Supplementary Online Content

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eAppendix. Computation of literature-based probabilistic region of interests.

eReferences.

This supplementary material has been provided by the authors to give readers additional information about their work.

eAppendix. Computation of literature based probabilistic region of interests

A Region of Interest (ROI) for the ventral striatum was created combining anatomical hypotheses with functional findings as reported in literature for comparable experimental designs. To this end, firstly we created an anatomical ROI for the basal ganglia (as provided by the Automated Anatomical Labeling (AAL) brain atlas, Tzourio-Mazoyer et al., 2002). Secondly, spatial coordinates for this ROI were taken from fMRI publications from reward anticipation contrast of healthy volunteers (Abler et al., 2007, 2006; Bjork and Hommer, 2007; Bjork et al., 2010, 2004; Cooper and Knutson, 2008; Dichter et al., 2012; Dillon et al., 2008; Dreher et al., 2008; Elliott et al., 2000; Ernst et al., 2004; Figee et al., 2011; Galvan et al., 2007, 2005; Hoogman et al., 2011; Jones et al., 2011; Juckel et al., 2006; Kappel et al., 2013; Kirsch et al., 2003; Knutson and Greer, 2008; Knutson and Wimmer, 2007; Knutson et al., 2008, 2005, 2004, 2001a, 2001b; Kuhnen and Knutson, 2005; Martino et al., 2009; Ossewaarde et al., 2011; Samanez-Larkin et al., 2007; Schlagenhauf et al., 2008; Schmack et al., 2008; Spicer et al., 2007; Stoy et al., 2012; Ströhle et al., 2008; Wrase et al., 2007a, 2007b; Xue et al., 2010; Yau et al., 2012; Yu et al., 2010). Based on this data set, we created the ROI in a three-step process (Schubert et al., 2008):

(1) The probability that a voxel at a given position within an anatomical ROI showed neural activity regarding the corresponding literature was estimated by calculating a 3D normal (Gaussian) distribution G(x, y, z) as follows (Turkeltaub et al., 2002):

$$G(x,y,z) = \frac{1}{2\pi\sqrt{|Det(C)|}} \exp\left(-\frac{1}{2}\begin{bmatrix} x-\bar{x} & y-\bar{y} & z-\bar{z} \end{bmatrix}\right) C^{-1} \begin{bmatrix} x-\bar{x} \\ y-\bar{y} \\ z-\bar{z} \end{bmatrix}$$

where C is the covariance matrix for all coordinate triples x, y, z from the underlying literature and $\bar{x}$, $\bar{y}$, $\bar{z}$ are the mean values of the x, y, and z coordinates, respectively (Nielsen and Hansen, 2002).

(2) The outer limits of the finally used ROI were defined by the outer limits of the anatomical ROI and a threshold of three standard deviations of the resulting 3D distribution.

(3) Finally, a binary mask including all voxels within these boundaries was formed.

Note: The script for generating the probabilistic ROIs (written in Matlab by author TW and compatible with SPM8) and the full lists of coordinates used for ROI generation can be obtained from the authors upon request.

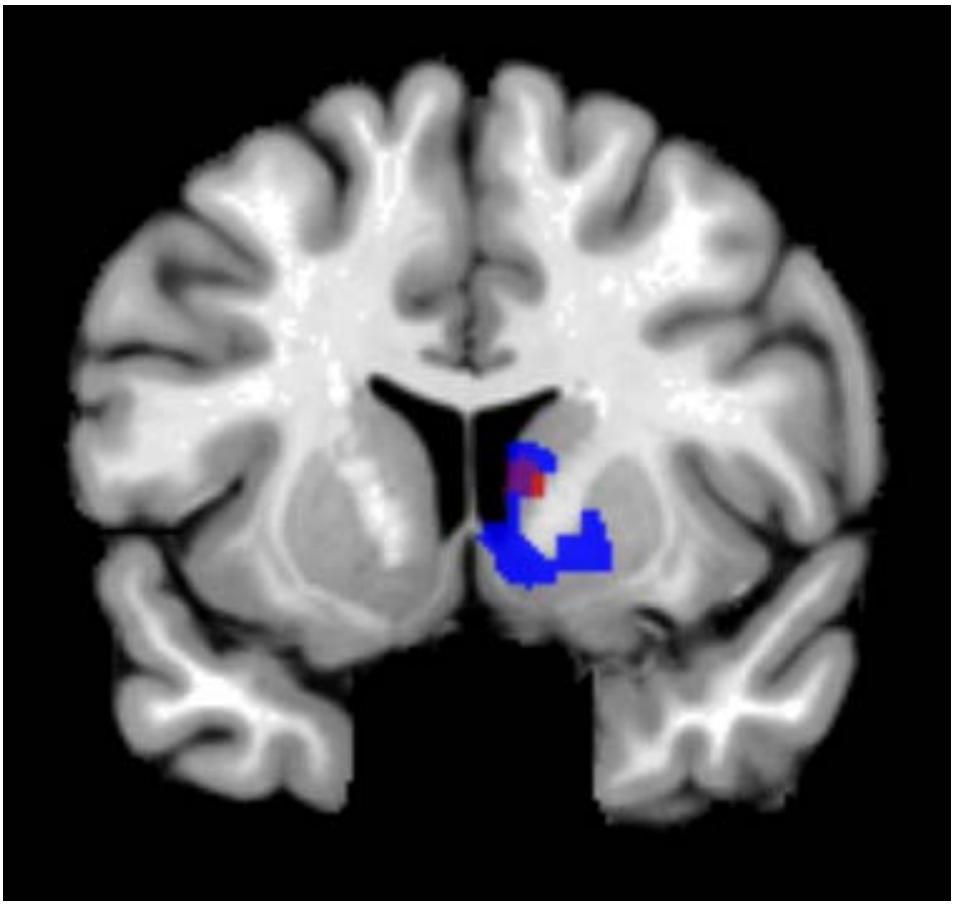

Figure S1: Literature based ROI is depicted in blue and the grey matter region in right caudate identified in the voxel-based morphometry analysis is depicted in red.

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