Supplemental Materials

Table S1: Self-report measures of emotion regulation
(References cited in Table S1 are numbered by the citations in the manuscript, not by the citations listed below in the supplemental references.)

Scale	Emphasis
Affect Intensity and Reactivity	
Affect Intensity Measure (AIM) (1)	Magnitude of positive and negative emotions (affect intensity)
Affective Lability Scale (ALS) (2)	Affect reactivity
Affective Modulation	
'Emotional Control' subscale of the Behavioral Regulation Index (BRI) domain of the Behavior Rating Inventory of Executive Function – Adult Version (BRIEF-A) (3, 4)	Ability to properly regulate behavioral and emotional impulses; whether or not someone experiences excessive periods of emotional upset
'Shift' subscale of the BRI domain of the BRIEF-A (3, 4)	Ability to actively shift/alter maladaptive problem-solving strategies; ability to tolerate change
Self Monitor' subscale of the BRI domain of the BRIEF-A (3, 4)	Ability to monitor the effects of one's behaviors on others; degree to which an individual perceives themselves as aware of their effect on others
'Nonacceptance' subscale of the Difficulties in Emotion Regulation Scale (DERS) (5)	Tendency to have negative secondary emotional responses to one's distress
'Clarity' subscale of the DERS (5)	Extent to which individuals know and are clear about the emotions they are experiencing
'Awareness' subscale of the DERS (5)	Tendency to attend to and acknowledge negative emotions
'Strategies' subscale of the DERS (5)	Degree to which someone believes there is little to do when one experiences negative emotions
Perceived Stress Scale (PSS) (6)	Degree to which situations in one's life are perceived as stressful
Trier Social Stress Task (TSST) (7)	Degree of negative affective response tests affective modulation processes, as the stressor is present for an extended period of time, naturally engaging these processes
Personalized Stress Task (8)	Emotional (anxiety/craving) response to personalized stressor
Cognitive Modulation	
Emotion Regulation Questionnaire (ERQ) (9, 10)	1) Ability to change a negative emotion to a positive one (positive reappraisal). 2) Tendency to inhibit expression of emotion (expressive suppression). Degree of positive reappraisal is adaptive; degree of expressive suppression is non adaptive (as measured by mental and physical health) (10).
Behavioral Control	

'Inhibit' subscale of the BRI domain of the BRIEF-A (3, 4)	Ability to inhibit inappropriate thoughts or actions, consider consequences before acting; degree to which one is "in control" of one's self
'Impulse' subscale of the DERS (5)	Ability to stay in control of behavior in setting of experiencing strong emotions
'Goals' subscale of the DERS (5)	Ability to stay in control of behavior in setting of experiencing strong emotions
'Negative urgency' subscale of the UPPS Impulsive Behavior scale (11)	Tendency to act on strong impulses, frequently under conditions of negative affect

Table reproduced from (12).

Table S2: Further details regarding the studies utilizing emotion regulation tasks during functional MRI in individuals with substance use disorders

(References cited in Table S2 are numbered by the citations listed below in supplemental references, not by the citations listed in the main manuscript.)

