Supplementary Table 1. Behavioral aberrations induced by acute administration of MK-801 at low-range doses

	Vehicle	MK-801									
		0.1 mg kg^{-1}		0.12 mg kg^{-1}		0.15 mg kg^{-1}		0.2 mg kg^{-1}		0.3 mg kg^{-1}	
	Mean ± SEM	Mean ± SEM	P value	Mean ± SEM	P value	Mean ± SEM	P value	Mean ± SEM	P value	Mean ± SEM	P value
Open field test											
Distance moved (cm)	7652 ± 451.6	10491 ± 395.9	0.0766	12258 ± 872.3	0.0003***	14089 ± 980.2	< 0.0001****	13506 ± 602.7	< 0.0001****	12298 ± 964.0	0.0011**
Y-maze											
Total arm entries	42.65 ± 1.336	53.20 ± 3.210	0.1496	58.93 ± 5.228	0.0009***	70.87 ± 5.093	< 0.0001****	67.90 ± 3.384	< 0.0001****	66.75 ± 4.228	< 0.0001***
Spontaneous alternation (%)	64.81 ± 1.818	47.81 ± 1.829	0.0004***	50.10 ± 3.093	0.0005***	47.29 ± 1.856	< 0.0001****	48.35 ± 2.262	0.0008***	43.04 ± 3.166	< 0.0001***
Cliff avoidance test											
Jumping latency (s)	1195 ± 5.000	1006 ± 114.6	0.7045	720.0 ± 135.7	0.0315*	999.3 ± 99.38	0.6753	678.8 ± 157.9	0.0168*	334.2 ± 146.2	< 0.0001***
Self-grooming											
Self-grooming time (s)	140.6 ± 17.72	174.1 ± 16.27	0.5657	159.0 ± 14.01	0.9437	105.1 ± 15.69	0.5181	71.43 ± 12.52	0.0146*	37.79 ± 7.457	< 0.0001***
Three chamber social assay											
Social novelty index	2.236 ± 0.2606	1.980 ± 0.1910	0.9015	1.419 ± 0.1262	0.0445*	1.422 ± 0.1597	0.0418*	1.749 ± 0.2417	0.4348		
Social preference index	1.876 ± 0.2033	1.415 ± 0.1749	0.5222	1.146 ± 0.1900	0.0977	1.223 ± 0.1684	0.1734	1.320 ± 0.2518	0.3300		

Supplementary Table 1. Behavioral aberrations induced by acute administration of MK-801 at low-range doses. MK-801, an NMDA antagonist, recapitulates a wide spectrum of neuropsychiatric symptoms. Listed above are the aberrant behaviors evoked by acute administration of low-dose MK-801 in this study.

Supplementary Table 2. Overview of the behavioral impairments induced by MK-801

Behavioral aberration	Current study	Published studies and references
Hyperlocomotion	Measured through open field test, increased distance moved at doses 0.12 to 0.3 mg kg^{-1}, with possible initial stereotypic episodes at 0.3 mg kg^{-1}	At doses above 0.3 mg kg^{-1} (used 0.02, 0.05, 0.15, 0.3, 0.6 mg kg^{-1}), hyperlocomotion only developed after the stereotypic phase in male C57BL/6 mice at 6 weeks measured through beam crossing [1] Increase in locomotor activity was induced in CD-1 mice at 0.5 mg kg-1 of MK-801 in a two-hour observation of horizontal counts. BALB/c and C57Bl6/J mice, however, demonstrated increases in horizontal counts at 0.32 mg kg^{-1} [2] "Popping," or irregular episodes of intense jumping behavior, was observed in the Balb/c mouse strain when administered with 0.56 mg kg^{-1} of MK-801 [3] Hyperactive locomotor activity at a significantly higher dose of MK-801 at 0.6 mg kg^{-1} in male Swiss mice, peaking in between 25 min and 35 min in a 195-min observation [4]
Cognitive dysfunction	Measured through Y-maze, decreased spontaneous alternation at 0.1 mg kg^{-1} without affecting total number of arm entries	Impairment in the spontaneous alteration of male C57Bl/6JIco mice at 0.07 and 0.1 mg kg^{-1}, administered subcutaneously, during T-maze continuous alternation task [5] Impaired spatial memory acquisition and reversal learning in C67Bl/6J mice in water T-maze and disrupted memory context and cue during fear conditioning at doses 0.05 and 0.1 mg kg^{-1} [6, 7] Amnesic effects of 0.1 and 0.15 mg kg^{-1} doses of MK-801 in male Swiss mice during passive avoidance test [8] Impairment in episodic memory during passive avoidance learning required higher doses of MK-801 ranging from 0.16 to 0.5 mg kg^{-1} in male CD-1 mice [9, 10]
Social dysfunction	Measured through three-chamber social assay, decreased social interaction at doses 0.12 and 0.15 mg kg^{-1}	Male C57Bl/6J mice aged 4-5 weeks treated with 0.3 mg kg^{-1} demonstrated impaired sociability and diminished social preference in groups treated with 0.2, 0.3, and 0.5 mg kg^{-1} using the same behavioral assay performed in this study [11] Administration of 0.1 mg kg^{-1} in male CD-1 mice the cumulative time the subject mice stayed with a companion mouse and the cumulative time spent investigating the tail/anogenital area of the

