

Social information in *Drosophila* Interaction, transmission, ecology

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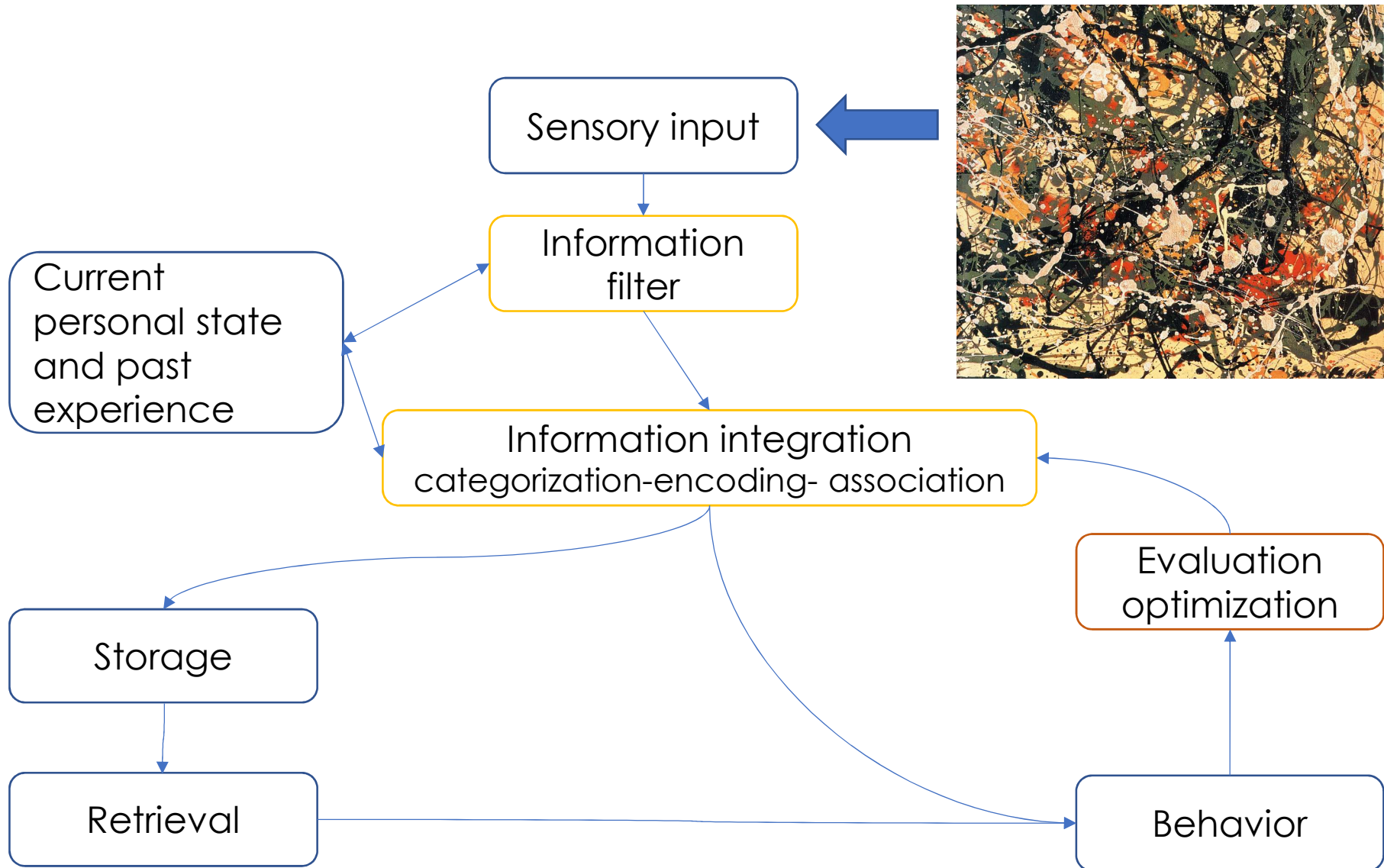
M. Sokolowski



Biodiversity
Ecosystems
Society
Climate

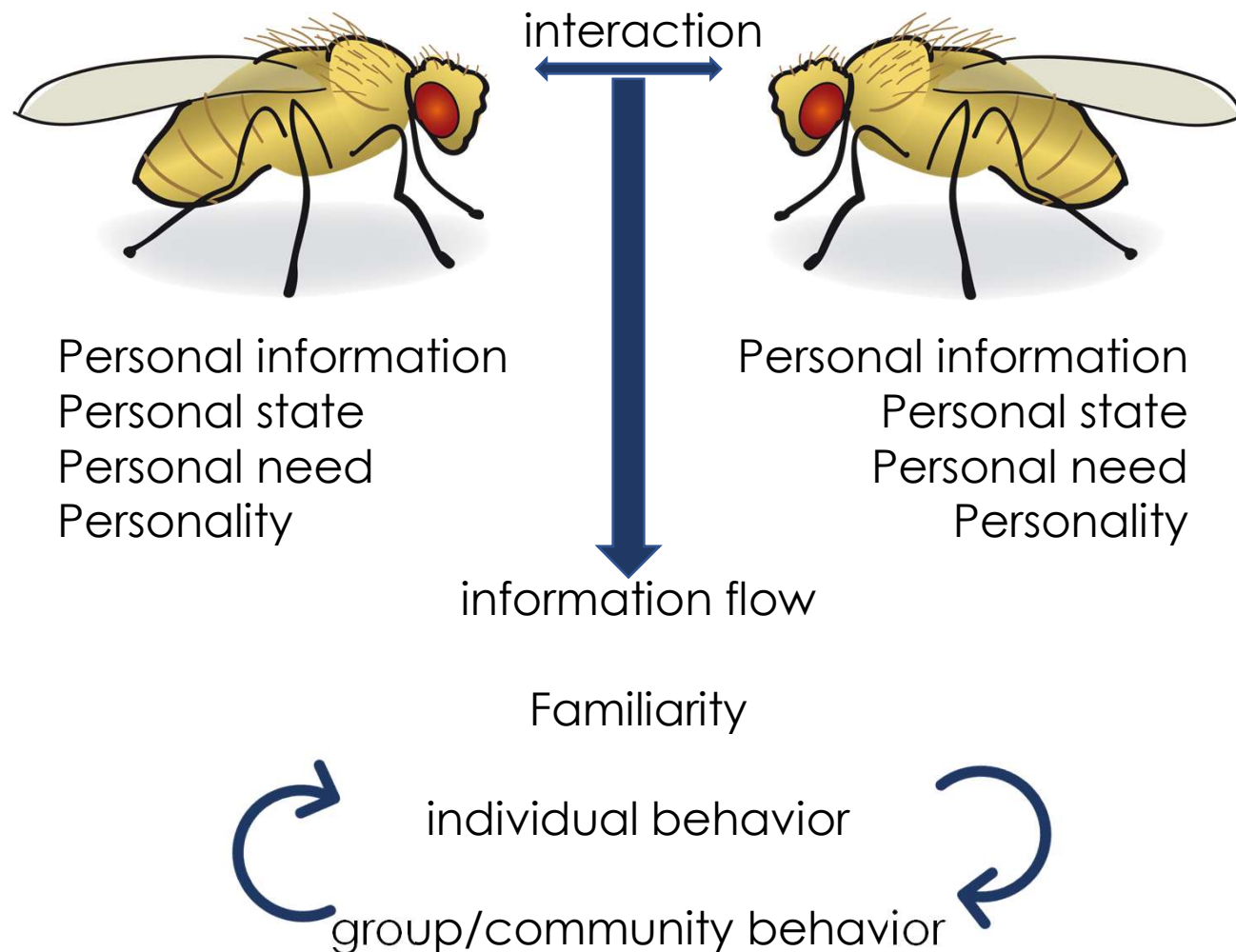
Biodiversity
Ecosystems
Society
Climate

An information is an abstract thing
which can be translated into a concrete behavior