Study	Subject Numbers by Diagnosis [Gender Distribution; Mean Age in Years (SD)]	Other Subject Details	Task Details and Statistical Analyses	Multiple Comparisons Corrections
Affect Intensity/Reactivity Tasks				
Gilman 2008 (17) *, **, &	12 AUD [(12m), 42(8)], 12 controls [(12m), 38 (7)]	AUD: -Recruited from inpatient unit 3 weeks after admission -Mean (SD) years education 14(2), 17(2) -Mean drinking days/month (SD) 27(6), 3(2) -Mean drinks per drinking day (SD) 16(9), 2(2) -8 AUD with comorbid drug abuse [cocaine (7), cannabis (6), sedatives (2), opioids (2), amphetamine (1) and hallucinogens (1)] -10 AUD with comorbid Axis I diagnosis [mood(4), anxiety(4)] -3 AUD with comorbid Axis II diagnosis (not specified) Controls: -No comorbid drug abuse, Axis I diagnoses, Axis II diagnoses Exclusion criteria: history of delirium tremens or gross neurological disorder, an intelligence quotient less than 80, signs of dementia or Korsakoff's disease, head injury or any serious alcohol-related medical disorder	MANOVA for all 4 conditions as follows: 1) negative pictures with neutral beverage, 2) positive pictures with neutral beverage, 3) negative pictures plus alcohol, 4) positive pictures plus alcohol	Region of interest analysis for amygdala; whole-brain analysis also performed (family wise error $p < .05$ Monte Carlo simulation, cluster size > 6 voxels) but no significant effects found within our regions for whole-brain analysis
O'Daly 2012 (73) *, **, &	29 AUD, 17 with a history of a single detoxification only; less severe) [(11m) 38(10)], 12 with a history of multiple detoxifications, more severe	AUD: -Inpatients -Minimum 2 weeks abstinent -During withdrawal were supported with chlordiazepxide -No benzodiazepine for > 72 hours before scan AUD and controls: -Groups significantly differed on alcohol dependence severity,	Fearful faces. Task 1-Implicit: indicate gender of face. Task 2-Explicit: indicate if expression is fear vs neutral. Condition 1: neutral; condition 2: 50/50 fear/neutral;	Region of interest analysis for amygdala, Whole-brain Greenhouse Geiser corrected $p<.05$.

	[(7m)44(10)], 31 controls (mild to moderate social drinkers) [(16m) 40(9)]	quantity of alcohol consumed, depression and anxiety scores (history of multiple detoxifications > history of a single detoxification > controls), and whether or not they smoked cigarettes (history of a single detoxification > history of multiple detoxifications > controls) <u>Exclusion Criteria:</u> mental, neurological or other chronic disorder, currently undergoing any drug treatment interfering with the scope of the trial	condition 3: all fear. Group effects: analysis tested for differences between all three groups (controls,history of multiple detoxifications and history of a single detoxification) with ANOVA.	
Salloum 2007 (72) *, **, &	11 AUD [(11m) 36(6)], 11 controls [(11m), 36(6)]	<u>AUD:</u> -Mean years drinking (SD) 20(6), 15(6) -Mean drinks per day (SD) 14(6) -Recruited from inpatient unit [days (SD) hospitalization 19(4)] -Mean days since last drink (SD) 28(15) -Comorbid Axis II disorder [obsessive compulsive personality disorder (4), antisocial personality disorder (2), personality disorder not otherwise specified (7), borderline personality disorder (3), histrionic personality disorder (1), avoidant personality disorder (1)] -Comorbid Axis I disorder [mood (6), attention deficit hyperactivity disorder (5), post traumatic stress disorder (2) generalized anxiety disorder (1), social phobia (4)] -Past drug abuse or dependence (8) [sedatives (1), cocaine (6), cannabis (7), hallucinogens (2)] <u>AUD and controls:</u> -Groups significantly differed on conscientiousness scores <u>Controls:</u> -No mental illness including SUD based on the Structured Clinical Interview for DSM Disorders	Faces with 5 emotions: fear, anger, disgust, happy, neutral. Five contrasts tested versus baseline. Ratings of intensity while faces up. In this review we do not report on happy, sad, or neutral trials.	Whole-brain overall $p < 05$, cluster size > 7 voxels, $t > 2.7$. No multiple comparisons correction for 5 tests.

