



TRANSLATIONAL MEASURES OF ADAPTATION AFTER LOSS IN ANIMALS

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GRIEF AND LOSS IN ANIMALS

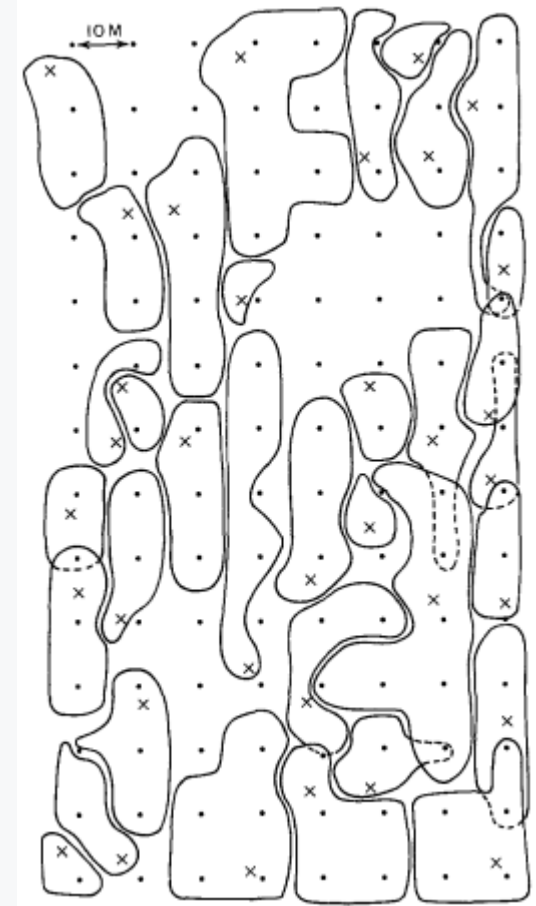
What types of “grief” and loss do we see in animals?

- Parent-infant separation
- Loss of an infant
- Adult loss of a partner

What are the behavioral, hormonal, and neural signs of adaptation to loss that we can measure in different species?

Prairie voles

- Display pair bonds in the wild and in the lab
- In the wild, if a female vole loses her mate, she typically remains at the nest but does not take a new mate
- If a male loses his mate, he often becomes a wanderer
- Overall, only 19% of widowed animals re-pair



Getz and Hofmann, 1986



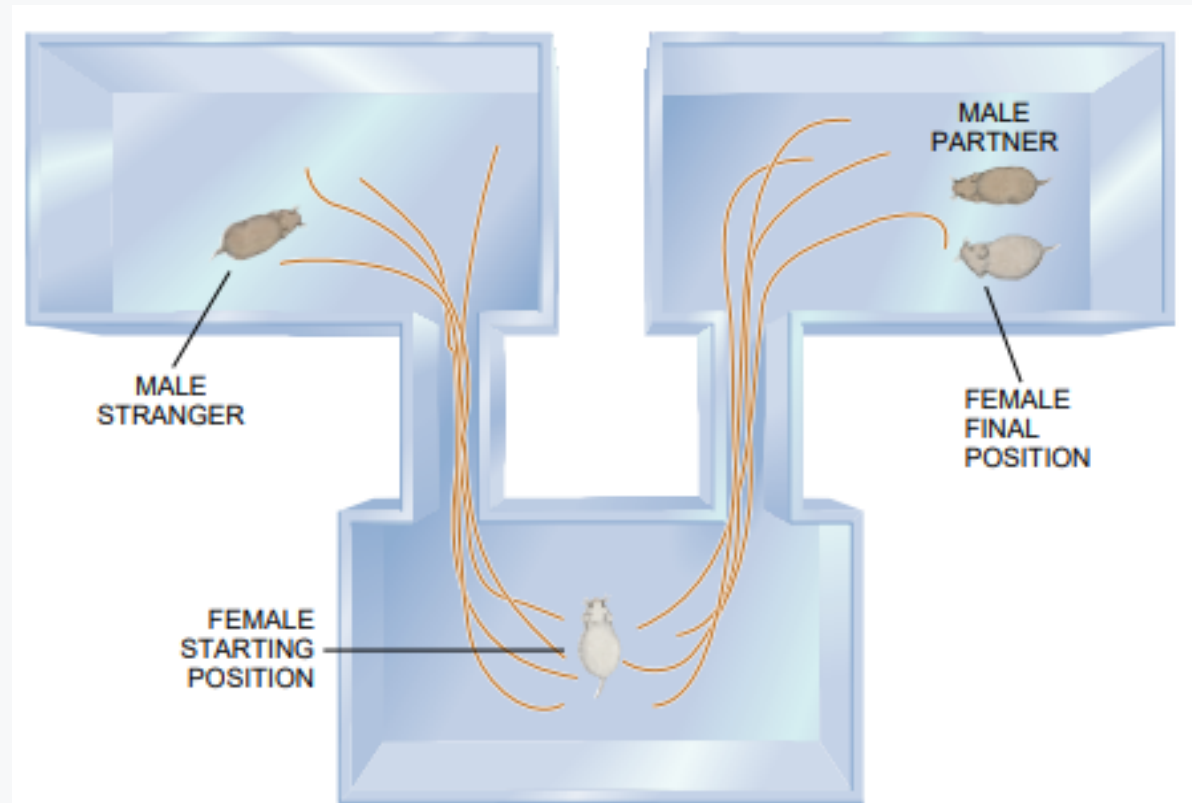
Titi monkeys

- Also display strong pair bonds in the wild and in the lab
- Little is known about what happens when an individual loses its mate in the wild

