Behavioral Neuroscience
2007, Vol. 121, No. 3, 579–585

0735-7044/07/$12.00 DOI: 10.1037/0735-7044.121.3.579

Facilitation of Ejaculation Induced by 8-OH-DPAT Does Not Produce Conditioned Place Preference in Male Rats

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The serotonin 1A receptor agonist 8-hydroxy-2-(di-n-propylamino)tetralin (8-OH-DPAT) produces a drastic facilitation of ejaculation characterized by a significant reduction in the number of pre-ejaculatory intromissions and a shortening of ejaculation latency. In the present study, the authors evaluated whether this facilitation of ejaculation can induce a reward state assessed by conditioned place preference. Males treated with 0.1 or 1.0 mg/kg of 8-OH-DPAT showed a clear facilitation of ejaculation but did not develop conditioned place preference. These results clearly indicate that the pharmacological facilitation of ejaculation and the reduction of the number of intromissions does not necessarily make sex rewarding.

Keywords: 8-hydroxy-2-(di-n-propylamino)tetralin (8-OH-DPAT), conditioned place preference (CPP), sexual behavior, reward

The conditioned place preference (CPP) procedure can measure approach responses to an environment where a reinforcing (positive or negative) event has occurred and can be used to reveal incentive motivational responses to reward-related stimuli. Using this paradigm researchers have shown that sexual behavior can induce a reward state in male (Hughes, Everitt, & Herbert, 1990; Mehrara & Baum, 1990; Miller & Baum, 1987) and female rats (Camacho, Sandoval, & Paredes, 2004; Paredes & Alonso, 1997; Paredes & Vazquez, 1999). The same paradigm was used to show that ejaculation in males induces a reward state. Males that were allowed to ejaculate once and were then immediately transferred to the conditioning cage developed place preference (Agmo & Berenfeld, 1990). The ability to control the rate of sexual stimulation appears to be important for rats of both sexes (Martinez & Paredes, 2001; Paredes & Vazquez, 1999). Males that mate in a chamber divided by a hole that allows only the female to go through, thus pacing the sexual interaction, do not develop conditioning after mating. Males that mate without the divider and have continuous access to the female develop a clear change of preference (Martinez & Paredes, 2001).

Treatment with the serotonin 1A receptor agonist 8-hydroxy-2-(di-n-propylamino)tetralin (8-OH-DPAT) produces a drastic facilitation of ejaculation. A significant reduction in the number of pre-ejaculatory intromissions (in some cases the animals ejaculate after one intromission) and a reduction of the ejaculation latency are consistently observed (Ahlenius & Larsson, 1997; Ahlenius, Larsson, & Arvidsson, 1989; Ahlenius et al., 1981; Morali & Larsson, 1984; Pattij et al., 2005; Rowland & Houtsmuller, 1998). The effects of 8-OH-DPAT are independent of the route of administration, with facilitation of ejaculation observed after systemic (Ahlenius et al., 1981; Pattij et al., 2005), intracerebral (Fernandez-Guasti, Escalante, Ahlenius, Hillegaart, & Larsson, 1992), and intrathecal injection (Lee, Smith, Mas, & Davidson, 1990). In addition, the effects of the compound are consistent regardless of the level of sexual activity of the subjects. For example, 8-OH-DPAT facilitates ejaculation in rats that otherwise express low levels of sexual activity following castration (Ahlenius et al., 1981). Moreover, when rats were classified as sluggish, normal, or rapid ejaculators, the compound reduced the number of intromissions and ejaculation latency and increased ejaculation frequency in all groups (Pattij et al., 2005). In the present study we evaluated whether the facilitation of ejaculation induced by 8-OH-DPAT produces a reward state as assessed by CPP.

