

## **Supplementary Materials for**

Folk Explanations of Behavior:  
A Specialized Use of a Domain-General Mechanism

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## 1. Supplemental Results

### 1.1. Within-Subject Performance Effects

Table S1 provides descriptives for task performance as a function of both Question Type (Why vs. How) and Stimulus Domain (Nonsocial vs. Emotion vs. Action). When examining the effect of these two factors on response accuracy, a repeated measures analysis of variance (ANOVA) revealed a main effect of Question Type,  $F(1, 18) = 39.55$  ( $p < .001$ ); a main effect of Stimulus Domain,  $F(2, 36) = 14.96$  ( $p < .001$ ); and an interaction effect,  $F(2, 36) = 23.64$  ( $p < .001$ ). Similarly, when examining their effects on response time (RT) for accurate judgments, a repeated measures ANOVA similarly revealed a main effect of Question Type,  $F(1, 18) = 52.74$  ( $p < .001$ ); a main effect of Stimulus Domain,  $F(2, 36) = 41.47$  ( $p < .001$ ); and an interaction effect,  $F(2, 36) = 10.51$  ( $p < .001$ ). These effects highlight the importance of controlling for the effects of within-subject performance variability on the measured fMRI signal. As described in the main text, each participant's model included regressors that model such variability as it occurs across the experimental conditions.

**Table S1**Performance outcomes for the Social/Nonsocial Why/How Task ( $N = 19$ ).

	Percent Correct				Response Time (ms)			
	Why		How		Why		How	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Nonsocial	95.41	3.23	98.60	2.05	854	157	788	134
Emotion	90.52	4.05	97.31	3.07	960	153	799	139
Action	95.31	5.19	93.10	4.14	981	159	918	135

**Table S2**

Whole-brain results for the simple contrasts that were used to test the conjunction hypotheses presented in the main text (N = 19). Clusters were identified using a cluster-forming threshold of  $p < .001$  (uncorrected) and a cluster-level family-wise error rate of 0.05. Within each cluster, we report all local maxima separated by at least 24 mm. Clusters were automatically labeled based on the Automated Anatomical Labeling (AAL) atlas. x, y, and z = Montreal Neurological Institute (MNI) coordinates in the left-right, anterior-posterior, and inferior-superior dimensions, respectively.

Effect Name Region Name	L/R	Extent	t-value	MNI Coordinates		
				x	y	z
<i>Expression-Why &gt; Expression-How</i>						
Inferior Orbitofrontal	L	1064	10.817	-45	24	-9
Middle Temporal	L	1064	7.815	-51	-39	0
Middle Temporal	L	1064	6.687	-57	-9	-21
Middle Frontal	L	1064	4.111	-42	18	39
Superior Frontal	L	1165	9.999	-12	36	54
Superior Medial Prefrontal	L/R	1165	9.983	0	51	36
Superior Medial Prefrontal	R	1165	6.464	12	57	12
Angular	L	175	9.589	-51	-66	24
Temporal Pole	R	87	8.537	45	15	-33
Lingual	R	135	7.874	30	-54	0
Cerebellum	R	182	7.127	18	-81	-33
Cerebellum	L	92	5.678	-24	-81	-33
Posterior Cingulate	L/R	77	5.434	0	-51	30
Inferior Orbitofrontal	R	223	5.356	39	27	-9
Inferior Frontal (Triangularis)	R	223	5.352	60	24	9
<i>Action-Why &gt; Action-How</i>						
Superior Medial Prefrontal	L	4539	12.821	-6	45	36
Middle Frontal	L	4539	10.545	-42	15	42
Middle Temporal	L	4539	10.229	-54	3	-30
Anterior Cingulate	L	4539	9.617	-3	33	9
Middle Orbitofrontal	L	4539	9.357	-3	60	-9
Superior Medial Prefrontal	L	4539	9.352	-6	33	57
Superior Medial Prefrontal	R	4539	9.211	12	54	18
Inferior Orbitofrontal	L	4539	8.447	-39	27	-9
Inferior Frontal (Triangularis)	L	4539	6.998	-54	24	15
Superior Frontal	R	4539	5.961	18	27	51
Hippocampus	L	4539	5.193	-33	-9	-21
Posterior Cingulate	L	673	11.799	-9	-48	30
Angular	L	521	11.748	-48	-66	27
Cerebellum	R	223	8.159	27	-81	-33
Inferior Frontal (Triangularis)	R	311	7.749	57	30	15
Middle Frontal	R	311	5.225	45	27	36
Inferior Orbitofrontal	R	138	7.554	42	33	-15

Cerebellum	L	226	7.471	-18	-84	-33
Cerebellum	L	226	4.832	-45	-75	-33
Angular	R	154	6.825	54	-63	30
Cerebellum	R	75	6.534	3	-54	-42
Caudate	L	171	5.829	-3	3	3
Cuneus	R	183	5.531	12	-96	15
Middle Temporal	R	102	5.137	51	-6	-24
Middle Temporal	L	70	5.098	-57	-33	-6

