

**Thesis Title:** The relationship between Age, Digit Span short term memory scores, and P300 Event-Related Potentials (ERPs) among subjects from the Institutionalized Elderly at Bangkhae Home.

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## ABSTRACT

The Late Positive Complex (LPC) of the P300 Event-Related Potential (ERP) from a simple auditory discrimination counting task was recorded along with the Digit Span (D.S.), subtest of the Weschler Adult Intelligence Scale (WAIS), from a group of old-age subjects from the Ban Bangkhae home for the elderly. The objective of the present study is to examine the relationship between the Late Positive Complex, Digit Span Score and Age in order to apply the result to characterize those subjects with mild cognitive decline.

Significant negative correlation between the Digit Span and age were found, although there were no significant relationships between the LPC latencies and age. There were also significant negative correlations between Digit Span scores and the LPC latencies, and the LPC latencies and the LPC amplitudes ( $P\text{-value} \leq 0.05$ ,  $P\text{-value} \leq 0.1$ ), but no significant

relationships were observed for the LPC amplitudes and the LPC latencies. When the subjects were divided into two groups, according to the Total Digit Span scores, both mean age and mean LPC latency were not significantly different ( $P\text{-value} \leq 0.1$ ).

A similar pattern of results was also obtained when the EEG/ERP electrode reference was changed to the so-called 'reference-independent' Common Average, as with Linked Mandibles ('reference-dependent'), but the degree of significance was less.

These results suggest that the LPC latencies of the ERP may index individual variations in memory ability. So the delay of LPC latencies and low Digit Span Scores may help to identify the cognitively impaired subjects, such as those with Mild Dementia. For Clinical application, the early detection of Mild Dementia will enable taking advantage of early treatment.