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

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The present study tested whether KM rats, an experimental model of autism, were able to display behavioural contagion upon observing the water-seeking behaviour of a cage-mate demonstrator re-introduced in their home-cage. For that, the authors used automated home-cages capable of monitoring the identity of each animal inside the drinking corners, as well as the occupation time and number of lickings after interacting with the demonstrator rat. Their main result showed an attenuated behaviour contagion response displayed by KM rats compared to controls. The authors also highlight the relevance of the method used in this study as a new automated method for studying social deficits in rodent models.

General Comments:

(1) It is an interesting study that addresses an important aspect of animal social behaviour (non-aversive behavioural contagion). Using an automated approach, the authors added rigor and objectivity, which is essential in behavioural studies. The authors were very careful in their experimental design, behavioural assays, and in the methodological description. I should also congratulate the team for the discussion on non-aversive paradigms of emotional contagion, something important to highlight.

(2) Please review the writing consistency across the manuscript, e.g., Fig. 2 and Fig2, as well as typographic errors, e.g., interrogation marks (?) left over.

Methods:

(1) The method was carefully designed and well-described in the manuscript.

(2) Considering Nodes > rats; Edge thickness > association index (are they #copied visits??) Visits as edges between rats or transferred behavior?? Considering that the behaviour of a rat affected the behaviour of another, but what if two rats moved to drink after a demonstration?

(3) Perhaps changing the water corner denomination from "a demonstrated one" to "a tagged one"?

(4) Threshold of 4s. Did the authors compute how the results are affected if the threshold is changed? Robust results usually change little with small changes in parameters.

Results:

(1) Figure 2A-B: Please increase panel sizes for better visualisation. Include labels and some reference tick marks for the x-axis (time). Perhaps the authors should use panel titles such as 'Baseline' and 'Contagion' to make them clear.

(2) Figure 2C-J: Increase font and marker sizes in all graphs for better visualisation. A suggestion: change the panel letters to C-D-E-F (upper row) and C'-D'-E'-F' (lower row) to make it clear which graph pairs to compare. Please add the name of the statistical test in the figure legend before the p-value.

(3) Would you be able to compute the mean response time of observers (CTL vs. KM) following the introduction of demonstrators into the cage? That would be interesting to know how attentive CTL and KM rats get to the returning of demonstrators and how fast they respond!

Critique:

(1) Considering the experiments were carried out during the lights-on phase of the circadian cycle, could this design have affected the degree of attention KM animals displayed towards the incoming demonstrator? Thinking of KM as inbred rats being more affected (less motivated) by a lower vigilance state, but not necessarily under a higher drive during lights-on. [Even though the authors used the control rats under the same light condition, CTL and KM rats might cope differently with this situation.]

(2) The authors did not control for the activity level of each animal during the experiment as a way to exclude behavioural variability (for example, by measuring the distance displaced during the experiment). Would it be possible to obtain these measurements and add them to the manuscript?

(3) In the discussion, it was absent how previous behaviour characteristics of KM rats (described in the literature) could explain the actual results of this study. If possible, add it.