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Identifying neural correlates of autobiographical implicit association test (aIAT) in a mock crime

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The autobiographical implicit association test (aIAT), a variant of the implicit association test for an individual's episodic memory, is a computerized categorization task which measures the implicit association strength between autobiographical sentences and logical sentences. Although aIAT research using behavioral responses has reported that the test is efficient in determining self-related events in crime, little is known about its neural correlates in the brain. This study aims to identify neural underpinnings of the aIAT and whether the aIAT using electroencephalogram (EEG) would be an alternative method to detect deception. Fifteen participants were divided into two groups: Guilty and innocent. The guilty were instructed to find a wallet and steal money, whereas the innocent were required to find a textbook and bring it to the experimenter. Then each participant was conducted the aIAT with EEG recording. Participants were requested to classify autobiographical sentences and logical sentences by pressing one of two response keys. Event-related potential analysis was conducted and the results showed a significant difference of amplitude at 600-700 ms in the frontal area (FPz, FP1, FP2). Mixed ANOVA with between-subject factor as group (guilty, innocent), and within-subject factor as block (congruent, incongruent), revealed that the main effect of block was significant ($p<.05$). The interaction was also significant in the same area ($p<.05$), indicating that the difference between the congruent and incongruent blocks was much greater in the guilty group, compared with the innocent group. These results suggest that aIAT using EEG has the possibility of becoming an alternative lie detection method.

Biography

Inuk Song majored in Psychology and minored in Law at Korea University (BA). He is currently an MS course student in the Lab of Psychophysiology & Brain Imaging in the Department of Psychology at Korea University. His main research interests are psychopathy, lie detection and neuro-law.

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