

# DO SPIDERS RIDE ON THE FEAR OF SCORPIONS?

## A CROSS-CULTURAL EYE TRACKING STUDY

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### OBJECTIVE

- The evolutionary origin of the fear of spiders is unclear - spiders are essentially harmless to humans.
- Fear of spiders shouldn't, therefore, be adaptive.
- US university students show a strong correlation of fear of spiders and fear of scorpions (Vetter et al. 2018).
- In a previous study with live animals we have shown that Arachnids (including both spiders and scorpions) are rated identically (Frynta et al., 2022).
- Hypothesis: Fear of spiders might be triggered by a generalized fear of chelicerates, where a scorpion is the original stimulus that signals danger.**
- We collected data in Somaliland and in the Czech Republic.
- In this cross-cultural comparison, Somalis represent the probable ancestral condition (nomadic pastoralists that never left the savannah environment), whereas Czechs represent a derived population, where deviations (higher fear of spiders) can be expected.

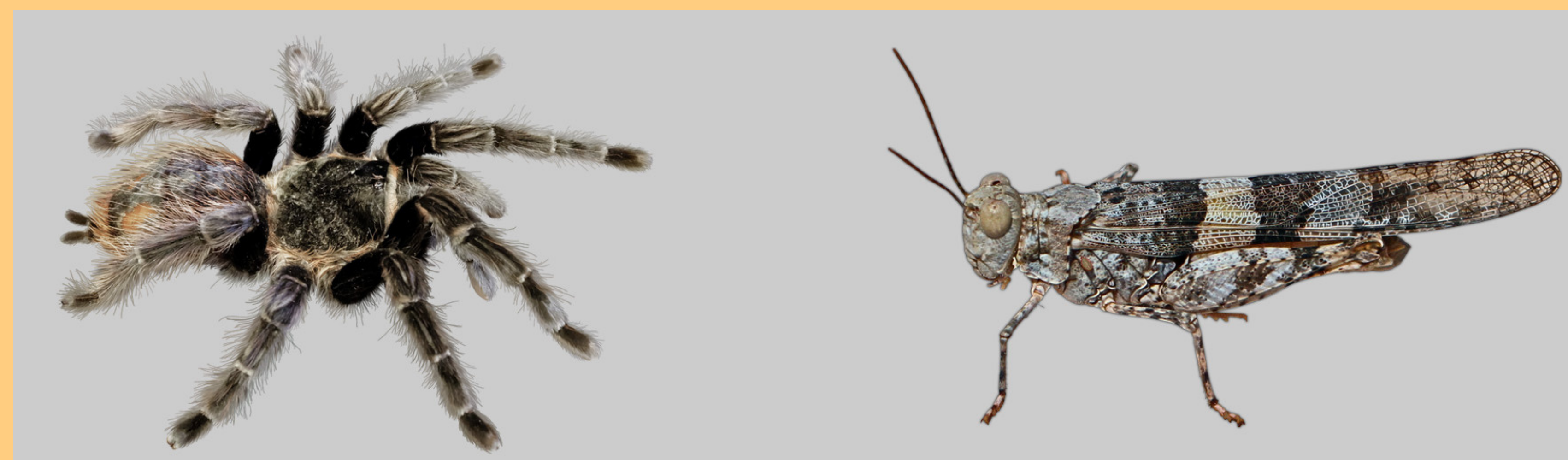
### PARTICIPANTS

- 67 participants from Somaliland (42 men, 25 women, average age: 22 years)
- 67 participants from the Czech Republic (32 men and 35 women, average age: 24 years)
- we recruited mainly university students in both countries