Photo: Kathy West Studios

1. Loss of preference

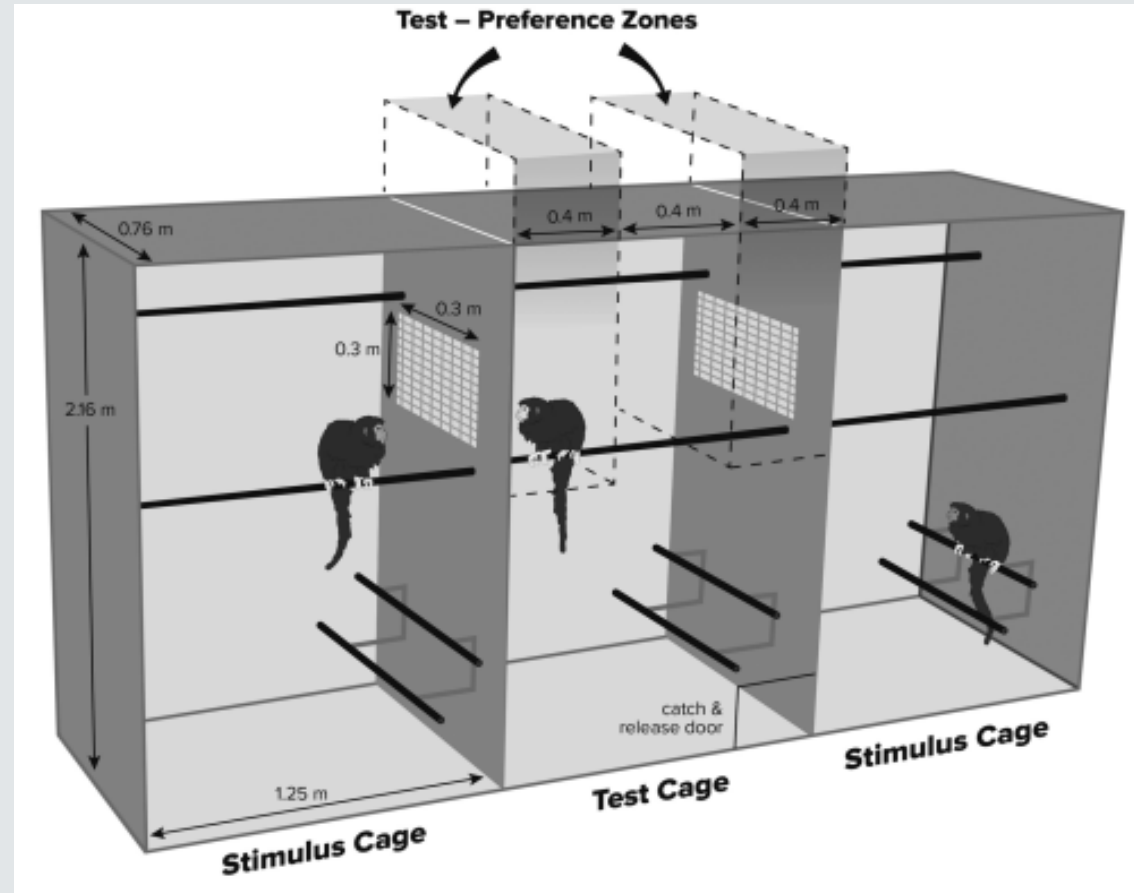
HOW DO WE
MEASURE
ADAPTATION TO
LOSS IN ANIMALS?



CHOICE TEST given to female prairie voles in the laboratory reveals a social preference for the mated males. Initially, females enter the cages of both strangers and their partners (*represented by brown lines*) and will mate with both. Within about 30 minutes, however, females tend to remain near the familiar male.

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Carter and Getz, 1993



Stranger
F

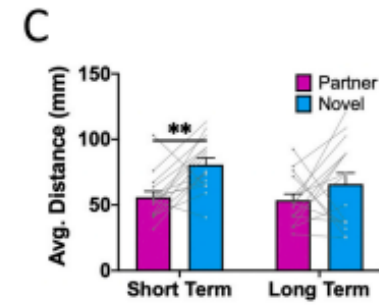
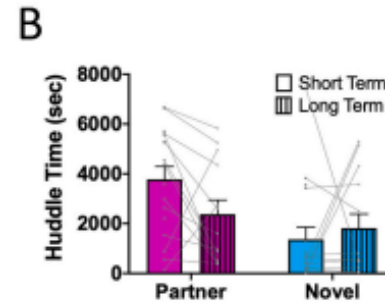
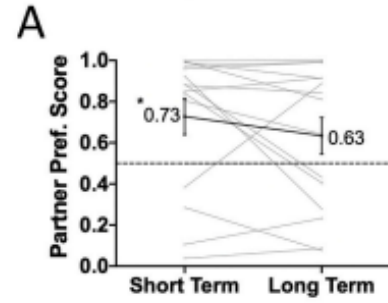
Pair 1
Male

Pair 1
Partner F

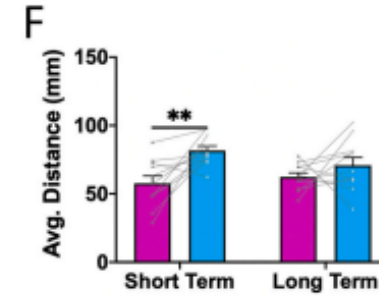
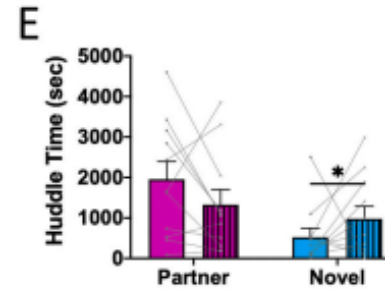
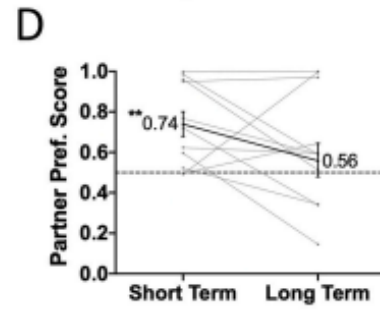
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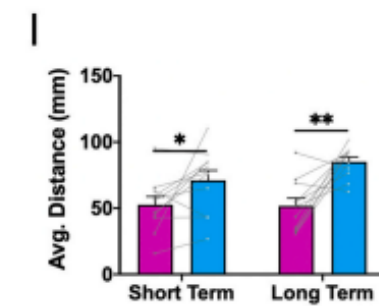
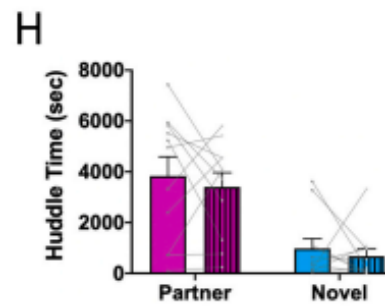
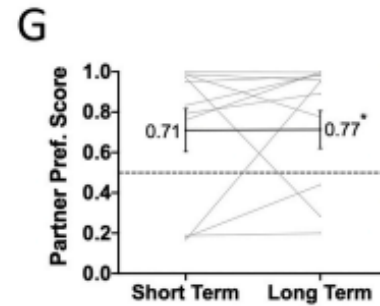
48 Hour Separation

