

# In field crickets, males and female express genetically distinct behavioral syndromes, leading to diverging evolutionary responses

## Cross-sex genetic correlations constrain the evolution of a behavioral syndrome

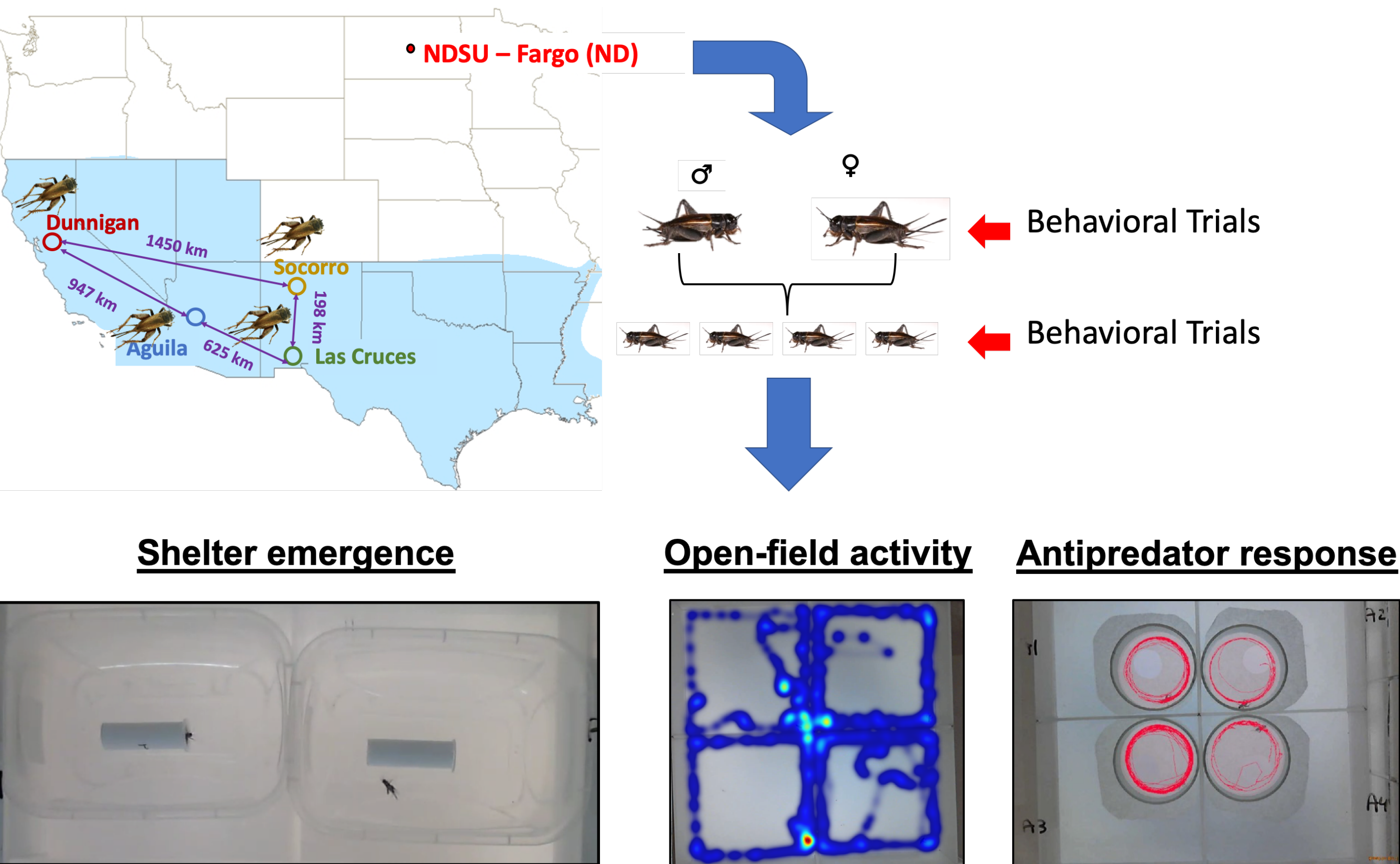
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### CONTEXT

- Behaviors often integrated into syndromes & have genetic basis
- Sex-specific architecture unknown
- Implications for the evolution of behavioral dimorphism

### METHODS

- Field crickets (*Gryllus integer*) collected from 4 populations
- Breeding design over 3 generations and behavioral phenotyping of 965 individuals

