

ABSTRACT

This study evaluates whether simulating social presence through pheromone-impregnated filter paper can attenuate alterations induced by social isolation in *Drosophila melanogaster*. We hypothesize that socially isolated individuals exposed to these chemical cues will display profiles more similar to socially grouped individuals. *Drosophila melanogaster* is a well-established model organism due to its genetic and physiological parallels with humans, enabling the investigation of socially relevant behaviors. This exploratory study modifies the environment of isolated subjects by introducing filter paper infused with social pheromones, followed by the quantification of their viability and pupation location. Results will be compared with socially raised and completely isolated control groups to assess the mitigating effect of sensory simulation.

METHODS

- Experimental Quantitative Design based on groups of *Drosophila Melanogaster Canton S*.

- N= 180 subjects.

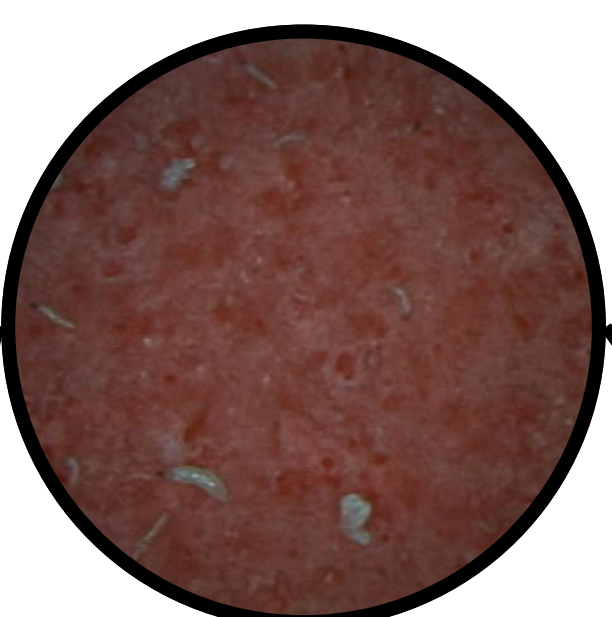
- Subjects are distributed in three conditions:
Isolation With Placebo (ACP); 60 subjects
Isolation Without Placebo (ASP); 60 subjects
Normal Social Condition (SC); 60 subjects

- Independent Variable: Social Condition
- Dependent Variables:
 - Viability
 - Place of pupation

