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**Are you looking at me? Exploring eye scan patterns of TBI and control groups when viewing static and dynamic facial affect**

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**Aim:** TBI frequently leads to socio-emotional problems but the mechanisms underpinning these are not well understood. Social interactions are dynamic and impairments in modulating relationships create a barrier to rehabilitation and community re-integration. We investigated eye scan patterns of TBI and controls viewing static/dynamic facial expressions.

**Design:** A factorial design compared correct response, reaction time, fixation duration/count to areas of interest (eyes, nose, mouth) across six emotions (anger, disgust, fear, happy, sadness and surprise).

**Method:** 17 TBI participants were recruited from regional NHS trusts. Seventeen age/gender matched controls were recruited using stratified opportunity sampling. Images from the Amsterdam Dynamic Facial Expression Set (ADFES) were presented on a Tobii T120 Eye Tracker screen. Multivariate and correlational methods were used to analyze data.

**Result:** Controls had significantly greater fixation durations and counts to eyes and were faster and more accurate at identifying emotions than the TBI group. The TBI group focused more on the nose compared to controls. Higher scores on the ADFES corresponded to faster responses across all emotions for all participants and positive relationships between empathy, emotion recognition and fixation patterns were shown. Controls were more accurate at identifying emotions than the TBI group but no group differences were found for gaze patterns. There was a positive correlation between correct scores on the ADFES and empathy scores across all emotions for all participants.

**Conclusion:** Visual strategies underlying the recognition of static/dynamic facial expressions may differ. Irregular gaze patterns could underpin some socioemotional problems after TBI but other cognitions, e.g. retrieval of social knowledge or response selection, may play a role. Findings advocate further eye tracking research with TBI cohorts and illustrate potential for innovative socio-cognitive rehabilitation approaches post-TBI. The key limitation was the small sample size which will hopefully be rectified in further work.

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