

Supplementary Table S1. Pearson correlation coefficients and associated *p* values per group between significant task variables and potential confounds.

Paradigm	Potential Covariate	Task Variable	HVs	Patients	All Participants (Pooled Sample)
DDT	BDI	Small Ln(<i>k</i>)	<i>r</i> = .318, <i>p</i> = .002	<i>r</i> = .046, <i>p</i> = .643	<i>r</i> = .223, <i>p</i> = .001
		Medium Ln(<i>k</i>)	<i>r</i> = .283, <i>p</i> = .005	<i>r</i> = .085, <i>p</i> = .391	<i>r</i> = .224, <i>p</i> = .001
		Large Ln(<i>k</i>)	<i>r</i> = .280, <i>p</i> = .006	<i>r</i> = .069, <i>p</i> = .482	<i>r</i> = .217, <i>p</i> = .002
	STAI-S	Small Ln(<i>k</i>)	<i>r</i> = .168, <i>p</i> = .104	<i>r</i> = .079, <i>p</i> = .424	<i>r</i> = .181, <i>p</i> = .010
		Medium Ln(<i>k</i>)	<i>r</i> = .195, <i>p</i> = .058	<i>r</i> = .078, <i>p</i> = .429	<i>r</i> = .186, <i>p</i> = .009
		Large Ln(<i>k</i>)	<i>r</i> = .185, <i>p</i> = .074	<i>r</i> = .103, <i>p</i> = .295	<i>r</i> = .197, <i>p</i> = .005
	STAI-T	Small Ln(<i>k</i>)	<i>r</i> = .217, <i>p</i> = .034	<i>r</i> = .023, <i>p</i> = .812	<i>r</i> = .184, <i>p</i> = .009
		Medium Ln(<i>k</i>)	<i>r</i> = .206, <i>p</i> = .045	<i>r</i> = .051, <i>p</i> = .608	<i>r</i> = .187, <i>p</i> = .008
		Large Ln(<i>k</i>)	<i>r</i> = .222, <i>p</i> = .031	<i>r</i> = .075, <i>p</i> = .450	<i>r</i> = .208, <i>p</i> = .003
Beads Task	BDI	Mean Beads	<i>r</i> = -.036, <i>p</i> = .717	<i>r</i> = .052, <i>p</i> = .592	<i>r</i> = .001, <i>p</i> = .986
		Confidence	<i>r</i> = -.252, <i>p</i> = .011	<i>r</i> = -.228, <i>p</i> = .017	<i>r</i> = -.261, <i>p</i> < .001
	STAI-S	Mean Beads	<i>r</i> = .042, <i>p</i> = .674	<i>r</i> = .018, <i>p</i> = .853	<i>r</i> = .011, <i>p</i> = .872
		Confidence	<i>r</i> = -.217, <i>p</i> = .029	<i>r</i> = -.281, <i>p</i> = .003	<i>r</i> = -.274, <i>p</i> < .001
	STAI-T	Mean Beads	<i>r</i> = -.062, <i>p</i> = .539	<i>r</i> = .058, <i>p</i> = .553	<i>r</i> = -.008, <i>p</i> = .907
		Confidence	<i>r</i> = -.281, <i>p</i> = .004	<i>r</i> = -.253, <i>p</i> = .008	<i>r</i> = -.289, <i>p</i> < .001
BART	BDI	Mean Pumps	<i>r</i> = -.120, <i>p</i> = .267	<i>r</i> = -.198, <i>p</i> = .045	<i>r</i> = -.187, <i>p</i> = .010
		Adjusted Pumps	<i>r</i> = -.118, <i>p</i> = .278	<i>r</i> = .063, <i>p</i> = .529	<i>r</i> = -.024, <i>p</i> = .739
		Bank Proportion	<i>r</i> = .172, <i>p</i> = .111	<i>r</i> = .218, <i>p</i> = .027	<i>r</i> = .217, <i>p</i> = .003
	STAI-S	Mean Pumps	<i>r</i> = .122, <i>p</i> = .262	<i>r</i> = -.049, <i>p</i> = .620	<i>r</i> = -.015, <i>p</i> = .841
		Adjusted Pumps	<i>r</i> = .141, <i>p</i> = .192	<i>r</i> = .079, <i>p</i> = .428	<i>r</i> = .075, <i>p</i> = .304
		Bank Proportion	<i>r</i> = -.066, <i>p</i> = .545	<i>r</i> = .064, <i>p</i> = .521	<i>r</i> = .043, <i>p</i> = .554
	STAI-T	Mean Pumps	<i>r</i> = .127, <i>p</i> = .241	<i>r</i> = -.097, <i>p</i> = .332	<i>r</i> = -.039, <i>p</i> = .596
		Adjusted Pumps	<i>r</i> = .180, <i>p</i> = .096	<i>r</i> = .024, <i>p</i> = .813	<i>r</i> = .057, <i>p</i> = .436
		Bank Proportion	<i>r</i> = -.072, <i>p</i> = .508	<i>r</i> = .098, <i>p</i> = .323	<i>r</i> = .061, <i>p</i> = .405
SST	BDI	SSRT	<i>r</i> = .170, <i>p</i> = .104	<i>r</i> = .098, <i>p</i> = .345	<i>r</i> = .040, <i>p</i> = .585
	STAI-S	SSRT	<i>r</i> = .176, <i>p</i> = .092	<i>r</i> = .116, <i>p</i> = .264	<i>r</i> = .052, <i>p</i> = .481
	STAI-T	SSRT	<i>r</i> = .188, <i>p</i> = .072	<i>r</i> = .136, <i>p</i> = .187	<i>r</i> = .056, <i>p</i> = .445
SWM	BDI	Total Errors	<i>r</i> = .073, <i>p</i> = .487	<i>r</i> = .092, <i>p</i> = .366	<i>r</i> = .107, <i>p</i> = .139
	STAI-S	Total Errors	<i>r</i> = .009, <i>p</i> = .930	<i>r</i> = .052, <i>p</i> = .611	<i>r</i> = .061, <i>p</i> = .398
	STAI-T	Total Errors	<i>r</i> = .066, <i>p</i> = .530	<i>r</i> = .112, <i>p</i> = .269	<i>r</i> = .117, <i>p</i> = .105
PAL	BDI	Total Errors	<i>r</i> = .091, <i>p</i> = .408	<i>r</i> = .122, <i>p</i> = .229	<i>r</i> = .177, <i>p</i> = .016
		Patterns Reached	<i>r</i> = .085, <i>p</i> = .440	<i>r</i> = -.070, <i>p</i> = .491	<i>r</i> = -.087, <i>p</i> = .241
	STAI-S	Total Errors	<i>r</i> = .026, <i>p</i> = .816	<i>r</i> = .240, <i>p</i> = .017	<i>r</i> = .231, <i>p</i> = .002

