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# Measuring Ultrasonic Communication Between Mouse Pups and Adult

Katie Ludwig

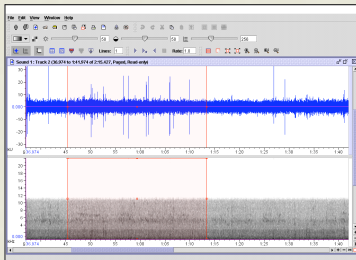
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## Mother Mice



### Abstract

Measuring ultrasonic communication provides us with a way to study parental influence on animals. In this study I measured the ultrasonic communication between mouse pups and two maternal females, one of which had given birth to the pups and the other had raised them. I found that there was no significant difference between the amount of noise expressed by pups in response to each the biological mother and foster mother test groups. Mouse pups call to maternal females regardless of genetic relatedness. Communication in mice may be a more complicated model because of their communal nature.



### Results

✧ Bouting was not visibly different between test groups and the control group was visibly higher than the test groups (Figure 1).

✧ The p-value of <0.05 from a Kruskal-Wallis test supports statistical difference between the three samples and a Mann-Whitney U test between test groups gives a p-value of >0.05 to support that there is no statistical significance between the test groups.

### Introduction

✧ Mice are an ideal model for studying kin recognition as mothers will care for as many pups as possible, even when they are not their own.

✧ In this study I measured the ultrasonic calls of mouse pups, whose exposure to the environment initially occurs primarily through smell and touch with maternal females.

✧ Hypothesis: ultrasonic communication between pups and their biological mothers will differ from that with a maternal female who raised but did not give birth to them.

✧ Prediction: prolonged early exposure to a foster mother will encourage a stronger social bond that would override genetic recognition of a biological mother.



### Materials and Methods

✧ Eight pregnant lab mice, *Mus musculus*, housed in pairs in separate bins so that each pair became closer. After 24 hours I placed each mouse in a clean bin in which she gave birth.

✧ Mothers exchanged within each pair, each mother cared for "abandoned" litter as if it were her own.

✧ Two weeks: exposed each pup in each litter separately to each the scent of its biological and foster mother, recorded behavioral response and the amount of ultrasonic bouts made by the pup using Belfrey Bat Detector from Converge Tech., Inc., and the Prattsound recording program on a PC.

✧ Control: litters of the same strain of lab mouse that remained with their biological mothers during the time the other litters were living with foster mothers.

### Discussion & Conclusions

✧ The scent of biological mothers invokes no less bouting from pups than does the scent of foster mothers and my hypothesis was not supported by this data.

✧ The fact that the control group bouted more than the test groups signifies an outlier in the control samples (only 3), possibly difference in pup development.

✧ Benefits of this study: documents baseline data on variation in vocal communication, especially in the ultrasound frequencies, that may be influenced by parental types.

✧ Future studies: tighten procedure, try to test at two periods in pup development.

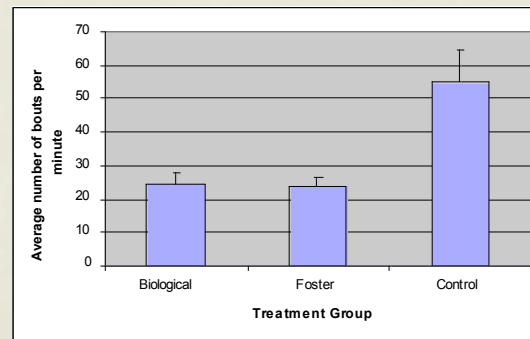


Figure 1. The average number of bouts per minute in each of the two test groups and the control group.