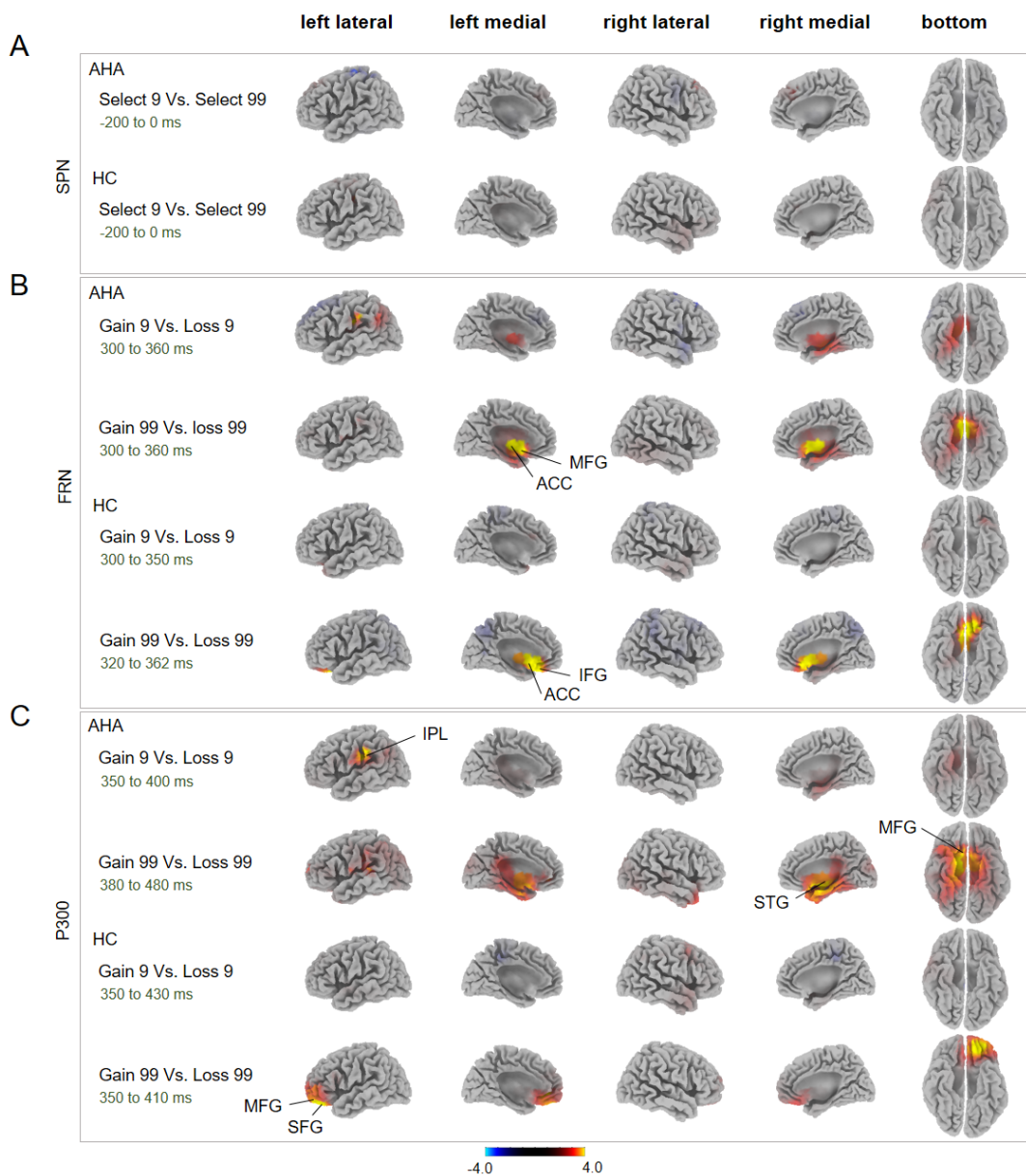


*Supplementary Material*

**Abstinent heroin addicts tend to take risks: ERP and source localization**



**Figure S1 –Within-group comparisons for SPN, FRN and P300 sources.** The t-score maps for within-subjects comparison are shown in low- (select 9) and high-risk (select 99) options for the SPN (up panel, A), FRN (middle panel, B), and P300 (bottom panel, C) of feedback outcomes,

respectively. The brain regions labeled with yellow/red indicate increased activity of the former compared with the latter (e.g. gain vs. loss). Significant brain regions ( $p < 0.05$ , FWE corrected) are indicated on the map. The peak MNI coordinates for the contrast per condition in each group are described in **Supplementary Table S1**. **Abbreviations:** ACC, anterior cingulate cortex; IPL, inferior parietal lobule; IFG, inferior frontal gyrus; MFG, middle frontal gyrus; SFG, superior frontal gyrus; STG, superior temporal gyrus.

**Supplementary Table S1 - Within-subjects comparisons for various ERP sources.**

ERPs	Time (ms)	Condition	Coordinate region	Peak MNI Coordinate			P-value	
<b>AHA</b>								
SPN	-100 - 0	Select 9 Vs. Select 99					0.1502	
FRN	290 - 350	Gain 9 Vs. Gain 99	Postcentral gyrus	-50	-25	30	0.3944	
		Loss 9 Vs. Loss 99						
		Gain 9 Vs. Loss 9	Postcentral gyrus	-50	-25	30		0.0364*
		Gain 99 Vs. Loss 99	ACC	5	5	-5		0.0008**
			MFG	15	10	-20		
			Hippocampus	15	-5	-15		
P300	360-420	Gain 9 Vs. Gain 99	IPL	-60	-25	35	0.0152*	
			Postcentral gyrus	-55	-25	30		
		Loss 9 Vs. Loss 99					0.2142	
		Gain 9 Vs. Loss 9	IPL	-55	-25	30	0.0146*	
			Postcentral gyrus	-60	-25	35		
		Gain 99 Vs. Loss 99	MFG	-15	45	5	0.0046**	
			STG	-50	-30	15		
<b>HC</b>								
SPN	-100 - 0	Select 9 Vs. Select 99					0.1832	
FRN	290 - 350	Gain 9 Vs. Gain 99	MFG	15	-15	60	0.0358*	
			SFG	20	-15	70		
		Loss 9 Vs. Loss 99					0.2392	
		Gain 9 Vs. Loss 9					0.7994	
		Gain 99 Vs. Loss 99	IFG	-20	30	-5	0.0036**	
			ACC	-5	20	-5		
P300	360-420	Gain 9 Vs. Gain 99	MFG	10	-15	60	0.0284*	
		Loss 9 Vs. Loss 99					0.4406	
		Gain 9 Vs. Loss 9					0.5440	
		Gain 99 Vs. Loss 99	SFG	-15	50	-20	0.0090**	
			MFG	-15	45	-20		
			Orbital gyrus	-10	50	-25		

Peak MNI coordinates for **between-subjects comparison between AHAs and HCs**. Clusters surviving FWE-corrected threshold  $p < 0.05$ .

**Abbreviations:** ACC, anterior cingulate cortex; IPL, inferior parietal lobule; IFG, inferior frontal gyrus; MFG, middle frontal gyrus; SFG, superior frontal gyrus; STG, superior temporal gyrus.