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The temporo-spatial gaze patterns analysis based on Multidimensional Scaling from autism spectrum disorders children

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Eye tracking has been used to investigate gaze behaviors in individuals with autism spectrum disorder (ASD). However, traditional analysis has yet to find behavioral characteristics shared by both children and adults with ASD. To take into account all of the temporo-spatial gaze patterns from all of the participants, we summarized the data using multidimensional scaling (MDS). To distinguish core ASD gaze behaviors from those that change with development, we extract the temporo-spatial gaze patterns from the database of video viewing of children and adults with and without ASD. By summarize the gaze patterns of 104 participants using MDS, we successfully in found two independent quantitative measures, of which one separated children from adults and the other separated participants with ASD from controls. Control participants clustered in the center of two-dimensional scaling plane, reflecting standard gaze behavior, whereas participants with ASD were distributed around the periphery. Moreover, children and adults were separated on the plane, thereby showing a clear effect of development on gaze behaviors. Post hoc frame-by-frame analyses revealed the following findings: I) both ASD groups shifted their gaze away from a speaker earlier than the control groups; II) both ASD groups showed a particular preference for letters; and III) typical infants preferred to watch the mouth rather than the eyes during speech, a preference that reversed with development. These results highlight the importance of taking the effect of development into account when addressing gaze behaviors characteristic of ASD.

The Effect of Expertise on Viewing of Dynamically Presented Medical Images

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The eye movement characteristics of medical experts during viewing of dynamically presented medical images were examined in two experiments. In Experiment 1, radiologists, CT radiographers, and psychology students viewed 9 volumes of multi-slice stack-view CT images from the upper to the lower part of the abdomen. The images were presented in succession with low, medium or high speed, while the participants had to detect enlarged lymph nodes or other abnormalities. The radiologists outperformed the other groups in detecting enlarged lymph nodes, and demonstrated shorter saccades than the other two participant groups. Moreover, unlike