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Short communication

A POSITIVE CORRELATION BETWEEN MALE AND FEMALE RESPONSE LATENCIES IN THE MUTUALLY REINFORCED INSTRUMENTAL SEXUAL RESPONSES IN RATS

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In a previous study (1) during the investigation of the mutually reinforced instrumental sexual responses in rats a positive correlation has been found between the male and female response latencies. The purpose of the present work was to investigate whether this correlation is related to the mating behavior.

Mutually reinforced instrumental responses, rewarded by contact with an animal of the opposite sex, were tested in male and female rats in two experimental situations, the estrus situation when the female subjects displayed estrus behavior (3, 5, 8) and the diestrus situation when they displayed diestrus behavior.

Four male albino rats, 4 male hybrids of albino and wild rats (F3 generation), and 7 female albino rats were the subjects of this study. The females were previously sterelized by a bilateral ligation of the uteral horns and in the course of the experiment displayed their natural sexual cycle. As a criterion of estrus behavior was assumed the display by the females of typical behavioral patterns such as lordosis, ear-wiggling, presentation, hopping and running.

The subjects were caged in groups of 3 to 4 animals of the same sex and maintained in 12 h reversed day-night cycle. The sessions were carried out 4 to 6 h after the begining of the dark period.

The apparatus for the investigation of the instrumental response (Fig. 1) was 90 cm long, 40 cm wide, and 40 cm high and was divided with two opaque doors into three equal compartments $30 \times 40 \times 40$ cm

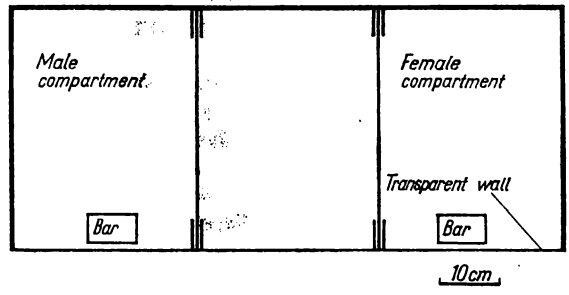

Fig. 1. Apparatus for the investigation of the mutually reinforced instrumental sexual responses, upper view

each. The front (30 cm long) walls of these compartments were transparent to permit the observation of the subjects. Bars of 8 × 5 cm were attached 7 cm above the floor on the front walls of the left and right compartments.

During the investigation of the mutually reinforced instrumental responses the subjects were put into the external compartments of the apparatus equipped with bars, the male always in the left and the female in the right compartment. The middle compartment remained empty. When either subject had pressed the bar, the door separating it from the middle compartment was opened. The contact between the subjects was possible after both of them had accomplished the instrumental response. After each contact, when intromissions, mouting, ejaculation, superficial contacts or exploratory behavior had taken place, the subjects were forced into their compartments, and the doors separating them from the middle compartment were immediately closed. Hence the durations of the intertrial intervals depended only on the subjects behavior. The contacts between the subjects lasted 15 s, unless the intromission or ejaculation occurred earlier, in those cases they were interrupted 1–2 s after the termination of the item. The sessions consisted of 9–23 trials in estrus situation and of 7–13 trials in diestrus situation. The intervals between the sessions ranged from 1 day up to 3 weeks. The response latencies that is the time between the closing of the subject in its compartment and the first bar-press were measured in male and female subjects in 0.6 s time units by a special device equipped with electromagnetic counters.

Fourteen sessions were performed in the estrus and 42 in the diestrus situation. The median response latencies in the estrus situation were 29.5 s in males and 31 s in females, whereas in the diestrus situation they were 16 s in males and 20.5 s in females. During the contacts between the subjects five behavioral items were distinguished: ejaculation, intromission, mounting, superficial contacts, and exploratory behavior. All the items were observed in the estrus situation and only the last three in the diestrus situation. These behavioral items (with the exception of the exploratory behavior) were accompanied in some sessions by female aver-

TABLE 1

The correlation between the male and female response latencies. E, estrus situation; D, diestrus situation. The subjects denoted ♂1, ♂2, ♂3, ♂4, were the F3 generation hybrids between the wild and albino rats

Male subject	Female subject	Experimental situation	Number of trials	r value	Male subject	Female subject	Experimental situation	Number of trials	r value
		D	10	0.626		♀1	D	11	−0.040
		D	10	−0.467			D	11	0.200
		E	14	−0.028		♀2	E	15	0.683
♂1	♀1	E	19	0.520*			D	7	−0.912*
		D	10	0.182			E	9	−0.174
		D	9	−0.324			D	10	−0.408
		D	8	−0.357			E	11	0.656*
		D	10	0.561			D	9	−0.357
		D	9	0.494			D	8	0.146
		E	12	0.525	♂4		D	9	0.338
		E	12	0.562			D	10	0.444
	♀2	D	9	0.400		♀5	D	11	−0.003
		D	9	0.132			D	9	0.618
		D	8	0.333			D	10	−0.381
		E	11	0.306			D	8	−0.225
♂2		D	9	0.470		♀1	E	14	0.510*
		D	10	0.279					
		D	9	0.401	♂5	♀3	D	9	0.465
		D	10	0.419		♀5	E	23	0.513*
		E	22	0.764*					
	♀5	D	9	−0.565					
		D	9	0.440			D	10	0.009
		D	13	0.395			D	10	0.153
		D	9	0.202	♂6	♀4	D	7	0.489
		D	11	0.058			D	8	0.611
		D	9	−0.614			D	9	0.019
♂3	♀3	D	10	−0.098			D	9	0.651
		E	16	0.932*	♂7	♀6	E	10	0.967*
							D	9	0.349
					♂8	♀7	E	21	−0.008
							D	9	0.394

* The statistically significant correlation for $\alpha = 0.05$.

sive behavior manifested by fending off the male. This aversive behavior occurred in 20–80% of contacts during 5 out of 14 sessions in the estrus situation and during 24 out of 42 sessions in the diestrus situation.

The correlation between the male and female response latencies was estimated for each session by Pearson's test for $\alpha = 0.05$. The data from 14 sessions performed in the estrus situation and 42 performed in the

diestrus situtation were analized. The r values for all sessions analized are shown in Table I. A statistically significant positive correlation was found in eight cases in the estrus situation, and in none of the cases in the diestrus situation. However, in the diestrus situation a negative correlation was observed in one case.

The results of this study reveal that the statistically significant positive correlation between the male and female response latencies occurs only in the estrus situation. Previously (1) also in the estrus situation such correlation was found in 33 out of 70 sessions analyzed. Both these findings seem to indicate that the positive correlation between the male and female response latencies is related to the mating behavior.

The occurrence of this correlation only in the estrus situation allows us to assume that for the female rat the copulatory events have different rewarding values than noncopulatory ones. This assumption differs from the point of view of these authors (2, 4, 6, 7) who deny the rewarding values of the mating for the female rats.

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