	STAI-T	Patterns Reached	$r = .072, p = .511$	$r = -.126, p = .215$	$r = -.130, p = .079$
		Total Errors	$r = -.028, p = .800$	$r = .241, p = .016$	$r = .213, p = .004$
		Patterns Reached	$r = .138, p = .207$	$r = -.143, p = .158$	$r = -.119, p = .106$
SOC	BDI	5-move problem	$r = .147, p = .170$	$r = .264, p = .010$	$r = .248, p = .001$
		Stages Completed	$r = -.157, p = .137$	$r = -.225, p = .028$	$r = -.224, p = .002$
	STAI-S	5-move problem	$r = .084, p = .436$	$r = .245, p = .017$	$r = .213, p = .004$
		Stages Completed	$r = -.107, p = .313$	$r = -.196, p = .058$	$r = -.188, p = .010$
	STAI-T	5-move problem	$r = .034, p = .749$	$r = .249, p = .015$	$r = .198, p = .007$
		Stages Completed	$r = -.055, p = .603$	$r = -.228, p = .026$	$r = -.188, p = .010$
Drug Rating	BDI	Neutral	$r = .178, p = .112$	$r = .261, p = .007$	$r = .413, p < .001$
		Negative	$r = .010, p = .933$	$r = .204, p = .036$	$r = .365, p < .001$
		Drug	$r = -.018, p = .871$	$r = .208, p = .032$	$r = .373, p < .001$
	STAI-S	Neutral	$r = .102, p = .367$	$r = .350, p < .001$	$r = .441, p < .001$
		Negative	$r = -.136, p = .227$	$r = .298, p = .002$	$r = .392, p < .001$
		Drug	$r = -.001, p = .992$	$r = .365, p < .001$	$r = .445, p < .001$
	STAI-T	Neutral	$r = .042, p = .707$	$r = .335, p < .001$	$r = .441, p < .001$
		Negative	$r = -.188, p = .093$	$r = .282, p = .003$	$r = .392, p < .001$
		Drug	$r = -.109, p = .333$	$r = .400, p < .001$	$r = .472, p < .001$

