

AN EXAMINATION OF DEVELOPMENTAL AND SEX DIFFERENCES IN ETHANOL CONSUMPTION BY LOW ALCOHOL-CONSUMING RAT LINES

Tammie Rachell Largent, Bethany S. Neal-Beliveau and (Richard L. Bell), Department of Psychology, Purdue University School of Science, Indiana University–Purdue University Indianapolis, Indianapolis, Indiana 46202

In the United States, alcohol use and dependence is a major health issue affecting 4-5% of the population (Hasin et al., 2007). Research indicates adolescents ages 12-20 drink 11% of all alcohol consumed nationally, with more than 90% consumed in the form of binge drinking (Center for Disease Control and Prevention, 2010). Similar to the human condition, adolescent rodents generally consume more ethanol than their adult counterparts.

Current rat animal model studies on alcoholism remain weighted toward examining Family History Positive (FHP), selectively bred, alcohol-preferring lines. Also, research has generally been focused on ethanol consumption behavior of male rodents. However, female rodents tend to consume more alcohol than male rodents (e.g., Adams et al., 1991). In addition, existing research on adolescent vs. adult alcohol abuse using “FHP” rats is not paralleled by research with “Family History Negative” (FHN) rats, which might reveal factors that prevent/protect an individual from excessive ethanol intake during this crucial stage of development.

The purpose of this study was to evaluate ethanol consumption by male and female FHN, selectively bred, alcohol-nonpreferring rats during adolescence and adulthood. Studying adolescent vs. adult behavior may reveal developmentally-specific, protective factors. Also, examining male versus female behavior may reveal sex-by-development factors guarding against alcohol abuse.

Animals were placed in cages and assigned to experimental conditions defined by the following independent variables: line of rodent, rodent’s sex and age of ethanol exposure. The following dependent measures were examined: changes in body weight as well as water and ethanol consumption. These measures were taken at least 5 days per week.

We hypothesized that there would be elevated levels of ethanol consumption (g ethanol/kg body weight/day) in (a) adolescent vs. adult rats and (b) female vs. male rats. Future research might focus on gene and/or protein expression differences within certain nuclei of the brain’s reward neurocircuit between the FHP and FHN lines of rats. Currently, some data has been collected and statistically analyzed. Upon completion the study results will be prepared for presentation and manuscript submission.

Funded in part by the Indiana University-Purdue University Indianapolis, Undergraduate Research Opportunities Program (UROP)