Affective Modulation Tasks				
Potenza 2012 (75) *, **, &	30 cocaine use disorder (14m), 36 controls (18 m), ages 21-50	<u>Cocaine use disorder:</u> -Inpatient treatment -At least 2 weeks abstinent -Mean length abstinence 22/23 days -Used cocaine > once/week before admission <u>Controls:</u> -Outpatients -Free of psychiatric disorder -All reported recreational alcohol consumption (an average of 6 drinks per week) and had never met criteria for abuse or dependence -Comparison subjects had not consumed alcohol for at least 72 hours before scanning <u>Exclusion Criteria:</u> DSM-IV dependence on a substance other than alcohol or tobacco, taking medications for medical or psychiatric concerns, needing detoxification for alcohol use	Individualized 2 minute stress or neutral scripts. Men and women subgroups analyzed separately.	Whole-brain family wise error p <.05.
Seo 2013 **, & (26)	AUD vs. controls: -30 AUD (22m), 30 controls (21m), age-matched Relapse Prediction: -45 AUD (35m), predicted number days alcohol used	<u>AUD:</u> -Inpatient treatment -Abstained from alcohol for mean 34 days -83% smokers -Post traumatic stress disorder lifetime 10% -Other anxiety disorder lifetime 10% -Major depressive disorder lifetime 20% <u>Controls:</u> -Post traumatic stress disorder lifetime 7% -Other anxiety disorder lifetime 0% -Major depressive disorder lifetime 17% <u>AUD and controls:</u> -Matched on lifetime prevalence psychiatric disorder -Significantly differed on smoking rates (83% AUD versus 17% controls)	Individualized 2 minute stress or neutral scripts.	AUD vs. controls: -Whole-brain family wise error p < .05 AFNI AlphaSim/ Monte Carlo simulated. Relapse prediction: -Whole-brain family wise error p<.01 AFNI AlphaSim/ Monte Carlo simulated.

		Relapse Prediction: -AUD in inpatient treatment -4-8 weeks abstinent -87% smokers -Post traumatic stress disorder lifetime 9% -Other anxiety disorder lifetime 7% -Major depressive disorder lifetime 13% Exclusion Criteria:currently using opiates or ever met criteria for opiate dependence, taking medications for any current psychiatric (including prescribed or unprescribed anxiolytics) or medical condition, history of head trauma		
Sinha 2005 (25) *, **, &	20 cocaine use disorder (16m), 8 controls (7m)	Cocaine use disorder: -Inpatient treatment -At least 2 weeks abstinent -Alcohol dependence n=6, cannabis dependence n=2 -All smokers. Controls: -Light social drinkers -1 smoker AUD and controls: -No significant difference on lifetime history of major depressive disorder or anxiety disorder Exclusion Criteria: co-occurring other substance dependence except nicotine, alcohol, currently on medications for medical or psychiatric problems, in need of alcohol detoxification	Individualized 2 minute stress or neutral scripts. Individual PSC maps created. Contrasted stress and neutral maps across groups separately.	Individual subject maps from effects of condition used, voxelwise $p<0.01$, cluster size > 20 voxels.
Sinha 2007 (118) *, **, &	31 cocaine use disorder (20m), predicted time to relapse.	Cocaine use disorder: -Inpatient treatment -At least 2 weeks abstinent Exclusion Criteria: co-occurring other substance dependence except nicotine, alcohol, current or past psychotic disorder, current anxiety or depressive disorder requiring treatment	Individualized 2 minute stress or neutral scripts.	Whole-brain voxelwise $p < .01$ uncorrected to identify region of interest, then signal in region of interest correlated with outcome.

Wang 2010 (28) *, **, &	17 opioid use disorder [(17m) 31(5)], 16 controls [(16m) 25(3)]	Opioid use disorder: -1 opioid use disorder on suboxone -Recruited 2-5 months post detox. For that time they had been in a hospital-like setting but isolated from society to prevent drug access -None were on medication -All reported daily tobacco smoking Controls: -No history of drug dependence -13 reported daily tobacco smoking Opioid use disorder and controls: -No history of active or past AUD -Chinese Exclusion Criteria: active neurological disorder, serious psychiatric disorder, or HIV	International Affective Picture System pictures. Block design (15 second blocks, 5 pictures for 3 seconds each).	Whole-brain overall $p < .05$ Monte Carlo simulation, voxelwise $p < .005$, volume > 336 mm^3.
Xu 2013 (119) *, **, &	67 cocaine use disorder (36m) were genotyped at kappa receptor OPRK1 rs6989250; ONLY 5 CG and 8 CC were imaged (very small sample)	Cocaine use disorder: -Inpatient treatment -At least 3 wks abstinent -CG group had significantly more cigarette smokers than CC (100% versus 75%) Exclusion Criteria: co-occurring other substance dependence (other than alcohol or nicotine), taking medications for medical or psychiatric conditions	Individualized 2 minute stress or neutral scripts. Groups were genotyped. CG had worse outcome than CC. 2x3 Group (genotype) by condition ANOVA with followup t-tests.	Whole -brain corrected with AFNI AlphaSim family wise error $p < .05$.
Yang 2013 (74) *, **, ***, &	15 AUD [(15m) 42(7)], 15 controls [(15m) 45(9)]	AUD: -Mean days abstinent (SD) 25(5) -Housed in residential treatment facility -1 AUD had post traumatic stress disorder AUD and controls: AUD were significantly more likely to smoke cigarettes than controls. AUD had significantly higher anxiety and depression scores, lower education compared to controls	Conditioned stimulus; ratings of anxiety obtained during conditioned stimulus presentation, correlated activation with anxiety ratings to obtain effects.	Whole-brain overall $p < .05$ using Gaussian random fields. Voxelwise $Z > 2.3$ ($p < .01$).

