The influence of observational fear learning on emotional responses and neural stimulus representations

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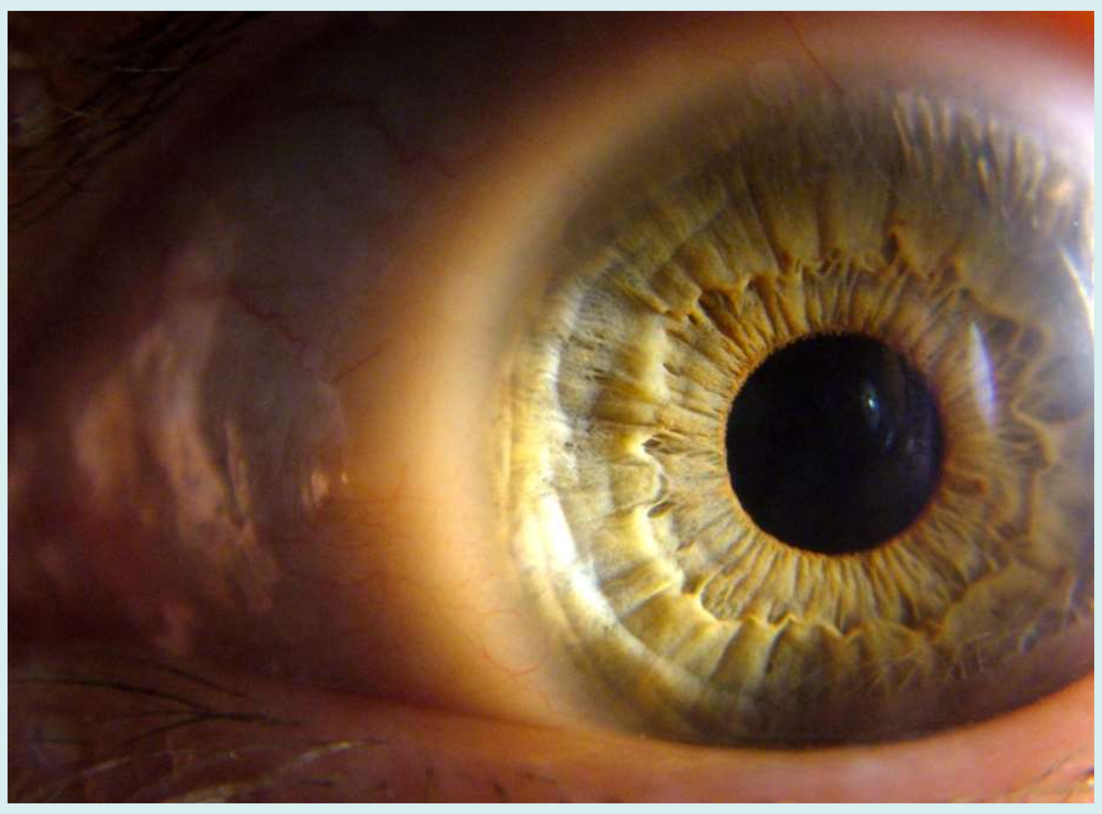


Disentangling emotion and perception

Background. Learning emotional value of stimuli is key for survival and health, and is often attained through observing the behavior and responses of others.

Aim. We aim to identify the neural responses associated with learned changes in emotional responses to visual stimuli, and separate these from the perceptual responses to the stimuli.

Pilot study. Using an observational learning task, we pilot a paradigm that alters emotional responses to selected stimuli between sessions, and measure responses to these stimuli by combining MEG, pupillometry, and subjective emotional rating.