*Nonsocial-Why > Nonsocial-How*

Middle Temporal	L	87	8.550	-63	-39	0
Middle Temporal	L	210	7.298	-54	3	-21
Precuneus	L	97	6.414	-3	-54	15
Inferior Frontal (Triangularis)	R	191	6.117	57	27	18
Inferior Frontal (Opercularis)	R	191	4.644	42	15	33
Middle Frontal	L	83	5.832	-42	18	54
Inferior Orbitofrontal	L	117	5.510	-51	36	-12
Inferior Frontal (Triangularis)	L	117	5.188	-45	24	12
Angular	L	171	5.479	-45	-69	33
Superior Medial Prefrontal	L	72	5.376	-9	45	51
Angular	R	59	4.925	45	-72	39
Cerebellum	R	60	4.336	21	-81	-30

*[Expression-Why > Nonsocial-Why] > [Expression-How > Nonsocial-How]*

Inferior Frontal (Triangularis)	L	139	6.575	-54	24	9
Superior Medial Prefrontal	L	356	6.245	-9	57	18
Supplementary Motor Area	L	356	6.074	-6	24	57

*[Action-Why > Nonsocial-Why] > [Action-How > Nonsocial-How]*

Superior Frontal	L	2044	9.896	-12	54	27
Anterior Cingulate	L	2044	8.610	-6	33	9
Superior Frontal	R	2044	7.286	18	51	9
Middle Orbitofrontal	L	2044	6.377	-6	66	-6
Superior Frontal	R	2044	4.903	15	39	57
Angular	L	257	8.574	-48	-63	24
Precuneus	L	252	6.621	-6	-54	30

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**Table S3**

Details for the Region of Interest (ROI) analyses presented in Tables S4-S5. The ROIs shown here are visually depicted in Figure 2.

ROI Name	Extent	MNI Coordinates (Peak)		
		x	y	z
Dorsomedial PFC	299	-6	57	36
Ventromedial PFC	171	0	57	-12
Lateral OFC	149	-48	27	-6
TPJ	152	-48	-66	30
Anterior STS	189	-57	-9	-18
Precuneus	189	-3	-48	30

**Table S4**

Results of region of interest (ROI) based domain-general t-tests. Regions that independently show an association with Why > How for all three stimulus categories are noted with an asterisk. As described in the main text, we report *p*-values after adjusting for multiple ROIs using a false-discovery rate procedure. ROI details can be found in Table S3.

ROI	Why > How Test Outcome											
	Nonsocial				Emotion				Action			
	t-stat	<i>p</i> <sub>ADJ</sub>	95% CI		t-stat	<i>p</i> <sub>ADJ</sub>	95% CI		t-stat	<i>p</i> <sub>ADJ</sub>	95% CI	
Dorsomedial PFC*	3.372	0.012	0.026	0.100	9.379	<.001	0.109	0.175	11.725	<.001	0.216	0.301
Ventromedial PFC	2.615	0.052	0.018	0.103	0.991	0.821	0.027	0.078	7.608	<.001	0.167	0.280
Lateral OFC*	4.181	0.003	0.061	0.154	10.683	<.001	0.170	0.244	7.203	<.001	0.141	0.251
TPJ*	5.536	<.001	0.064	0.132	6.272	<.001	0.083	0.153	6.540	<.001	0.106	0.194
Anterior STS*	4.946	0.001	0.060	0.132	5.572	<.001	0.065	0.133	11.352	<.001	0.232	0.326
Precuneus	1.807	0.215	0.005	0.075	3.867	0.003	0.039	0.115	10.281	<.001	0.157	0.229

**Table S5**

Results of region of interest (ROI) based domain-specific t-tests. Regions that independently show a stronger association for Social compared to Nonsocial attributions in both Social stimulus categories are noted with an asterisk. As described in the main text, we report  $p$ -values after adjusting for multiple ROIs using a false-discovery rate procedure. ROI details can be found in Table S3.

ROI	[(Why <sub>Social</sub> > How <sub>Social</sub> ) > (Why <sub>Nonsocial</sub> > How <sub>Nonsocial</sub> )] Test Outcome							
	Emotion				Action			
	t-stat	$p_{ADJ}$	95% CI		t-stat	$p_{ADJ}$	95% CI	
Dorsomedial PFC*	4.240	0.007	0.046	0.124	6.400	<.001	0.146	0.263
Ventromedial PFC	-1.130	1.000	-0.102	0.010	4.764	<.001	0.100	0.234
Lateral OFC	3.915	0.008	0.041	0.149	2.224	0.115	-0.013	0.177
TPJ	0.393	1.000	-0.033	0.041	6.880	<.001	0.134	0.232
Anterior STS	0.661	1.000	-0.032	0.064	1.888	0.184	-0.003	0.107
Precuneus	1.517	0.718	-0.015	0.087	5.471	<.001	0.106	0.215