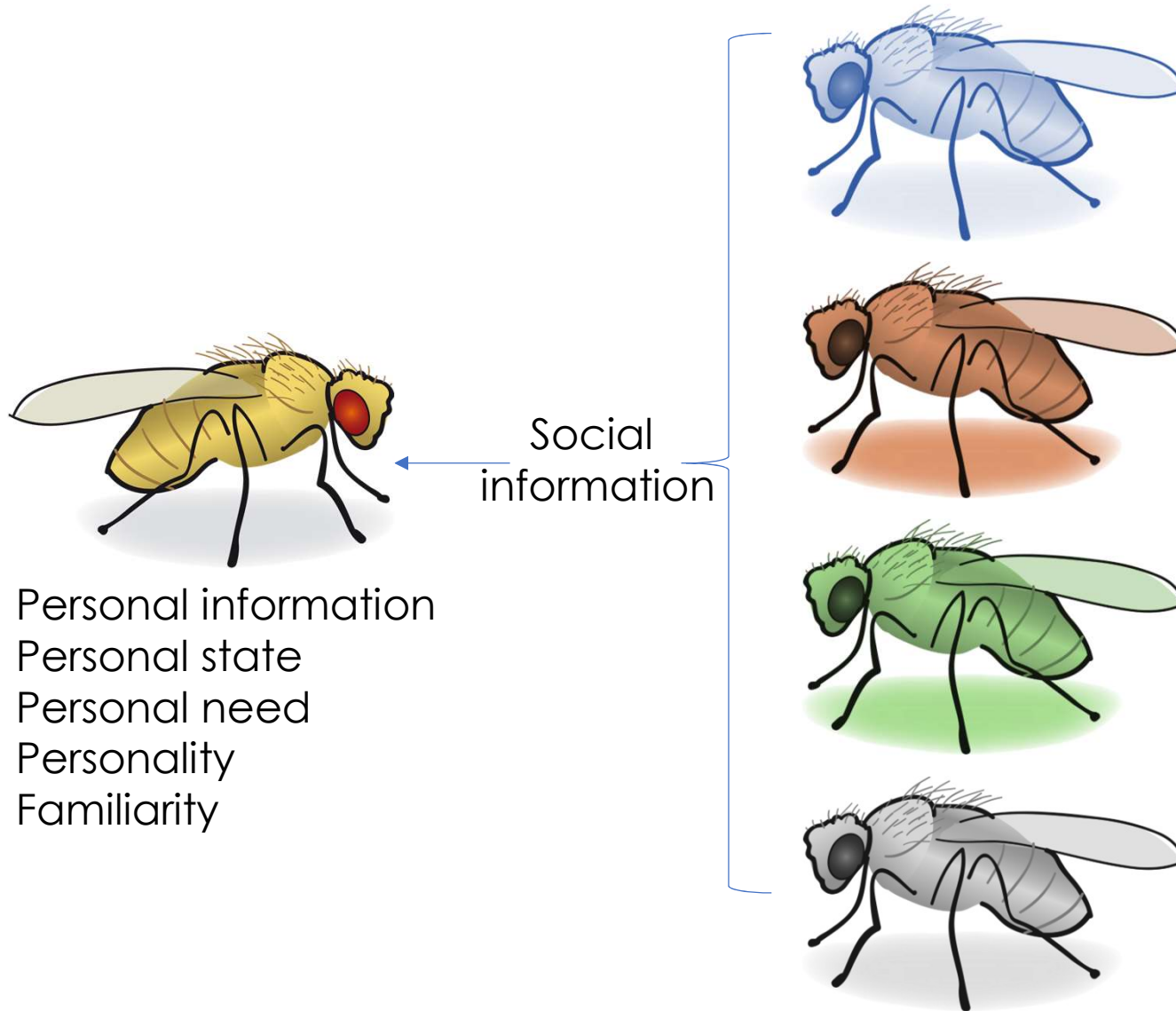


Social interaction...what is special?

The social environment is characterized by a high degree of flexibility and intrinsic unpredictability



Social information...from who?



Filtering, categorizing, encoding in a social world... fundamental factors

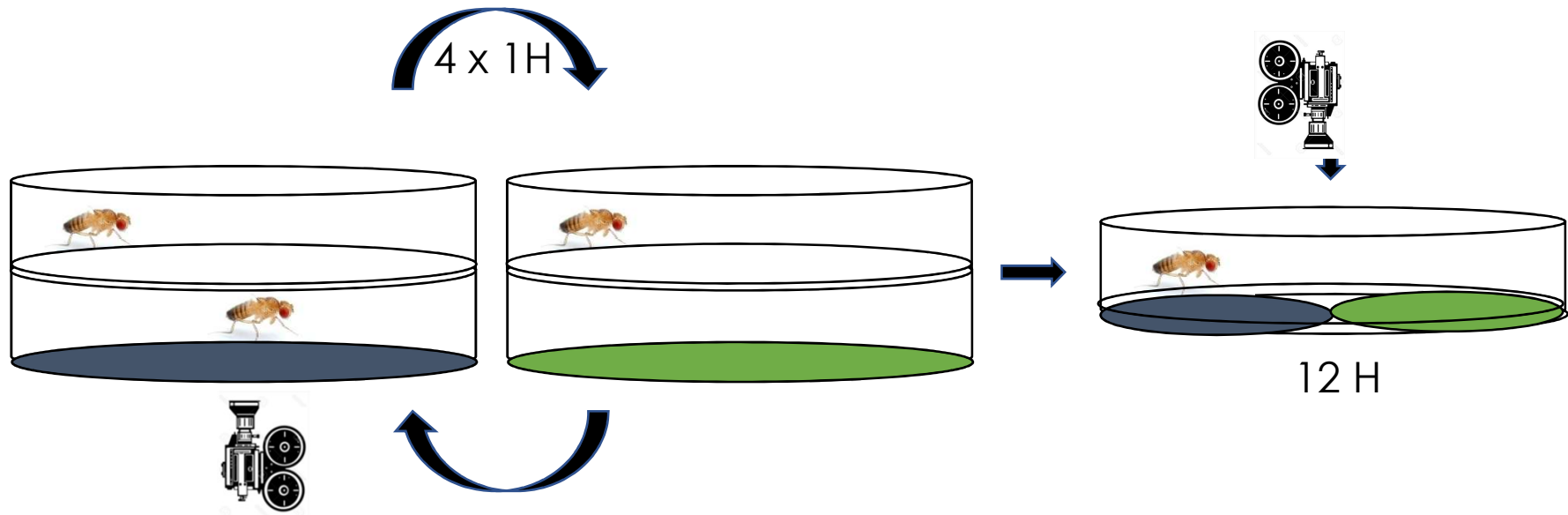
- *Not only was it difficult for him to comprehend that the generic symbol dog embraces so many unlike individuals of diverse size and form; it bothered him that the dog at 3:14 pm (seen from the side) should have the same name as the dog at 3:15 pm (seen from the front)."*

L Borges, 1962, "Funes el memorioso")



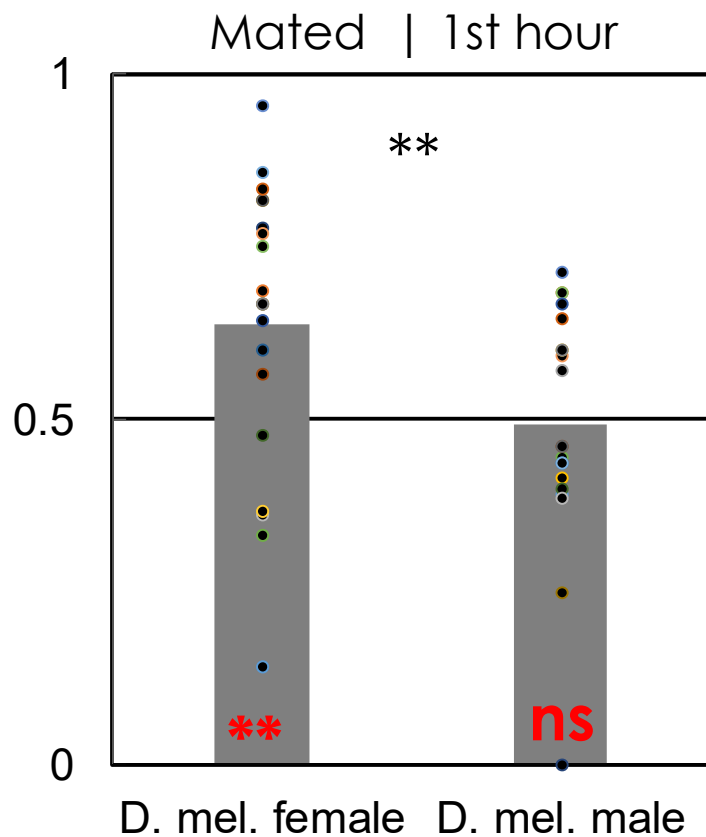
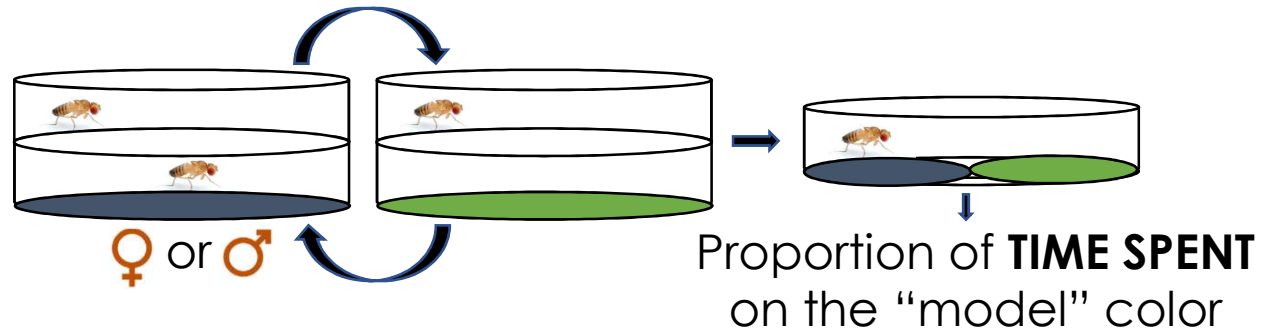
Sporadic aggregation
and group formation

Social learning in *Drosophila*

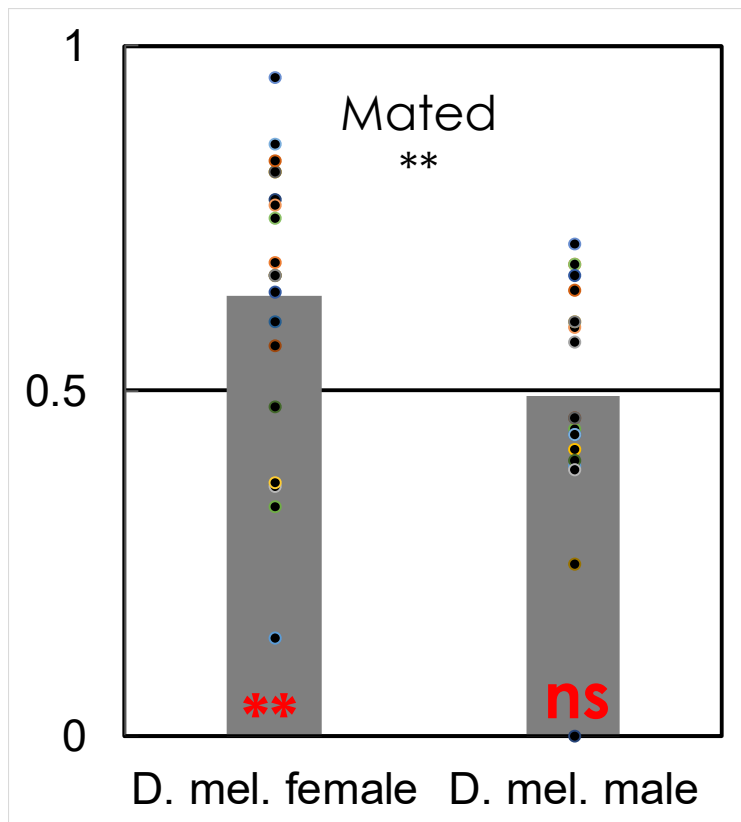
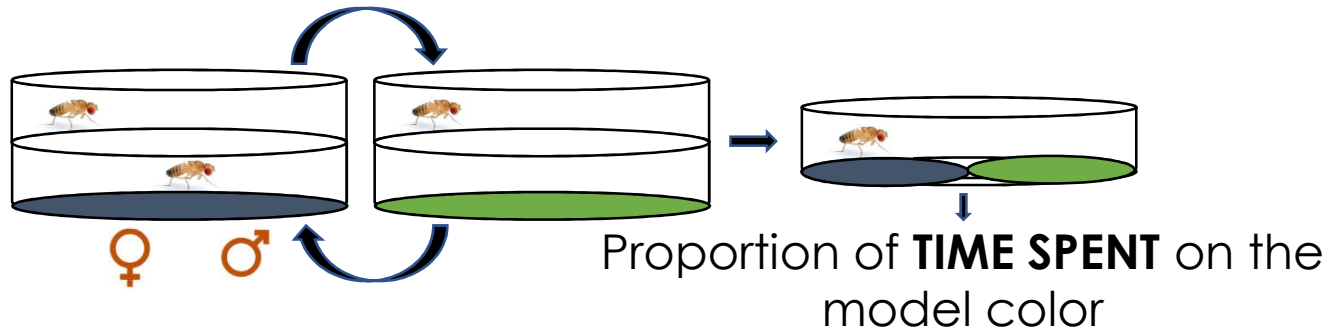


