

# A note on psychogenic polydipsia<sup>1</sup>

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## Abstract

Water drinking behavior of albino rats was studied as a function of two schedules of food reinforcement and one schedule of shock avoidance. Considerable water drinking occurred concurrently with the food reinforced response but none with the shock avoidance response. This difference might be attributed either to the use of food instead of shock or to the presence of timing behavior in conjunction with the food schedules but not the shock schedules.

## Problem

Falk (1961) has reported that rats on a variable interval schedule of food reinforcement for barpressing show a very high rate of drinking when a water bottle is placed in the test chamber. He has termed this phenomenon "psychogenic polydipsia" since the excessive intake of water is dependent on psychological factors, i.e. the schedule of food reinforcement for the bar-press response. It should be emphasized that the food reinforcement is not contingent on the water drinking response. Segal (1963) has demonstrated this phenomenon using the schedule of differential reinforcement of low rates. In the present experiment an attempt was made to replicate this phenomenon, not only with the above schedules of positive reinforcement, but also with a schedule of negative reinforcement.

## Method

Six naive male albino rats were used. They were all food deprived and fed at the end of each daily 50 min. session. They were maintained at approximately 80% of normal body weight. A Grason-Stadler test chamber, shock generator and scrambler were used. Food reinforcements consisted of 45 mg Noyes pellets. The spout of the water bottle protruded through the right hand side of the intelligence panel into the test chamber. A Lehigh Valley Electronics drinkometer was used to record the drinking response.

Two Ss were reinforced on a variable interval schedule with a mean of 64 sec.; two Ss were reinforced on a differential reinforcement of low rate schedule in which the required pause between responses was 8 sec.; and two Ss were reinforced on a non-cued avoidance schedule in which both the time between uninterrupted shocks and the time between an avoidance response and the next shock was 16 sec. The shock was .5 ma and lasted for .2 sec.

## Results

The behavior of the food-reinforced animals was essentially the same as that previously reported by Falk (1961) and Segal (1963). The median numbers of drinking responses per session during the last three sessions of exposure to these schedules (sessions 16-18) were 4287 and 1279 for the animals on the variable interval schedule and 6586 and 5036 for the animals on the low rate schedule. Neither of the animals on the avoidance schedule emitted any drinking responses during these sessions.

## Discussion

In non-cued avoidance experiments with rats, two different types of avoidance behavior are sometimes observed. In some instances, a sort of timing behavior develops in which the bar-press responses are so effectively spaced that most of the shocks are avoided and the average interresponse time is approximately the same as the amount of time the shock is postponed by the response. More frequently, the performance consists of one or a few responses occurring during and immediately following each shock; then there is no evidence of timing behavior. This latter pattern of responding is what was observed in the present experiment; no timing behavior seemed to occur.

Since a spacing of responding or timing behavior occurs in both the variable interval and the low rate schedules, it might be that this is an important feature of psychogenic polydipsia and accounts for its absence in the avoidance experiment. If such is the case, it would be anticipated that animals which show timing behavior in an avoidance schedule would also show psychogenic polydipsia.

The other obvious difference between the interval and low rate schedules on the one hand and the avoidance schedule on the other hand is the use of negative instead of positive reinforcement in the latter case. This might also account for the absence of psychogenic polydipsia.

## References

- FALK, J. L. Production of polydipsia in normal rats by an intermittent food schedule. *Science*, 1961, 195-196.  
SEGAL, E. F., & HOLLOWAY, S. M. Timing behavior in rats with water drinking as a mediator. *Science*, 1963, 140, 888-889.

## Notes

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