Method

Subjects

Seventy-seven sexually naive male Wistar rats obtained from the breeding colony at the Instituto de Neurobiología, Universidad Nacional Autónoma de México (Querétaro, México), and weighing 300–350 g were maintained in a room with a 12-hr reversed light–dark cycle (lights off at 0900). Commercial rat pellets (Lab-Diet; Nutrition International, Brentwood, MO) and water were always available. Subjects were housed 4 per cage, with rats of the same group living together. Stimulus females of the same strain (200–250 g) were bilaterally ovariectomized following anesthetization with a mixture of ketamine (95 mg/kg) and xylazine (12 mg/kg). They received subcutaneous injections of 25 μg/rat of estradiol benzoate 48 hr before mating tests plus 1 mg/rat of progesterone 4 hr before testing. The steroids were dissolved in corn oil and injected in a volume of 0.2 ml/rat. Males that ejacu-

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Grants from Dirección General de Asuntos del Personal Académico (DGAPA) IN204206 and Consejo Nacional de Ciencia y Tecnología (CONACyT) V40286M supported this research. We thank Martín García, Leonor Casanova, Lourdes Lara, Pilar Galarza, Omar González, and Rafael Silva for their excellent technical assistance.

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lated in one screening test of sexual behavior were included in the actual experiments. All experiments were carried out in accordance with the "Reglamento de la Ley General de Salud en Materia de Investigación para la Salud" ("Regulation of the General Law of Health for Research on Health-Related Topics") of the Mexican Health Ministry.

Apparatus

The mating cages (40 × 60 × 40 cm) had wood shavings on the floor and a front wall made of glass for observation. In each test, a stimulus female was placed in the mating cage 2 min before the male was introduced.

The place preference apparatus consisted of a three-compartment box made of wood. The middle compartment (22 × 24 × 32 cm) was painted gray and communicated with the lateral compartments through a sliding door (10 × 10 cm). One of the lateral compartments (23 × 37 × 32 cm) was painted white, and the floor was covered with clean wood shavings. The opposite lateral compartment was painted black, had no bedding, and was moistened with a 2% solution of glacial acetic acid. In this way, the lateral compartments offered distinct stimuli in odor, color, and texture. The rats were observed through the front wall of the middle compartment, made of fine wire mesh.

The place preference cages and the mating cages were located in adjacent rooms illuminated with dim white light. The subjects were put in the preference cage a few seconds after mating to allow evaluation of the physiological state induced by mating and to reduce the association with the execution of sexual behavior (Agmo & Berenfeld, 1990).

Chemicals

The 8-OH-DPAT was purchased from Sigma Chemical (St. Louis, MO). The drug was dissolved in distilled water and injected intraperitoneally, in a volume of 1 ml/kg. Both doses (0.1 and 1.0 mg/kg) were injected 15 min before males were placed with receptive females.

Treatment and Design

We evaluated if male rats injected with doses of 8-OH-DPAT, which produce a drastic facilitation of ejaculation, developed CPP. Control groups were injected with saline prior to mating. In addition, a third group of rats was given 8-OH-DPAT without copulation to evaluate the effect of the compound alone on CPP. In Experiment 1, a dose of 0.1 mg/kg was administered. In Experiment 2, subjects received a dose of 1 mg/kg. Because drug-treated rats did not develop CPP after mating, indicating that the pharmacological facilitation of ejaculation and the reduction of the number of intromissions does not necessarily make sex rewarding, in Experiment 3 we evaluated if the repeated administration of the drug would eventually reduce the rewarding properties of intromissions and ejaculations and inhibit sexual behavior. One group of rats was tested once a week for 9 weeks with 1.0 mg/kg of 8-OH-DPAT. On Weeks 10 and 11, rats copulated without treatment. All control subjects received saline solution.

Behavioral Procedures

Mating test. Stimulus females were primed with a hormone replacement treatment (see *Subjects*) that induces high levels of proceptive and receptive behavior and has been used repeatedly in experiments of CPP and mating (García Horsman & Paredes, 2004; Martinez & Paredes, 2001; Paredes & Alonso, 1997). During mating tests, the following parameters of sexual behavior were recorded: latencies and number of mounts, intromissions, and ejaculations.