		Exclusion Criteria: any DSM non-substance abuse disorder, taking certain medications (psychotropics, antihypertensives other than thiazides, hypoglycemic agents); controls only: other SUD		
Cognitive Modulation Tasks				
Albein-Urios 2012 (76) &	17 cocaine-users [(16m)36(6)], 18 controls [(17m)31(5)]	Cocaine users: -At least 15 days abstinent (confirmed by twice-weekly urine toxicological tests plus an additional test on the day of the scanner) -Mean months abstinent 2.5 Cocaine users and controls: Monthly alcohol use standard drinks significantly greater in cocaine-users 30 (31) compared to controls 9 (8) Exclusion Criteria: any Axis I (Structured Clinical Interview for DSM Disorders and Conners Adult) or Axis II (International Personality Disorders Examination) co-morbid disorder (except alcohol abuse and nicotine dependence), head injury, neurological, infectious, systemic, or any other diseases affecting the central nervous system, having had other treatments in the 2 years preceding study onset, having entered treatment by court request	Supress > Maintain and Maintain > Observe were contrasted. In this review we only report on Supress > Maintain.	Whole-brain false discovery rate p <.05, voxelwise p<.005, cluster size > 10 voxels
Behavioral Control Tasks				
Smoski 2011 (38) *, **, ***	12 opioid dependence/borderline personality disorder [(12m) 31(10)], 12 controls [(12m) 33(14)]	Opioid dependence/borderline personality disorder: -All on suboxone -Had been in treatment for at least 15 weeks -Urine tests positive for opiates (4), cannabis (9), cocaine (2), benzodiazepines (1), amphetamines (1) Controls: -UAs positive for cannabis (1) Opioid dependence/borderline	Two-sample t-tests to compare voxel-wise signal changes at the peak time point (6 s post-negative image) between opioid dependence/borderline personality disorder and controls.	Only voxels whose hemodynamic responses were significantly correlated with the canonical hemodynamic response (false discovery rate p < 0.01, cluster > 5 voxels) were entered into further within-and between-group

		personality disorder and controls: -Significantly differed on mean (SD) years of education: opioid dependence/borderline personality disorder 5(2) controls 8(2) Exclusion Criteria: co-occurring BAD, psychotic disorder, current use psychiatric medications -MDD, eating disorder, anxiety disorder not excluded		analyses. Whole-brain threshholded at $p < 0.001$ uncorrected, cluster size < 5 voxels.

Table S3: Further details regarding the resting state functional connectivity studies in individuals with substance use disorders (References cited in Table S3 are numbered by the citations in the manuscript, not by the citations listed below in the supplemental references.)