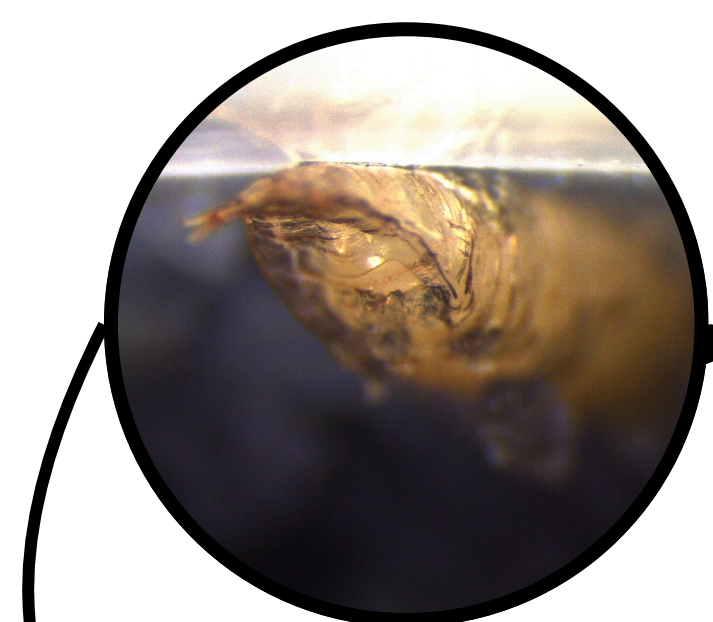
1. ENVIROMENT WITH PLACEBO



2. ISOLATE LARVAE



3. SECOND MEASUREMENT AT 480 HOURS



4. FIRST MEASUREMENT AT 48 HOURS



5. PUPATION IN ISOLATION

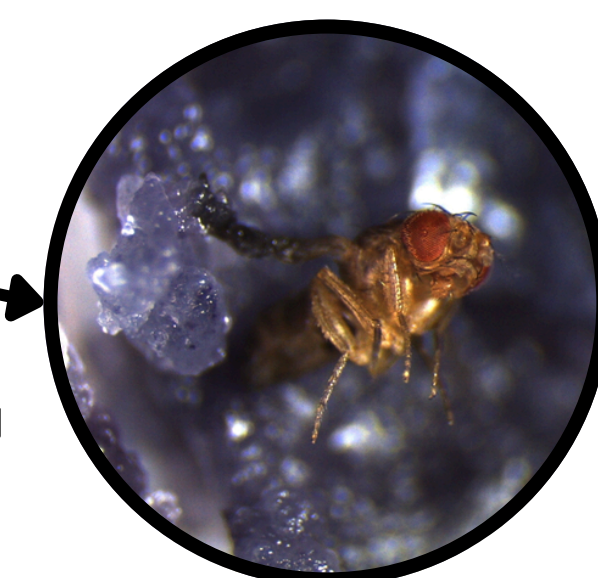
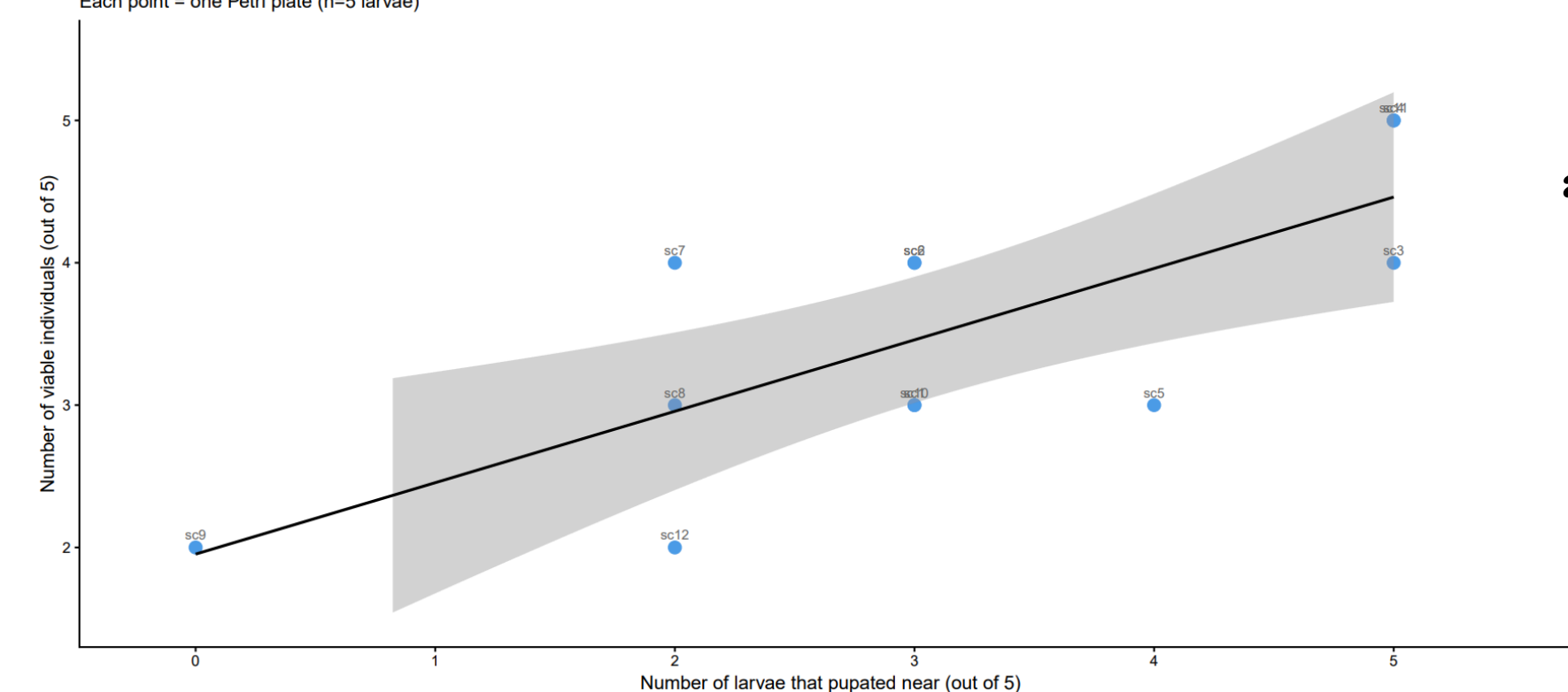


