

center of the chamber and at the same time permit enough freedom to rotate about and move laterally a few inches. The harness also gave sufficient support and stability to the target so it could maintain a posture which kept the uninsulated forepaws off the grid floor.

Each experimental rat was placed in the chamber with the previously paired insulated and harnessed target rat. After 10-15 sec, .5-sec 2-mA shocks were presented at a rate of 20 per minute for 10 min. This procedure was repeated for 10 sessions over a 2-week period. Two Es recorded the occurrence of shock-elicited aggression responses, which consisted of biting and pawing at the target rat while in the stereotyped aggressive posture (Ulrich & Azrin, 1962). Only one response per shock was recorded.

RESULTS

Very little shock-elicited aggression occurred in this experimental situation. All Ss displayed some attack responses directed at the target, but the frequency was never more than 36 out of a possible 200 shock presentations. The initial response of the experimental rats to the shock was characterized by a high activity level, running about the chamber, rearing up on hindlegs, and often bumping into and attempting to climb on the target animal. Within the first session all rats began to display responses which developed into behavior patterns with individualized stereotyped posturing. Most frequently this response included an upright posture, but did not include fighting. It was observed that this response was occasionally effective in preventing shock presentation to the experimental rat and, starting with the second session, shock avoidance as well as shock-elicited aggression was recorded for each S. Fig. 1 shows the mean proportion of shocks which were avoided during the final 9 sessions and the mean proportion of shocks which elicited aggression during all 10 sessions.

It is obvious that very little shock-elicited aggression occurred in this experiment. However, the data presented in Fig. 1 suggest the acquisition of avoidance responses during this procedure. The avoidance responses typically involved the maintenance of an upright posture and balancing with only one hindleg in contact with a single floor grid. This posture was most frequently established with the experimental rat in contact with the target animal. In fact, usually the experimental rat could maintain the posture successfully only by leaning or climbing upon the other animal. What seems noteworthy in this experiment is the fact that, although the rats were

developing avoidance responses, they continued to receive more than 50% of the possible shocks. Yet, even when in close proximity or even in direct contact with the target animal, there was almost no attack behavior elicited by the shock presentation.

The target rats typically remained in a crouched position with both uninsulated forepaws kept off the grid floor. Although they were mobile, they could not be characterized as displaying an activity level even approaching that of an unharnessed shocked rat. Also, the target rat rarely assumed an upright posture during these sessions.

DISCUSSION

This experiment replicated the finding of Ulrich & Azrin (1962) that shocking a single member of a rat pair results in an attack frequency far lower than has been reported when both members of a pair were shocked. Similarly, these data parallel the report by Powell et al (1969) that injection of a single rat with chlorpromazine seriously mitigates the frequency of footshock-elicited aggression.

The more interesting result of the experiment was the rapid acquisition of individual stereotyped responses, which served as partially successful avoidance responses. These data certainly support the position (Azrin, Hutchinson, & Hake, 1967) that if a situation offers both fighting and escape or avoidance opportunities, a shocked rat will display a higher probability of escape or avoidance responding than attack. Even if the rat experiences a relatively high frequency of a high-intensity shock, avoidance or escape seems to be a higher probability response than attack. The avoidance behavior in the present study usually involved close physical contact between the experimental Ss and the targets. With close physical contact maximizing the opportunity for fighting, the low fighting frequency obtained seems to emphasize the priority of avoidance or escape behavior over fighting behavior.

The target rat, not receiving any shock, displayed a lowered activity

level and very little rearing up on the hindlegs. This suggested that the upright posture that occurs in shocked pairs, in addition to making escape by climbing on the other rat less likely, might serve as a response which a rat must display in order to be attacked with a high frequency. Systematic investigations of the role of various target rat behaviors seems indicated in order to determine if specific target responses are necessary in the shock-elicited aggression paradigm.

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ERRATUM

WONG, SCULL & AMSEL The effect of partial "quinine" reward on acquisition and extinction. *Psychonomic Science*, 1971, Vol. 18 (1) 48-49. The unit of quinine concentration should have been expressed in grains per milliliter not grams. Thus .12g/ml should read .12gr/ml.