Note. Significant correlations are highlighted in bold.

HVs = Healthy Volunteers; DDT = Delay Discounting Task; BART = Balloon Analogue Risk Task; SST = Stop Signal Task; SSRT = Stop-Signal Reaction Time; SWM = Spatial Working Memory; PAL = Paired Associative Learning; SOC = Stockings of Cambridge; BDI = Beck Depression Inventory; STAI-T = State-Trait Anxiety Inventory (trait version); STAI-S = State-Trait Anxiety Inventory (state version).

Supplementary Table S2. Group comparison results after the potential confounds being regressed out.

Paradigm	Covariates	Task Variable	Statistics	P value
DDT	BDI, STAI-S, STAI-T	Group	$F(1,195)=7.342$	.007
		Magnitude	$F(1.938,377.965)=5.195$	.006
		Interaction	$F(1.938,377.965)=0.131$	.871
Beads	BDI, STAI-S, STAI-T	Confidence	$F(1,206)=0.217$	.642
BART	BDI	Mean Pumps	$F(1,187)=0.435$	.511
		Bank Proportion	$F(1,187)=0.250$	.618
PAL	BDI, STAI-S, STAI-T	Total Errors	$F(1,184)=3.743$	.055
SOC	BDI, STAI-S, STAI-T	5-move problem	$F(1,179)=0.152$	.697
		Stages Completed	$F(1,182)=0.176$	.675
Drug Rating	BDI, STAI-S, STAI-T	Group	$F(1,182)=126.568$	<.001
		Type	$F(1.934,351.899)=1.694$	.186
		Interaction	$F(1.934,351.899)=2.814$	.063

Note. Significant effects are highlighted in bold.

DDT = Delay Discounting Task; BART = Balloon Analogue Risk Task; PAL = Paired Associative Learning; SOC = Stockings of Cambridge; BDI = Beck Depression Inventory; STAI-T = State-Trait Anxiety Inventory (trait version); STAI-S = State-Trait Anxiety Inventory (state version).

Supplementary Table S3. Pearson correlation coefficients and associated *p* values per group between impulsivity and craving task variables and performance on the executive functioning tasks.

