# Variability in the content of mind wandering is associated with intrinsic connectivity within the default network

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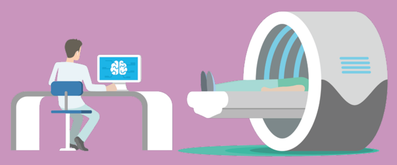
Spontaneous cognition is supported by dynamic interactions within the ***default network*** (Raichle et al., 2001), which is comprised of a central hub that represents information about the self, and two distinct subsystems that characterize the content of internally-generated thoughts – the ***dorsomedial subsystem***, which is involved in mentalizing and conceptual processing, and the ***medial temporal subsystem***, which is involved in constructive mental simulation (Andrews-Hanna et al., 2010; 2014).

Though these neural dissociations have been validated using introspective tasks, it is unclear whether the general content of mind wandering, ***independent of any task***, is reflective of the functional organization within subregions of the default network.

Here, we investigated the relationship between individual variability in the social content of mind wandering and stable patterns of connectivity within the dorsomedial subsystem of the default network.

## Procedure



**Time 1**
*(n = 51)*

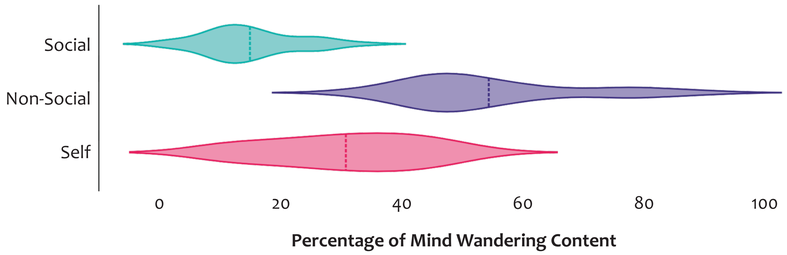
*6-min resting-state fMRI scan*

*approximately 8 months later*

**Time 2**
*(n = 32)*

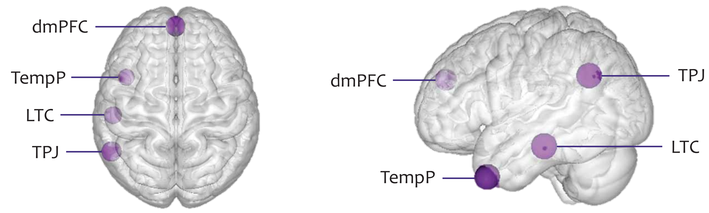
*Questionnaire about the general content of mind wandering during various activities*

## Mind Wandering Content Analyses



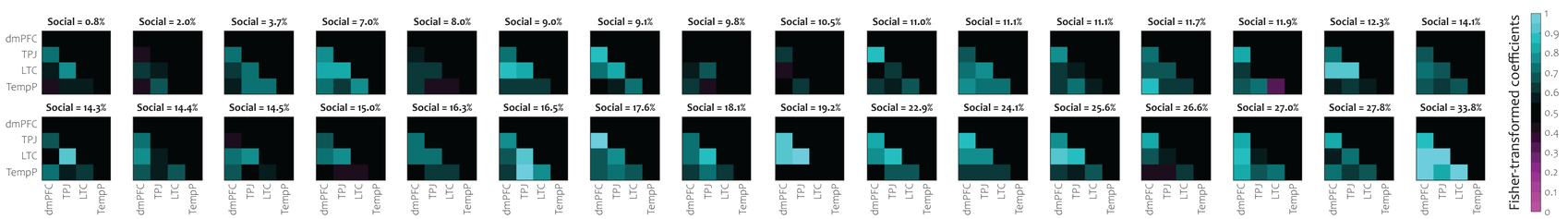

Self-reported content of mind wandering was independently rated as social, non-social, or self-related. Overall percentage of content when mind wandering was then calculated for each individual.

## fMRI Analyses

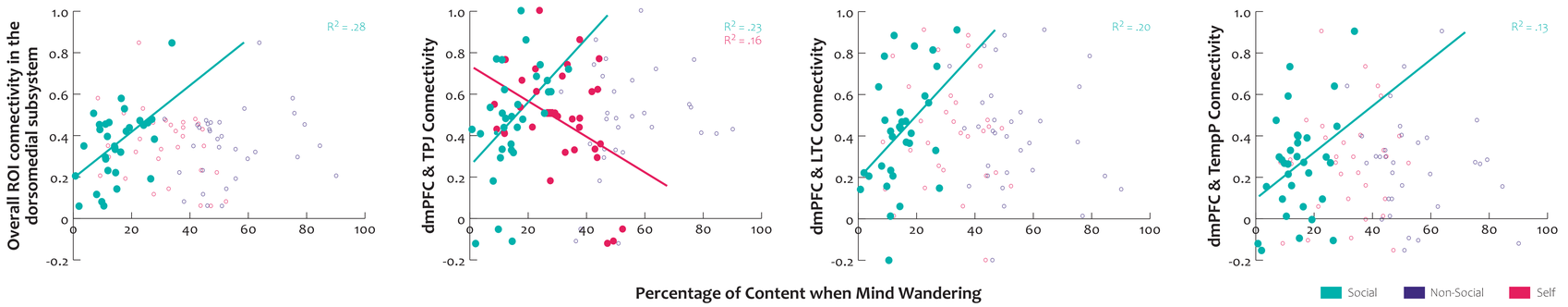



Four 8mm left-lateralized regions of interest (ROIs) were created: dorsomedial prefrontal cortex (dmPFC), temporal parietal junction (TPJ), lateral temporal cortex (LTC), & temporal pole (TempP).

## Does overall social content when mind wandering relate to connectivity within the dorsomedial subsystem?




ROI-to-ROI matrices showed greater co-activation within the dorsomedial subsystem with increased social content during mind wandering.




Percentage of social content when mind wandering was positively related to overall connectivity within the dorsomedial subsystem (β=.39) and between the dmPFC and TPJ (β=.48), LTC (β=.44), and TempP (β=.37), regions associated with socially-directed thoughts and mentalizing. Importantly, this relationship did not consistently hold for percentage of non-social or self-related content when mind wandering.

**Task-independent content of mind wandering** is reflective of stable connections within the functional organization of the default network.

*All questions and comments can be directed to effie.pereira@mail.mcgill.ca and lauri.gurguryan@mail.mcgill.ca*