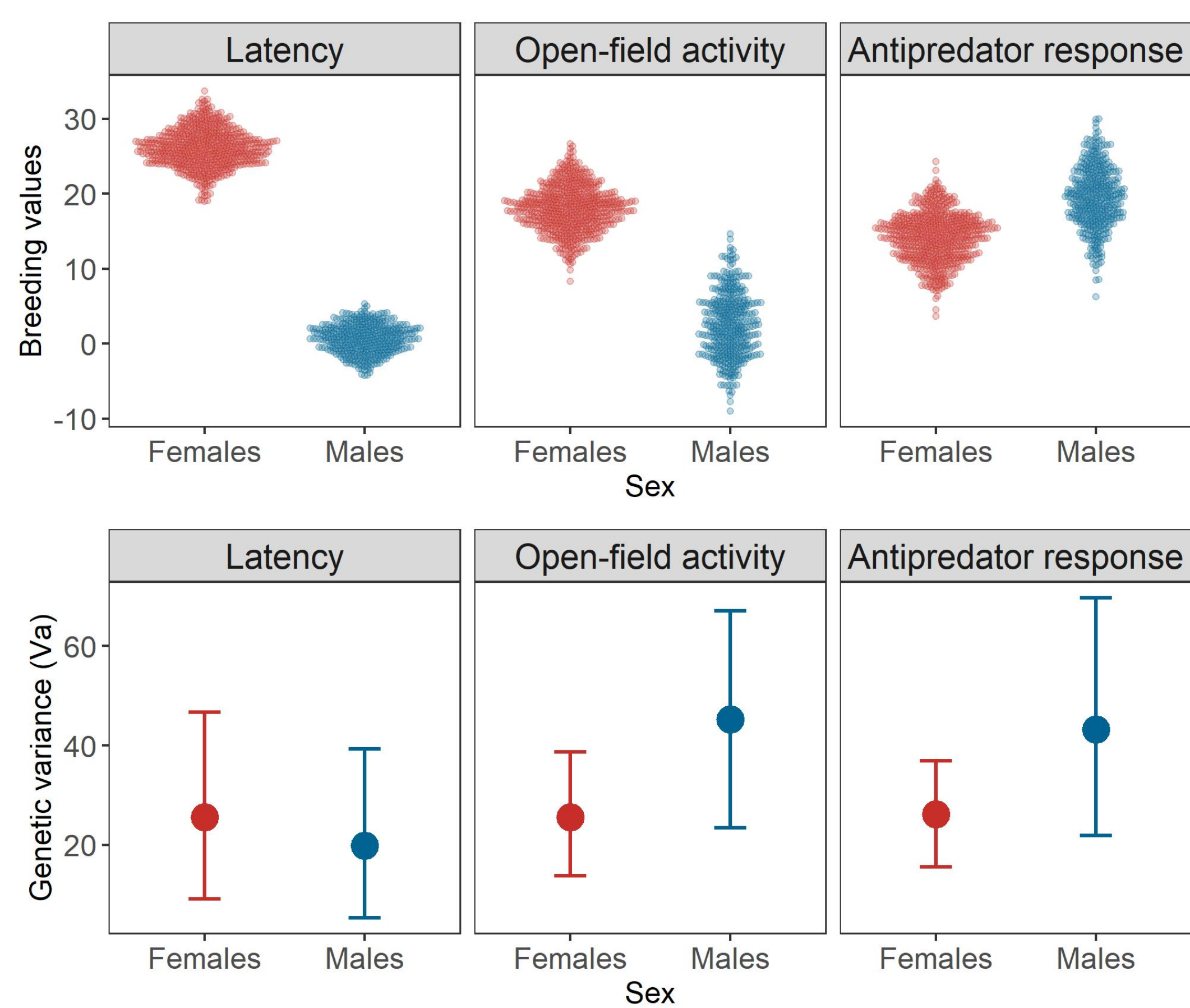


### PREDICTIONS

Stronger selective pressure for ♀ to be active and for ♂ to guard burrows

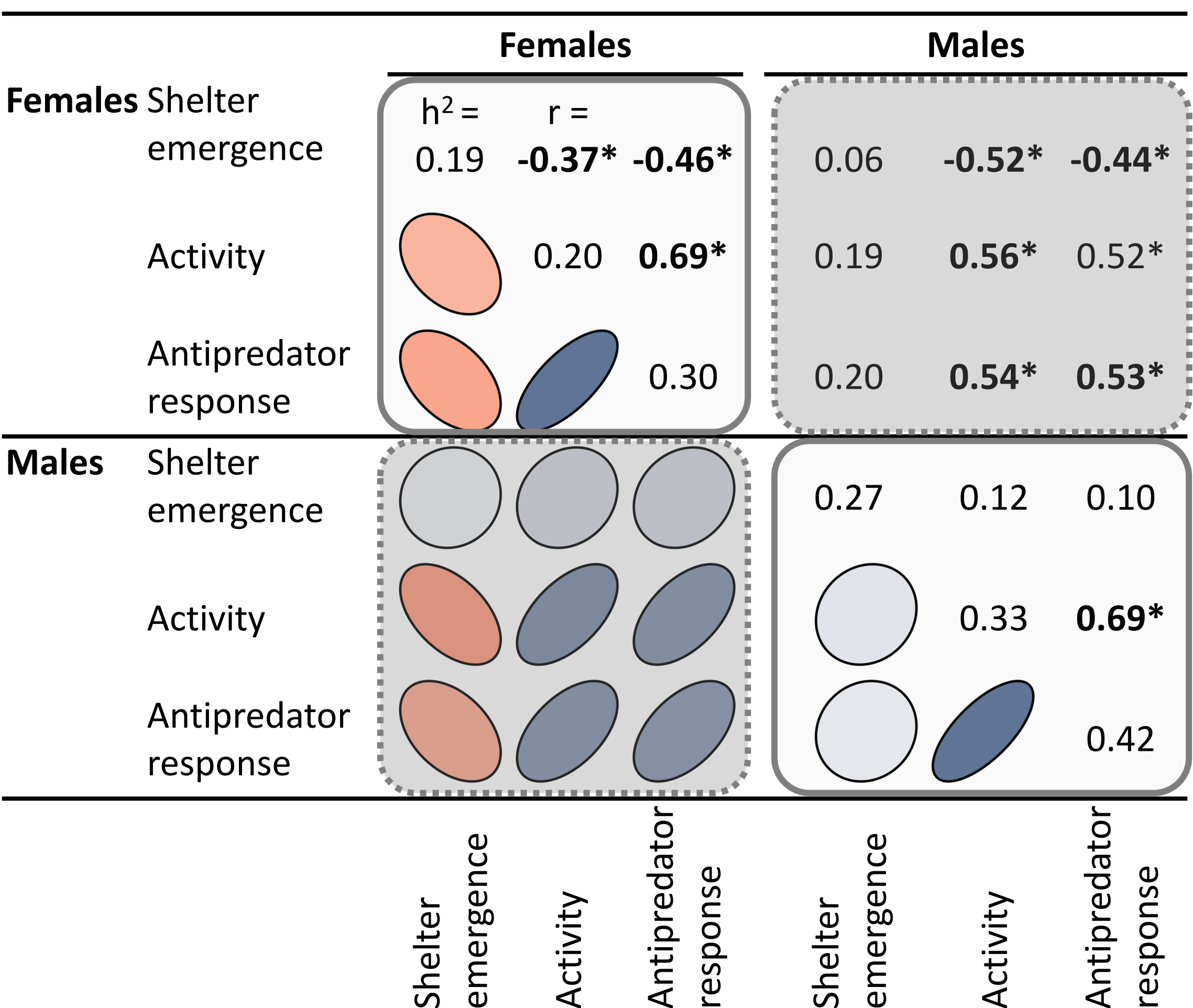
- ♀ quicker to exit shelter and more active X ✓
- Less genetic variance in shelter emergence & activity in ♀ X ✓
- Stronger activity-antipredator response syndrome in ♀ ✓

### RESULTS



**FIGURE 1.** Males and females expressed diverging behaviors with females less prone to leave shelter ( $Pmcmc = 0.95$ ) and more active than males ( $Pmcmc = 0.90$ ). Males had more genetic variation in activity ( $Pmcmc = 0.95$ ) and antipredator response ( $Pmcmc = 0.92$ ). Shelter emergence had equal genetic variance among sexes ( $Pmcmc = 0.68$ ).

$Pmcmc$ : Bayesian probability for finding a difference among sexes.  
 $Pmcmc < 0.7$ : Poor evidence of difference  
 $Pmcmc > 0.8$ : Moderate evidence  
 $Pmcmc > 0.9$ : Strong evidence  
 $Pmcmc > 0.95$ : Very strong evidence



**FIGURE 2.** Genetic variance-covariance matrix. Heritabilities ( $h^2$ ) are indicated on the diagonal and genetic correlations ( $r$ ) on the off-diagonal elements. Shelter emergence was genetically uncoupled between sexes ( $r = 0.07$ ,  $Pmcmc = 0.61$ ). The activity-boldness syndrome had weaker correlations in males.

sex-specific correlations  
Cross-sex correlations