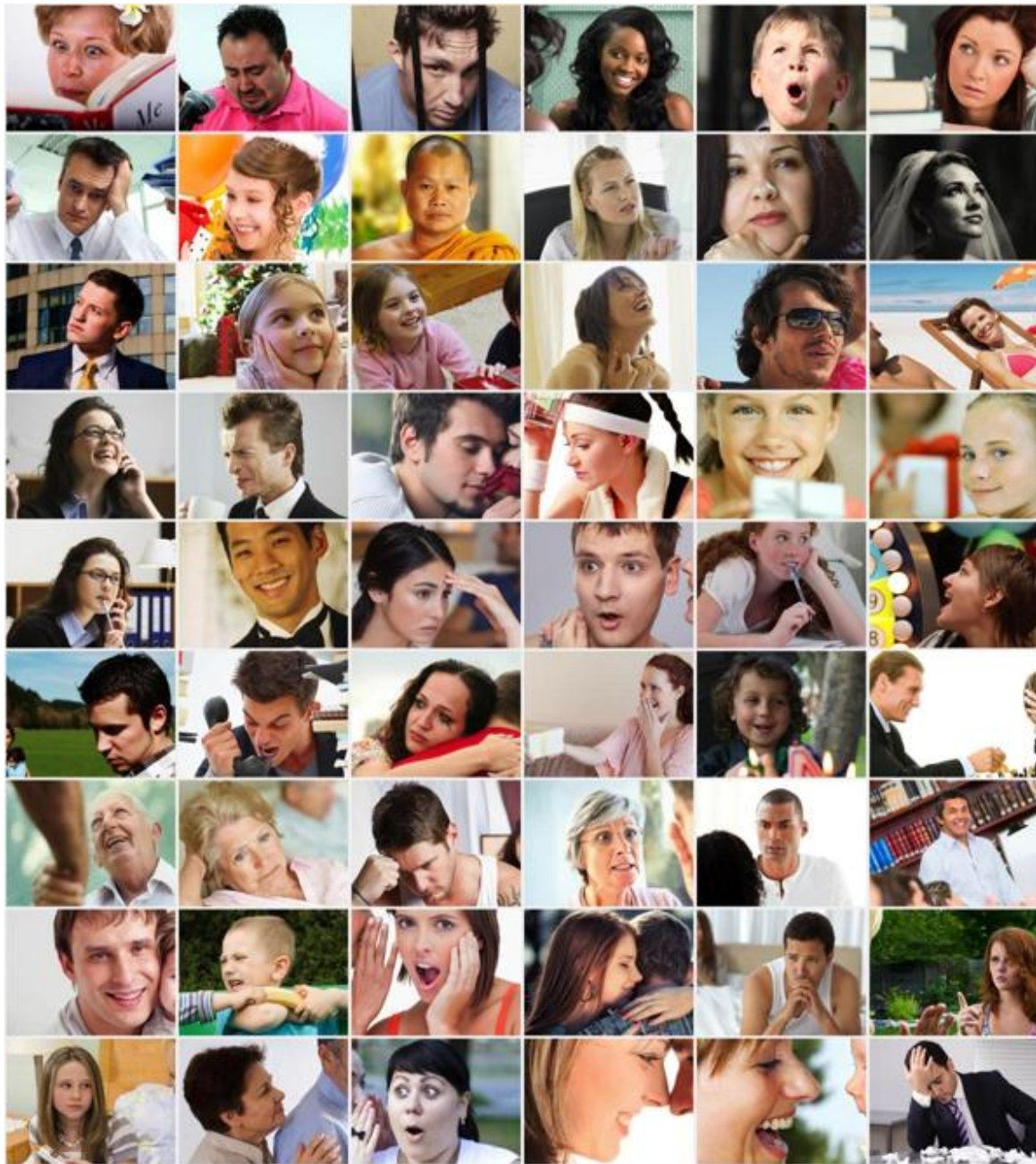
**Table S6**

Zero-order correlations among variables included in the exploratory analysis of individual differences in dorsomedial prefrontal cortex (DMPFC) activity related to performing social or nonsocial attributions; total accuracy for the social and nonsocial attribution tasks; and self-reported scores on the Empathy Quotient, Social Curiosity Scale, and the Attributional Complexity Questionnaire.

	1	2	3	4	5	6	7
1 DMPFC (Social Attribution)	-	0.11	0.59**	0.20	-0.29	-0.07	-0.24
2 DMPFC (Nonsocial Attribution)	0.11	-	0.31	0.70***	0.57*	0.66**	0.59**
3 Accuracy (Social Attribution)	0.59**	0.31	-	0.53*	-0.20	-0.10	-0.15
4 Accuracy (Nonsocial Attribution)	0.20	0.70***	0.53*	-	0.51*	0.30	0.21
5 Empathy Quotient	-0.29	0.57*	-0.20	0.51*	-	0.61**	0.49*
6 Social Curiosity	-0.07	0.66**	-0.10	0.30	0.61**	-	0.71***
7 Attributional Complexity	-0.24	0.59**	-0.15	0.21	0.49*	0.71***	-

*Note.*  $N = 19$ ; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Figure S1.** The set of facial expression photographs used in the study.



**Figure S2.** The set of intentional action photographs used in the study.



**Figure S3.** The set of nonsocial scene photographs used in the study.

