

Supplementary Material for:

Combined Varenicline and Naltrexone Attenuates Alcohol Cue-Elicited Activation in Heavy Drinking Smokers

Erica N. Grodin¹, Elizabeth M. Burnette^{1,2}, ReJoyce Green¹, Aaron C. Lim¹, Karen Miotto³, Lara A. Ray^{1,3,4}

Supplemental Information:

Table S1. Whole Brain Results for Alcohol vs. Beverage Contrast by Medication Condition

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Table S2. Whole Brain Results for Alcohol Cues by Medication Condition

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Table S3. Whole Brain Results for Non-Alcoholic Beverage by Medication Condition

Figure S3. Whole Brain Results for Non-Alcoholic Beverage by Medication Condition

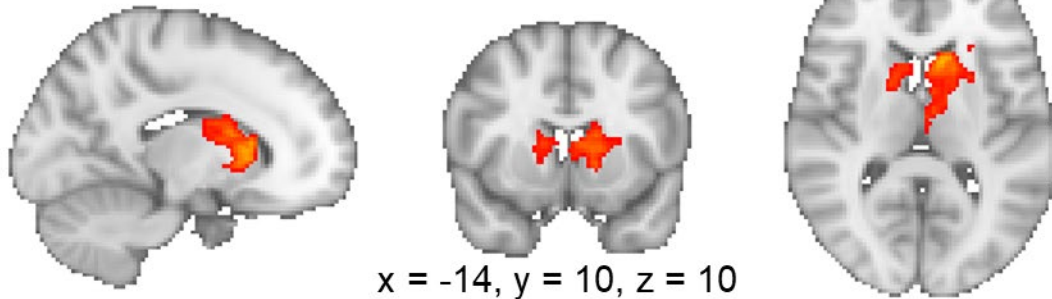
Table S1. Whole Brain Results for Alcohol vs. Beverage Contrast by Medication Condition

Medication Condition	Voxels	Region	x	y	z	Peak Z	p-value
VAR	1212	L Caudate	-10	16	10	5.68	<0.001
VAR + NTX	N/A						
PLAC	5412	Bilateral Cingulate, Posterior Cingulate, Caudate, Midbrain	-2	-20	34	4.88	<0.001
	2733	Bilateral mPFC	-4	62	20	4.36	<0.001
	1917	L Superior Frontal Gyrus	-6	14	68	4.32	<0.001
	438	R Occipital Cortex	12	-74	0	3.90	0.01
	367	L Lateral Occipital Cortex	-42	-58	28	3.91	0.04

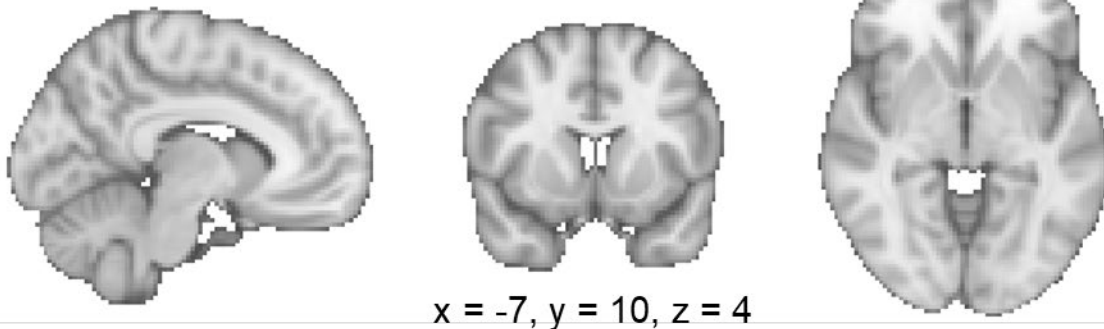
VAR = varenicline; VAR+NTX = varenicline and naltrexone; PLAC = placebo; L = left; R = right; Coordinates are in Montreal Neurological Institute (MNI) space.