		companion mice [12]
Impulsivity	Measured through cliff avoidance test, all groups displayed significant impairment of their cliff avoidance reaction and decreased jumping latency at doses 0.12, 0.2, and 0.3 mg kg^{-1}	induced an increase in premature responding in 5-CSRT at 0.015 and 0.063 mg kg^{-1} in Long Evans and Sprague-Dawley rats, respectively [13, 14]

Supplementary Table 2. Overview of the behavioral impairments induced by MK-801. Listed above are the behavioral aberrations induced by MK-801 in our study and in others with the strains, age, and doses used.

1. Wu, J., et al., *Bimodal effects of MK-801 on locomotion and stereotypy in C57BL/6 mice.* Psychopharmacology, 2005. **177**(3): p. 256-263.
2. Kalinichev, M., et al., *Locomotor reactivity to a novel environment and sensitivity to MK-801 in five strains of mice.* Behavioural pharmacology, 2008. **19**(1): p. 71-75.
3. Deutsch, S.I., et al., *Inbred mouse strains differ in sensitivity to "popping" behavior elicited by MK-801.* Pharmacology Biochemistry and Behavior, 1997. **57**(1-2): p. 315-317.
4. Zuo, D.-Y., et al., *Effect of acute and chronic MK-801 administration on extracellular glutamate and ascorbic acid release in the prefrontal cortex of freely moving mice on line with open-field behavior.* Life sciences, 2006. **78**(19): p. 2172-2178.
5. van der Staay, F.J., et al., *Effects of the cognition impairer MK-801 on learning and memory in mice and rats.* Behavioural brain research, 2011. **220**(1): p. 215-229.
6. Csernansky, J.G., et al., *Cholinesterase inhibitors ameliorate behavioral deficits induced by MK-801 in mice.* Neuropsychopharmacology, 2005. **30**(12): p. 2135.
7. Bardgett, M.E., et al., *NMDA receptor blockade and hippocampal neuronal loss impair fear conditioning and position habit reversal in C57Bl/6 mice.* Brain research bulletin, 2003. **60**(1-2): p. 131-142.
8. Benvenga, M.J. and T.C. Spaulding, *Amnesic effect of the novel anticonvulsant MK-801.* Pharmacology Biochemistry and Behavior, 1988. **30**(1): p. 205-207.
9. Castellano, C., et al., *MK-801-induced disruptions of one-trial inhibitory avoidance are potentiated by stress and reversed by naltrexone.* Neurobiology of Learning and Memory, 1999. **72**(3): p. 215-229.
10. Venable, N. and P.H. Kelly, *Effects of NMDA receptor antagonists on passive avoidance learning and retrieval in rats and mice.* Psychopharmacology, 1990. **100**(2): p. 215-221.
11. Moy, S.S., et al., *Disruption of social approach by MK-801, amphetamine, and fluoxetine in adolescent C57BL/6J mice.* Neurotoxicology and teratology, 2013. **36**: p. 36-46.
12. Zou, H., et al., *Low dose MK-801 reduces social investigation in mice.* Pharmacology Biochemistry and Behavior, 2008. **90**(4): p. 753-757.
13. Paine, T.A., et al., *Sensitivity of the five-choice serial reaction time task to the effects of various psychotropic drugs in Sprague-Dawley rats.* Biological psychiatry, 2007. **62**(6): p. 687-693.
14. Fletcher, P.J., et al., *Impulsive action induced by amphetamine, cocaine and MK801 is reduced by 5-HT2C receptor stimulation and 5-HT2A receptor blockade.* Neuropharmacology, 2011. **61**(3): p. 468-477.