- Bottom of the top petri dishes are always covered with a thin layer of agar + sucrose
- N=26-28 replicates for each experiment/treatment (50% for blue, 50% for green)
- Humidity: 70%
- Temperature: 23°C

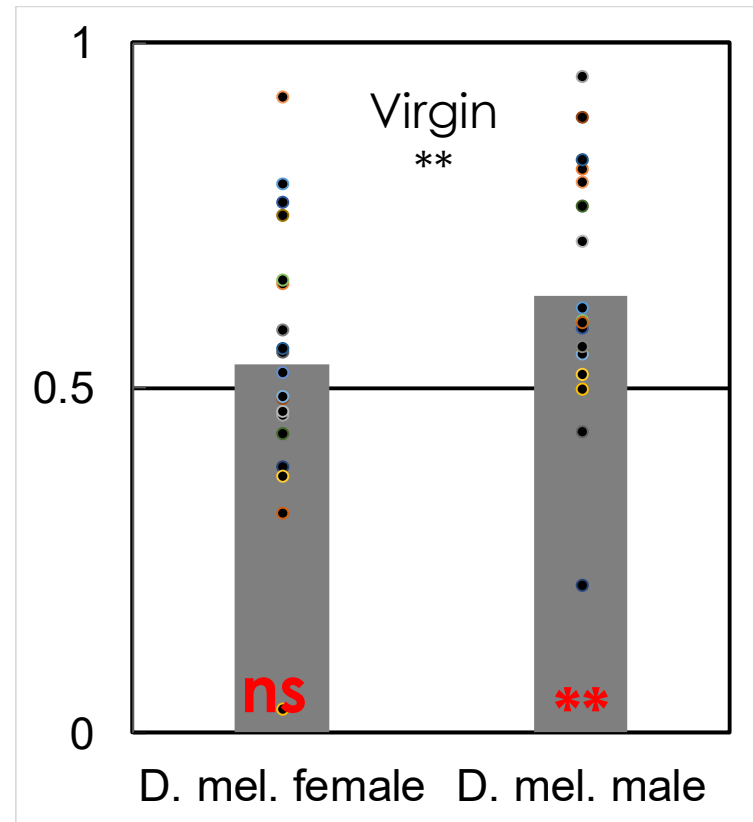
Social learning in *Drosophila*: sex model effect



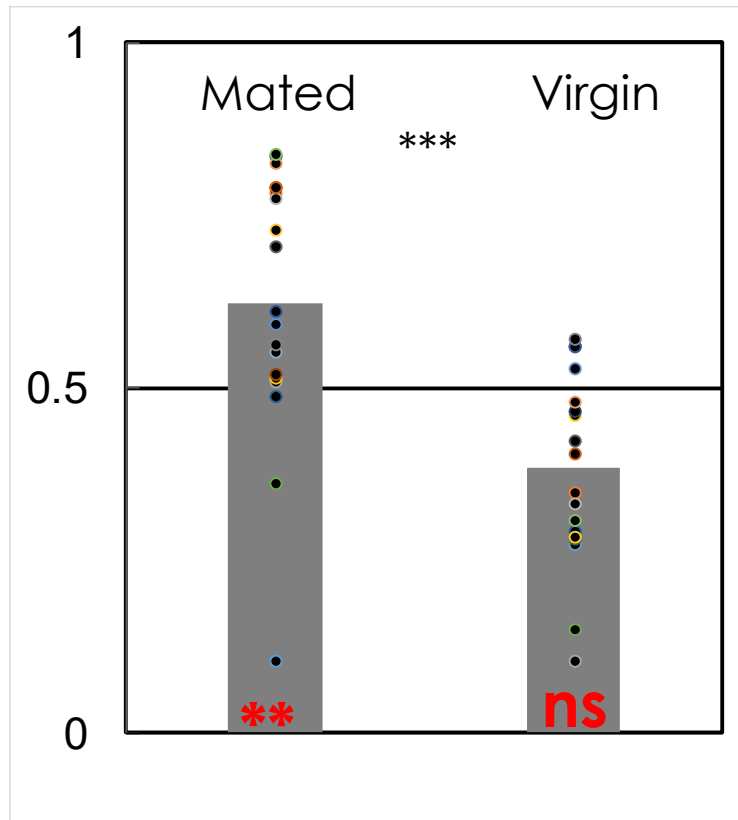
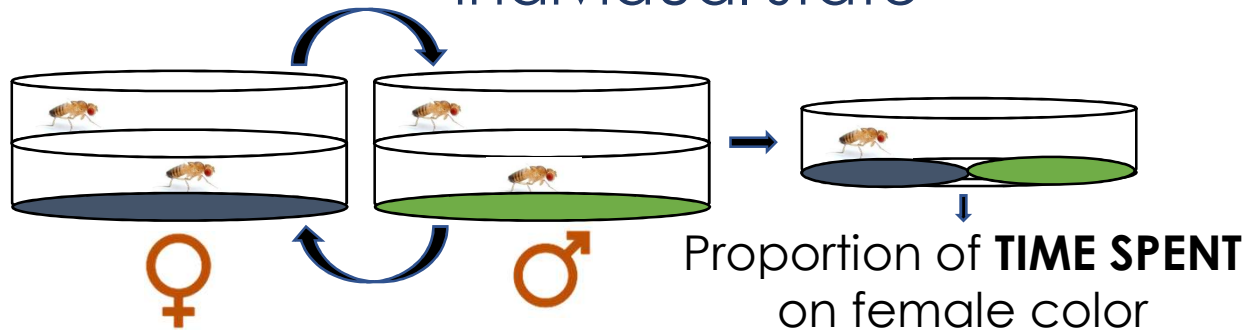
Individual state effect



1ST hour



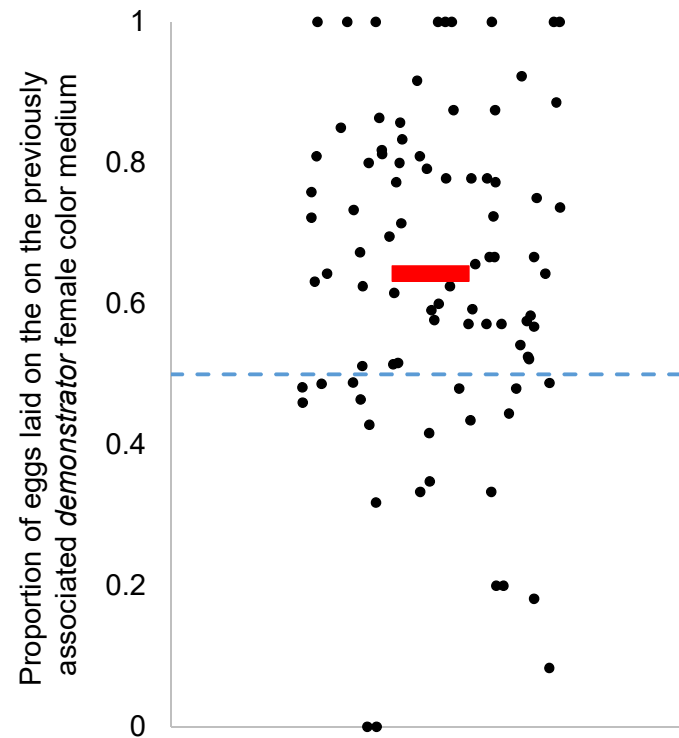
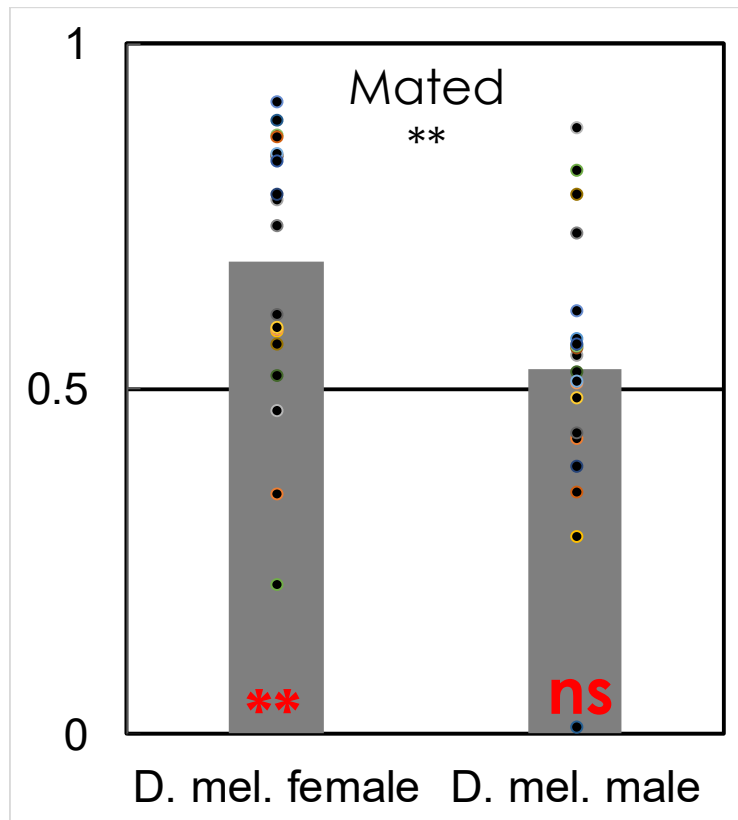
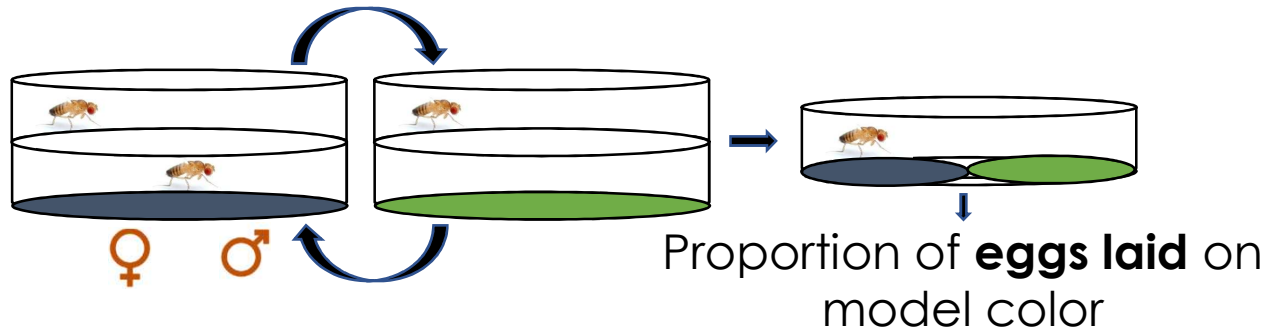
Response to the social information depends on individual state