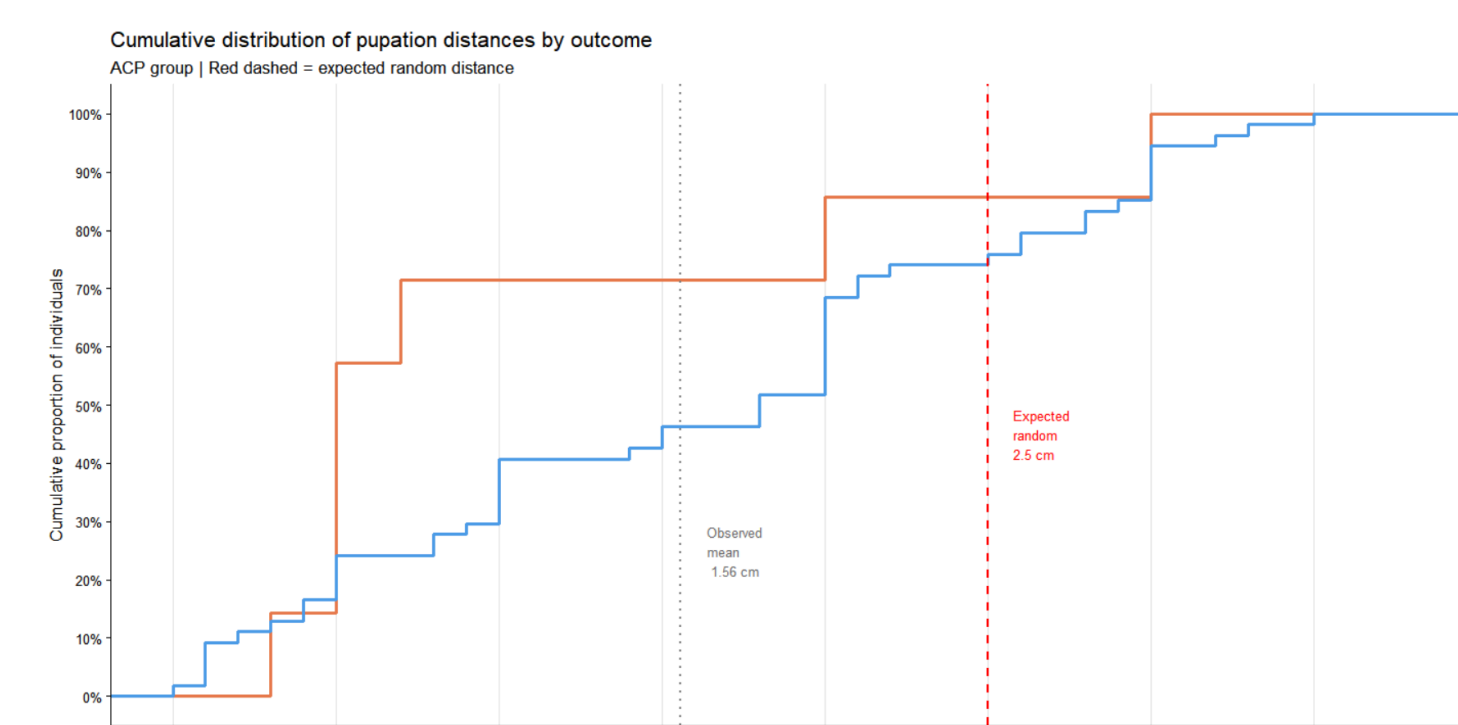
Figure 1: Proposed methodology cycle (SIRC, 2026) **Source:** Personalized design

PRELIMINARY RESULTS

Viability vs pupation proximity in SC group
Each point = one Petri plate (n=5 larvae)

