Survival stamina as a function of social interaction

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The present experiment was undertaken in an attempt to determine possible effects of social facilitation upon survival stamina of rats running on a motorized treadmill. Forty albino rats were used as Ss. A two-tailed *t* test indicated that paired rats ran significantly ($p < .05$) longer than did single rats. The data implied that as a result of social facilitation, animal pairs exhibited greater survival stamina than did single animals.

Although many psychologists have studied the various social organizations which exist among animals, few, if any, have studied the effects of such interaction in avoidance situations (Allee, 1938; Altman, 1967; Alverdes, 1927; Young, 1961). The majority of experimentation concerning social organization has dealt with its facilitory effects upon learning, nutritional acquisition, and consumption (Allee, 1931; Gates & Allee, 1933; Harlow, 1932). With the exception of studies done by Anderson (1939), Lepley (1937), and Winslow (1940), which dealt with social interaction in competitive situations, little has been done to discern the effects of social facilitation in any type of stressful situation.

The present experiment is an attempt to determine the possible effects of what Altman (1967, p. 455), Harlow (1932), and Yudin (1933, p. 171) refer to as "social facilitation" upon an avoidance situation. Altman defined social facilitation "as a phrase that refers to the observed phenomenon of the initiation or induction of the performance of an act as a result of its exhibition by others [1967, p. 455]." The experimental hypothesis contends that paired groupings of rats will exhibit stronger survival stamina as measured by running time on a treadmill than will single animals in the same situation. If one is to assume that social facilitation exists in avoidance situations as well as competitive stress situations, such a hypothesis will be found to be consistent with the findings of Waters, Rethlingshafer, & Ealdwell (1960).

SUBJECTS

The Ss consisted of 40 male albino rats, weighing between 235 and 375 g.

APPARATUS

The apparatus consisted of a stopwatch and a variable-speed motor-driven treadmill, 17 x 28 in., which was enclosed by an 8-in. wall with plastic top. A 4 x 17 in. shocking grid was located at the rear of the canvas belt.

PROCEDURE

Twenty Ss were assigned randomly to a single group (S1) and 20 Ss were assigned to a paired group (P1). The 20 Ss in the S1 group were individually placed on the treadmill, which was running at 2 ft/sec. Each S was run until complete exhaustion ensued. Ten consecutive seconds on the shocking grid was used as criterion for complete exhaustion. A similar procedure was used for Ss in the P1 group run in pairs. The first rat to reach criterion in the P1 group was immediately removed without stopping the treadmill. Using a stopwatch, E recorded the total length of time, to the nearest sixth of a minute, that each S spent in the apparatus. All Ss were run at sea level at a temperature of 70° F.

RESULTS

Table 1 exhibits the mean times of the P1 and S1 groups, indicating a consistent superiority of running endurance attained by the P1 groups. A two-tailed *t* test indicated that P1 Ss ran significantly ($p < .05$) longer than did S1 Ss.

Table 1
Endurance Time

S1 Group		P1 Group	
Weight (Grams)	Minutes	Weight (Grams)	Minutes
352	18	335	25½
375	47½	375	47½
370	22	320	20½
320	27	320	34
280	30	265	26
340	32½	265	38
340	24	320	37
338	28	326	40
280	29	325	27
300	23	330	35½
235	20½	320	26
240	22½	315	38
320	25	315	30
275	27½	325	36
340	23	310	23
235	23	300	35½
240	28½	265	26
340	29	275	29
235	26	270	32
325	21	270	36½
$\bar{X} = 304$	$\bar{X} = 26.2$	$\bar{X} = 308$	$\bar{X} = 32$

DISCUSSION

The results of this experiment imply that social facilitation stimulates an increased level of survival stamina, resulting in higher levels of physical endurance of animal aggregates as compared to single animals. Such implications are in accordance with findings by Waters, Rethlingshafer, & Ealdwell (1960), which pose important determinants other than primary biological drives as mechanisms of behavior. However, Gates & Allee (1933) found no such social facilitatory effects in cockroaches running a maze. Allee (1938) found that social interaction interfered with maze learning of parakeets. However, Waters (1960) found no significant difference between paired and single groups of rats in learning situations. Such findings would seem to imply that increased survival stamina in rats may be dependent upon social facilitation for motivation derivations, but that such social facilitation is void of processes concerning learning. Thus, it is evident that the significantly longer running times accomplished by P1 rats compared to S1 rats is dependent upon some type of interaction which facilitates stamina.

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