**Materials**

* 2 identical rodent cages, complete with water bottles, food bowls and exercise wheels
* 1 additional cage for rotating rats in and out of maze
* 8 Female Rats (feeder rats)
* Mixed Rodent Feed
* wooden maze
* stopwatch
* leather gloves for handling rats
* permanent colored markers for marking rats' tails
* cedar bedding
* electric toothbrush, massager, TV, radio, ect.

**Procedure**

1. Purchase rats from local pet store.

2. Once home, divide them into two groups of four - an experimental and a control group. Let them become acclimated to their new environments for at least two days.

(*Preliminary Experiment)*

*3. On day 3, test the effectiveness of various devices in keeping the rats awake. For 1/2 hour each, when the rats of either group are in a deep sleep, test the noise electric toothbrush, the vibration of the toothbrush, the noise of a loud radio, the noise of a TV, and a vibrating chair massager placed under their cage.*

4. On day 4, after the rats have recovered from the preliminary experiment, put the rats in the maze for the first time. Put a pile of sunflower seeds at the end of the maze, and observe each rat's individual ability to find the food pile and quickly return to it. Make sure that the rat can demonstrate that it understands how to repeatedly get to the food pile. If a rat is not learning the maze at all, it may be necessary to remove them for a 10-15 min. period and let them try again.

5. On day 5, test the rats' ability to remember the maze from the previous night. Start the timer when a rat has been placed at the beginning of the maze, and then record the times that it took its first, second and third helpings of food. Average the time periods between the first/second, second/third feedings for each cage. Let the rats sleep normally for the next 24 hours.

6. On day 6, teach the rats a new maze of the same difficulty level as the first maze. See step 4.

7. On day 7, deprive the rats of two hours of sleep using the most effective tool from step 3. (Since rats sleep for 16 hours a day, 2 hour increments would be the equivalent of 1 hour out of a human sleep period.) The massager proved to be most effective in keeping my rats awake. Lay in flat on the floor and place the experimental group's cage on top. Keep the massager cycle going for two consistent hours. Then, that evening, test the rats from both group (the sleep deprived group and control group) like you did in step 5.

8. On day 8, let the rats sleep normally. Then teach them another new maze that evening. See step 4.

9. On day 9, deprive the experimental rats of four hours of continuous sleep during their prime sleep hours. Then, test them in the maze, following the procedure from step 5.

10. Days 10-21: Follow the established pattern of teaching one evening, depriving during the following day, and testing that evening. Continue depriving through 16 hours. (The equivalent of 8 hours of human sleep and therefore a 24 hour period of no sleep).

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