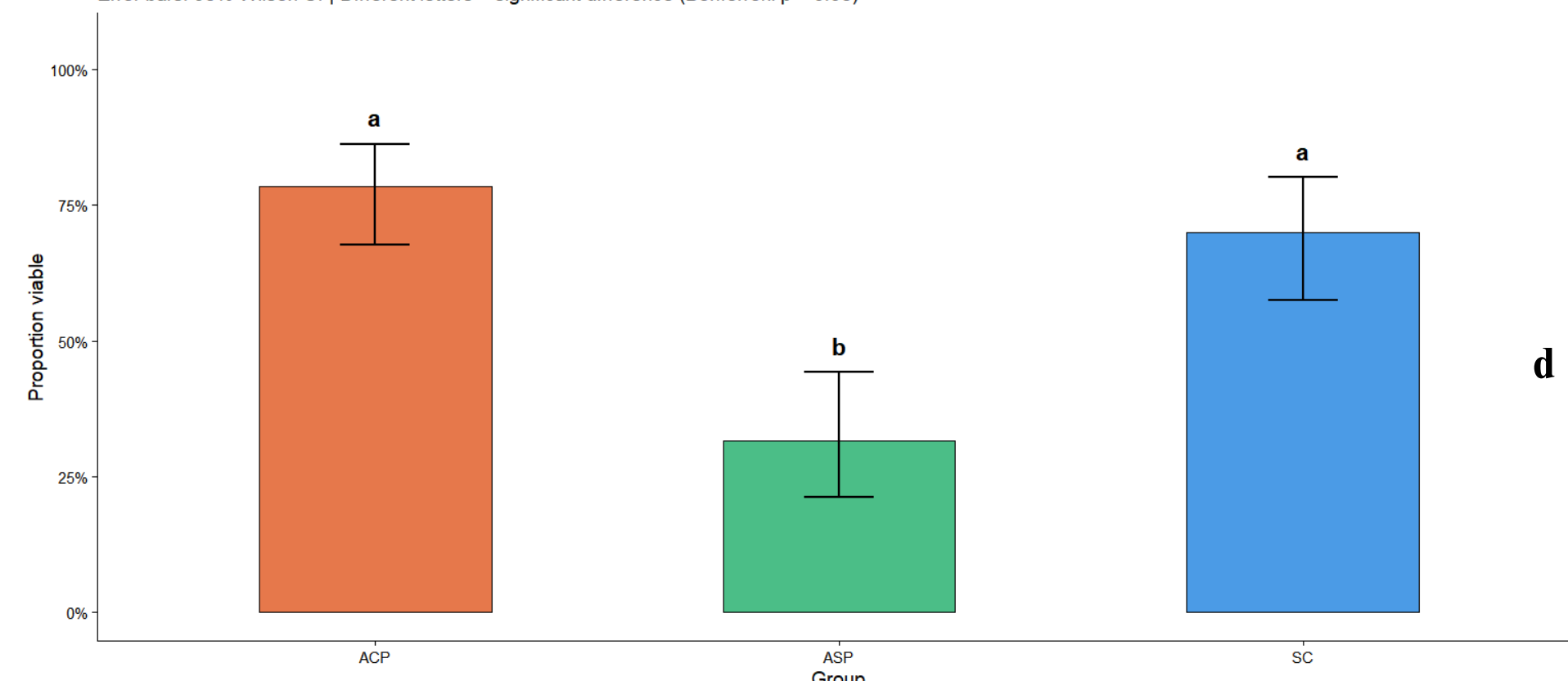


Graph A: In social control groups, there is a preference to pupate near each other, and the closer the group pupates the more subjects become viable.



Graphs B-C: The mean of the pupation location of isolated subjects with placebo shows that there is a preference to pupate closer to it rather than far from it or being at random.

Proportion of viable individuals per group
Error bars: 95% Wilson CI | Different letters = significant difference (Bonferroni $p < 0.05$)



GRAPHS: **a)** Correlation between viability and pupation proximity in social control groups; each point represents one Petri plate (n=5 larvae). Visualization generated in R. **b)** Cumulative distribution of pupation distances by outcome in isolated subjects with placebo; orange = dead pupa, blue = success. Visualization generated in R. **c)** Effect of pupation distance on viability in isolated subjects with placebo (ACP group); each point = one individual. Visualization generated in R. **d)** Proportion of viable individuals per experimental condition; error bars represent 95% Wilson confidence intervals; different letters indicate significant differences (Bonferroni $p < 0.05$). Statistical comparison conducted in R; *** $p < 0.001$

DISCUSSION

I- Alteration of Viability

Social isolation is a variable that can affect the viability of subjects and it can be modified via sensorial intervention

II- Preference towards Placebo

There is a preference towards pupation near the placebo, same social conduct that social subjects show towards each other. Representing a recognition of another social individual in the placebo.

CONCLUSIONS

Intervention via social placebo shows itself to be a promising option to mitigate the effects of social isolation. This opens the path to make further investigations in human population and fight back against conditions in which social isolation plays a factor like Alzheimer's disease.