Place preference paradigm. A procedure similar to that used by Paredes and Alonso (1997) was followed. Placing the subject in the middle compartment and recording the time spent in each of the lateral chambers during a 10-min session determined the initial preference (pretest). During conditioning sessions, the rats were placed in the preferred compartment for 30 min. On alternate days, the males were exposed to the reinforcing event after treatment with 8-OH-DPAT (0.1 or 1.0 mg/kg). Immediately after ejaculation, subjects were placed in the nonpreferred (rewarded) compartment for 30 min. After six conditioning sessions, three reinforced and three nonreinforced, the preference for each chamber was tested again (test) in exactly the same way as before conditioning (pretest).

Statistical Analysis

The number and latencies of mount, intromission, and ejaculation during conditioning were evaluated by a 2 (group) × 3 (session) analysis of variance (ANOVA) followed by Fisher's least significant difference. To evaluate place preference conditioning, we used two criteria: (a) the preference score (time in reinforced compartment/time in reinforced compartment + time in nonreinforced compartment) should increase after conditioning and (b) the time in the reinforced compartment (time in reinforced compartment between pretest and test) should increase after conditioning. The data were analyzed by a *t* test comparing each parameter in the pretest versus test; in this way, each animal served as its own control. Subjects were randomly assigned to the different groups

Table 1
Experiment 1: Sexual Behavior Parameters in Males After Treatment With NaCl or 8-OH-DPAT (0.1 mg/kg) During Conditioning Sessions (n = 10 for Each Group)

Behavior parameter	Session	NaCl	8-OH-DPAT
No. of mounts	1	14.2 ± 1.9	8.7 ± 2.1*
	2	13.1 ± 1.6	7.3 ± 1.6**
	3	14.7 ± 3.1	6.4 ± 2.1**
No. of intromissions	1	19.6 ± 3.1	15.3 ± 2.1*
	2	15.8 ± 1.6	12.2 ± 1.5
	3	15.3 ± 1.8	13.4 ± 1.7
Mount latency	1	104 ± 31.1	63 ± 15.3
	2	81 ± 17.3	148 ± 53.6
	3	158 ± 89.7	87 ± 39
Intromission latency	1	147 ± 44.6	79 ± 21
	2	144 ± 38	197 ± 69
	3	199 ± 98.5	92 ± 38.9
Ejaculation latency	1	822 ± 71.6	465 ± 101**
	2	542 ± 54.6	79 ± 49.3**
	3	565 ± 102	378 ± 84.3*

Note. Values are means plus or minus standard errors. Latencies are in seconds. Notations of significance refer to differences between treatment groups within the same session.
* $p < .05$. ** $p < .01$.

before the pretest; they were not equated for the time in the reinforced compartment or the preference score, because one measure does not necessarily correspond with the other. Both values should increase between pretest and test. The use of both criteria reduces the possibility of a false preference change. Comparisons between groups would not be appropriate because the groups could differ in their baseline levels. In Experiment 3, sexual behavior parameters were evaluated by a 2 (group) × 11 (week) ANOVA followed by Fisher's least significant difference.

Results

Experiment 1: Sexual Behavior and CPP After 0.1 mg/kg 8-OH-DPAT

A significant effect was observed in the number of mounts (group), $F(1, 19) = 6.85$, $p = .017$; number of intromissions (session), $F(2, 19) = 3.51$, $p = .04$; and ejaculation latency (group), $F(1, 19) = 10.61$, $p = .005$. Post hoc tests revealed that the number of mounts and ejaculation latency were significantly reduced in the three conditioning sessions. The number of intromissions was significantly reduced in the first conditioning session (see Table 1).

Both the time in the reinforced compartment, $t(9) = -2.53$, $p = .03$, and the preference score, $t(9) = -4.41$, $p = .001$, increased significantly in the group that mated after the injection of saline. No significant differences were observed in the group that mated after the injection of 8-OH-DPAT: time in reinforced compartment, $t(9) = 2.04$, $p = .07$; preference score, $t(9) = -0.72$, $p = .48$; or in the group that only received the injections of the compound: time in reinforced compartment, $t(9) = -0.15$, $p = .87$; preference score, $t(9) = -0.71$, $p = .49$. As can be seen in Figure 1, the reduction in ejaculation latency produced after the injection of 8-OH-DPAT did not produce a change of preference.

