Running list of regions of interest in IPD fMRI.

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**from current-study Choice contrasts (bichoice and monochoice models).**

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**ChoiceALL (Coop+Defect) > Baseline**

\*Right Thalamus (strong cluster SR>SD) (in both choice models)

Posterior Insula

Right Insula (in monochoice model)

Cerebellum (suggesting motor preparation in choice cons) (both choice models)

Left lingual gyrus (in both choice models)

Precuneus (increased in SD) (in both choice models)

\*Bilateral Inferior Parietal (increased in SD) (in both choice models)(strong cluster SD>SR)

Angular Gyrus (increased in SD)

Right Middle (not medial) Temporal (increased in SD) (both choice models)

\*Right superior temporal (increased in SD) (in both choice models)(strong cluster SD>SR)

Right Middle Frontal (increased in SD)(in both choice models)

\*Right Mid Cingulate (increased in SD) (in both choice models) (strong cluster SD>SR)

Bilateral ACC (increased in SD) (in monochoice model)

Right post-central (increased in SD) (in both choice models)

\*Right Supramarginal (increased in SD) (in monochoice model) (strong cluster SD>SR)

Right Inferior Temporal (increased in SD) (in monochoice model)

Right Caudate (increased in SD) (in monochoice model)

Left Inferior Frontal Gyrus (increased in SD) (in monochoice model)

**Cooperation > Baseline**

Bilateral Angular Gyrus (increased in SD)

Right Middle Temporal (increased in SD)

Inferior Temporal (increased in SD)

Right Superior Temporal (increased in SD)

Medial Frontal (increased in SD)

Middle Frontal (increased in SD)

Right Mid Cingulate (increased in SD)

Left Post-central (increased in SD)

Precuneus (increased in SD)

Lingual Gyrus

Cerebellum

Right Thalamus

**Defection > Baseline**

Cerebellum

Right parahippocampal / fusiform

Right hippocampus

Right Superior/Middle Temporal (increased in SD)

Right Caudate (increased in SD)

Right ACC (increased in SD)

Left Mid Cingulate (increased in SD)

Left Mid Frontal (increased in SD)

Left Superior Frontal (increased in SD)

Right Angular Gyrus (increased in SD)

Right Precentral (increased in SD)

Right postcentral (increased in SD)

Bilateral inferior parietal (increased in SD)

**Coop > Defect**

Right Inferior Temporal (increased in SD)(in both choice models)

Right Middle Temporal (increased in SD)

\*Right Superior Temporal (in both choice models)(strong cluster SR>SD)

\*Right Thalamus (in both choice models)

Frontal Operculum (increased in SD)

\*Right Superior Occipital (increased in SD)(in both choice models)

Left Middle Frontal (increased in SD)

Left Precentral (in both choice models)

\*Left Superior Frontal (increased in SD)

Left Superior Frontal (note: different cluster than above) (SR>SD in monochoice)

\*Superior Medial Frontal / SMA (in both choice models)(strong cluster SR>SD)

Left Angular Gyrus (increased in SD) (in monochoice)

**Defect > Coop**

\*Right Inferior Temporal (in both choice models)(strong cluster SR>SD)

Bilateral Angular Gyrus (in both choice models)

\*Right Superior Temporal (increased in SD)(in both choice models)

Right Thalamus (increased in SD)

Right Frontal Operculum (in both choice models)

Left Middle Frontal (in both choice models)

Left Precentral (increased in SD)(in both choice models)

\*Superior Medial Frontal / SMA (increased in SD) (in both choice models)

\*Right Thalamus (increased in SD) (monochoice)

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**From literature**

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* **Nucleus Accumbens –** Activated for reinforcing symmetrical social behaviors (CC or DD outcomes).
* **Caudate Nucleus (R) –** CC>other outcomes; CC,DD>other outcomes; Player(C) given prior Partner (C) (XC,CX);
* **Ventromedial PFC -** Activated for reinforcing symmetrical social behaviors (CC or DD outcomes).
* **Orbitofrontal PFC -** Activated for reinforcing symmetrical social behaviors (CC or DD outcomes).
* **rACC / sub-genual ACC –** Activated for reinforcing symmetrical social behaviors (CC or DD outcomes). CC>else;
* **L\_post central gyrus (BA 1/3) –** CC,DD > other outcomes; CC>other outcomes;
* **R central sulvus (BA4) –** CC,DD > other outcomes
* **R medial frontal gyrus (BA11) –** CC,DD > other outcomes; CC>else;
* **L/R paracentral lobule (BA7) –** CC > other outcomes
* **L superior temporal gyrus (BA22/42) –** CC>else; ToM / Reponse to Partner C
* **L\_insula –** CC>else;
* **L/R OFC (BA11) –** CC>else;
* **L Ant insula –** CC>else;
* **L frontal pole (BA10) –** CC>else;
* **R post-central gyrus --** (XC,CX)
* **R ACC / DMPFC (BA32) --** (XC,CX); ToM / Reponse to Partner C
* **R collateral sulcus --** (XC,CX);

*see: Rilling et al., 2002 – A Neural Basis for Social Cooperation*

* **MPFC** – ToM / Reponse to Partner C
* **TPJ –** ToM / Reponse to Partner C
* **ACC –** ToM / Reponse to Partner C
* **Temporal Pole –** ToM / Reponse to Partner C
* **Precuneus / Posterior Cingulate (BA 7/31)** – ToM / Reponse to Partner C
* **Lingual Gyrus–** ToM / Reponse to Partner C; unreciprocated cooperation
* **Thalamus –** ToM / Reponse to Partner C; unreciprocated cooperation
* **L hippocampus–** ToM / Reponse to Partner C
* **L putamen–** ToM / Reponse to Partner C
* **R Superior frontal gyrus (BA8) –** ToM / Reponse to Partner C

*See: Rilling et al., 2004 – The neural correlates of theory of mind within interpersonal interactions.*

* **Anterior Insula** – unreciprocated cooperation
* **Mid frontal gyrus (BA9) –** unreciprocated cooperation
* **L amygdala**  -- unreciprocated cooperation
* **Lateral OFC (connectivity with insula)** – unreciprocated cooperation CD outcome

*Rilling et al., 2008 – The neural correlates of the affective response to unreciprocated cooperation*

* **Increased Anterior Insula –** unreciprocated coop > reciprocated coop
* **Increased left hippocampus –** unreciprocated coop > reciprocated coop
* **Increased left lingual gyrus –** unreciprocated coop > reciprocated coop
* **Connectivity (AntIns~LOFC)** – predicts subsequent defection following unreciprocated cooperation.

**See also:** *Opposing BOLD responses to reciprocated and unreciprocated altruism in putative reward pathways*

* **vmPFC / rACC**
* **striatum / subgenual ACC**

*Sanfey 2007 – Social Decision-Making: Insights from Game Theory and Neuroscience (revie)*

* **Striatum (NAcc, caudate, putamen)**
* **DLPFC – see also:** Soutschek et al., The importance of the lateral PFC for strategic decision making in the PD. 2015. [*TMS to DLPFC reduces cooperation following CD trials*]
* **MPFC**
* **OFC**
* **ACC**
* **PCC**
* **Insula**
* **Amygdala**