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## Presentation Abstract

**Title:** Electrophysiological Evidence of Gender Difference in Subliminal Processing of Fearful Faces

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**Abstract:** **Background:** Previous studies have shown that emotion can be processed outside conscious awareness. The purpose of the current study is to investigate the gender difference in processing “invisible” emotional stimuli using electroencephalography (EEG) signals. **Methods:** 40 healthy participants (19 male) matched in age and education level were tested in this study. Upon arrival, they completed Beck Depression Inventory II (BDI-2), Beck Anxiety Inventory (BAI), State-Trait Anxiety Inventory (STAI), and the Positive and Negative Affect Schedule (PANAS). For each trial, using the backward-masking paradigm, a fearful or a neutral face target was presented for varied durations - i.e., 20, 30, and 200ms (subliminal, medium and supraliminal conditions respectively) -- followed immediately by a scrambled neutral face as a mask. Participants performed a 2-alternative-forced-choice (2AFC) emotion discrimination task, guessing if necessary while their EEG activity was recorded at multiple electrode sites. The amplitude and latency of relevant event-related potential (ERP) components such as P100, N170, N250, P3, and the early posterior negativity (EPN) were analysed. Gender effects on processing the subliminal emotional face was analysed by repeated-measures ANOVA with gender as a between-group factor, and emotion and durations of targets as within-group factors. In order to control pre-existing emotional status of participants, scores from questionnaires were put as covariates. **Results:**

Participants in both genders showed chance-level discrimination performance (female: 52.6%, male: 52.3%) in the shortest target duration, which verifies the “invisibility”. Statistically significant differences were observed between genders at early ERP components; the amplitude of P100 was greater in females than in males particularly for subliminal fearful face ( $p=0.003$ ). In addition, only females showed greater amplitude of EPN for fearful face compared to neutral face regardless of their awareness of targets ( $p=0.002$ ). **Conclusion:** These results indicate that females and males show differential neural response to subliminal emotion stimuli from the early processing stages, which bears implication for studying abnormal emotion processing in females and anxiety disorder. This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Ministry of Education, Science and Technology (No. 2013K2A1A2053850 & No. 2012R1A1A2043992).

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