Study	Subject Numbers by Diagnosis [Gender Distribution; Mean Age Yrs (SD)]	Other Subject Details	Analysis Details	Multiple Comparisons Corrections
Camchong 2013 (80) Predicted abstainers vs. relapsers at 6 mos &&	69 AUD, 40 abstainers [(20m), 46(7)], 29 relapsers [(20m), 47 (7)]	AUD: -Had between 6 and 15 weeks of abstinence at study entry by self report -41 had lifetime comorbid drug dependence Abstainers and relapsers; -No significant differences in rates of psychiatric disorder (Structured Clinical Interview for DSM diagnoses; anxiety, mood, antisocial personality disorder, attention deficit hyperactivity disorder, conduct disorder, externalizing disorder) between groups or current/lifetime dependence on other drugs (meth, marijuana, cocaine, nicotine) Exclusion Criteria: head trauma or cranial surgery,	Seed was 3.5mm radius sphere. Group-level analyses produced t-maps showing between group differences at each voxel for each seed.	Monte Carlo simulation family wise error $p < 0.05$ was preserved with an a priori voxelwise $p < 0.001$ and cluster size > 151 voxels.

		diabetes, stroke, or hypertension, neurological disorder, clinical or laboratory evidence of active hepatic disease, clinical evidence for Wernicke–Korsakoff syndrome, lifetime diagnosis of schizophrenia or schizophreniform disorder (as assessed by the Diagnostic Interview Schedule), positive breath alcohol on day of scan		
Gu 2010 (77) *, **	39 cocaine use disorder [(23m) 40(5)], 39 controls [(29m) 38(6)]	<u>Cocaine use disorder:</u> -17 current, 13 past nicotine dependence or abuse -2 current, 12 past alcohol abuse or dependence -5 current 13 past marijuana abuse or dependence -1 past amphetamine abuse or dependence -3 past heroin abuse or dependence -On the day of scanning, 15 had negative urine screens for all drugs tested, 21 individuals had positive urine results for cocaine, one of which was also positive for marijuana, 1 had urine positive for amphetamine and marijuana, 1 had urine positive for marijuana only, 1 had missing urine screen results <u>Controls:</u> -9 current, 9 past nicotine dependence or abuse -1 current, 2 past alcohol abuse or dependence <u>Exclusion Criteria:</u> major illness, neurological or psychiatric disorder other than current dependence on nicotine (Structured Clinical Interview for DSM Diagnosis), scanned	Seeds: 3mm bilateral spheres. First a within group analysis was done (positive connectivity was observed in all maps). Then a group contrast (t-test) between within group maps was performed.	Within group maps: Whole-brain corrected $p<.001$ based on Monte Carlo simulations, voxelwise threshold of $t>3.8$, cluster size > 38 voxels. Between group t-test maps: Whole-brain corrected $p<0.05$ based on Monte Carlo simulations, voxelwise threshold of $t>2.4$, cluster size 81 voxels (amygdala) or 72 voxels (rACC) and significant clusters had to belong to significant regions in one or both groups' connectivity maps.

		only if breath alcohol negative		
McHugh 2014 (70) Predicted non-relapsers vs. relapsers **, &	45 cocaine use disorder (39 m): 21 non-relapsed at day 30 (18m) 43(7), 24 relapsed at day 30 (21m) 44(8), 22 controls (14 m) 42(8)	<u>Cocaine use disorder:</u> -Residential treatment <u>Cocaine use disorder and controls:</u> -There were significantly more smokers in the Cocaine use disorder compared to the controls group (n=35 vs. n=1). -Cocaine use disorder scored significantly higher on neuroticism and harm avoidance than controls <u>Relapsed and non-relapsed individuals:</u> -Relapsed individuals had significantly more years of education, and fewer years smoking -Mean days since last cocaine use 71 (22) for non-relapsed and 70 (25) for relapsed <u>Exclusion Criteria:</u> major illness, IQ below 70 (per theWechsler test of adult reading), any neurological or active axis I disorder (other than substance use disorders), on psychotropic medications. Other drug use among cocaine use disorders was not a condition for exclusion as long as cocaine dependence was the primary diagnosis.	A General Linear Mixed Model comparing relapse to non-relapse. Where differences emerged, post hoc contrasts compared controls to each individual group (eg. relapse and non-relapse)	Relapse vs non-relapse: whole brain, corrected at $p < .01$, voxelwise $z > 3.3$, cluster size > 55 voxels. Controls to each individual group: voxel-wise $p<.005$, corrected clusterwise threshold of $p<.05$.
Muller Ohering 2014 (81) *, **, &&	27 AUD [(18m), 49(11)], 26 controls [(17m), 50(9)]	<u>AUD:</u> -Median number of weeks since last met alcohol dependence criteria was 17 weeks [mean (SD) = 16.0 (12.8)]. -Recruited from local rehab programs <u>AUD and controls:</u> -AUD had significantly lower mean years	Within group analysis performed first. Between group contrast analyses performed afterwards.	Within group: Peak intensity of $p < 0.001$ and cluster level/extent threshold family wise error $p < 0.05$. Between group: Peak intensity of $p < 0.01$ and cluster level/ extent threshold family wise error $p < 0.05$.

