Review of: "Novel Method to Assess Group Dynamics in Rats Reveals Deficits in Behavioral Contagion in KM Rats"

Caio G. Zeppelini[1]

1 Universidade Federal da Bahia, Brazil

Potential competing interests: No potential competing interests to declare.

The study presents the application of an emotionally-neutral behaviour test to assess social behavior aspects. The study provides a novel and highly relevant technique for studies on behavior, development, and psychosocial disorders. While the study is of high quality, with sound organization of methods, rigorous protocols, and significant results, there are a few aspects that should be discussed in order to further develop the quality of the manuscript.

General comments:

- Values such as the frequencies of behaviors and the number of individuals engaging in certain behaviors should be present in the text in order to better help navigate and judge quanti- and qualitatively the results of the research.
- The figure is tiny and a bit crowded; it could benefit either from a) becoming a full-page image, or b) being separated into two or three images. It also should use more contrasting colors that would facilitate seeing the results in the figures, particularly for people with poor eyesight and/or on smaller devices/printed pages.

Specific comments:

How representative are males of the range of social behaviors and interactions of Wistar, KM, and mixed-group rats? Were the Wistar rats used for behavioral contagion the same in all experiments?

Were the rats allowed to acclimate to the insertion of the chip?

Were there any controls to deal with potential other behaviors that could come from the Wistar male either during introduction or coming from its water-deprived state? Were there other behaviors observed during the research procedures that should be taken into account?

Were there any means to control for the potential influence of body scents (such as stress hormones from the water-deprived rat) that could affect behaviors?

In section 2.4, describe the types of graphs used for the data presentation.

Was 30 minutes as the window of analysis chosen for a particular behavioral reason, or as a standardizing cutoff?

Section 3.1: there should be a more detailed description of the behavioral responses and exploration of the graphs. Declaring that the individuals “responded or not responded” is both a bit confusing and not really descriptive of the results.

Section 3.2 should come before 3.1, as it presents the behavioral baselines.

"We found no differences between the Wistar rats and KM rats in terms of the number of animals activated (making visits) during the baseline period" in section 3.2 has a stray “?”

"Namely, the effects of “strain” and “conditions” were the following: the total number of visits ({F(1,29)=9.24, p=0.005} for “strain”; {F(1,29)=15.28, p=0.0005} for “condition”; the interaction of “strain”*”condition”{F(1,29)=3.87, p=0.06}, respectively), the number of drinking visits ({F(1,29)=5.26, p=0.03} for “strain”, {F(1,29)=6.68, p=0.01} for “condition”, insignificant interaction), as well as for the inspection visits ({F(1,29)=9.66, p=0.004} for “strain”, {F(1,29)=23.83, p=0.0003} for “condition”; the interaction of “strain” * “condition” significant: F(1,29)=7.26, p=0.01)" "insignificante interaction" lacks the open parenthesis. I would, however, encourage presenting the statistical and p-values even for the insignificant interactions.

A table presenting the number/percentage of interactions within subgroups (condition, strain...) would be important to better present and characterise the subgroupings of behavior and interaction.

"To summarize, KM rats displayed a remarkably attenuated pattern of behavioral contagion, with a low number of mimicked behavioral acts, expressed by a few activated observer rats." I would recommend adding some detail regarding whether the KM group displayed contagion behavior that more frequently ended in inspection or drinking bouts.

"In this study, we observed that the simplest mode of group action—mimicking of a behavioral pattern—is well expressed in laboratory rodents, outbred normotypic Wistar (WS) rats." I believe that, given that the KM rats were the "treatment" rats of the experiment, the main conclusion in the first paragraph of the discussion should be focused on KM rats and their capacity (or lack thereof) of acquiring the contagion behaviour.

Are there signs of hierarchical structuring within the laboratory rat colonies? Are there differences between Wistar and KM social organization that could explain the lack of effect from the introduced Wistar males due to ingrouping?