Neural correlates of controlling attitudes of trust

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INTRODUCTION

•Interpersonal trust is an important component of human social interaction.

•Previous neuroimaging research implicates the paracingulate cortex, amygdala, insula and orbitofrontal cortex are involved in the evaluation of trust and distrust[1-4]

•It is currently unknown how the brain functions to consciously control the attitudes of trust or distrust.

•Previous research on control of emotion[5,6] and control of attitudes[7] implicates brain areas such as the prefrontal cortex (PFC), specifically the dorsolateral prefrontal cortex (DLPFC) and anterior cingulate cortex (ACC)[5-7] as people try to reformulate their ideas and beliefs.

•We predicted we would observe increased activation within the ACC and DLPFC during active attempts to trust or distrust compared to assessing age.

METHODS

Participants

37 right handed, healthy participants (13 male/24 female). Mean age 20.35 ± 2.01 years.

fMRI task:

Subjects presented with an instruction to trust (T), distrust (D) or evaluate age (A), prior to an image of a neutral face.

Imaging Parameters:

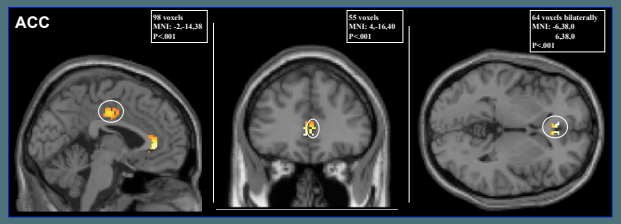
•3T GE-Signa HDx scanner
•Gradient echo T2*-weighted echo-planar sequence
•TR = 2s, Flip angle 90°
• FOV= 220mm x 64

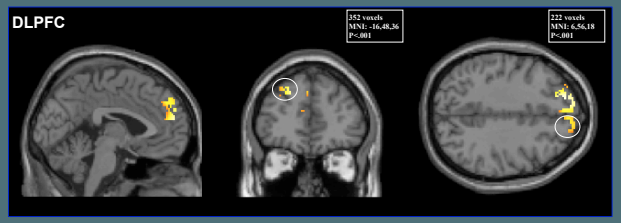
Analysis

•fMRI: SPM8
•Significance threshold (p < .005, 12 voxel extent)
•ROIs:WFU PickAtlas: ACC and DLPFC

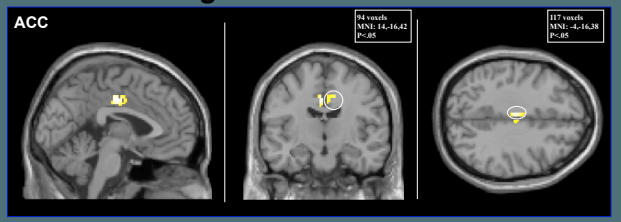
RESULTS

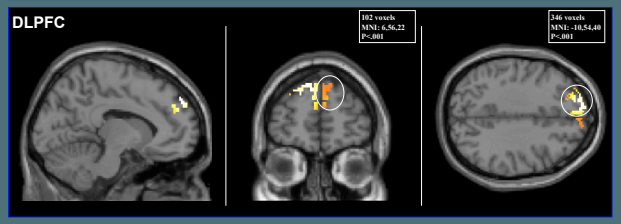
1. Trust > Age





2. Distrust > Age





CONCLUSIONS

•Significant differences were seen between both conditions.

•Both the ACC and DLPFC showed significantly more activation when subjects were instructed to trust or distrust compared to age evaluation.

•PFC activation may represent an increase as individuals attempt to control their instinctual attitudes toward something or someone.

•ACC activation may represent conflict arising from trying to alter an initial inclination to trust or distrust

•These findings indicate the presence of specific brain regions involved in the conscious control of trust evaluations.

•These findings may improve the understanding and treatment of disorders characterized by abnormalities in social cognition such as Autism Spectrum Disorders and Williams syndrome.

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SUPPORT

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