**Figure S1.** Statistical parametric maps of the proactive control (B > A Cue) contrast for each AX protocol version (AX-1 and AX-2) across all participants. Significant activation was observed in the superior parietal cortex (SPC) and dorsolateral prefrontal cortex (DLPFC) in each protocol version (see Supplementary Table 2 for peak p values, peak t values, and cluster sizes at threshold). Maps thresholded at voxelwise p < 0.001, cluster size k > 10 voxels and masked with an inclusive gray matter mask for visualization.
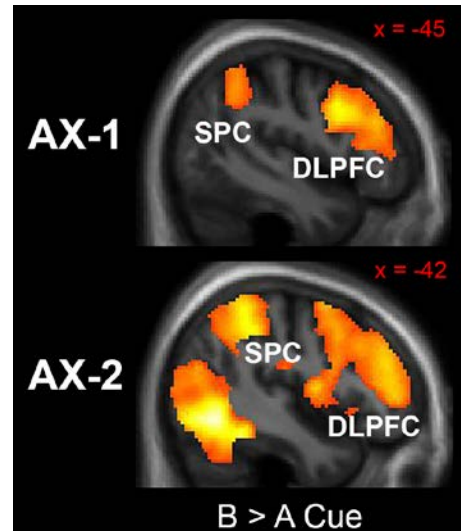
Table S1A. Task parameters for AX-CPT Protocols 1 (AX-1) and 2 (AX-2). Abbreviations: ISI = Interstimulus Interval, ITI = Intertrial Interval.

Protocol	%AX/AY/BX/BY Trials	Total Trials	Cue Duration (ms)	Probe Duration (ms)	ISI (ms)	ITI (ms)	Total Time
AX-1	70/10/12.5/7.5	4x40 = 160	500	500	3500	9500	37m 20s
AX-2	60/10/15/15	5x40 = 200	500	500	2200-3500 (jittered)	1700-14500 (jittered)	30m 20s

Table S1B. Scanning parameters for AX-CPT Protocols 1 (AX-1) and 2 (AX-2).

Protocol	Scanner	TR (ms)	TE (ms)	Flip Angle	FOV (cm)	# Slices	Resolution (mm)	Acquisition
AX-1	1.5T Signa (GE Healthcare)	2000	40	90°	22x22	24	3.40x3.40x4.00	Contiguous, Interleaved
AX-2	3.0T Tim Trio (Siemens)	2000	29	77°	24x24	32	3.75x3.75x3.5	Contiguous, Interleaved

Table S2. Comparison of patients with vs. without follow-up clinical data on primary proactive control measures of interest and baseline BPRS score. Proactive control measures were adjusted for protocol version prior to analysis (see Methods). Numbers in parentheses represent the standard deviation.

	With Follow-Up	Without Follow-Up	t (*p*)
D-Prime Context	-0.24 (1.10)	-0.24 (1.06)	0.04 (0.97)
DLPFC ROI BOLD (B > A Cue)	-0.16 (0.96)	-0.14 (1.04)	0.15 (0.88)
SPC ROI BOLD (B > A Cue)	-0.13 (0.96)	-0.24 (1.03)	0.72 (0.47)
Baseline BPRS Total	42.74 (9.69)	41.28 (9.91)	0.97 (0.33)

Table S3. Whole-brain results showing significant (height $p < 0.001$, whole-brain cluster $p_{FDR} < 0.05$) activation for the B > A contrast (correct trials only) in expected brain regions for each protocol version (AX-1 and AX-2) across all participants.[a]

Protocol Version	Brain Region	Hemi	Cluster p_{FDR}	Cluster Size (Voxels) at Voxelwise $p < 0.001$	Peak x,y,z	Peak p	Peak t
AX-1	DLPFC	L	<0.001	1909	-48, 8, 34	<0.001	6.93
AX-1	SPC	R	<0.001	2364	34, -68, 52	<0.001	6.13
AX-1	DLPFC	R	<0.001	1085	54, 12, 36	<0.001	5.84
AX-1	SPC	L	<0.001	1716	-28, -72, 46	<0.001	5.36
AX-2	DLPFC	R	<0.001	69931 (contiguous cluster)[b]	52, 14, 38	<0.001	9.16
AX-2	SPC	R	<0.001		54, -34, 52	<0.001	10.01
AX-2	DLPFC	L	<0.001		-50, 8, 26	<0.001	7.51
AX-2	SPC	L	<0.001		-52, -38, 50	<0.001	8.05

[a] Abbreviations: ACC = Anterior Cingulate Cortex, DLPFC = Dorsolateral Prefrontal Cortex, SPC = Superior Parietal Cortex.

[b] Left/Right SPC and DLPFC break into separate clusters at higher significance thresholds.

Table S4. Raw behavioral and functional data segregated by protocol version for the final sample (controls and patients with follow-up clinical data). Numbers in parentheses represent the standard deviation.

Primary Measures (Used for Logistic Regression)	AX-1	AX-2
D-Prime Context	3.31 (0.83)	2.86 (0.79)
DLPFC ROI BOLD (B > A Cue)	0.24 (0.96)	0.55 (0.93)
SPC ROI BOLD (B > A Cue)	0.54 (1.01)	0.95 (1.37)
Auxiliary Measures (Not Used for Logistic Regression)		
Accuracy (%)		
AX Trials	96.08 (6.02)	92.10 (7.03)
AY Trials	82.31 (19.20)	79.18 (16.55)
BX Trials	89.61 (12.45)	88.66 (11.08)
BY Trials	97.71 (5.54)	96.08 (6.98)
Reaction Time		
AX Trials	576.38 (140.39)	460.61 (77.12)
AY Trials	747.37 (150.69)	577.64 (90.11)
BX Trials	678.35 (235.04)	471.05 (125.46)
BY Trials	607.76 (173.64)	470.77 (103.82)