Experiment 2: Sexual Behavior and CPP After 1.0 mg/kg 8-OH-DPAT

Sexual behavior was facilitated by this dose in all three conditioning sessions. Significant effects were observed in the number of mounts (group), $F(1, 19) = 21.75$, $p < .001$; number of intromissions (group), $F(1, 19) = 91.95$, $p < .001$; mount latency

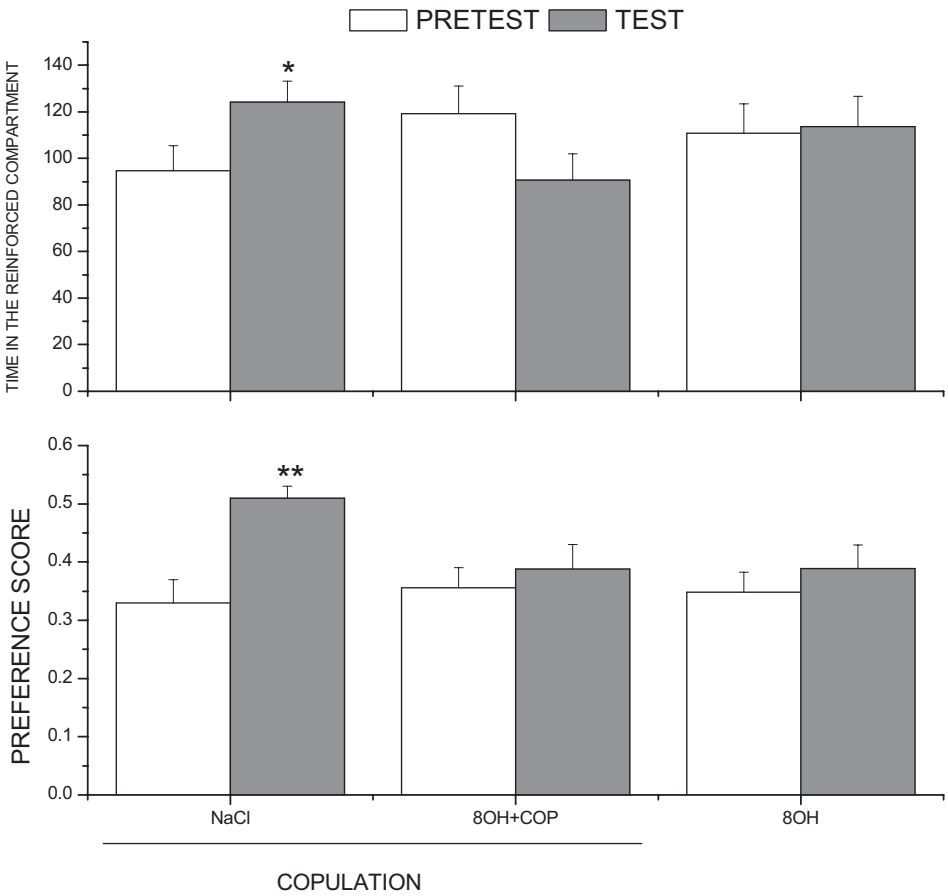

Figure 1. Experiment 1: Time spent in the reinforced compartment (in seconds) and preference score in rats injected with saline or 0.1 mg/kg 8-hydroxy-2-(di-n-propylamino)tetralin (8-OH-DPAT) before copulation or only injected with 8-OH-DPAT ($n = 10$ for each group). COP = copulation. $^{*}p < .05$, $^{**}p < .01$ for difference from pretest. Error bars represent the standard error of the mean.

(group), $F(1, 19) = 91.85$, $p < .001$; intromission latency (group), $F(1, 19) = 15.64$, $p < .001$; and ejaculation latency (group), $F(1, 19) = 34.64$, $p < .001$. Post hoc tests revealed that the number of mounts, number of intromissions, and ejaculation latency were significantly reduced in the three conditioning sessions (see Table 2).