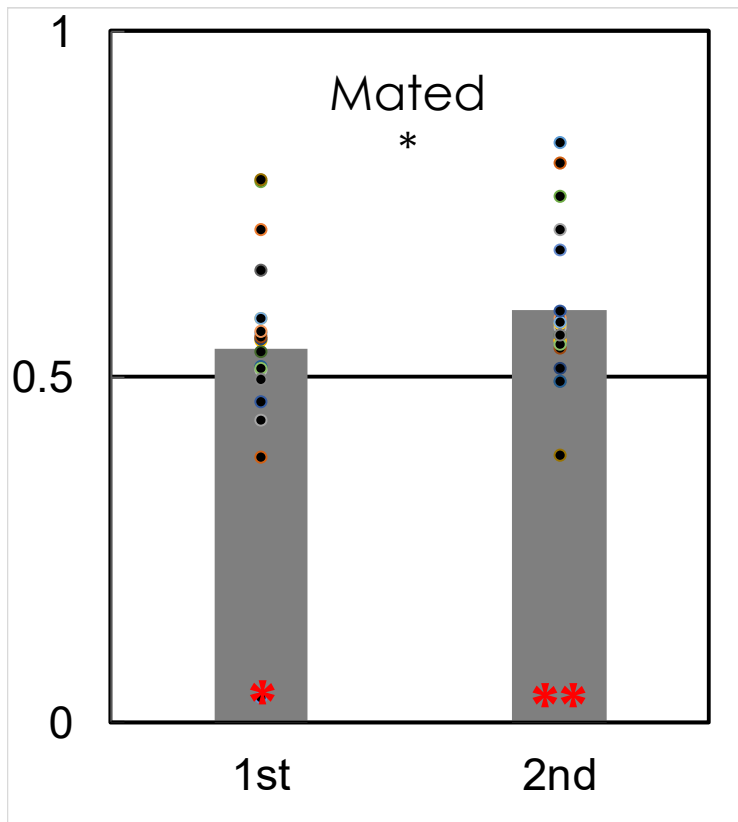
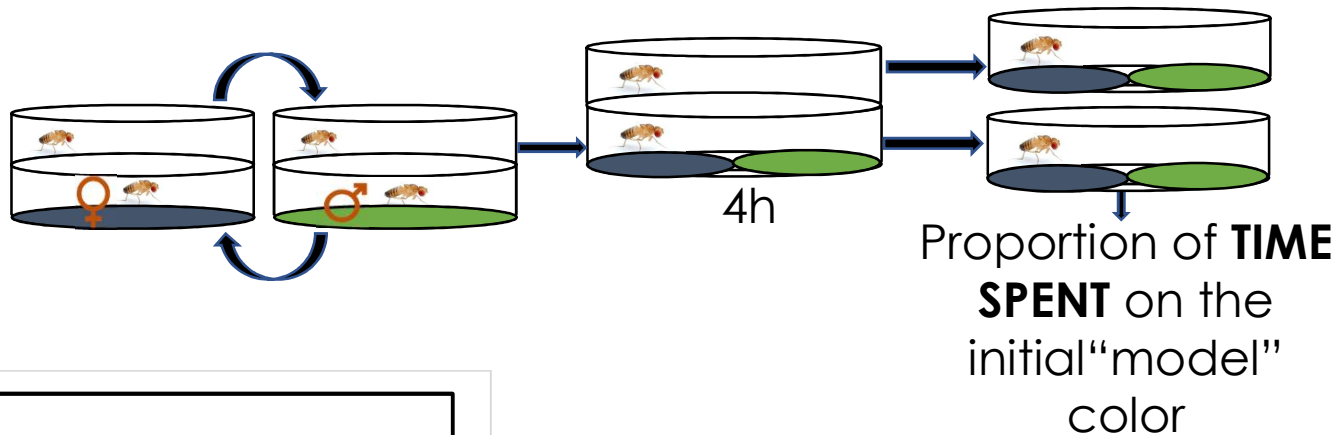
This is not “*basic*” “social enhancement”

Social transmission is based on individual recognition and the behavioral output is state dependent (mated or virgin)

Social learning may have 'long term' fitness effect?



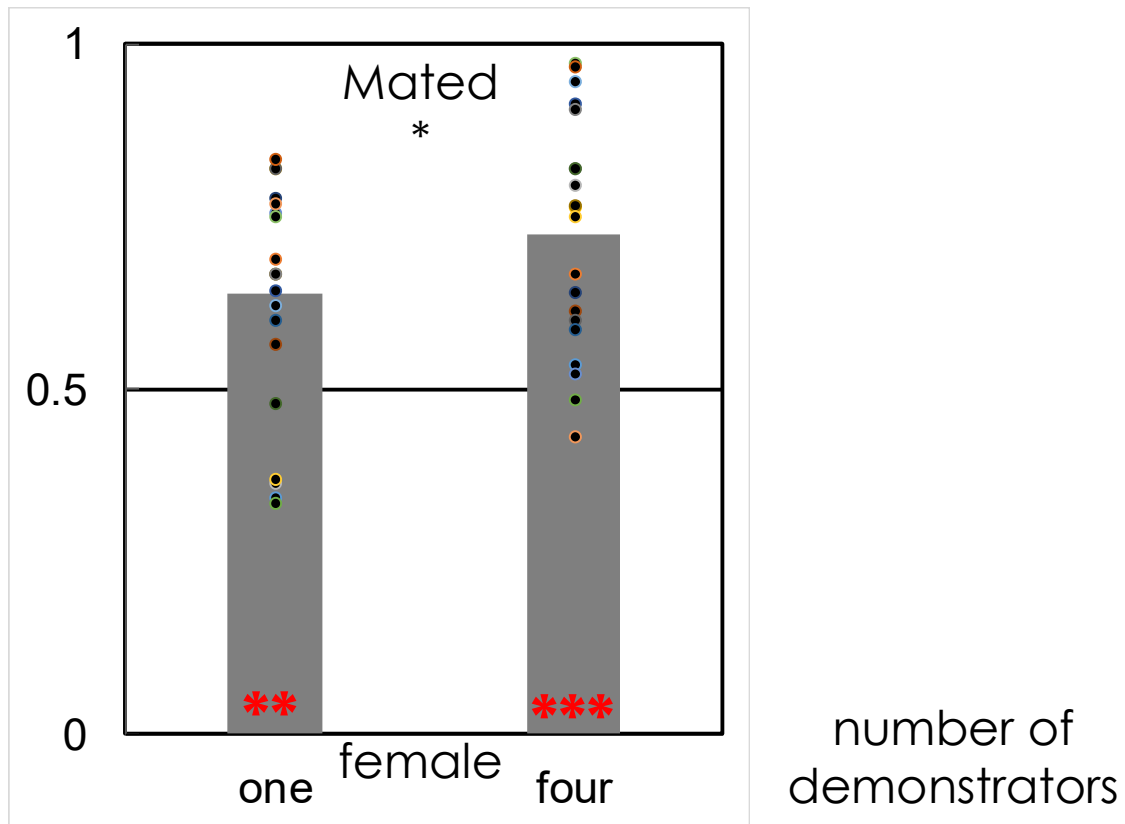
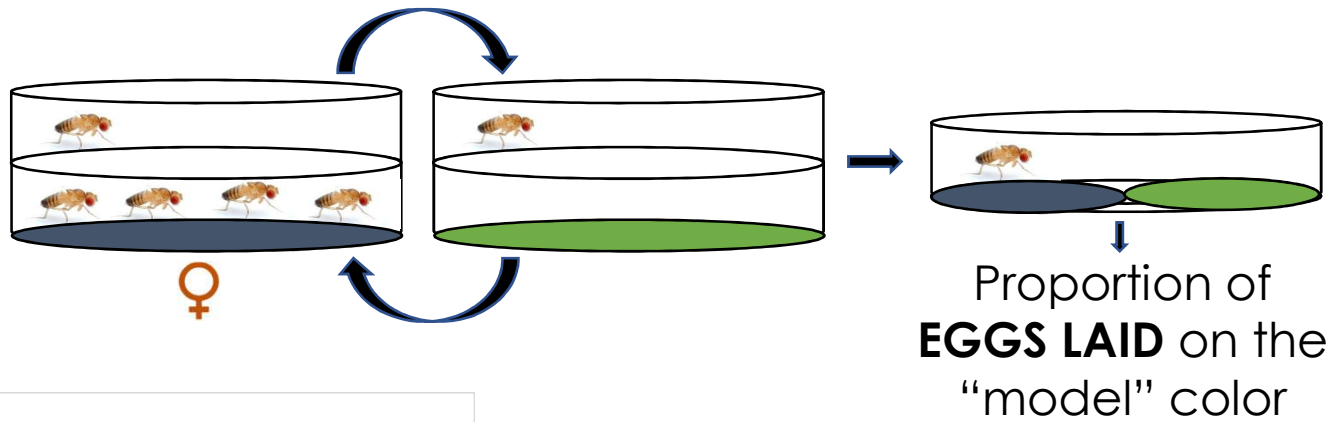
Social learning may have 'long term' fitness effect?