		education and socioeconomic status -AUD had significantly greater scores on self-report questionnaires assessing anxiety, depression, impulsivity (Barratt Impulsivity Scale) and self esteem -AUD had significantly poorer performance on tests of verbal intelligence quotient,perceptual-motor processing speed, and working memory <u>Exclusion Criteria:</u> DSM IV Axis I disorder based on Structured Clinical Interview for DSM Diagnosis -More AUD (50%) than controls (0%) reported past history drug dependence (cocaine 35%). In no case was drug dependence more recent than alcohol dependence.-Significantly more AUD met DSM-IV criteria for current nicotine dependence (54%) than did controls (12%).		
O'Daly 2012 (73) *, **, &	29 AUD, 17 with a history of a single detoxification only; less severe) [(11m) 38(10)], 12 with a history of multiple detoxifications, more severe) [(7m)44(10)], 31 controls (mild to moderate social drinkers) [(16m) 40(9)]	<u>AUD:</u> -Inpatients -Minimum 2 wks abstinent -During withdrawal were supported with chlordiazepxide -No benzodiazepine for > 72 hours for scan <u>AUD and controls:</u> -Groups significantly differed on depression and anxiety scores (history of multiple detoxifications > history of a single detoxification > controls), and whether or not they smoked cigarettes (history of a single detoxification > history of multiple detoxifications >	Seeds: insula, amygdala, lOFC. lOFC seed derived from main effect of task (described above). Group effect: Used timeseries from task and entered task conditions as regressors of no interest. Group Contrast: ANOVA with 3 groups (controls, history of a single detoxification, history of multiple detoxifications), to identify significant clusters, then subtracted Z scores between maps for controls and those	Whole-brain corrected p<.05 Greenhouse Geiser.

		Controls) <u>Exclusion Criteria:</u> mental, neurological or other chronic disorder, currently undergoing any drug treatment interfering with the scope of the trial	with a history of a single detoxification and between maps for controls and those with a history of multiple detoxifications. Severity Effect: Regression with connectivity and number of detoxifications (severity).	
Pujol 2014 (79) **	28 cannabis use disorder [(28m)21(2)], 29 controls [(29m)22(3)]	<u>Cannabis use disorder and controls:</u> -Excluded for DSM IV Axis I disorder, use of psychoactive medications, lifetime alcohol abuse or dependence, relevant medical or neurological disorders, learning disabilities, previous use of any other recreational drug for more than 5 occasions lifetime except alcohol and nicotine <u>Cannabis use disorder and controls:</u> Cannabis use disorder had significantly greater anxiety scores and impairments on tests of memory negative urine test for drugs other than cannabis	Within group analysis performed first. Between group contrast analyses afterwards.	Within group: Monte Carlo simulations/AlphaSim family wise error $p < 0.05$, voxelwise $p<.005$, cluster >176 voxels, Between group: family wise error $p <.05$, voxelwise $p<.005$, cluster size > 106 voxels