Significant increases in the time spent in the reinforced compartment, $t(9) = -3.93$, $p < .01$, and in the preference score, $t(9) = -5.42$, $p < .01$, were observed in the group that mated after the injection of saline. No significant differences were observed in the group that mated after the injection of 8-OH-DPAT: time in reinforced compartment, $t(9) = 1.88$, $p = .09$; preference score, $t(9) = -1.10$, $p = .29$. The group that was only injected with 8-OH-DPAT showed an increase in the preference score, $t(9) = -3.01$, $p = .01$, but no increase in the time spent in the reinforced compartment was observed after conditioning, $t(9) = -1.05$, $p = .31$. Again, no change of preference was observed in rats that ejaculated with fewer intromissions (see Figure 2).

Experiment 3: Repeated Testing After Injections of 1.0 mg/kg of 8-OH-DPAT

Significant differences were observed between groups in mount, $F(1, 16) = 15.77$, $p = .0012$; intromission, $F(1, 16) = 14.79$, $p = .0016$; and ejaculation latencies, $F(1, 16) = 36.66$, $p < .001$. Differences were also observed between the group repeatedly injected with 8-OH-DPAT and the group injected with saline in the number of mounts, $F(1, 16) = 21.84$, $p = .0003$, and intromissions, $F(1, 16) = 170.5$, $p < .001$. As can be seen in Table 3, mount and intromission latencies as well as the number of mounts were reduced after 8-OH-DPAT treatment in several weeks of testing. The ejaculation latency and the number of intromissions were significantly reduced in the group treated with 8-OH-DPAT during the first 9 weeks. In Weeks 10 and 11, when the treatment was discontinued, no differences between groups in these parameters were found. Mount and intromission latencies were reduced in Weeks 10 and 11 in the group previously treated with 8-OH-DPAT as compared with the group treated with saline.

Table 2
Experiment 2: Sexual Behavior Parameters in Males After Treatment With NaCl or 8-OH-DPAT (1.0 mg/kg) During Conditioning Sessions (n = 10 for Each Group)

Behavior parameter	Session	NaCl	8-OH-DPAT
No. of mounts	1	9.1 ± 2.8	1 ± 0.4**
	2	10.5 ± 1.8	0.9 ± 0.4**
	3	5.5 ± 1.3	1.8 ± 0.4*
No. of intromissions	1	22.4 ± 1.9	3.1 ± 0.4**
	2	19.1 ± 2.3	4.7 ± 0.7**
	3	15.1 ± 1.2	4.8 ± 0.9**
Mount latency	1	66 ± 14.2	37 ± 8.9
	2	138 ± 45.1	37 ± 8.5**
	3	78 ± 27	15 ± 2.0
Intromission latency	1	97 ± 21.7	84 ± 36.2
	2	219 ± 48.2	55 ± 10.2**
	3	94 ± 25.9	36 ± 12.7
Ejaculation latency	1	724 ± 95.3	149 ± 30**
	2	736 ± 137.8	225 ± 34**
	3	429 ± 55.1	148 ± 20.5**

Note. Values are means plus or minus standard errors. Latencies are in seconds. Notations of significance refer to differences between treatment groups within the same session.
* $p < .05$. ** $p < .01$.

Discussion

Both doses of 8-OH-DPAT produced a shortening of ejaculation latency during conditioning sessions, consistent with many previous findings (Ahlenius & Larsson, 1997; Ahlenius et al., 1989, 1981; Morali & Larsson, 1984; Pattij et al., 2005; Rowland & Houtsmuller, 1998). The dose of 1 mg/kg also produced a significant reduction in the number of mounts and intromissions in the three conditioning sessions. However, this facilitation of ejaculatory behavior was not associated with a change of preference after conditioning. The groups that copulated after 8-OH-DPAT injections (0.1 or 1 mg/kg) and were then placed in the originally nonpreferred compartment did not develop a change of preference after conditioning. On the other hand, the groups that copulated after saline injections developed a clear change of preference after conditioning. These results clearly indicate that the pharmacological facilitation of ejaculation and the reduction of the number of intromissions does not necessarily make sex rewarding.