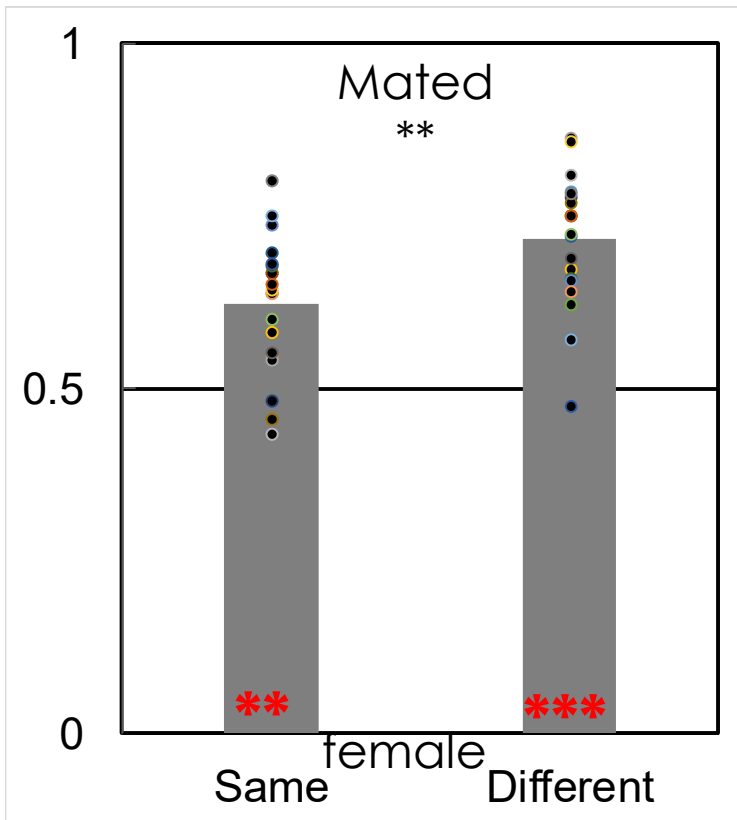
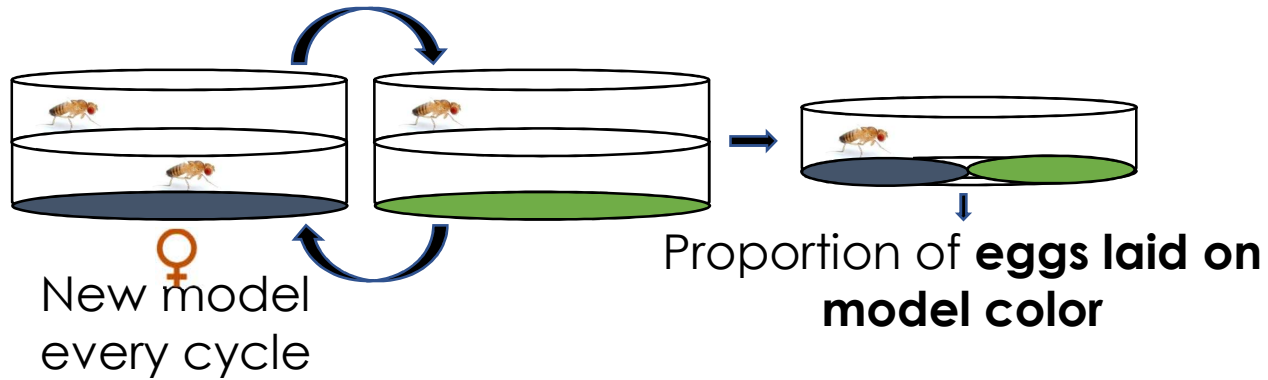
A balance between extinction and transmission?

Fast spreading may counter balance individual extinction and maintain information at the group level

Group effect...

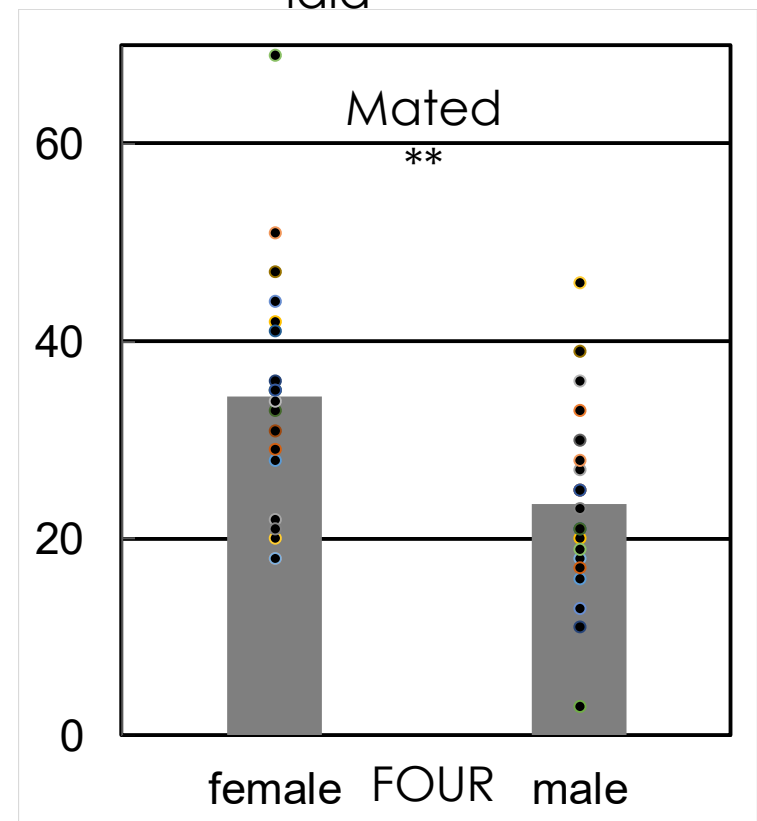
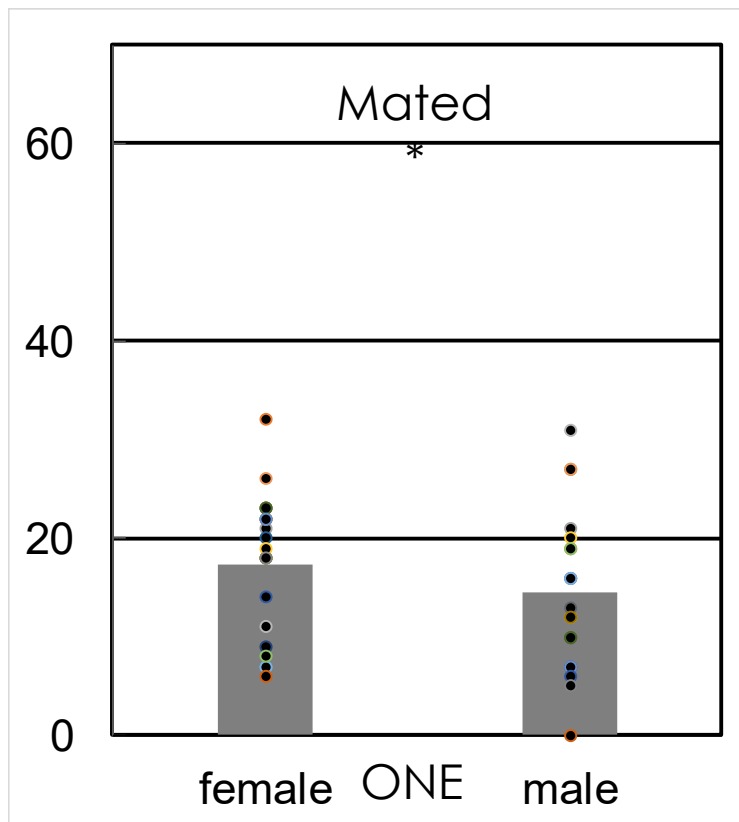
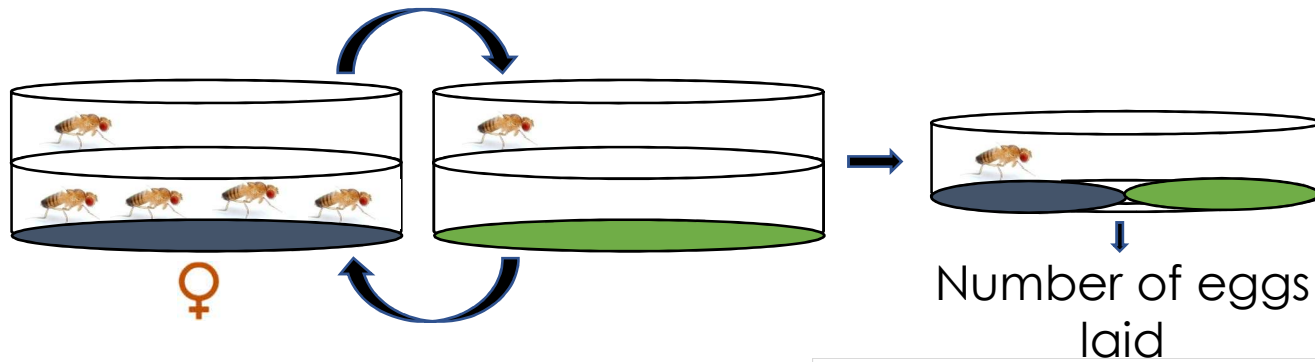


Or sampling effect?