Figure S1. (A) The varenicline only group showed increased activation to alcohol cues relative to beverage cues in the bilateral striatum. (B) There were no brain regions which had increased activation to alcohol cues relative to beverage cues in the combined varenicline + naltrexone group. (C) The placebo group showed increased activation to alcohol cues relative to beverage cues in the prefrontal cortex, striatum, and posterior cingulate. Z-statistic maps are whole-brain cluster corrected, $Z > 2.3$, $p = .05$. Coordinates are in Montreal Neurological Institute space. Brain is displayed in radiological convention (L = R).

A. VAR Only



B. VAR+NTX



C. PLAC

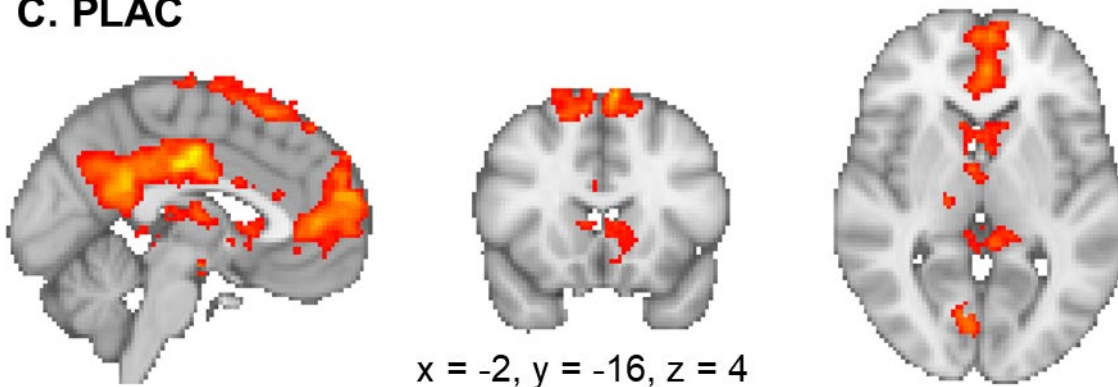


Table S2. Whole-Brain Group Results Alcohol Cues

Comparison	Voxels	Region	X	Y	Z	Peak Z	p-value
Mean Across All Subjects							
	70056	R Lateral Occipital Cortex / Insula / Ventral Striatum / Putamen / Cingulate	40	-86	12	7.63	<0.001
	4456	L Superior Frontal Gyrus / mPFC	-4	68	30	5.76	<0.001
	700	L Orbitofrontal Cortex	-32	34	-10	5.5	0.003
VAR							
	5300	R Lateral Occipital Cortex / Temporal Occipital Cortex / Hippocampus	40	-86	12	6.5	<0.001
	3789	L Superior Frontal Gyrus / Anterior Cingulate / mPFC	-12	54	30	5.33	<0.001
	2693	L Occipital Cortex / Temporal Occipital Cortex / Hippocampus	-26	-62	-6	4.47	<0.001
	481	Bilateral Precentral Gyrus	-6	-30	60	3.98	0.03
VAR+NTX							
	6734	R Lateral Occipital Cortex / Temporal Occipital Cortex / Hippocampus	36	-88	24	5.71	<0.001
	4947	L Lateral Occipital Cortex / Temporal Occipital Cortex / Hippocampus	-28	-98	12	5.62	<0.001
	1534	L Superior Frontal Gyrus	-4	68	26	5.92	<0.001
	1221	Bilateral mPFC	2	38	-18	4.59	<0.001
	964	L Orbitofrontal Cortex	-38	42	-12	4.98	<0.001
PLAC							
	7068	R Temporal Occipital Cortex / Lateral Occipital Cortex / Hippocampus / Thalamus	30	-48	-16	6.42	<0.001
	2309	L Temporal Occipital Cortex / Hippocampus / Thalamus	-30	-54	-12	5.93	<0.001
	2178	L Superior Frontal Gyrus / mPFC / Anterior Cingulate	-8	62	20	4.31	<0.001
	1137	L Lateral Occipital Cortex	-20	-90	20	4.52	<0.001
	680	L Superior Frontal Gyrus	-18	34	56	4.95	0.004
VAR > VAR+NTX							
	1246	R Operculum / Insula / Putamen	56	-22	8	4.5	<0.001
	531	R Postcentral Gyrus	48	-34	58	3.79	0.02
VAR + NTX > VAR							