Paradigm	Potential Covariate	Task Variable	HVs	Patients	All Participants (Pooled Sample)
DDT	PAL Total Errors	Small Ln(<i>k</i>)	$r = -.058, p = .611$	$r = .129, p = .214$	$r = .096, p = .205$
		Medium Ln(<i>k</i>)	$r = -.047, p = .678$	$r = .051, p = .625$	$r = .060, p = .430$
		Large Ln(<i>k</i>)	$r = -.085, p = .459$	$r = .129, p = .211$	$r = .095, p = .210$
	PAL Patterns	Small Ln(<i>k</i>)	$r = .079, p = .489$	$r = -.097, p = .350$	$r = -.070, p = .316$
		Medium Ln(<i>k</i>)	$r = .087, p = .447$	$r = .020, p = .850$	$r = -.002, p = .982$
		Large Ln(<i>k</i>)	$r = .108, p = .342$	$r = -.024, p = .814$	$r = -.026, p = .730$
	SWM Total Errors	Small Ln(<i>k</i>)	$r = .002, p = .988$	$r = .182, p = .077$	$r = .114, p = .127$
		Medium Ln(<i>k</i>)	$r = -.056, p = .612$	$r = .237, p = .021$	$r = .109, p = .145$
		Large Ln(<i>k</i>)	$r = .007, p = .950$	$r = .251, p = .014$	$r = .154, p = .040$
	SOC 5-move Problem	Small Ln(<i>k</i>)	$r = -.090, p = .422$	$r = .040, p = .706$	$r = .029, p = .709$
		Medium Ln(<i>k</i>)	$r = -.134, p = .231$	$r = .125, p = .238$	$r = .054, p = .482$
		Large Ln(<i>k</i>)	$r = -.080, p = .473$	$r = .081, p = .445$	$r = .058, p = .449$
	SOC Stages Complete	Small Ln(<i>k</i>)	$r = .066, p = .552$	$r = -.001, p = .989$	$r = -.015, p = .843$
		Medium Ln(<i>k</i>)	$r = .125, p = .262$	$r = -.131, p = .214$	$r = -.055, p = .473$
		Large Ln(<i>k</i>)	$r = .052, p = .640$	$r = -.065, p = .538$	$r = -.057, p = .450$
Beads Task	PAL Total Errors	Mean Beads	$r = -.036, p = .750$	$r = .052, p = .611$	$r = .000, p = .998$
		Confidence	$r = .128, p = .248$	$r = -.013, p = .900$	$r = .014, p = .854$
	PAL Patterns	Mean Beads	$r = .024, p = .831$	$r = -.060, p = .562$	$r = -.013, p = .861$
		Confidence	$r = -.220, p = .046$	$r = -.140, p = .171$	$r = -.134, p = .073$
	SWM Total Errors	Mean Beads	$r = -.102, p = .338$	$r = -.101, p = .326$	$r = -.104, p = .154$
		Confidence	$r = -.218, p = .038$	$r = -.071, p = .487$	$r = -.169, p = .020$
	SOC 5-move Problem	Mean Beads	$r = -.097, p = .373$	$r = -.177, p = .090$	$r = -.144, p = .054$
		Confidence	$r = -.200, p = .063$	$r = -.344, p = .001$	$r = -.287, p < .001$
	SOC Stages Complete	Mean Beads	$r = .099, p = .354$	$r = .175, p = .092$	$r = .143, p = .053$
		Confidence	$r = .242, p = .023$	$r = .290, p = .005$	$r = .277, p < .001$
BART	PAL Total Errors	Mean Pumps	$r = .104, p = .369$	$r = -.084, p = .422$	$r = -.020, p = .799$
		Adjusted Pumps	$r = .029, p = .803$	$r = .048, p = .643$	$r = .030, p = .696$
		Bank Proportion	$r = -.037, p = .751$	$r = .075, p = .473$	$r = .042, p = .583$
	PAL Patterns	Mean Pumps	$r = .016, p = .893$	$r = .058, p = .579$	$r = .055, p = .475$
		Adjusted Pumps	$r = .098, p = .396$	$r = -.112, p = .283$	$r = -.019, p = .802$
		Bank Proportion	$r = -.048, p = .678$	$r = -.022, p = .833$	$r = -.046, p = .554$
	SWM Total Errors	Mean Pumps	$r = -.286, p = .011$	$r = -.120, p = .250$	$r = -.214, p = .005$