### METHOD

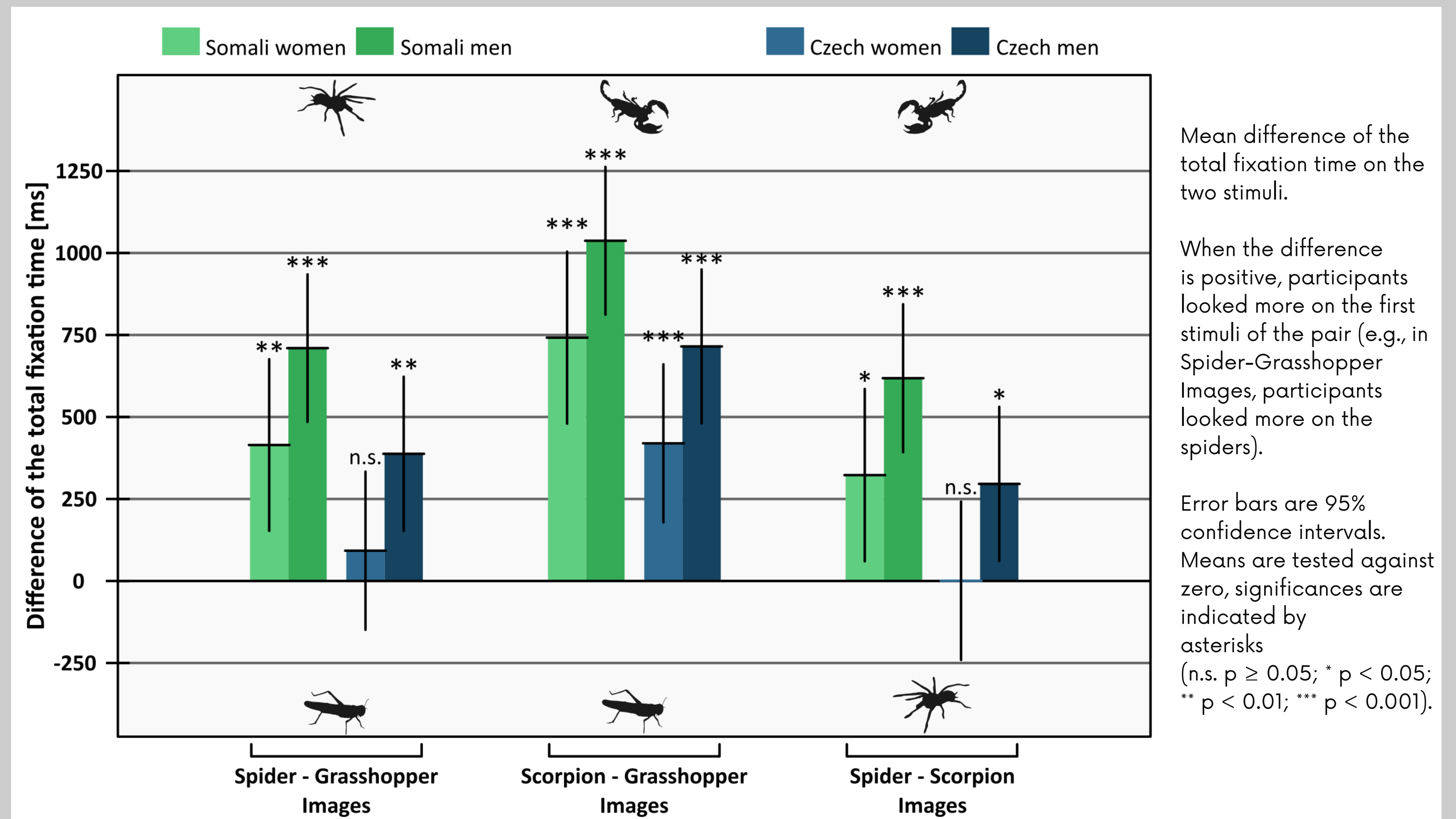
- an eye tracking experiment using spontaneous gaze preference
- stimuli: spiders, scorpions and grasshoppers (control stimuli)
- sequence of paired stimuli (each presented for 5 seconds)
- attentional bias: fear eliciting stimuli should be fixated faster, more frequently and/or for a longer time period
- linear mixed-effect modelling

### EXAMPLE OF THE STIMULI



### RESULTS

- Both Somali and Czech participants direct their attention toward the threatening stimuli: higher number of fixations and longer duration of the gaze on spiders and scorpions.
- Discrepancy between men and women in how they look at the pictures (women inspect both of the images in more detail).
- Spider - Scorpion Images:**
  - Somalis direct more attention toward the scorpion.
  - Czech men focused more on the scorpion, Czech women paid equal attention to both.
- Total fixation time was significantly influenced by the pair of stimuli ( $F = 17.77, p < 0.001$ ), participant's gender ( $F = 6.19, p < 0.014$ ) and participant's nationality ( $F = 5.91, p < 0.016$ ). None of the interactions proved significant.
- The number of fixations was significantly influenced by the pair of stimuli ( $F = 33.40, p < 0.001$ ), participant's gender ( $F = 5.88, p = 0.017$ ) and participant's nationality ( $F = 5.03, p = 0.027$ ). None of the interactions proved significant.



### DISCUSSION

- The threatening stimuli (spiders and scorpions) attract more attention in both countries.
- The view of chelicerates as fear-eliciting stimuli is, therefore, likely shared among the cultures.
- Somalis direct more attention to scorpions - the fear is reinforced by their continuous presence in the environment.
- Spiders do not attract more attention in Czech participants, even though they are encountered on a daily basis and scorpions are absent.
- Spiders seem to be a less salient stimuli than scorpions.
- Generalization of fear among chelicerates:**
  - The strong attentional bias towards scorpions in Somalis and the lack of attention bias towards spiders in Czechs corroborate the scorpion as the original threatening stimulus.