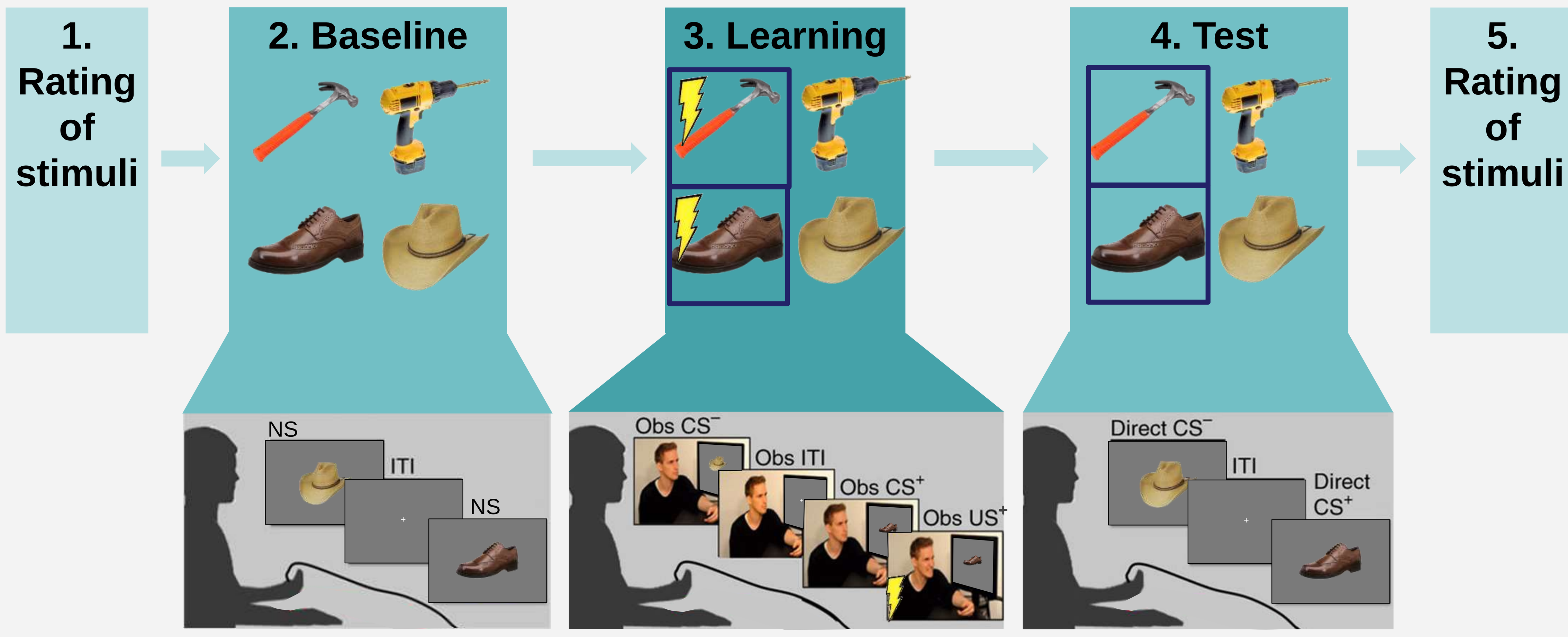
Pilot results

Subjective rating. As expected, emotional responses to stimuli paired vs. not paired with shock decrease in valence and increase in arousal.

MEG. MVPA's of raw evoked potentials show reliable decodability of perceptual stimulus features, but no strong modulation by emotional learning when comparing baseline and test.

Conclusion. Weak learning or habituation across repeated exposures may influence results. Although the ratings indicate successful aversive learning, further analyses on a more comprehensive MEG dataset are needed to capture the emotional response.

