***Abstract***

***Objectives***
The superior colliculus (SC) is a sub-cortical midbrain structure involved in attentional shifts and distractibility. As distractibility is often atypical within ADHD, it is possible SC functionality in ADHD is also atypical. Indeed, a recent theory suggests distractibility observed within ADHD could be attributed to dysfunction, specifically hyperactivity, of the SC (Overton, 2008). This experiment aimed to explore whether SC responses to visual stimulation were associated with ADHD traits. We predicted a positive correlation between ADHD traits and SC responses.
***Methods***
The present study uses fMRI to examine the relationship between SC responsiveness and inattention-ADHD traits, assessed with the ASRS questionnaire. Seventeen typically developed adults, who ranged along the continuum of inattention-ADHD traits, were shown radial motion and static dot stimuli presented unilaterally in the left or right hemifield, while they performed a central rapid colour counting task.
***Results***
Responses in the left and right SC to motion versus static stimuli presented in the right hemifield, showed significant positive correlations with ADHD inattention traits (left hemisphere: r=.50 p=.020, right hemisphere: r=.45 p=.035), with those exhibiting higher levels of inattention traits showing larger motion responses compared to static. However, when the same stimuli were presented in the left hemifield, there was no significant correlation between left or right SC responses to motion versus static stimuli and ADHD inattention traits. Whole brain analyses also revealed positive associations between the left hemisphere early visual cortex response to right hemifield motion versus static stimuli and ADHD inattention traits. Again, no similar results were found for left hemifield presentation.
***Conclusions***
The results found preliminary support the initial hypothesis that those with higher levels of inattention traits showed increased SC activity to motion distractors compared to static, suggesting SC dysfunction may underlie some ADHD distractibility. Interestingly, such results only occurred to right hemifield distractors, which may reflect the hemifield differences in spatial attention previously observed within ADHD.