If the administration of 8-OH-DPAT facilitates ejaculation but does not induce a reward state, it could be argued that repeated testing with this compound could eventually modify the facilitation of sexual behavior or inhibit the display of this reproductive pattern. The results of our third experiment show that this is not the case. Rats tested for 9 consecutive weeks after administration of 1 mg/kg of the compound showed a consistent reduction in the number of intromissions and a reduction of ejaculation latency. These results are in agreement with previous observations in which the chronic effects of 8-OH-DPAT were evaluated (Johansson, Meyerson, & Hoglund, 1990). The rats received a daily injection of the compound for 15 days and were tested for sexual behavior on Days 1, 8, and 15. A significant reduction in the number of intromissions and in the ejaculation latency in comparison with the control group was observed in the three tests (Johansson et al., 1990). In the present experiment the same facilitation of sexual behavior was observed even after nine tests of sexual behavior preceded by 8-OH-DPAT administration. If the rats treated with 8-OH-DPAT do not find sex rewarding, why do they continue to mate? We have previously shown that if females control the rate of sexual stimulation, males do not develop a reward state evaluated by CPP (Martinez & Paredes, 2001). We have also shown that males that mated 10 times in a chamber in which the female, but not the male, controlled the rate of sexual stimulation continued mating even though they did not develop CPP (Camacho et al., 2004). In the present experiment males were tested nine times with 8-OH-DPAT, and still ejaculatory behavior was facilitated.

At least two possible explanations can be proposed to explain why males continue to mate. The first explanation is that sexual behavior may indeed be rewarding but that CPP is not sensitive enough to reveal a reward state. The alternative explanation is that females and sexual behavior are very powerful incentives for the male even when there is no reward or when the value of the reward associated with sex is reduced. Different lines of evidence support the second explanation. For example, it has been demonstrated that the intensity of sexual behavior is related to the efficacy of sex as a reinforcer. Males allowed to ejaculate showed a more consistent

