

# Options for Rat Research Project

W. Jeffrey Wilson  
Psychology 348

This handout describes the resources available to students in PSY 348 as they prepare a proposal for a behavioral neuroscience project. Although the assumption is that rats will serve as subjects, under special circumstances a student can propose a project using human subjects.

Each of you independently should prepare a proposal for an experiment to be done with rats as subjects, and examining a behavioral measure as it is influenced by a physiological manipulation. The proposal should be written according to APA style and (in addition to Title Page and References) should consist of Introduction, Methods, and Results. The Introduction should include the hypothesis to be tested and a brief literature review justifying the study. The Methods should describe the proposed experiment in sufficient detail that the reader could perform the study. In Results you should address the possible outcomes and their interpretations. Your proposal will be graded on the basis of three things:

1. Is the experiment well designed? Are independent and dependent variables clear, are extraneous variables well controlled, and are the proposed methods understandable?

2. Is the experiment justified? Does the Introduction include a review of the literature that makes clear why this particular experiment should be done?

3. Does the paper conform to APA style guidelines?

The experiment that you propose is subject to the restrictions specified below. One (or per-

haps two) proposals will be selected to be performed as class projects. The selection will be based on “do-ability” as well as on the items specified in points 1 through 3 above.

## Restrictions

### *Subjects*

There will be a total of 24 female Sprague-Dawley rats for use by both lab sections. This limits the total number of rats that you can specify for your study.

- Within-subjects designs might be best given the small n.
- Rats will be housed in groups.
- All rats will live in the same room.

### *Behavioral Equipment*

The following behavioral equipment (listed in no particular order) will (probably) be available. In all cases various discriminative stimuli are available: room lights can be manipulated, sounds can be used, walls of the apparatus can be dark or light, etc. The measures available in each apparatus appear below the apparatus name.

*Runway (straight or “circular”).*

- start latency
- run latency

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Email me at [wjwilson@albion.edu](mailto:wjwilson@albion.edu) or see me in my office (Olin 322) if you have any questions.

*T-maze* .

- start latency
- run latency
- correct or not

*Y-maze*.

- Like T-maze
- Continuous sessions easier than T-maze

*Open Field*.

- locomotor activity
- exploration
- anxiety

*Elevated +-maze*.

- anxiety

*Hole Board (Barnes maze; Cottone apparatus)*.

- memory
- exploration

### *Physiological Manipulations*

Physiological manipulations that can be used include (but are not necessarily limited to):

*Surgical Manipulations*. Bilateral lesions of the medial septum, fornix, or nucleus basalis. Don't worry about details of surgery, but do provide the stereotaxic coordinates.

- Damage to these structures can lead problems with learning and memory, or emotional changes (e.g., Lamprea, Cardenas, Silveira, Walsh, & Morato, 2003; Shors, Beylin, Wood, & Gould, 2000;

*Drugs or "Herbals"*.

- Preferably non-controlled substances
- You must research doses and drug side-effects carefully!

### References

Lamprea, M. R., Cardenas, F. P., Silveira, R., Walsh, T. J., & Morato, S. (2003). Effects of septal cholinergic lesion on rat exploratory behavior in an open-field. *Brazilian Journal of Medical and Biological Research*, 36, 233–238.

Shors, T. J., Beylin, A. V., Wood, G., E., & Gould, E. (2000). The modulation of Pavlovian memory. *Behavioural Brain Research*, 110, 39–52.