

AB008. The impact of affect on environmental scene perception

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Background: The environment that individuals are surrounded by have been linked to have an effect on affect, like anxiety, and well-being. On a whole, rural and natural environment scenes have been showed through previous research to increase positive affect and well-being. Until now, the methods of assessing affect in relation to environmental scene perception have been studied in a healthy sample, and mostly via self-report questionnaires and heart rate. Here, we present a novel quantitative research study that uses frontal electroencephalography (EEG) asymmetry to investigate the impact of viewing images of environmental scenes on affect in a sample of self-reported sub-clinically anxious adults. Frontal EEG asymmetry has previously been used in research related to motivation and assessing emotional affect, with most researchers showing greater left-frontal hemisphere activity compared to the right being associated with positive affect and approach behaviours. Consequently, frontal asymmetry EEG can be used to explore the impact of scene perception on affect.

Methods: Forty-six participants (18–52 years) took part in the study. To determine the psychophysiological predictors of affect, specifically anxiety, we monitored brain activity

using EEG, while participants viewed a series of natural and man-made images on a computer screen. Natural images consisted of beaches, forests, meadows, mountains, waterfalls. Man-made images consisted of cityscapes, construction sites, highways, skyscrapers and street views. EEG was Fourier transformed, and the alpha-band frequencies (8–12 Hz) isolated and averaged across each image type.

Results: Preliminary analysis of frontal-asymmetry shows that individuals with sub-clinical levels of anxiety experience significantly more negative affect (i.e., increased right asymmetry in alpha bands, ($M=-3.15$, $SD=0.63$) when viewing man-made images compared to control participants ($M=-1.02$, $SD=0.67$). These preliminary results contrast to when viewing natural images, whereby both controls and the anxious individuals experience high levels of positive affect (i.e., increased left asymmetry in alpha bands: ($M_{anxiety}=3.31$, $SD_{anxiety}=2.26$; $M_{control}=3.33$, $SD_{control}=1.12$). Lastly, frontal-asymmetry indices were significantly different ($t=17.48$, $P<0.001$, $d=2.58$, $BF_{10}=3.81e+18$) when viewing natural and man-made images. This result was consistent across both groups.

Conclusions: This research presents a novel approach to investigating the neuro-cognitive correlates of affect and scene perception. Additionally, these initial observations would indicate that man-made scenes induce negative affect, and that this effect is amplified in individuals with sub-clinical levels of anxiety. Future work should expand this research to investigate environmental scene perception in individuals with clinical levels of anxiety, and use other physiological measures, such as heart-rate variability and eye-tracking to objectively assess affect.

Keywords: Anxiety; affect; scene perception; frontal-asymmetry; electroencephalography (EEG)

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