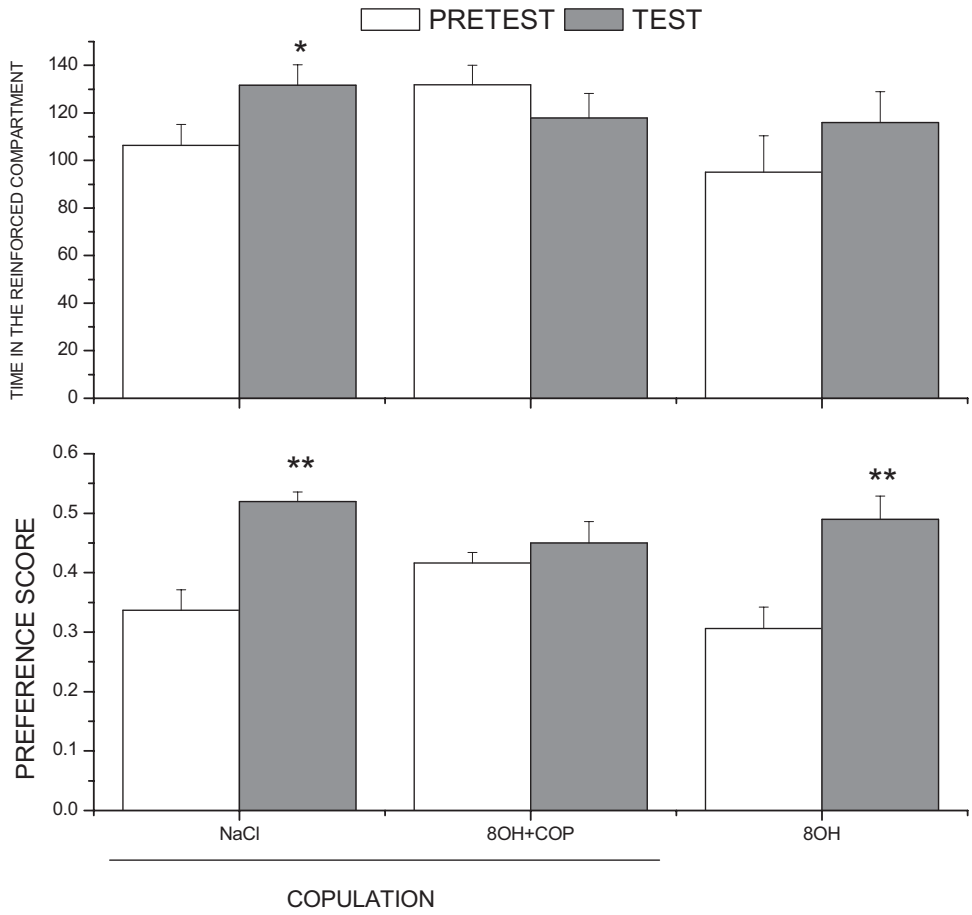

Figure 2. Experiment 2: Time spent in the reinforced compartment (in seconds) and preference score in rats injected with saline or 1 mg/kg 8-hydroxy-2-(di-n-propylamino)tetralin (8-OH-DPAT) before copulation or only injected with 8-OH-DPAT ($n = 10$ for each group). COP = copulation. $^{*}p < .05$, $^{**}p < .01$ for difference from pretest. Error bars represent the standard error of the mean.

choice to the female side of a T maze than those allowed only to mount or intromit (Kagan, 1955). It has also been shown that intromission without ejaculation is a self-maintaining behavior pattern that can act as a reward for learning. Male rats that were allowed to make four intromissions ran faster to the female than did males allowed a single intromission, and males that were allowed only to mount ran much slower but still showed a preference for the female (Whalen, 1961). That is, when the reward is reduced, as presumably occurs when the males are allowed to mount or intromit but not ejaculate, sexual behavior is still displayed.

Different studies have evaluated the effects of 8-OH-DPAT on CPP. Systemic injections of low doses (0.1–0.25 mg/kg) (Fletcher, Ming, & Higgins, 1993; Papp & Willner, 1991; Shippenberg, 1991), as well as infusions of the compound in the dorsal or median raphe, induced a significant CPP (Fletcher et al., 1993). There is one study in which the administration of a dose of 1 mg/kg of 8-OH-DPAT produced conditioned place aversion (Papp & Willner, 1991). In the present study no changes were observed in the time spent in the reinforced compartment or in the preference score with the 0.1-mg/kg dose. The dose of 1 mg/kg produced a significant increase in the preference score but not in the time spent in the reinforced compartment. This could be due to a reduction in the time spent in the originally preferred compartment without an increase in the originally nonpreferred compartment. This is one of the reasons we used two criteria to consider a change of preference. It is interesting to note that in the Papp and Willner (1991) study the preference reported by the authors reflects more a decrease in the aversion for the nonpreferred side rather than an increase in the time spent in the reinforced compartment. The preference induced by 8-OH-DPAT was blocked by the dopamine (DA) receptor antagonists spiperone and SCH-23390, suggesting that the appetitive effects of 8-OH-DPAT result from an interaction with dopamine receptors (Shippenberg, 1991). Because DA receptor antagonists are not able to block the reward state induced by ejaculation in males (Agmo & Berenfeld, 1990) and paced mating in females (García Horsman & Paredes, 2004), it is clear that 8-OH-DPAT and sex induced a reward state by different mechanisms. There is also considerable evidence indicating that DA does not mediate the hedonic pleasures of reinforcers, that is, the "liking" aspects of the stimuli, but that it is involved in the "wanting" of the incentives (Berridge & Robinson, 1998). For

Table 3
Experiment 3: Sexual Behavior in Rats Treated With 8-OH-DPAT (n = 9) or Saline (n = 8) 15 Min Before Testing Once a Week for 9 Weeks, With No Treatment Before Testing in Weeks 10 and 11