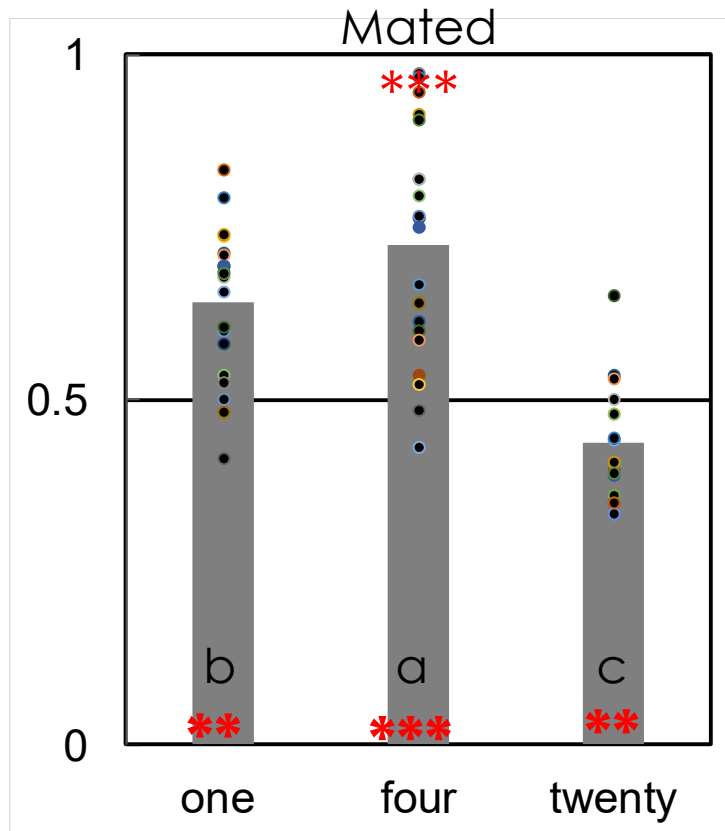
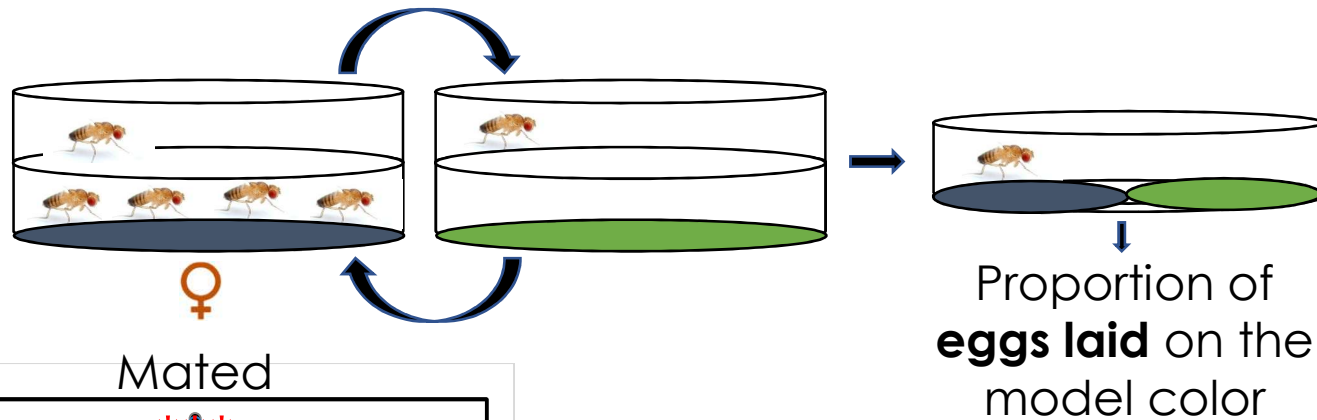


Integration of inter-individual variations improves categorization and learning?

Side observation: Group and sex effect on eggs laid



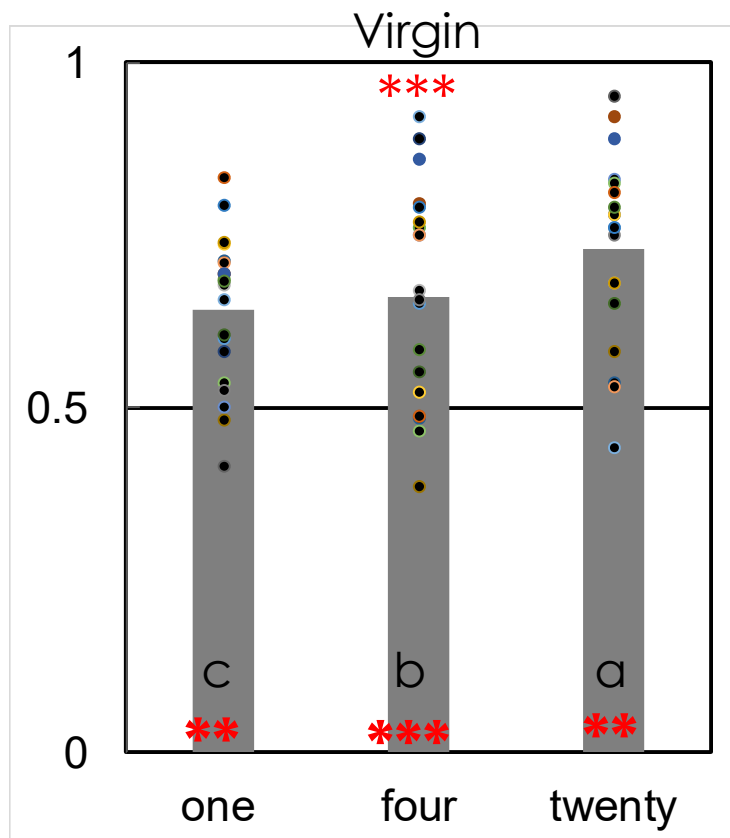
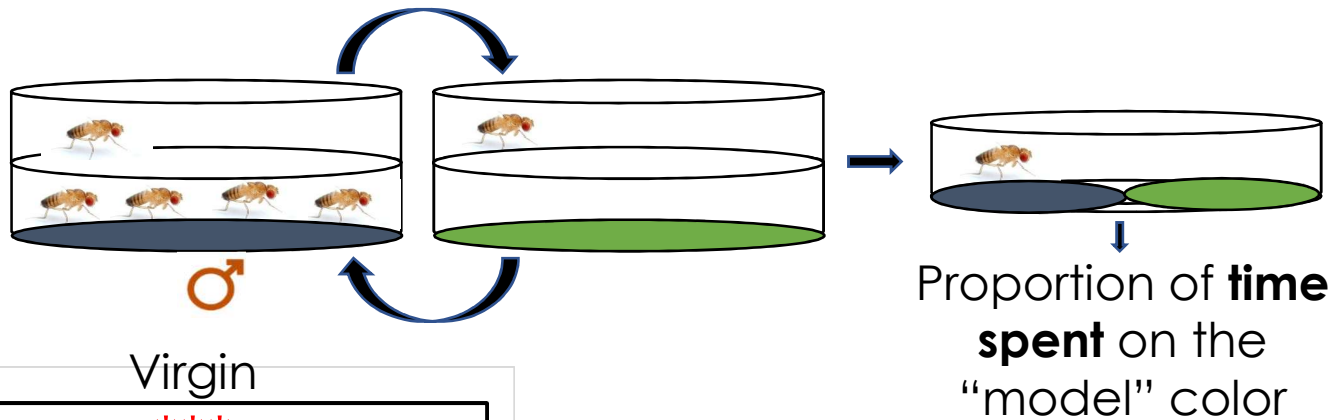
Group effect... adaptive competition avoidance?



An interaction between reliability (and categorization) of the information and over flow of information (rejection)?