	SOC 5-move Problem	Adjusted Pumps	$r = -.132, p = .248$	$r = -.049, p = .641$	$r = -.096, p = .210$
		Bank Proportion	$r = .298, p = .008$	$r = .056, p = .594$	$r = .187, p = .014$
		Mean Pumps	$r = -.355, p = .002$	$r = -.071, p = .508$	$r = -.201, p = .010$
		Adjusted Pumps	$r = -.274, p = .016$	$r = -.019, p = .863$	$r = -.132, p = .090$
		Bank Proportion	$r = .379, p = .001$	$r = .078, p = .469$	$r = .211, p = .006$
		Mean Pumps	$r = .405, p < .001$	$r = .191, p = .072$	$r = .293, p < .001$
		Adjusted Pumps	$r = .279, p = .013$	$r = .099, p = .352$	$r = .184, p = .017$
	SOC Stages Complete	Bank Proportion	$r = -.449, p < .001$	$r = -.166, p = .118$	$r = -.296, p < .001$
		SSRT	$r = .051, p = .644$	$r = .153, p = .144$	$r = .051, p = .502$
		SSRT	$r = .059, p = .593$	$r = -.019, p = .860$	$r = .057, p = .451$
		SSRT	$r = .115, p = .275$	$r = .283, p = .006$	$r = .153, p = .038$
		SSRT	$r = .153, p = .152$	$r = .098, p = .363$	$r = .100, p = .185$
		SSRT	$r = -.211, p = .045$	$r = -.128, p = .229$	$r = -.148, p = .047$
		SSRT			
Drug Rating	PAL Total Errors	Neutral	$r = .111, p = .354$	$r = -.097, p = .338$	$r = .117, p = .127$
		Negative	$r = .172, p = .149$	$r = .079, p = .437$	$r = .220, p = .004$
		Drug	$r = .096, p = .421$	$r = -.076, p = .454$	$r = .131, p = .088$
	PAL Patterns	Neutral	$r = -.098, p = .411$	$r = .189, p = .061$	$r = -.027, p = .725$
		Negative	$r = -.040, p = .741$	$r = .016, p = .872$	$r = -.125, p = .103$
		Drug	$r = -.067, p = .577$	$r = .165, p = .103$	$r = -.043, p = .578$
	SWM Total Errors	Neutral	$r = .054, p = .635$	$r = .095, p = .350$	$r = .151, p = .043$
		Negative	$r = .009, p = .935$	$r = .056, p = .581$	$r = .127, p = .091$
		Drug	$r = -.035, p = .761$	$r = -.030, p = .770$	$r = .084, p = .265$
	SOC 5-move Problem	Neutral	$r = .267, p = .019$	$r = .201, p = .050$	$r = .261, p = .001$
		Negative	$r = .406, p < .001$	$r = .132, p = .201$	$r = .232, p = .002$
		Drug	$r = .198, p = .084$	$r = .209, p = .043$	$r = .257, p = .001$
	SOC Stages Complete	Neutral	$r = -.139, p = .225$	$r = -.070, p = .500$	$r = -.169, p = .026$
		Negative	$r = -.235, p = .038$	$r = -.042, p = .681$	$r = -.160, p = .035$
		Drug	$r = -.086, p = .457$	$r = -.082, p = .428$	$r = -.172, p = .023$

Note. Significant effects are highlighted in bold.

HVs = Healthy Volunteers; DDT = Delay Discounting Task; BART = Balloon Analogue Risk Task;

SST = Stop Signal Task; SSRT = Stop-Signal Reaction Time; PAL = Paired Associative Learning; SWM

= Spatial Working Memory; SOC = Stockings of Cambridge.

Supplementary Table S4. Group comparison of the performance on tasks measuring impulsivity and craving after the executive functioning variables being regressed out.