Procedure

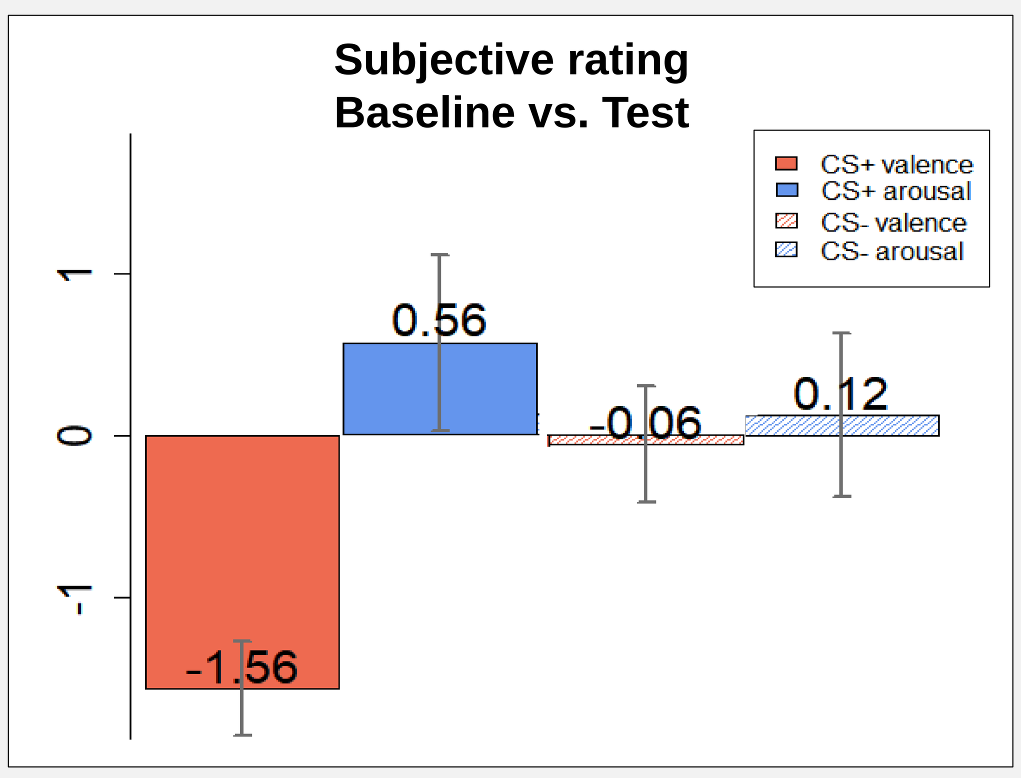


1. Participants are asked to rate neutral stimuli (NS) on two Self Assessment Manikins: valence and arousal
2. Participants' responses to viewing the stimuli are then recorded (MEG, pupillometry)
3. Participants watch another person receive shocks (US+) to some stimuli (CS+) but not to other (CS-)
4. Following this, participants view the stimuli again, without seeing the other person
5. Participants rate the stimuli once more

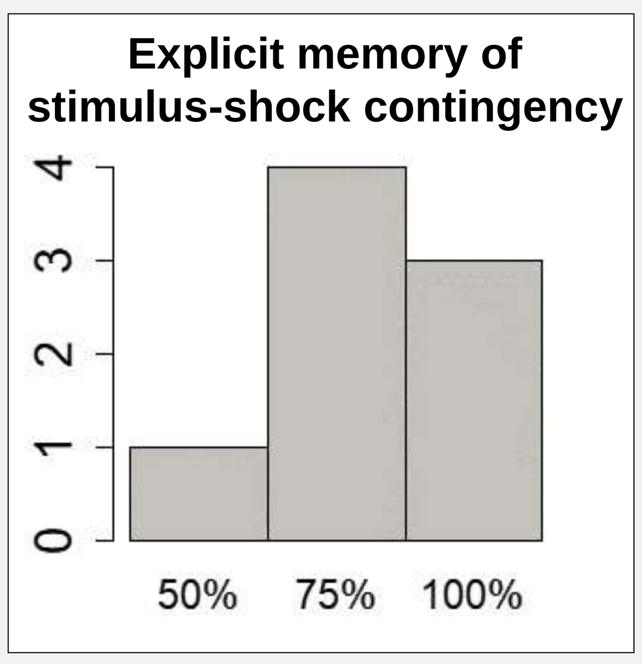
(Adapted from Haaker, Golkar, Selbing & Olsson, 2017, Nat. Protoc.)