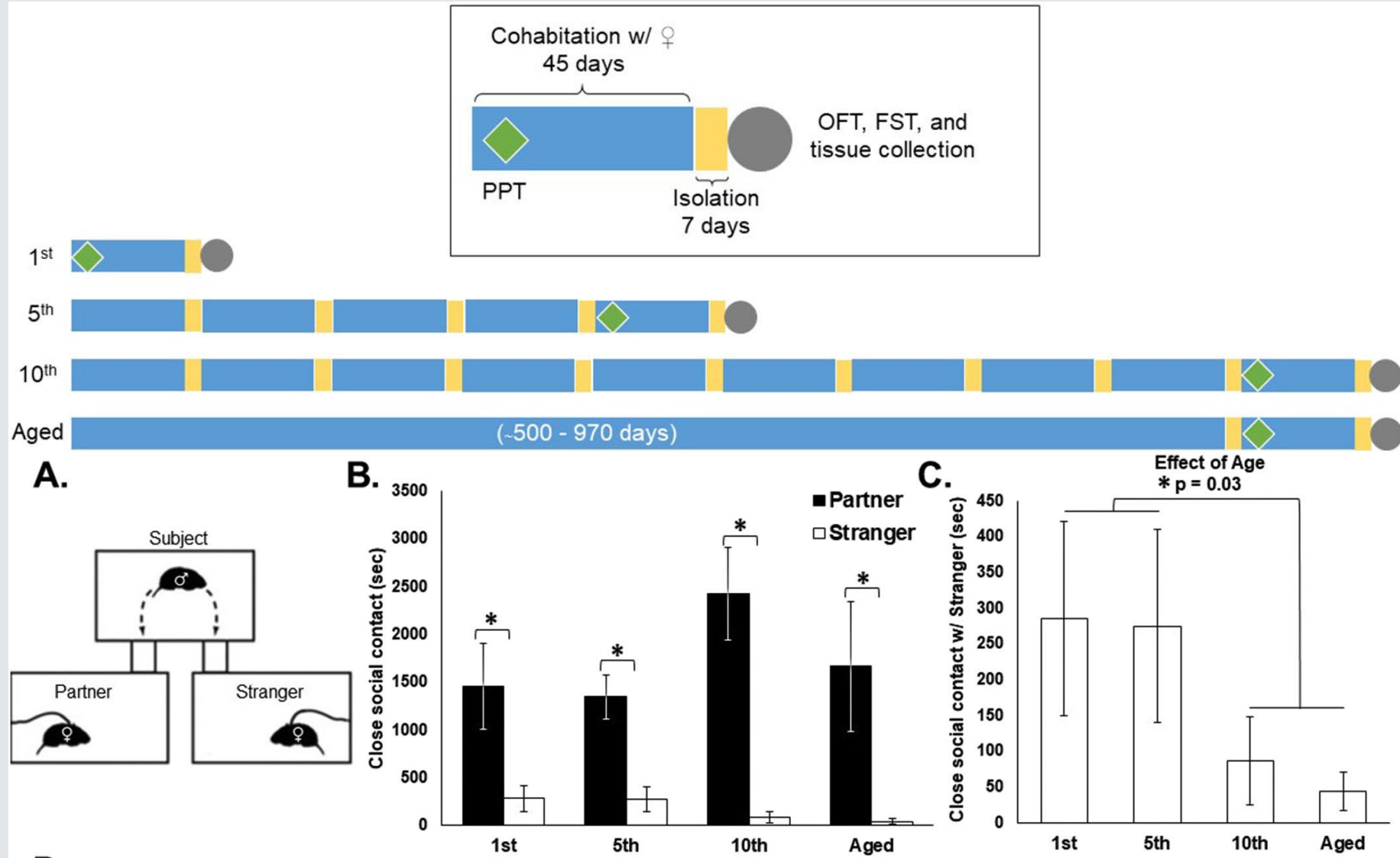


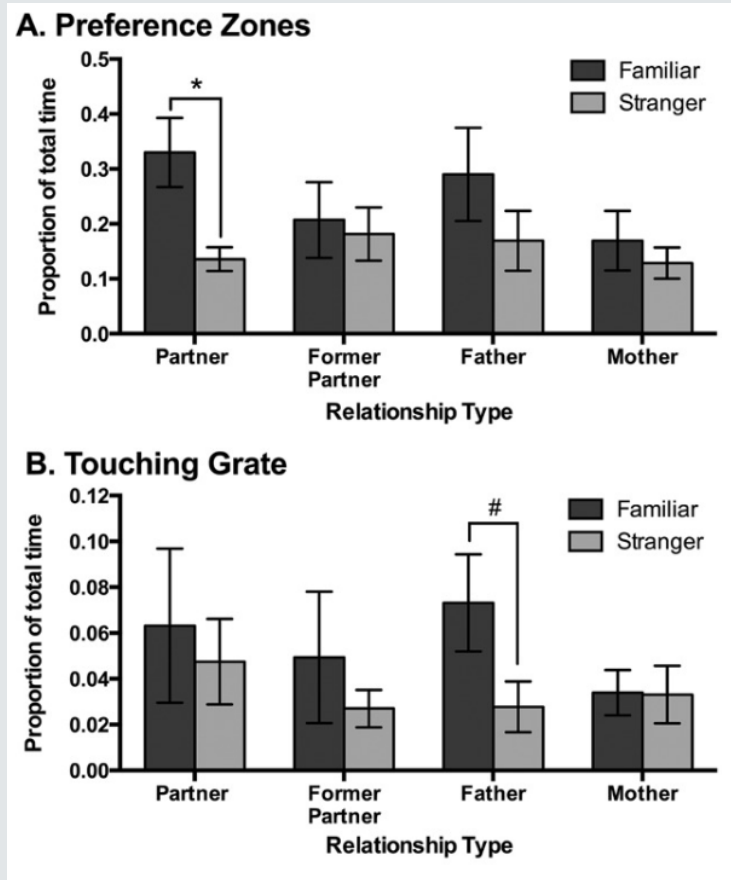
2 Week Separation



4 Week Separation

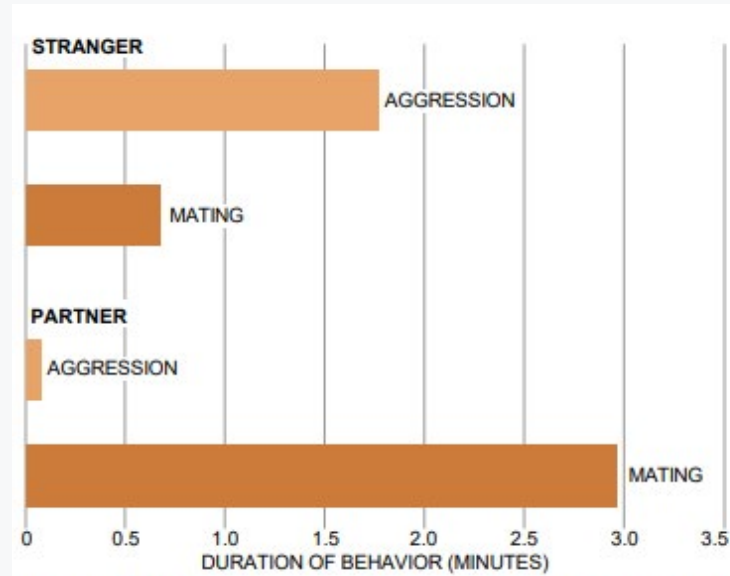






2. Loss of aggression towards strangers

AGGRESSION

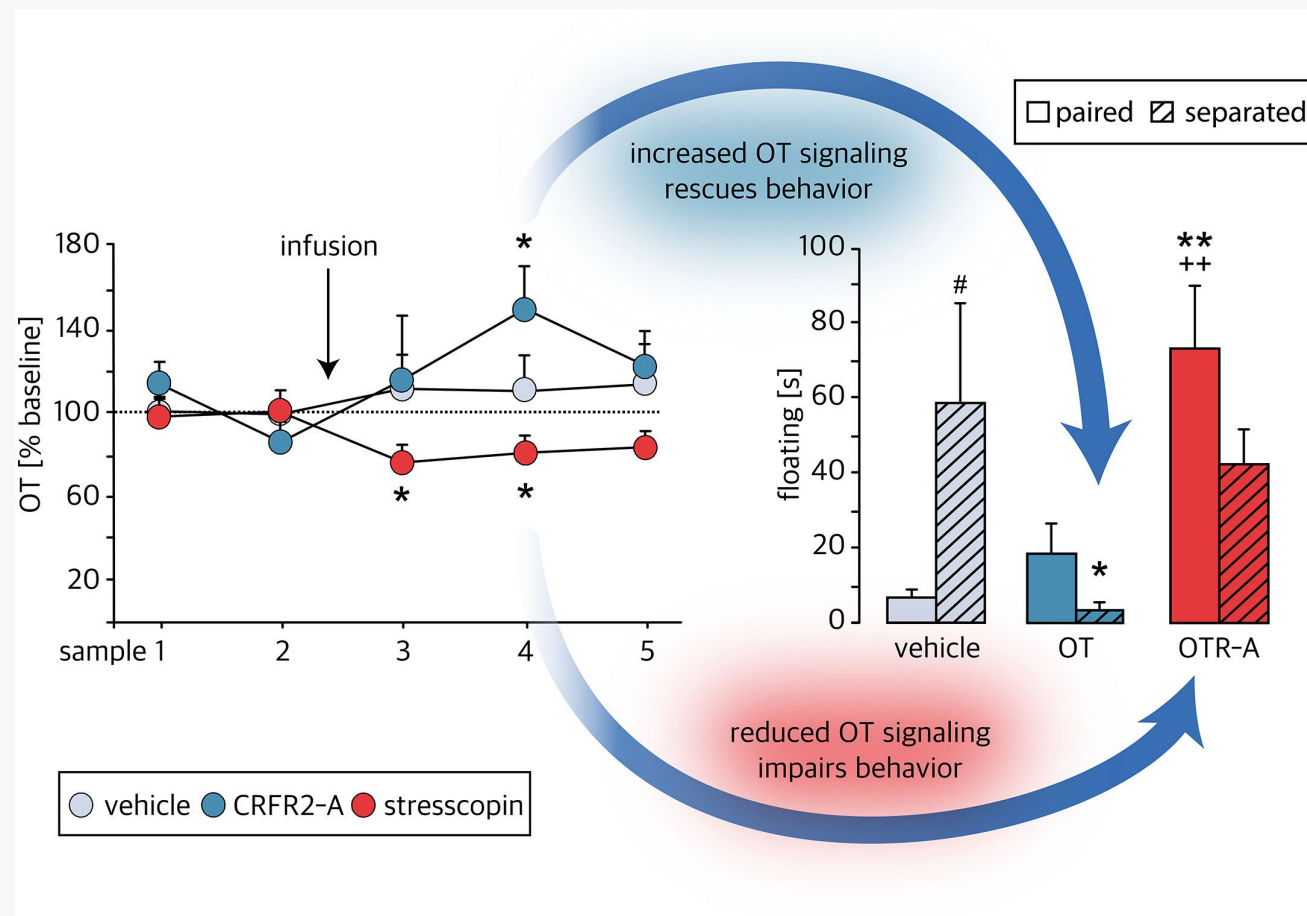


AGGRESSION by female prairie voles is revealed in 10-minute tests comparing hostility with mating preference. Females spent more time attacking strangers rather than mating with them. In contrast, they show little aggression toward their partners.