Week	Group	Mount latency	Intromission latency	Ejaculation latency	Mounts	Intromissions
1	NaCl	140 ± 51	209 ± 89	776 ± 95	11.3 ± 1.4	17.1 ± 1
	8-OH	18 ± 5*	35 ± 9*	71 ± 17**	1.4 ± 0.2**	1.9 ± 0.4**
2	NaCl	39 ± 11	64 ± 15	565 ± 48	8.4 ± 2.1	17.8 ± 1.2
	8-OH	15 ± 4	19 ± 4	118 ± 36**	1.3 ± 0.3**	2.9 ± 0.8**
3	NaCl	44 ± 12	64 ± 14	458 ± 72	5.8 ± 1	15 ± 1.7
	8-OH	15 ± 4	15 ± 4	89 ± 35**	2.7 ± 1.2	3.9 ± 1.1**
4	NaCl	43 ± 8	73 ± 18	468 ± 73	6.6 ± 1.1	14.1 ± 1.4
	8-OH	16 ± 5	16 ± 5	116 ± 47**	1.7 ± 0.7*	3.9 ± 1.3**
5	NaCl	122 ± 69	139 ± 69	483 ± 68	5.4 ± 1.3	14.1 ± 1.3
	8-OH	14 ± 5	17 ± 4	106 ± 32**	1.3 ± 0.3*	4.2 ± 1.7**
6	NaCl	133 ± 57	181 ± 78	487 ± 105	5.1 ± 1.4	13.5 ± 1.2
	8-OH	44 ± 24	47 ± 24	177 ± 49**	2.4 ± 0.9	4.6 ± 1.4**
7	NaCl	117 ± 48	136 ± 50	438 ± 78	5.8 ± 2.3	12.3 ± 0.9
	8-OH	21 ± 10	21 ± 10	98 ± 22**	1 ± 1*	3 ± 0.6**
8	NaCl	149 ± 45	230 ± 76	567 ± 107	3.7 ± 1.1	14.5 ± 1.2
	8-OH	26 ± 11*	26 ± 11**	198 ± 53**	2.3 ± 1.3	5.6 ± 1.7**
9	NaCl	251 ± 136	261 ± 137	482 ± 57	4.3 ± 1.1	12.3 ± 1
	8-OH	20 ± 7**	20 ± 7**	155 ± 44**	0.3 ± 0.3	5.1 ± 1.4**
10	NaCl	340 ± 88	402 ± 101	468 ± 76	10.3 ± 2.9	12.1 ± 1.4
	8-OH	38 ± 15**	67 ± 14**	410 ± 63	9.8 ± 2.3	9.6 ± 0.7
11	NaCl	333 ± 67	539 ± 108	491 ± 102	5.9 ± 1.1	11 ± 1
	8-OH	91 ± 29**	259 ± 103**	536 ± 112	7.2 ± 1.6	10.4 ± 0.6

Note. Values are means plus or minus standard errors. Latencies are expressed in seconds. Notations of significance refer to differences between treatment groups.
* $p < .05$. ** $p < .01$.

example, animals with a depletion of DA up to 99% in the nucleus accumbens and striatum still show normal hedonic reaction patterns to different stimuli (Berridge & Robinson, 1998). The opioid receptor antagonist naloxone blocks the reward state induced by sexual behavior (Agmo & Berenfeld, 1990; Miller & Baum, 1987) and ejaculation in males (Agmo & Berenfeld, 1990; Agmo & Gomez, 1993) and that induced by paced mating in females (Paredes & Martinez, 2001), suggesting that a common opioid system mediates sexual reward in male and female rats.

To summarize, the administration of 8-OH-DPAT facilitates ejaculation by reducing the number of intromissions. This pharmacological facilitation of ejaculation does not induce CPP, suggesting that under this condition sex is not rewarding. In men suffering from premature ejaculation, the lack of sexual reward itself could be another problem aside from the impact on self-confidence, anxiety, depression, and concern for their relationships (Symonds, Roblin, Hart, & Althof, 2003).

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Received November 3, 2006
Revision received January 19, 2007
Accepted February 20, 2007 ■