Behavioral pilot results

(*N* = 8)



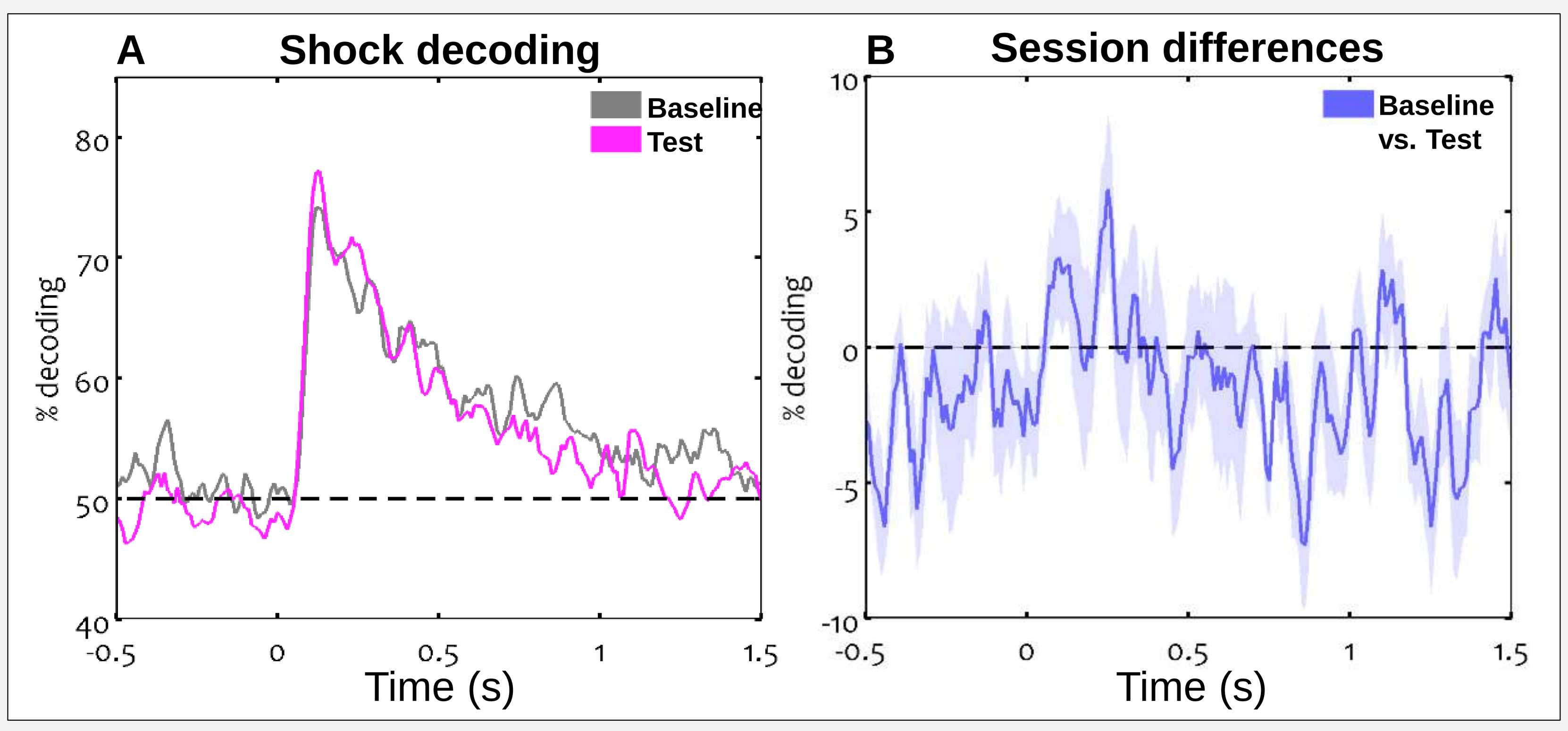
Change in participants' rating of images (test - baseline). Full scale 1-9, error bars = ± 1 SE.



Number of participants, by the rate at which they correctly identified stimuli paired with shock in the videos.

MEG pilot results

(*N* = 8)



A) Multivariate pattern analysis of evoked responses to shock paired stimuli (CS+) vs. the other stimuli (CS-) at baseline and test, and B) test - baseline.

In progress are continued MVPA on raw and time-frequency decomposed MEG data, as well as pupillometry data.

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