N/A

VAR > PLAC

N/A

PLAC > VAR

N/A

VAR+NTX > PLAC

N/A

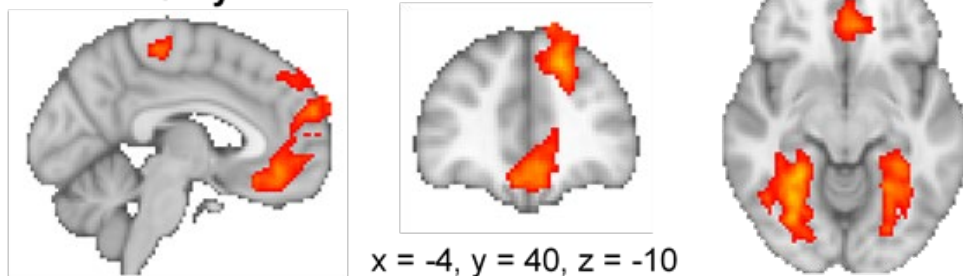
PLAC > VAR+NTX

N/A

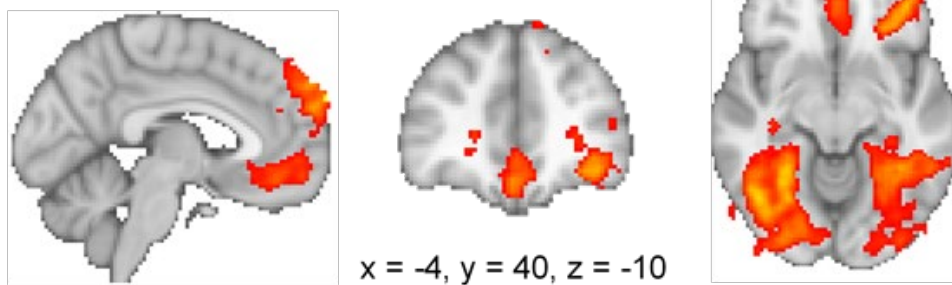
VAR = varenicline; VAR+NTX = varenicline and naltrexone; PLAC = placebo; L = left; R = right;
Coordinates are in Montreal Neurological Institute (MNI) space.