Sutherland 2013 (71) *, **	24 nicotine use disorder [(12m), 36(10)], 20 Controls [(10m), 30(7)]	Nicotine use disorder and controls: -Smokers were significantly younger than non-smokers. -Smokers had significantly higher depression and negative affect scores, but there was no difference in anxiety scores. Exclusion Criteria: a history of neurological, psychiatric or addiction disorder (other than nicotine in smokers) based on Structured Clinical Interview for DSM Diagnosis, cardiovascular or renal impairment, diabetes	Subject level z maps were entered into separate ANCOVAs to identify brain areas whose resting state functional connectivity with a seed region: 1) smokers versus nonsmokers (GROUP main effect) 2) alexithymia regardless of group (ALEX main effect), and 3) was differentially predicted by alexithymia in smokers versus nonsmokers (GROUP X ALEX interaction).	Overall $p < 0.006$ correcting for number of seeds tested using Bonferroni correction (a=0.05/8) which resulted in a voxel-wise $p<0.005$; cluster size > 64 voxels
Upadhyay 2010 (78) *, **	10 Opioid use disorder [(7m) 29 (9)], Controls [(7m), 30(8)]	Opioid use disorder: -Prescription opioid dependent Opioid use disorder and controls: -All non-smokers -Depression scores not significantly different between groups Exclusion Criteria: chronic pain (in the past 3 months), positive urine screen at the time of the scan, other psychiatric disorders (determined by the Composite International Diagnostic Interview) or medial conditions (in the past 3 months), used any potentially confounding medications or drugs (in the past 3 months) including psychostimulants, cannabinoids, dopaminergic or antidopaminergic agents including antipsychotics, mood stabilizers or antidepressants (e.g. tricylclics, bupropion,	A series of General Linear Model analyses were performed for within subject maps. Mixed effects group analyses then performed. Negative control seed in bilateral precentral gyrus.	Whole-brain corrected using Gaussian mixture modeling approach for $p < .05$.

		mirtazapine, venlafaxine and duloxetine), non-steroidal anti-inflammatory drugs and methadone, were at suicide risk within the past 30 days, used heroin more than four days in the past 30 days, had ever injected heroin, had elevated liver function tests, were currently receiving formal substance abuse treatment, had received methadone or buprenorphine maintenance in the past 30 days, or were dependent on alcohol, sedatives or stimulants		

Abbreviations:
Substance use disorders: alcohol use disorder (AUD), substance use disorder (SUD)
Brain regions: lateral orbitofrontal cortex (lOFC), rostral anterior cingulate cortex (rACC)
Other: diagnostic and statistical manual (DSM), male (m), standard deviation (SD)

*Results possibly confounded by Axis I diagnosis (either Axis I diagnosis not specified in exclusion criteria or rates not presented in results); if the article simply states psychiatric diagnosis excluded without specifying which diagnoses excluded, the study is flagged as having results possibly confounded by Axis I diagnosis.
**Results possibly confounded by Axis II diagnosis (either Axis II diagnosis not specified in exclusion criteria or rates not presented in results); if the article simply states psychiatric diagnosis excluded without specifying which diagnoses excluded, the study is flagged as having results possibly confounded by Axis II diagnosis.
***Results possibly confounded by recent substance use (outpatients who did not have urine-negative confirmed status stated explicitly in the article before the scan).
& At least 2 weeks abstinent before the scan confirmed by residential status or urine screens.
&& At least 2 weeks abstinent by self-report only.

Supplemental Reference List

The below references are relevant to the review but were not included due to space limitations.

Supplemental References by Topic:

Self-report scales of emotion regulation (1-12)
Reviews on Emotion Regulation (13, 14)
Emotion Regulation in Substance Use Disorders (15-17)
Neural Circuitry of Emotion Regulation and of Cognitive Control (18-29)
Alterations in fMRI Activation during Tasks of Emotion Regulation in Disorders of Emotion Regulation without Substance Use Disorders (30-37)
Functional Connectivity Alterations in Disorders of Emotion Regulation without Substance Use Disorder (36, 38)
Structural Connectivity Alterations in Disorders of Emotion Regulation without Substance Use Disorder (39)
Structural Connectivity Alterations in Substance Use Disorder (40-54)
Default Mode Network Alterations in Substance Use Disorder (55, 56)
Meditation/Mindfulness Based Therapy (57-60)
Oxytocin (61)
Neural Circuitry of Emotion Regulation in Attention Deficit Hyperactivity Disorder (62)

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