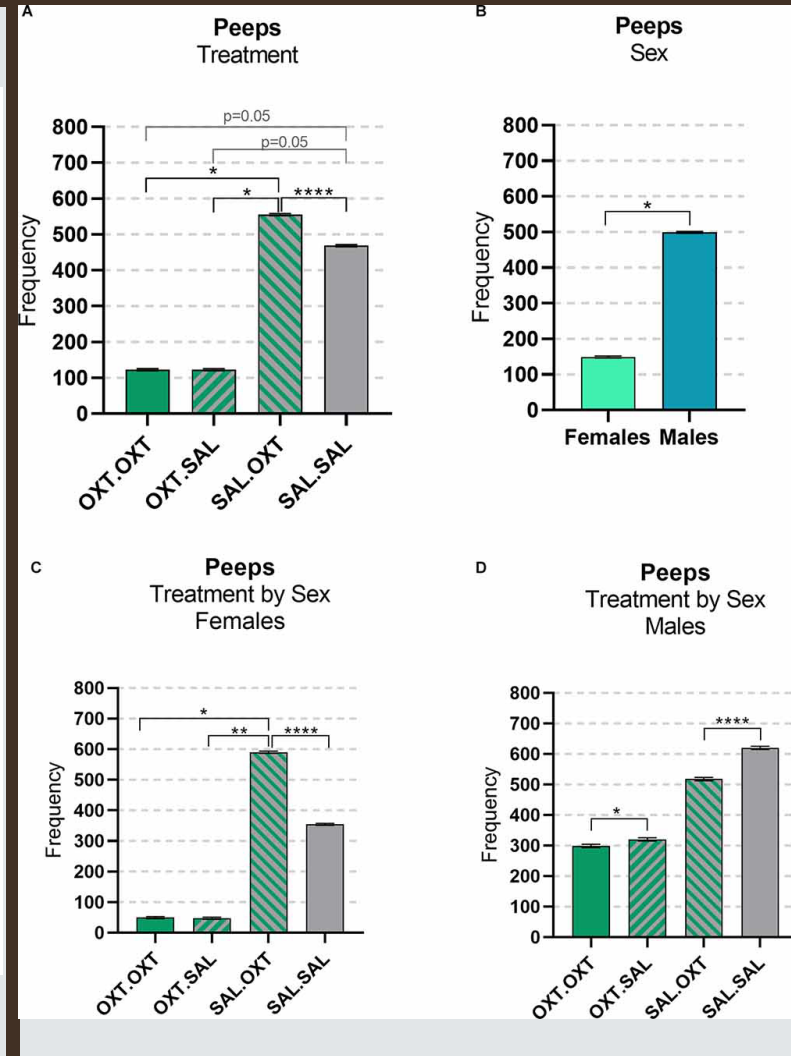
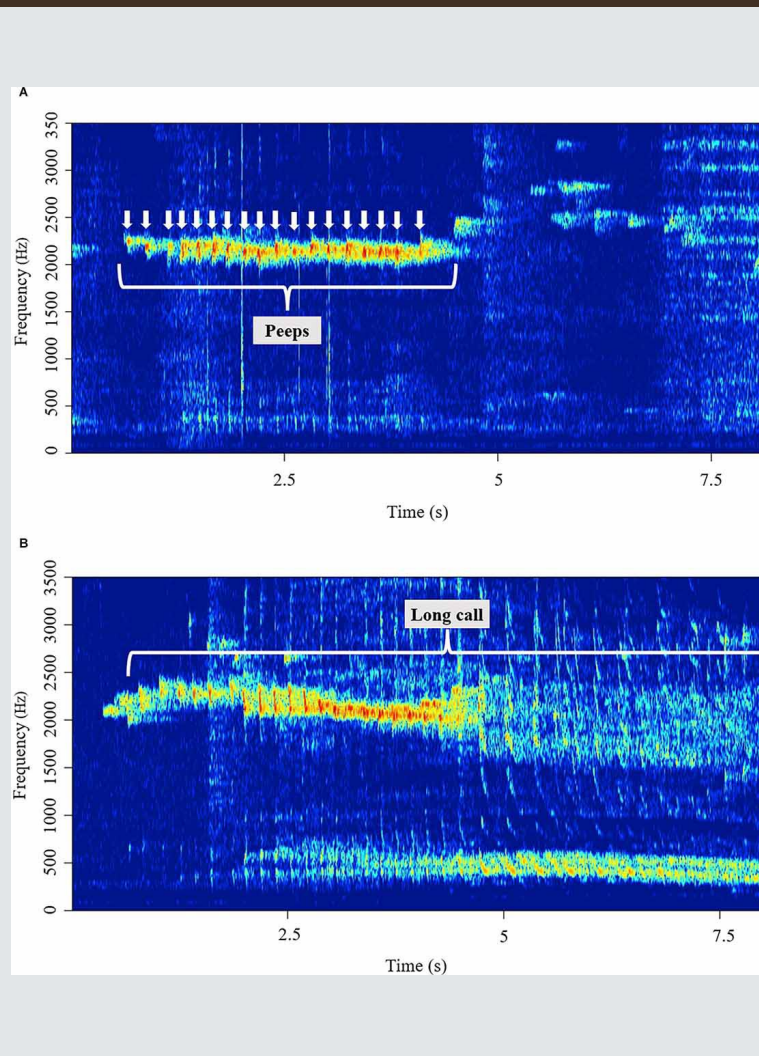
3. Changes in depression-like behavior