Paradigm	Covariates	Task Variable	Statistics	P value
DDT	PAL Total Errors	Group	$F(1,171)=10.538$	.001
		Magnitude	$F(2,342)=10.919$	<.001
		Interaction	$F(2,342)=0.250$	.779
	PAL Patterns	Group	$F(1,171)=11.681$	.001
		Magnitude	$F(2,342)=3.265$	.039
		Interaction	$F(2,342)=0.380$	.684
	SWM Total Errors	Group	$F(1,176)=14.875$	<.001
		Magnitude	$F(2,352)=16.729$	<.001
		Interaction	$F(2,352)=0.312$	.732
	SOC 5-move Problem	Group	$F(1,170)=13.261$	<.001
		Magnitude	$F(1.926,327.478)=5.558$	.005
		Interaction	$F(1.926,327.478)=0.135$	.867
	SOC Stages Complete	Group	$F(1,172)=12.724$	<.001
		Magnitude	$F(1.920,330.256)=3.744$	.026
		Interaction	$F(1.920,330.256)=0.126$	.874
Beads	PAL Total Errors	Mean Beads	$F(1,177)=0.801$	.372
		Confidence	$F(1,177)=6.081$	.015
	PAL Patterns	Mean Beads	$F(1,177)=0.852$	.357
		Confidence	$F(1,177)=7.833$	.006
	SWM Total Errors	Mean Beads	$F(1,185)=0.324$	.570
		Confidence	$F(1,185)=4.127$	.044
	SOC 5-move Problem	Mean Beads	$F(1,177)=0.020$	.889
		Confidence	$F(1,177)=5.555$	.020
	SOC Stages Complete	Mean Beads	$F(1,180)=0.073$	.788
		Confidence	$F(1,180)=4.640$	.033
	PAL Patterns, SWM Total Errors, SOC 5-move Problem, SOC Stages Complete		$F(1,162)=6.373$	.013
BART	PAL Total Errors	Mean Pumps	$F(1,168)=0.927$	.337
		Adjusted Pumps	$F(1,168)=0.421$	.517
		Bank Proportion	$F(1,168)=0.682$	.410
	PAL Patterns	Mean Pumps	$F(1,168)=0.759$	.385
		Adjusted Pumps	$F(1,168)=0.376$	.541

		Bank Proportion	$F(1,168)=0.677$	.412
	SWM Total Errors	Mean Pumps	$F(1,168)=0.240$	.625
		Adjusted Pumps	$F(1,168)=0.101$	.751
		Bank Proportion	$F(1,168)=0.195$	.660
	SOC 5-move Problem	Mean Pumps	$F(1,162)=0.318$	.574
		Adjusted Pumps	$F(1,162)=0.129$	.720
		Bank Proportion	$F(1,162)=0.174$	.677
	SOC Stages Complete	Mean Pumps	$F(1,165)=0.065$	.799
		Adjusted Pumps	$F(1,165)=0.038$	.846
		Bank Proportion	$F(1,165)=0.010$	.919
	SWM Total Errors, SOC 5-move Problem, SOC Stages Complete	Mean Pumps	$F(1,157)=0.051$	.821
	SOC 5-move Problem, SOC Stages Complete	Adjusted Pumps	$F(1,161)=0.086$	.770
	SWM Total Errors, SOC 5-move Problem, SOC Stages Complete	Bank Proportion	$F(1,157)=0.023$	.878
SST	PAL Total Errors	SSRT	$F(1,175)=7.103$	.008
	PAL Patterns	SSRT	$F(1,175)=5.368$	.022
	SWM Total Errors	SSRT	$F(1,182)=10.108$	.002
	SOC 5-move Problem	SSRT	$F(1,175)=9.826$	.002
	SOC Stages Complete	SSRT	$F(1,178)=9.836$	.002
	SWM Total Errors, SOC Stages Complete	SSRT	$F(1,174)=9.695$	.002
Drug Rating	PAL Total Errors	Group	$F(1,168)=162.945$	<.001
		Type	$F(1,919,322.355)=3.099$	.049
		Interaction	$F(1,919,322.355)=4.917$	.009
	PAL Patterns	Group	$F(1,168)=175.234$	<.001
		Type	$F(1,921,322.778)=2.215$	.113
		Interaction	$F(1,921,322.778)=4.963$	.008
	SWM Total Errors	Group	$F(1,176)=179.798$	<.001
		Type	$F(2,352)=3.404$	.034
		Interaction	$F(2,352)=5.191$	.006
	SOC 5-move Problem	Group	$F(1,169)=168.593$	<.001
		Type	$F(1,845,311.776)=0.208$	.795
		Interaction	$F(1,845,311.776)=6.124$	.003

