## Developmental Neuropsychology of Cognition in Children with Severe Brain Dysfunction

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## 1993 Fiscal Year Final Research Report Summary

## Developmental Neuropsychology of Cognition in Children with Severe Brain Dysfunction

Research Project

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Kanazawa University
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Severe brain Dysfunction / Auditory Cardiac Responses / Orienting Reflexes / Postnatal Experience
Research Abstract

The subjects were 6 children with severe brain dysfunction, who were resident in hospitals for severely handicapped children. Through measuring auditory evoked potentials(ABR, MLR, SVR), the functional state of brain were estimated.

Cardiac responses to environmental stimuli reflect the active aspects of cognitive system. Therefore, based on the information about these responses, it is possible to estimate cognition in children with severe brain sysfunction.

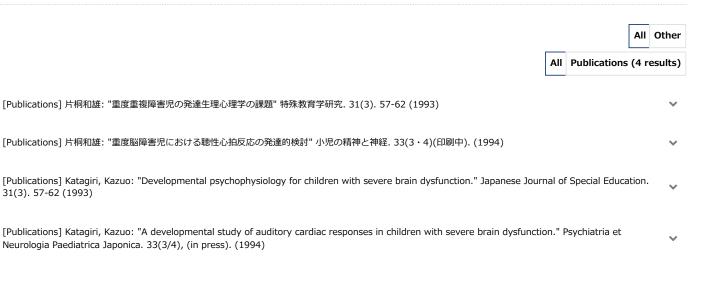
About these subjects, cardiac responses to auditory stimuli were examined regarding both aspects of transient changes (phasic) and long-lasting changes(tonic) of heart rates(HRs). Results were as follows:

- 1. In subjects with brainstem dysfunction, infered from waveforms of ABRs, tonic and phasic HR responses were hardly observed to auditory stimuli.
- 2. In subjects with normal functions of brainstem, developmental shift in the direction of HR responses were observed. Namely phasic accelerating

responses (defensive reflexes) became to be clear with increasing temporal variability of HRs, and then occurrences of decelerating responses(orienting reflexes) gradually insereased. In the further stage of development, "the second" accelerating responses to signal stimuli were observed. These responses were regarded as occurences of active attention.

Considering the immature level of cardiac responses to environmental stimuli, it might be possible estimate the aspect of plasticity in the cognitive function of children with severe brain dysfunction.

## Research Products (4 results)



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