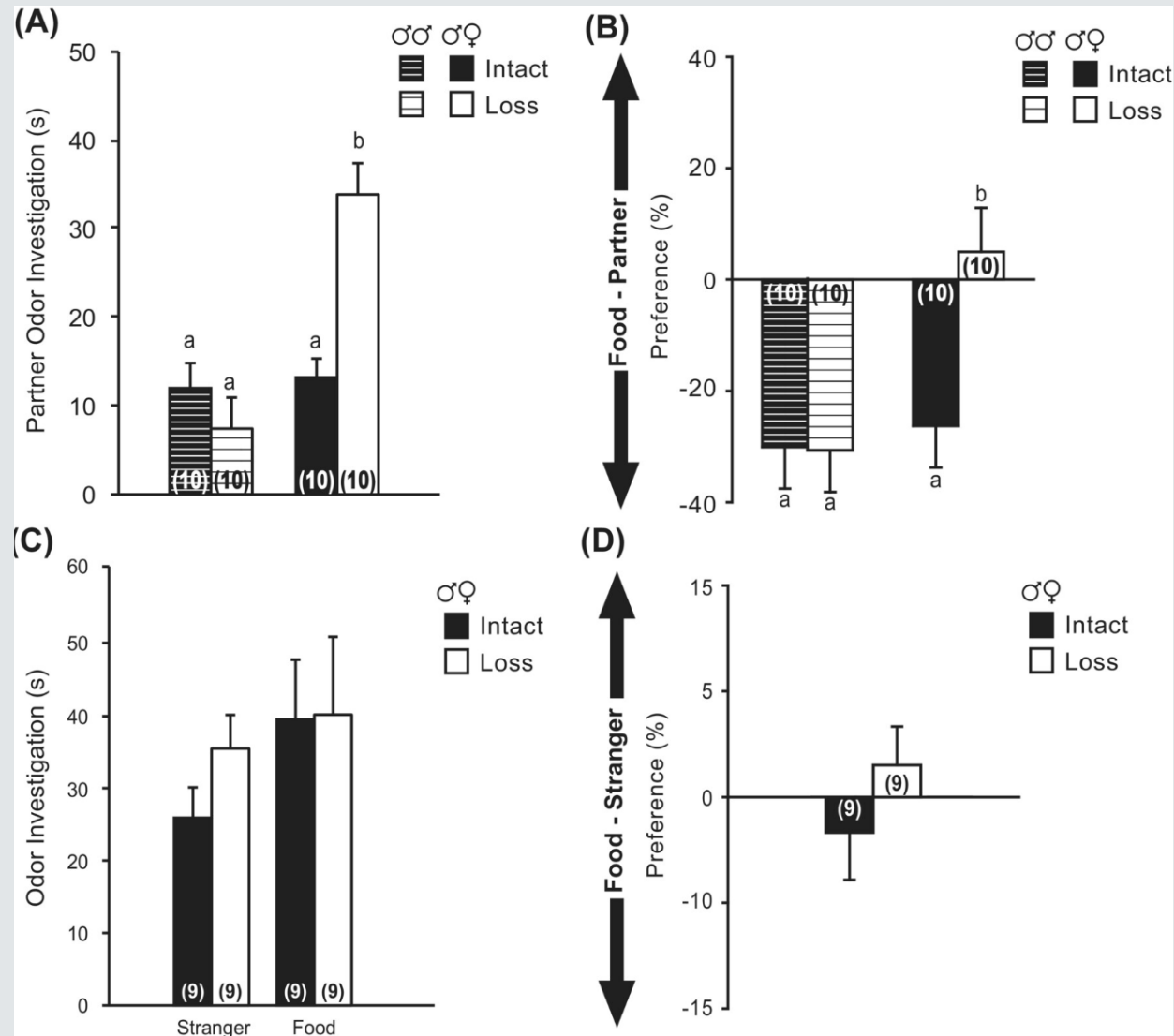
DEPRESSION- LIKE BEHAVIOR



4. How long does the individual keep looking for their partner?

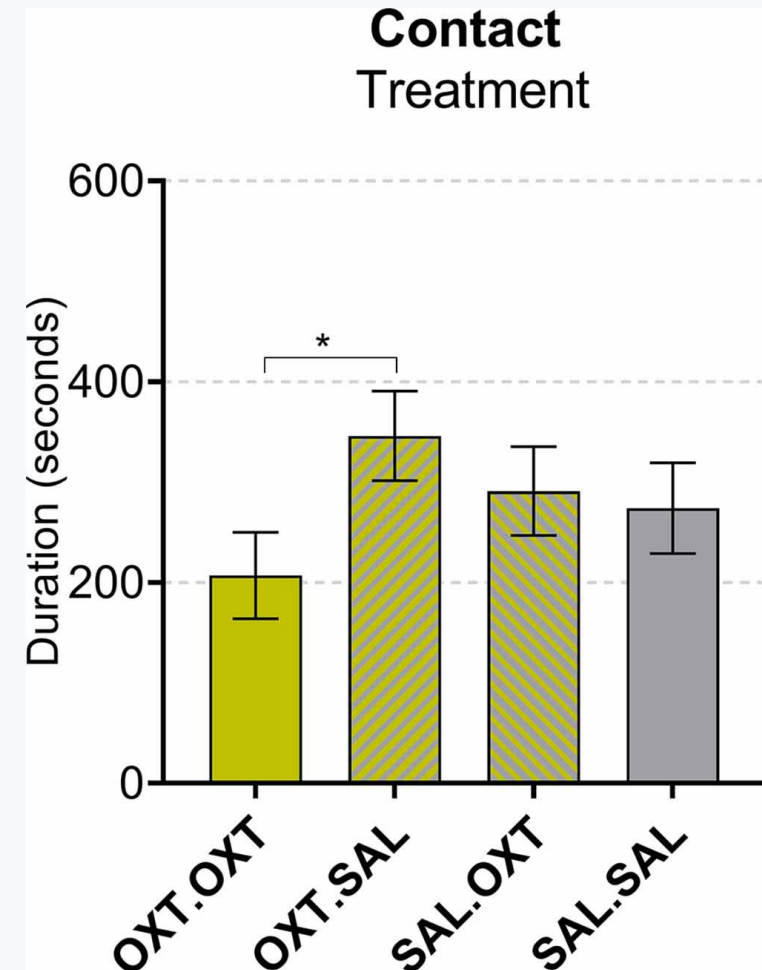
PARTNER-SEEKING BEHAVIOR





5. Does reunion with the partner differ from meeting a stranger? Or in this case, did prior treatment affect reunion behavior?

