The reassurance of the Complex Trial Protocol against ecologically validated countermeasures

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Abstract

The P300-based Complex Trial Protocol (CTP), developed by Rosenfeld et al. (2008), is known to compensate for accuracy degradation and countermeasure issues of the Concealed Information Test. Although a myriad of CTP studies using electroencephalogram has been investigated, the lack of crime-related details and the complexity of the previously used countermeasures have revealed the necessity of in-depth experiment. In the present study, fifty participants were divided into three groups: guilty, innocent, and guilty-countermeasure. Participants engaged in a mock-crime scenario and only the guilty-countermeasure group performed ecologically validated countermeasures during the CTP. Participants reaction time and the amplitude of P300 components of event-related potential were analyzed and there was a significant difference ($p_i0.05$). Moreover, using the bootstrapping method, participants were correctly classified as guilty or innocent, regardless of the use of countermeasure, with accuracy above 80%. The results support the possibility of the on-site usage of the CTP.