The effect of amphetamine on established hoarding in the rat¹

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Abstract

Rats in which hoarding has been established hoard more under the influence of moderate doses of amphetamine. After a large dose, however, hoarding is almost completely eliminated.

Problem

It has been shown by Morgan et al (1943) that rats tend to hoard more when allowed to eat before the hoarding test. The present study tests the prediction that moderate doses of amphetamine (known to reduce food consumption) will facilitate the hoarding of food.

Subjects

Thirty-five hooded rats of both sexes were used.

Procedure

Subjects were placed on a 23 hr. food deprivation schedule and fed pellets 1 hr. per day. Half hour hoarding tests were conducted in a apparatus similar to that used by Morgan et al (1943). The apparatus consisted of a set of four runways 30 in long spaced about 10 in apart, each with a bin of food pellets at one end and a place for the S's cage at the other. Four animals were tested simultaneously. At the end of each test session pellets were removed from each cage and counted. A rat was considered a hoarder if it brought back five or more pellets during the session. Animals that hoarded on four consecutive days were allocated to one of three groups. Ss in Group 1 were injected with physiological saline; Ss in Groups 2 and 3 with 1 and 2.5 mg/kg of racemic amphetamine sulfate respectively. Fifteen min. after injections Ss were tested for hoarding as usual. At the end of this study 14 Ss drawn from the three groups were divided into two groups equated for hoarding and one group was injected with saline, the other with 5 mg/kg amphetamine.

Results

The preinjection hoarding score for each S was obtained by taking the mean of its four consecutive hoarding scores; the difference (D) between the number of pellets hoarded by each S on the day of the injection and S's mean preinjection hoarding score was taken as a measure of the effect of the injection (Table 1). The mean increase in pellets hoarded was significantly larger for Ss injected with 1 mg/kg ($p < .025$) and 2.5 mg/kg ($p < .05$) of amphetamine than for Ss injected with saline (Mann-Whitney U test, 1 tail). Hoarding was almost

Table 1. Hoarding Before and After Injection of Drug or Saline

Group	N	Mean preinjection hoarding score	Hoarding score on day of injection	Difference
1 (saline)	12	32.8	35.7	2.9
2 (1 mg/kg amph.)	11	34.3	55.8	21.5
3 (2.5 mg/kg amph.)	12	33.7	61.0	27.3

completely eliminated in Ss given 5 mg/kg amphetamine (Mean = 4.6 pellets hoarded). This is significantly different ($p < .001$) from the number of pellets hoarded by the control group injected with saline. Some of the Ss injected with this higher dose repeatedly picked up a pellet and dropped it again or tried repeatedly to get more than one pellet into their mouths. Other Ss ran back and forth between the cage and bin without trying to pick up any pellets.

Discussion

The predicted increase in hoarding under amphetamine was based on the drug's anorexogenic properties but it appears from the inverted U relation between hoarding rate and dosage that other factors must be considered. Morgan et al (1943) found no similar turnover in the facilitatory effects of prefeeding; rats hoarded 50% more when completely satiated than when tested under 23 hr. deprivation, implying that the decline in hoarding at higher levels of amphetamine can not be due to the disappearance of the hunger drive.

Observations of general behavior suggest that the decline is due to a fragmentation of the total behavior pattern. At higher doses responses such as picking up and dropping pellets are accentuated and repeated compulsively to cause a complete breakdown of overall performance.

Reference

MORGAN, C. T., & STELLAR, E., & JOHNSON, O. Food-deprivation and hoarding in rats. *J. comp. Psychol.*, 1943, 35, 275-295.

Notes

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