

The alkaloid neotrix seems to have some effect on the higher functions of the brain. To test its possibilities, an experiment was done, using the maze-running capacity of laboratory rats as a measure of mental function. Two properties were tested: intelligence and memory.

The experiment used 3 groups of 10 white rats each. After several runs, each rat eventually learned to go through the entire maze to reach a food pellet without making a wrong turn. The experimental datum was the number of times the rat had to run the maze until it could do it without a mistake.

For each rat, intelligence was measured by counting the number of runs the rat needed to learn the maze (i) at the start of the experiment. A measure of memory (m) was made by putting the rat into the maze again three days later, and again counting the number of runs it required to go through without error. In the data chart, below, data for each rat is entered as i,m. Thus, for example, 6,2 means that at the start, the rat ran the maze without error on the 6th run; three days later, it reached the food without making a wrong turn on the second try.

The experiment was done three times, once with untreated rats, once with rats that had been fed 20 milligrams of neotrix a day before the test began, and once with rats that had been given 20 milligrams of neotrix every day for two weeks before the test began.

*Experiment 1. Untreated rats*

A	B	C	D	E	F	G	H	I	J	average
7,4	5,3	7,4	8,3	5,4	6,2	4,4	4,5	7,4	5,5	5.7, 4.3

*Experiment 2. Rats medicated for one day*

K	L	M	N	O	P	Q	R	S	T	average
5,2	5,1	7,4	6,4	4,2	6,2	6,2	6,2	5,2	4,3	5.5, 2.4

*Experiment 3. Rats medicated for 2 weeks*

U	V	W	X	Y	Z	A'	B'	C'	D'	average
7,4	6,5	5,1	6,3	7,1	6,3	4,3	6,1	8,4	6,1	6.1, 2.5

- The data seem to indicate that neotrix improves the rats':
  - memory only.
  - memory and intelligence.
  - intelligence only.
  - neither memory nor intelligence.
- One notable feature of the unmedicated rats is that:
  - they lost their memory more quickly than the medicated rats.
  - they were able to run the maze more rapidly than the medicated rats.
  - some of them demonstrated no memory of the maze.
  - none of them performed worse after three days than in their first trials.
- What accounts for the unusually poor intelligence of rat D?
  - It is just an accident of sampling.
  - It was probably chosen as an example of how a less intelligent rat will react.
  - It responded unusually well to the medication.
  - It may have had previous experience in maze running.

4. An appropriate measure of the memory of each rat would be:
- F.  $i/m$
  - G.  $i - m$
  - H.  $i + m$
  - J.  $m/i$
5. The most notable effect of medicating the rats for 2 weeks instead of just once is that:
- A. on the average, memory was substantially improved.
  - B. on the average, intelligence was substantially improved.
  - C. some of the rats retained their memory for a longer period of time.
  - D. some of the rats showed perfect memory.
6. It would seem that a valuable control would be to test each rat's intelligence before the medication was given. Why was this not done?
- F. The rat had to be kept unfamiliar with the maze before the experiment began.
  - G. It would have taken too much time for a very trivial improvement in the experiment.
  - H. It was unnecessary because the rat intelligence was controlled and well known from Experiment 1.
  - J. Too much maze-running might tire the rats and invalidate the results.

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