownNOM.SG’) that were transposed. All primes were noun forms in oblique cases, targets were real nouns in nominative singular or nonce nouns. Primes were presented for 200 ms. Two factors were manipulated: whether the prime was a transposed-letter (TL) neighbor of the target (experimental vs. control condition); whether the prime was more/less frequent than the target. The transposition always occurs across morphological boundaries (between root and inflection).

Statistical analysis using mixed-effect linear modeling showed that high-frequency TL neighbors significantly increased response latencies compared to the control condition, whereas low-frequency TL neighbors facilitated recognition of the targets.

Discussion. The results let us conclude that high-frequency Russian noun forms in oblique cases are stored as a whole. They compete with lexical items that share all their letters, therefore the lexical inhibition occurs. As for low-frequency noun forms, they probably require some kind of morphological processing, that puts the lexical activation on hold. Therefore, we registered facilitation caused by the overlapping letters, rather than inhibition due to lexical competition.

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