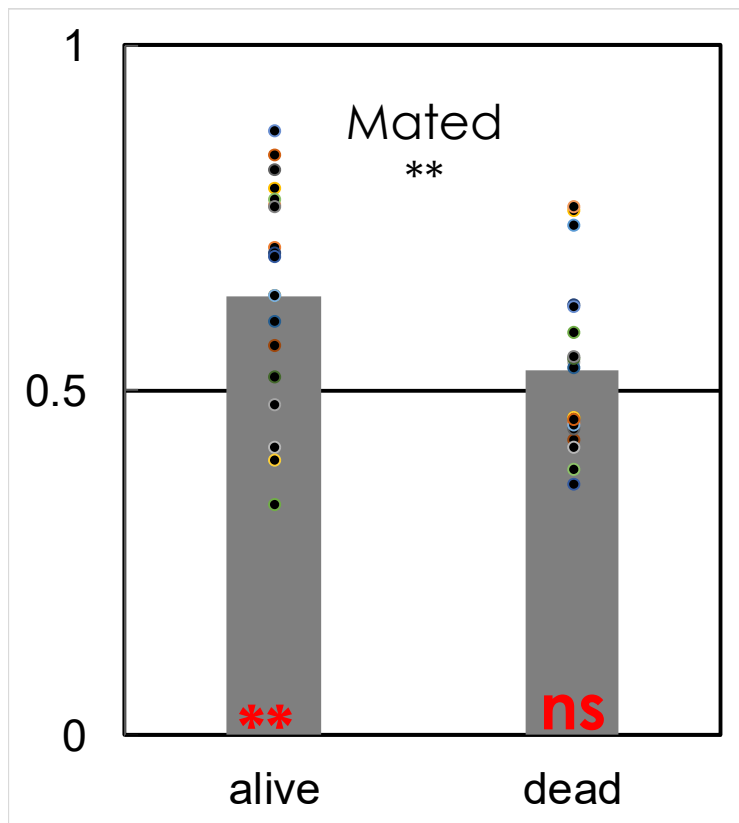
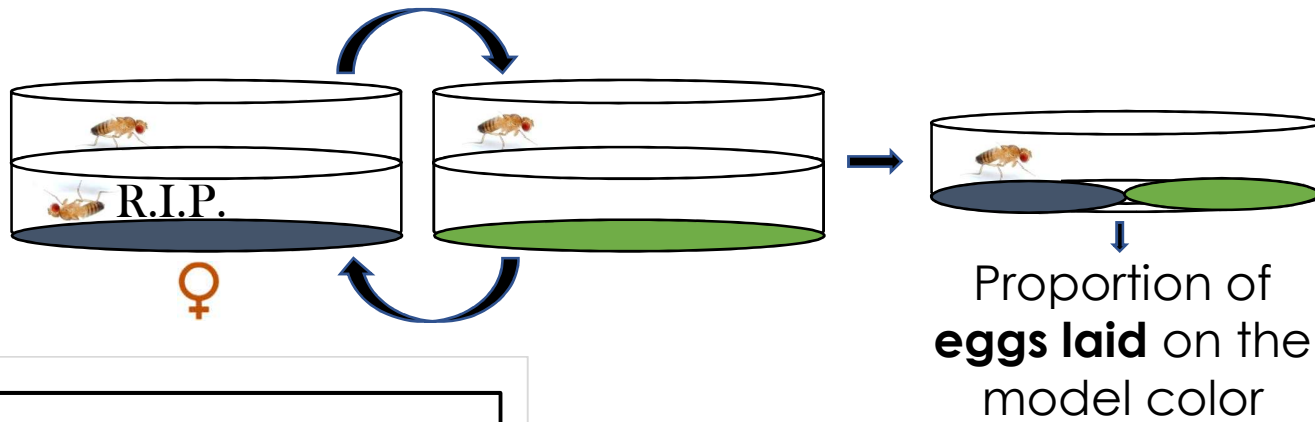
number of
Female demonstrators

Group effect and individual / model state interaction



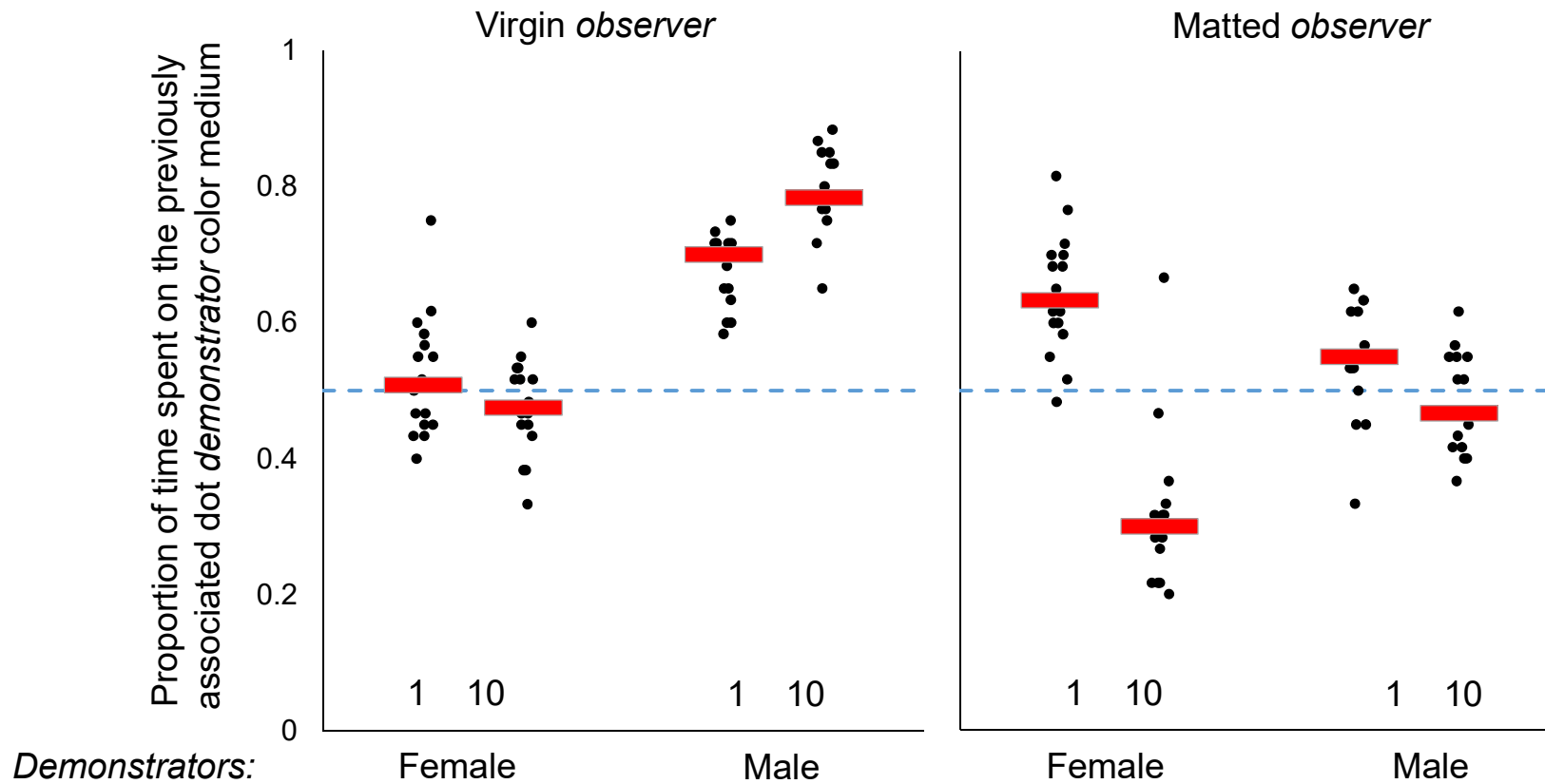
number of **male** models

Shape is not enough

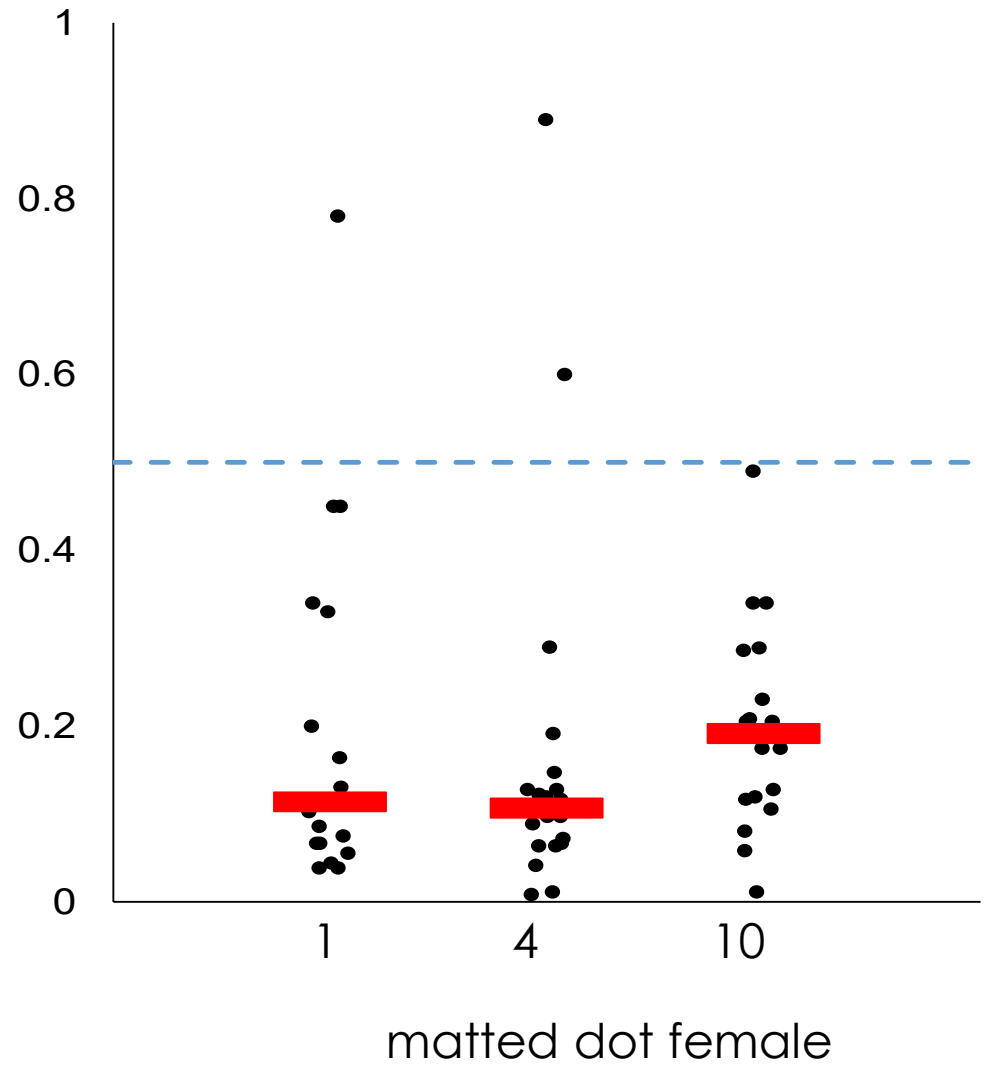
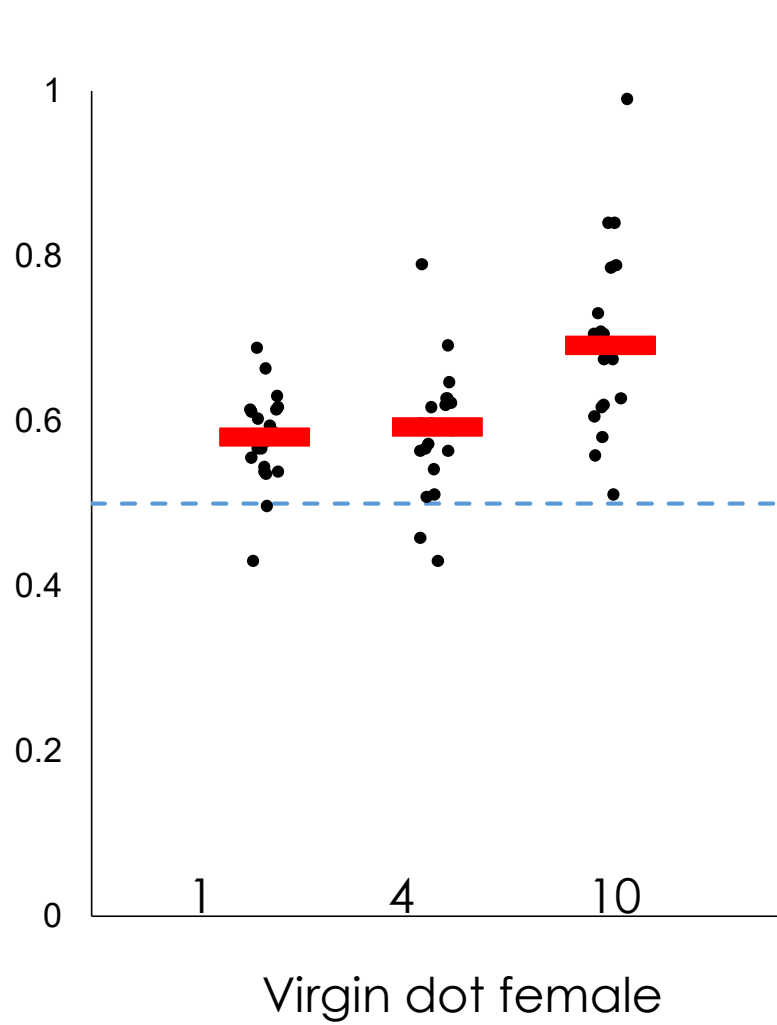


