



Neural correlates of perspective taking in youths

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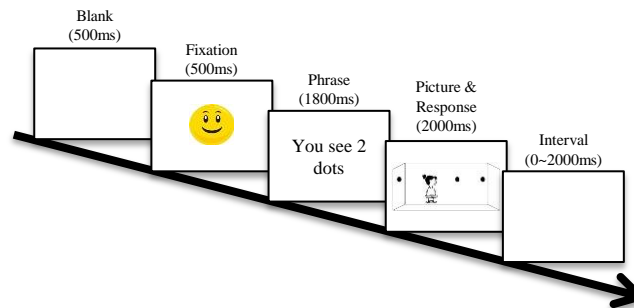
Introduction

- Theory of Mind (ToM), also known as 'mentalizing' or 'mindreading,' refers to the ability to infer another person's mental states, such as beliefs, desires, and intentions.
- Visual perspective taking (VPT), the ability to adopt others' visual view, is one of the essential parts in Theory of Mind (ToM).
- Previous neuroimaging studies mainly use adults as participants to examine the neural substrates of perspective taking.
- However, little is known about the age differences in the neural mechanisms of ToM, especially in adolescents. The present study aims to use the visual perspective taking paradigm to study the neural correlates of ToM in youths.

Methods

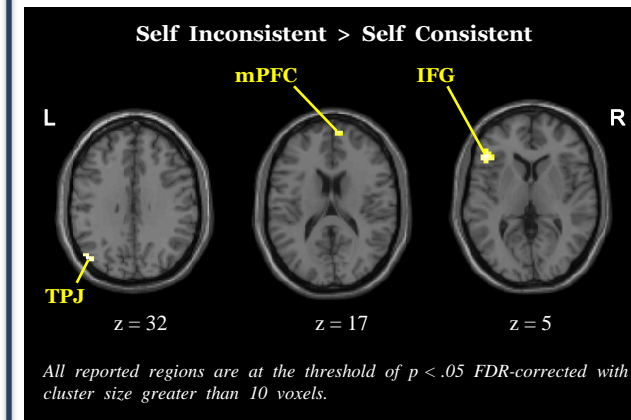
- Participants
 - Twenty-eight youths (age range: 15–20 years) were recruited from the Taipei city metropolitan area.
 - All participants are right-handed, native Mandarin Chinese speakers, with normal or corrected-to-normal vision, and free of neurological diseases or psychiatric disorders.

- Functional Task (Event-related design)
 - In each trial, participants were asked to indicate whether the picture is consistent with the preceding phrase, which instructed participants to make a judgment from his/her perspective (Self condition) or the avatar's perspective (Other condition).
 - The present study used [Self Inconsistent > Self Consistent] contrast to examine the neural underpinning of visual perspective taking.



- MRI acquisition parameters
 - 3-T Siemens MAGNETOM Prisma MRI scanner
 - EPI: TR = 2000 ms, TE = 24 ms, flip angle = 90°, matrix size = 64 × 64, field of view = 192, slice thickness = 3.5 mm, number of slices = 42, 120 volumes in each session (three functional sessions)
 - Data analysis was performed by SPM12

Results



Discussion

- The present study has found the brain regions related to ToM processing in the VPT task, including left temporo-parietal junction (calculation of different perspectives), right medial prefrontal cortex (selection of perspective), and left inferior frontal gyrus (inhibition of the irrelevant perspectives).
- These findings suggest that youth participants may have the ability to distinguish other's perspective from one's own, and select relevant perspective while inhibiting irrelevant one to calculate perspectives.

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