SOC Stages Complete	Group	$F(1,171)=167.159$	<.001
	Type	$F(1.844,315.360)=1.117$	.325
	Interaction	$F(1.844,315.360)=6.393$	.003
PAL Total Errors,	Group	$F(1,154)=135.044$	<.001
SWM Total Errors,	Type	$F(1.851,285.101)=0.168$	.829
SOC 5-move Problem,	Interaction	$F(1.851,285.101)=5.534$	.005
SOC Stages Complete			

Note. Significant effects are highlighted in bold.

DDT = Delay Discounting Task; BART = Balloon Analogue Risk Task; SST = Stop Signal Task; SSRT = Stop-Signal Reaction Time; PAL = Paired Associative Learning; SWM = Spatial Working Memory; SOC = Stockings of Cambridge.

Supplementary Table S5. Correlations between significant variables and addiction-related variables.

Paradigm - Variable	Addiction-related Variable	Patients
DDT - Small	Craving ratings - Drug	$r = .046, p = .649$
	Withdrawal symptoms	$r = .133, p = .169$
	Daily dosage	$r = .024, p = .802$
	Duration on MMT	$r = .054, p = .580$
	FTND score	$r = .040, p = .685$
DDT - Medium	Craving ratings - Drug	$r = .086, p = .390$
	Withdrawal symptoms	$r = .007, p = .943$
	Daily dosage	$r = .059, p = .539$
	Duration on MMT	$r = .107, p = .270$
	FTND score	$r = .090, p = .360$
DDT - Large	Craving ratings - Drug	$r = .149, p = .136$
	Withdrawal symptoms	$r = .143, p = .137$
	Daily dosage	$r = .043, p = .657$
	Duration on MMT	$r = .109, p = .258$
	FTND score	$r = .103, p = .295$
Beads - Confidence	Craving ratings - Drug	$r = -.142, p = .149$
	Withdrawal symptoms	$r = -.038, p = .696$
	Daily dosage	$r = -.034, p = .721$
	Duration on MMT	$r = -.278, p = .003$
	FTND score	$r = .024, p = .808$
SST - SSRT	Craving ratings - Drug	$r = .011, p = .915$
	Withdrawal symptoms	$r = .071, p = .496$
	Daily dosage	$r = .049, p = .640$
	Duration on MMT	$r = .083, p = .424$
	FTND score	$r = -.037, p = .722$
PAL - Total Errors	Craving ratings - Drug	$r = -.076, p = .454$
	Withdrawal symptoms	$r = .107, p = .292$

	Daily dosage	$r = .008, p = .936$
	Duration on MMT	$r = -.075, p = .460$
	FTND score	$r = .149, p = .141$
PAL – Patterns Reached	Craving ratings - Drug	$r = .165, p = .103$
	Withdrawal symptoms	$r = .004, p = .970$
	Daily dosage	$r = .080, p = .429$
	Duration on MMT	$r = .033, p = .747$
	FTND score	$r = -.086, p = .398$

Note. Significant correlations are highlighted in bold. DDT = Delay Discounting Task; SST = Stop Signal Task; SSRT = Stop Signal Reaction Time; PAL = Paired Associative Learning; MMT = Methadone Maintenance Treatment; FTND = Fagerstrom Test for Nicotine Dependence.

Supplementary Table S6. Group comparison results of smokers versus non-smokers.