Figure S2. Whole-Brain Group Results Alcohol Cues

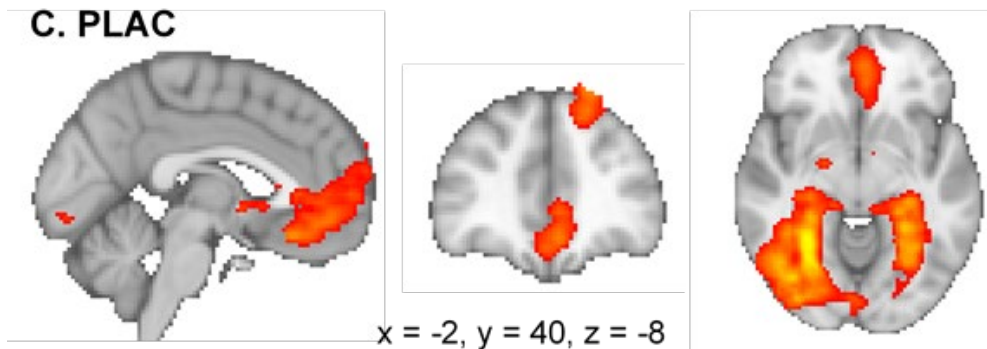
A. VAR Only



B. VAR+NTX



C. PLAC



D. VAR > VAR+NTX

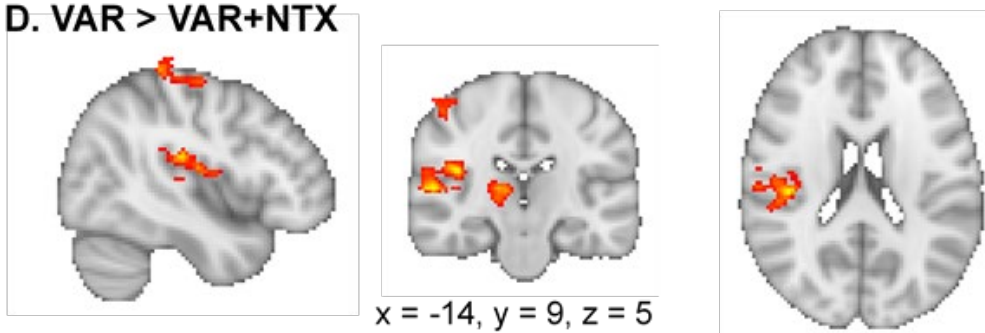


Table S3. Whole-Brain Group Results Non-Alcoholic Beverage Cues

Comparison	Voxels	Region	X	Y	Z	Peak Z	p-value
Mean Across All Subjects							
	92054	Bilateral Posterior Cingulate / Occipital Cortex / Insula / Caudate / Putamen / Cingulate	4	-22	38	7.72	<0.001
	2421	L Orbitofrontal Cortex / mPFC	-28	30	-10	6.19	<0.001
VAR							
	4403	R Lateral Occipital Cortex / Temporal Occipital Cortex / Hippocampus	40	-86	12	6.26	<0.001
	3161	L Temporal Occipital Cortex / Occipital Cortex / Hippocampus	-30	-40	-12	4.94	<0.001
	1670	Bilateral Precentral Gyrus	-6	-32	60	5.04	<0.001
	1369	L Superior Frontal Gyrus	-20	36	38	4.43	<0.001
	877	Bilateral mPFC / Anterior Cingulate Cortex	-6	32	-14	4.05	<0.001
VAR+NTX							
	6754	R Lateral Occipital Cortex / Temporal Occipital Cortex / Hippocampus / Thalamus	38	-86	12	6.29	<0.001
	5940	L Lateral Occipital Cortex / Temporal Occipital Cortex / Hippocampus	-38	-86	6	5.66	<0.001
	1716	L Orbitofrontal Cortex / Middle Frontal Gyrus	-34	38	-10	5.65	<0.001
	1009	L Superior Frontal Gyrus	-6	62	38	5.45	<0.001
	705	Bilateral mPFC / Anterior Cingulate Cortex	0	34	-18	4.63	0.003
PLAC							
	4988	R Temporal Occipital Cortex / Occipital Cortex / Parahippocampus	30	-60	-8	6.04	<0.001
	2372	L Temporal Occipital Cortex / Occipital Cortex / Parahippocampus	-30	-54	-12	5.39	<0.001
	861	L Orbitofrontal Cortex / mPFC / Anterior Cingulate Cortex	-28	30	-10	4.59	<0.001
VAR > VAR+NTX							
	1426	R Postcentral Gyrus	28	-30	76	5.26	<0.001
	709	L Parietal Operculum / Insula	48	-22	22	4.36	0.003
VAR + NTX > VAR							

	530	Lateral Occipital Cortex	50	-62	-20	3.51	0.02
VAR > PLAC							
	4015	R Postcentral Gyrus	16	-42	66	4.58	<0.001
	1940	R Precentral Gyrus	66	-2	28	4.57	<0.001
	1575	L Parietal Operculum / Insula	-42	-34	18	4.64	<0.001
PLAC > VAR							
	N/A						
VAR+NTX > PLAC							
	818	R Temporal Pole	54	10	-28	3.63	<0.001
	594	R Lateral Occipital Cortex	26	-88	26	4.00	0.008
	545	Bilateral Superior Frontal Gyrus	0	56	34	4.29	0.01
	543	L Middle Frontal Gyrus	-50	12	46	3.74	0.01
	509	L Precentral Gyrus	-14	30	72	3.71	0.02
	448	L Lateral Occipital Cortex	-26	-86	32	3.82	0.04
PLAC > VAR+NTX							
	N/A						
Age +							
	N/A						
Age -							
	N/A						

VAR = varenicline; VAR+NTX = varenicline and naltrexone; PLAC = placebo; L = left; R = right; Coordinates are in Montreal Neurological Institute (MNI) space.

Figure S3. Whole-Brain Group Results Non-Alcoholic Beverage Cues