Working on motion....

Replace flies by dots... specific state – sex interaction



Yes, males have a brain....



From intra to interspecific transmission: the ecological importance of social information

	melanogaster	simulans	suzuki
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

Melanogaster and simulans lay eggs on rotten fruit ie ecological niche overlap

Suzuki lay eggs on fresh red fruit ie no ecological nich overlap

Abundance in "ferme de Villetin" area (france, close to Paris).

Thanks to C. Montchamp Moreau (egce, data 2015-2018)

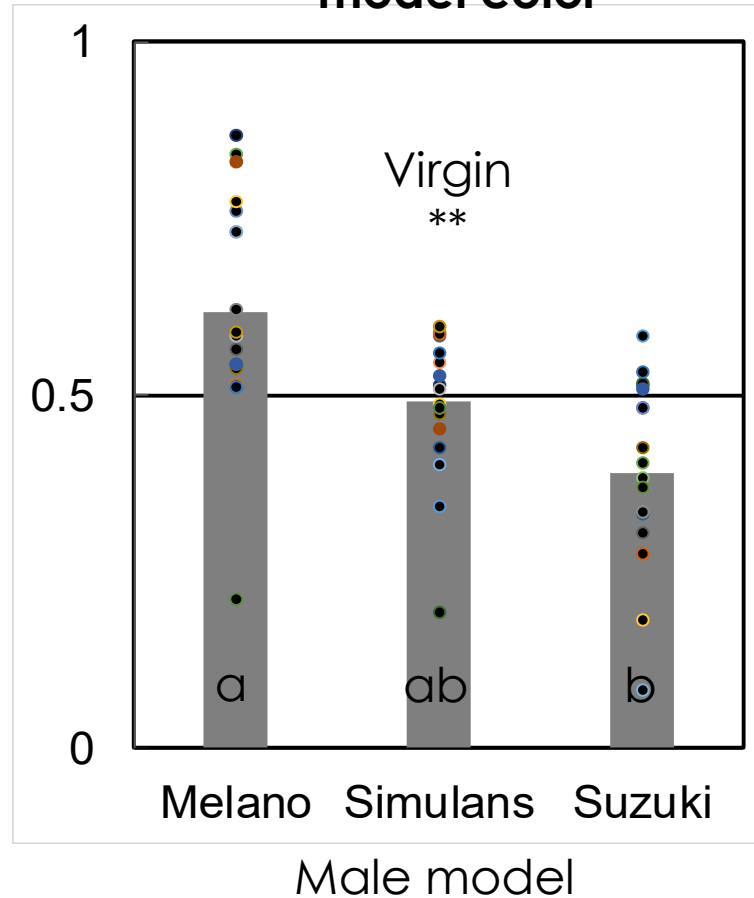
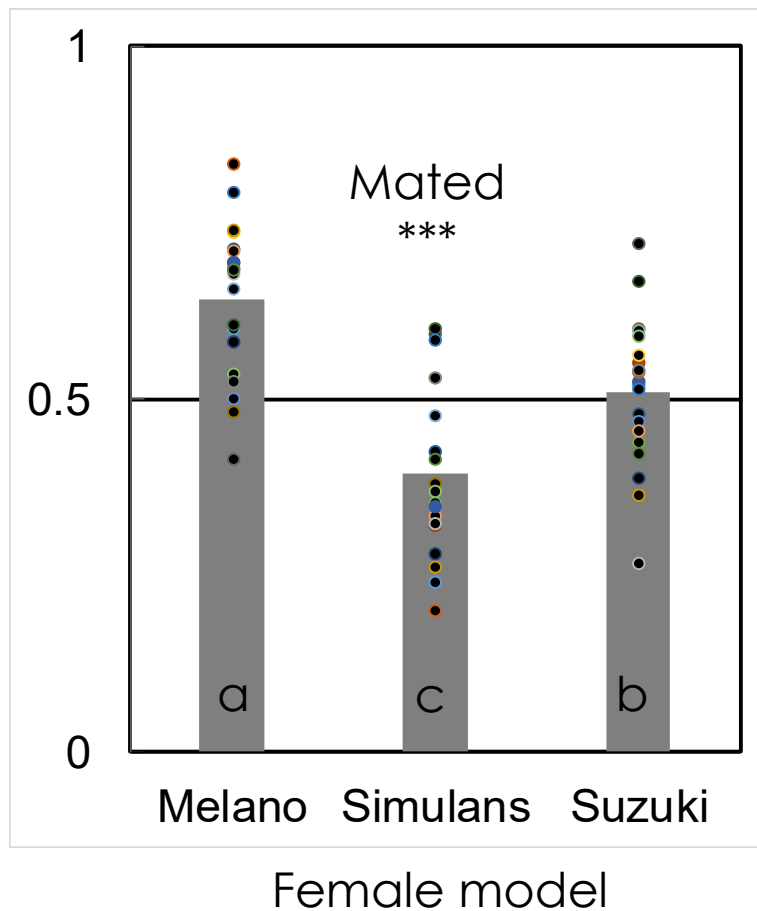
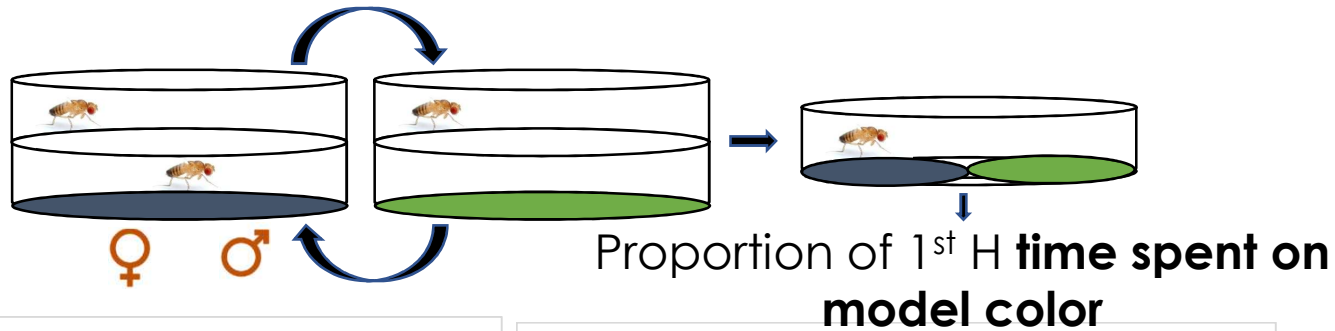


Larval competition:
Adult males emerging

Melano < simulans
Melano > Suzuki

Thanks to M. Desgardin

An adaptive integration of social information?



Working on motion....

Take home message and perspectives

Social transmission is based on individual recognition and the behavioral output is state dependent (mated or virgin)

Fast spreading may counter balance individual extinction and maintain information at the group level

integration of inter-individual variations improves categorization and learning?

An interaction between reliability (and categorization) of the information?
Adaptive behavior for competition?

Shape is not enough... WORKING ON MOTION

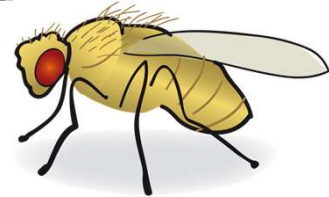
The output of interspecific social transmission may depend on the respective ecological niche (adaptive use of the social information)

Thanks a lot...



Isaac Elias
A party 1629

Social information in drosophila
Interaction, transmission, ecology



Let's play a social transmission game...