Paradigm	Task Variable	HV Non-smokers	HV Smokers	MMT Smokers		HV Smokers vs. HV Non-smokers	HV Smokers vs. MMT Smokers
DDT	Small $\ln(k)$	-4.68 (1.94)	-4.28 (2.06)	-3.54 (1.76)	Group	$F(1,101)=0.030$ $p=.862$	$F(1,136)=7.245$ $p=.008$
	Medium $\ln(k)$	-5.02 (1.86)	-4.97 (2.17)	-4.10 (1.78)	Magnitude	$F(1,884,190.261)=32.699$ $p<.001$	$F(2,272)=42.194$ $p<.001$
	Large $\ln(k)$	-5.28 (1.98)	-5.53 (1.92)	-4.43 (1.84)	Interaction	$F(1,884,190.261)=4.133$ $p=.019$	$F(2,272)=1.224$ $p=.296$
Beads	Mean Beads	7.57 (4.71)	8.60 (4.97)	7.16 (4.86)		$F(1,109)=1.152$ $p=.286$	$F(1,141)=2.400$ $p=.124$
	Confidence	474.55 (92.91)	493.81 (91.66)	460.43 (83.67)		$F(1,109)=1.084$ $p=.300$	$F(1,141)=4.218$ $p=.042$
BART	Mean Pumps	6.67 (1.29)	6.80 (1.04)	6.45 (1.15)		$F(1,93)=0.247$ $p=.620$	$F(1,131)=2.428$ $p=.122$
	Adjusted Pumps	5.71 (1.23)	5.85 (0.89)	5.57 (1.08)		$F(1,93)=0.314$ $p=.576$	$F(1,131)=1.751$ $p=.188$
	Bank Proportion	0.54 (0.16)	0.52 (0.14)	0.57 (0.15)		$F(1,93)=0.382$ $p=.538$	$F(1,131)=2.396$ $p=.124$
SST	SSRT	287.21 (79.16)	309.48 (77.91)	266.31 (53.78)		$F(1,91)=1.748$ $p=.189$	$F(1,124)=12.517$ $p=.001$
SWM	Total Errors	15.78 (9.34)	14.20 (9.88)	17.03 (7.57)		$F(1,91)=0.595$ $p=.442$	$F(1,128)=3.016$ $p=.085$
PAL	Total Errors	21.06 (13.08)	24.53 (11.83)	28.20 (13.96)		$F(1,83)=1.548$ $p=.217$	$F(1,127)=1.867$ $p=.174$
	Patterns Reached	7.65 (0.77)	7.65 (0.77)	7.33 (0.95)		$F(1,83)=0.000$ $p=1.000$	$F(1,127)=3.126$ $p=.079$
SOC	5-move Problems	7.85 (2.08)	7.85 (1.81)	8.42 (2.21)		$F(1,87)=0.000$ $p=1.000$	$F(1,122)=1.791$ $p=.183$
	Stages Reached	6.77 (2.61)	6.97 (2.14)	6.22 (2.56)		$F(1,89)=0.140$ $p=.709$	$F(1,124)=2.333$ $p=.129$
Drug Rating Task	Neutral	5.72 (28.10)	12.06 (38.35)	211.18 (154.20)	Group	$F(1,79)=2.095$ $p=.152$	$F(1,128)=61.165$ $p<.001$
	Negative	6.10 (26.32)	21.15 (46.34)	236.55 (178.35)	Type	$F(1,824,144.094)=1.291$ $p=.277$	$F(2,256)=1.451$ $p=.236$
	Drug	5.26 (22.54)	11.52 (43.00)	261.94 (188.03)	Interaction	$F(1,824,144.094)=0.986$ $p=.369$	$F(2,256)=1.511$ $p=.223$

Note. Significant effects are highlighted in bold.

HV = Healthy Volunteers; MMT = Methadone Maintenance Treatment; DDT = Delay Discounting Task;

BART = Balloon Analogue Risk Task; SST = Stop Signal Task; SSRT = Stop Signal Reaction Time;

SWM = Spatial Working Memory; PAL = Paired Associative Learning; SOC = Stockings of Cambridge.