

Training Exercises Improve Temporal Processing Abilities In Language-Based Learning Disabled Children (LLDs): Use-Dependent Reorganization

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Learning-induced changes in cortical neuronal responses have been the subject of many of our prior animal studies. We developed interactive multimedia perceptual training procedures in order to train children to overcome the temporal processing deficits that characterize LLDs.

Four interactive games were designed that used modified speech and speech-like sounds and employed different standard psychophysical methods. The speech stimuli were arranged along various continua of phonetic characteristics and temporal pre-processing so that initial high performance was easily attainable. In order to maintain successful performance, the children were required to process and identify target sounds that were presented at increasingly higher presentation rates and decreasing amounts of pre-processing approaching normal rates of temporal variations. In all four games, task difficulty tracked performance.

In initial trials, children played each of these games for at least 20 minutes/day for 20 days. Several- to many-fold gains were recorded in time-order judgment abilities (see poster by Miller et al.), and children were able to recognize progressively shorter-duration consonants.

We conclude that these "games" can contribute powerfully to remediating the temporal processing deficits that underlie LLDs. We hypothesize that changes in speech representation in the central auditory nervous system underlie these performance gains.