REUNION BEHAVIOR

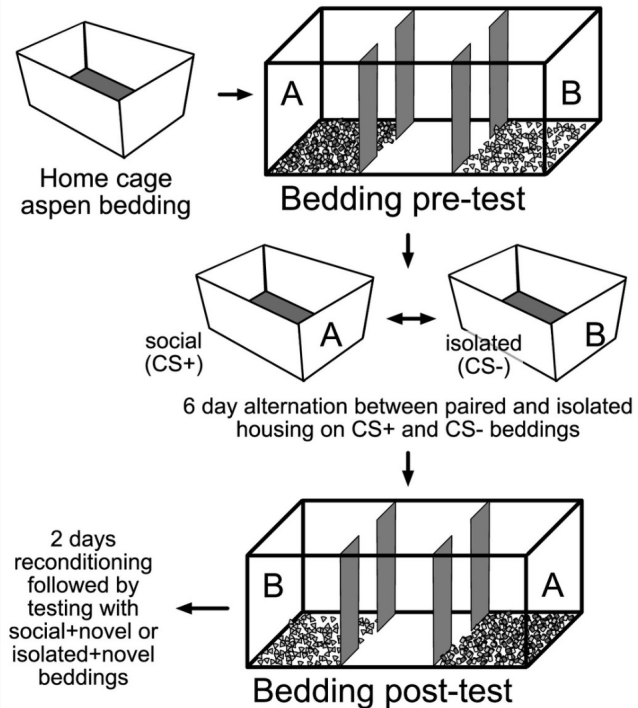


6. Does the reward value of the partner change over time?

REWARD BEHAVIOR

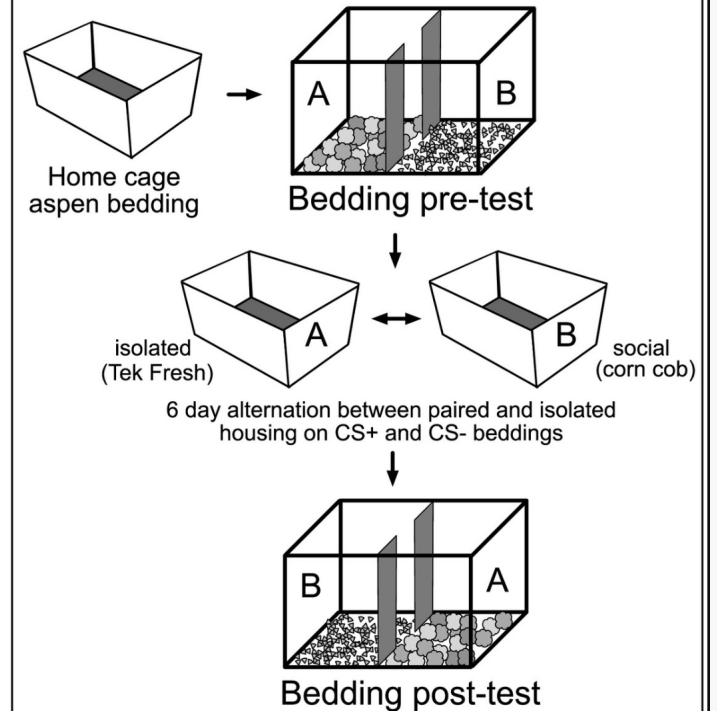
SCPP setup: study 1

Equally palatable beddings; CS+ bedding assigned and alternated between subjects; neutral chamber present.



SCPP setup: study 2

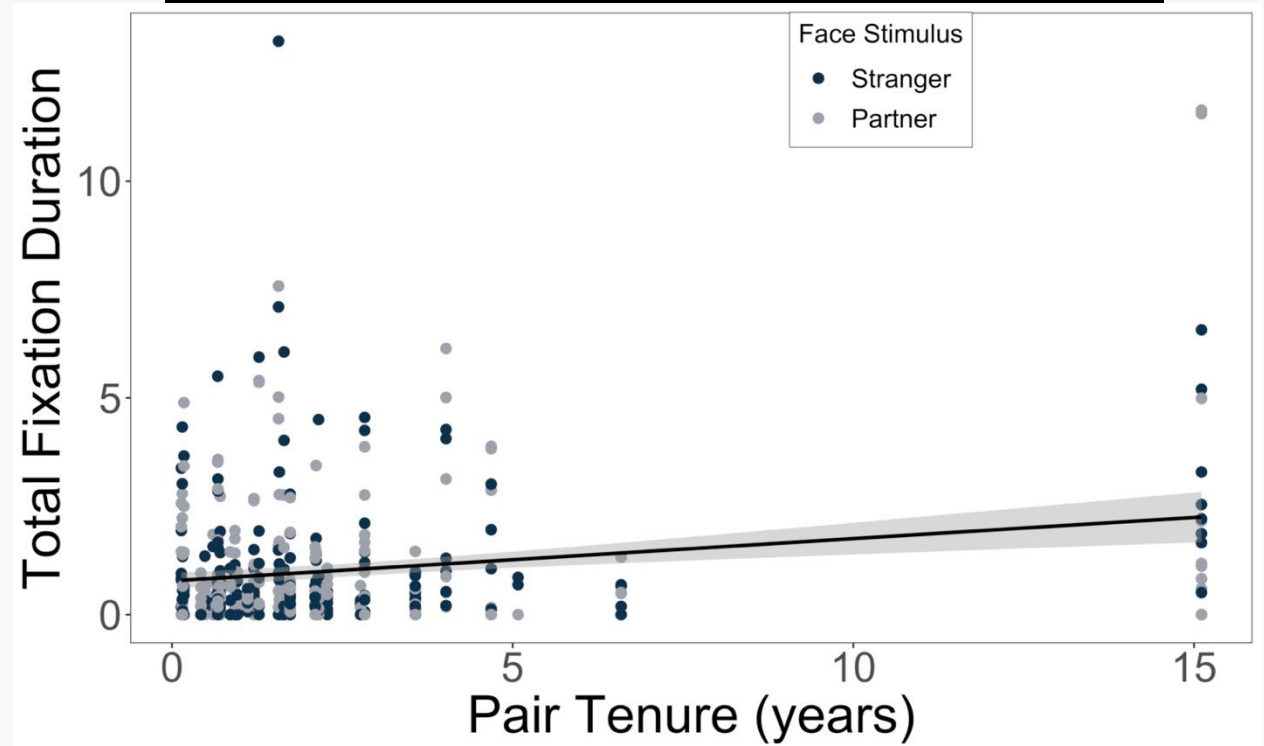
Unequal beddings; subjects counter-conditioned with CS+ as less preferred bedding; no neutral chamber.



