

## Operant conditioning of *M. musculus* in marble-sorting tasks

### Objective

Operantly train *M. musculus* to herd marbles into separate containers. A variety of marbles will be used: big/small, black/white, smooth/rough (wood/metal), all of which will be attempted to be the objects of mouse training sessions.

### Participants

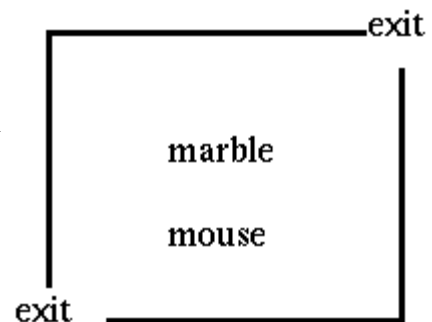
All members will cycle through training session responsibilities. Miller will acquire marbles and possibly netting/wire. Ayuso will acquire “NutraGram bars” and possibly a portable, separate cage. Vasquez will record experimental results and data. Bishop, Flinn and Ayuso will be the main participants in training. Materials will therefore be mesh or wire-grid, cardboard, scissors,

### Discussion

Mice have the aversion to handling from above, therefore handling from the side is preferred to avoid psychological damage. Instead of a box, a frame of a box with a see-through substance will be used so that the mouse can see from the side such as from netting. The mouse must not be distracted by the surroundings. The side of a tank can be removed and replaced with cardboard and wire-netting to essentially create a Skinner box. A flap will be made in the wire netting.

This will be completely operant conditioning. The antecedent is movement and “pack-rat” behavior. The behavior is the sorting and herding behavior. The consequence will be positive reinforcement via the NutraGram portion, each time the same proportion (ignoring the inconsistency of the NutraGram bar). Discrimination will be attempted by inserting other, similar objects, after the mouse exhibits desired operantly-conditioned behavior.

The goal of the conditioning is to (firstly) have the mouse sort marbles into the flap door. The secondary is herding, circling the marbles and moving them together in a similar region, or on the other side of the cage. A variety of behaviors will be attempted from one base or root behavior. And if that works out too easily, sorting with multiple varied items will be attempted. The steps in our training process will begin with the placement of mouse and one marble in a plain, boxed cage and through the process of stimulation omission, it is predicted that the mouse, being an animal, will eventually come to the marble. The first step is to establish a baseline behavior (movement of the marble) which will be consequented with a treat. After this baseline behavior is achieved, the behavior will be extended to moving the marble around the cage, then to the borders where it will be consequented with another treat, after it pushes the marble to the “exit point” the positive reinforcement will be given. At least four trials of reinforcement will be executed before moving on to the next step of the sequence. Once the baseline behavior is established, the number of marbles will be increased. The reinforcement schedule will be immediate: after each successful behavior, a treat will be given, unless the training requires it to expand to the next step.



## Herding Marbles

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Lack of success will lead to an alternate experiment: the rodent power-wheel that generates electricity, powering a capacitor to release a treat to the mouse. If the operant conditioning works too soon, then it will be possible to resort to extra training, such as sorting and herding marbles into sectors of the cage.