7. Does visual preference for the mate change over time?

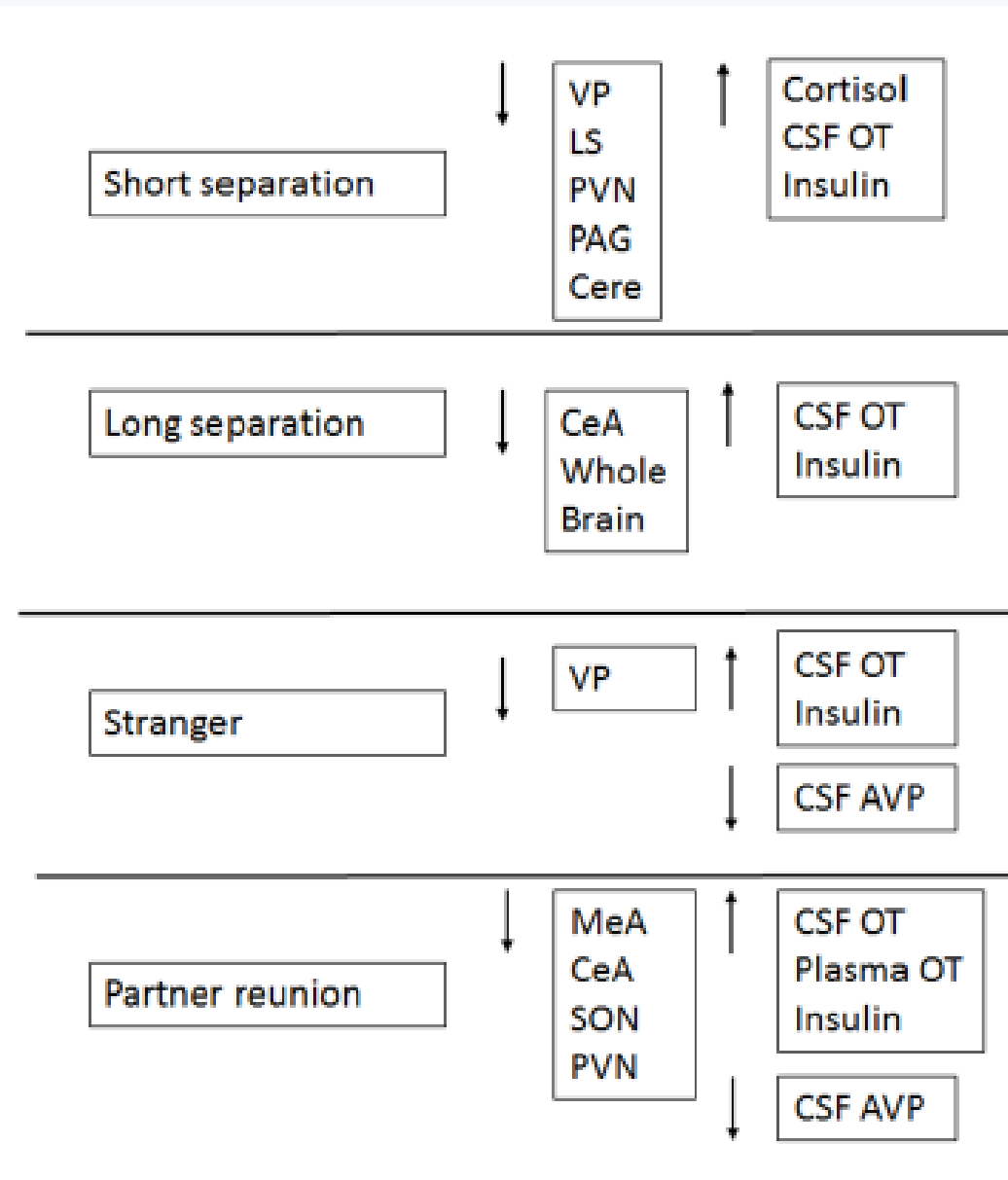


EYE-TRACKING



Lau et al., in review

HORMONAL CHANGES





NEURAL CHANGES

These are harder to align with human measures, unless you're using imaging

- **Imaging – FDG, GR103545**
- **Transcriptome**
- **Recording from individual neurons or ensembles**

Would the neurobiology of grief benefit from a CNTRICs-like process?

- Nominate promising measures for further refinement
- Consider construct validity, cross-species homology, translatability, parametric properties, reliability, reproducibility, standardization/automation, ethics, animal and human welfare
- Produce valid procedures for test of new treatments, etc.

Another consideration may include the type of grief/loss

DISCUSSION



Thanks!!!