

How and when social anxiety manifests

A meta-analysis investigating the effects of social anxiety on subjective distress, autonomic and endocrine measures in different experimental settings



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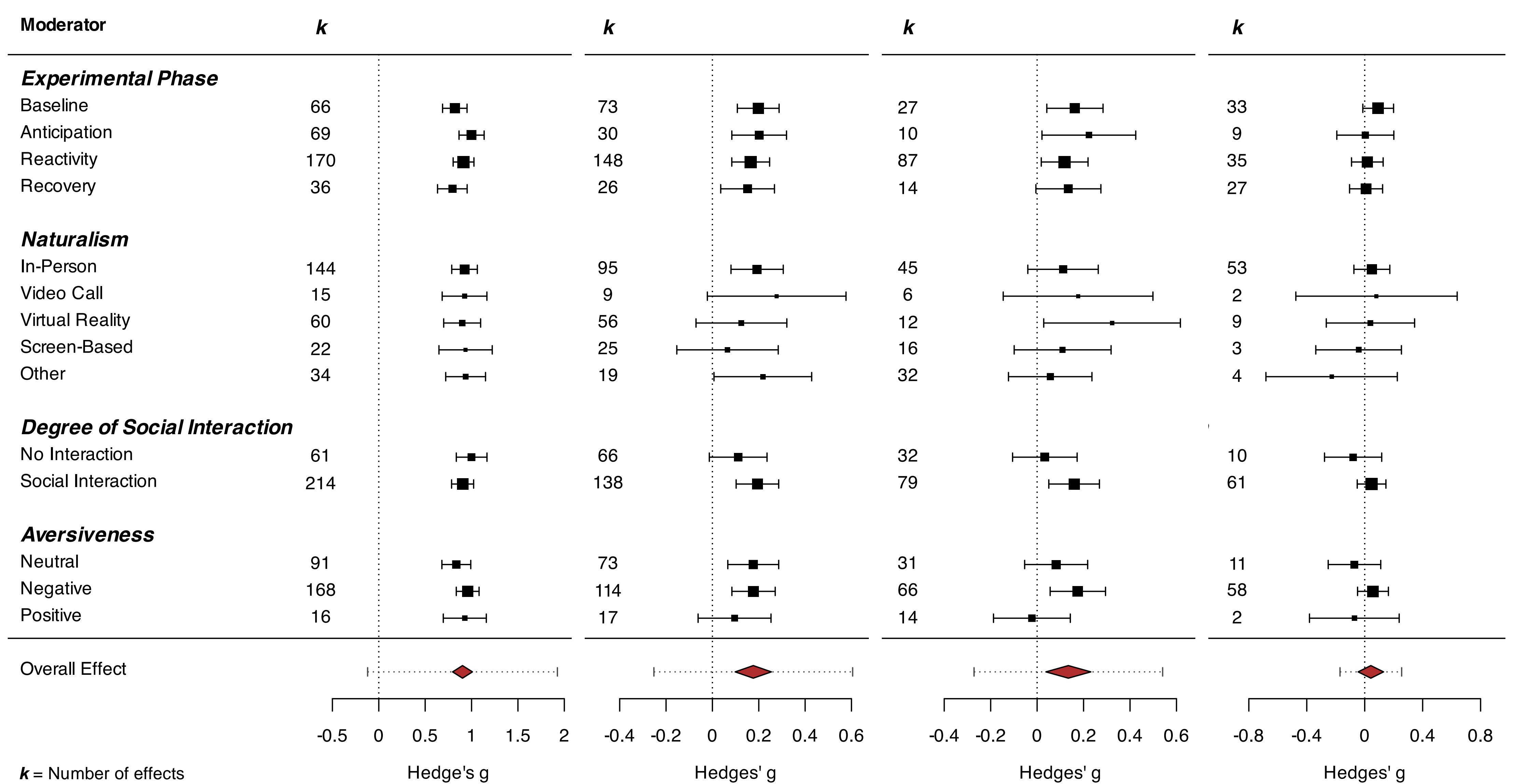
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1 BACKGROUND

- Social anxiety disorder (SAD) “is characterized by marked and excessive fear or anxiety that consistently occurs in one or more social situations” [ICD-11; WHO, 2019].
- SAD is a very common mental disorders [2, 3] and the prevalence is on the rise in recent years [4, 5].
- With this meta-analysis, we investigated the effect of social anxiety on **state anxiety ratings, heart rate (HR), skin conductance (SC), and cortisol** levels.
- Hereby, we accounted for differences in the experimental settings, i.e., **experimental phase** (baseline, anticipation, reactivity, or recovery), **naturalism** of the situation, **degree of social interaction**, and **aversiveness** of the stressor.

State Anxiety Ratings Heart Rate Skin Conductance Cortisol

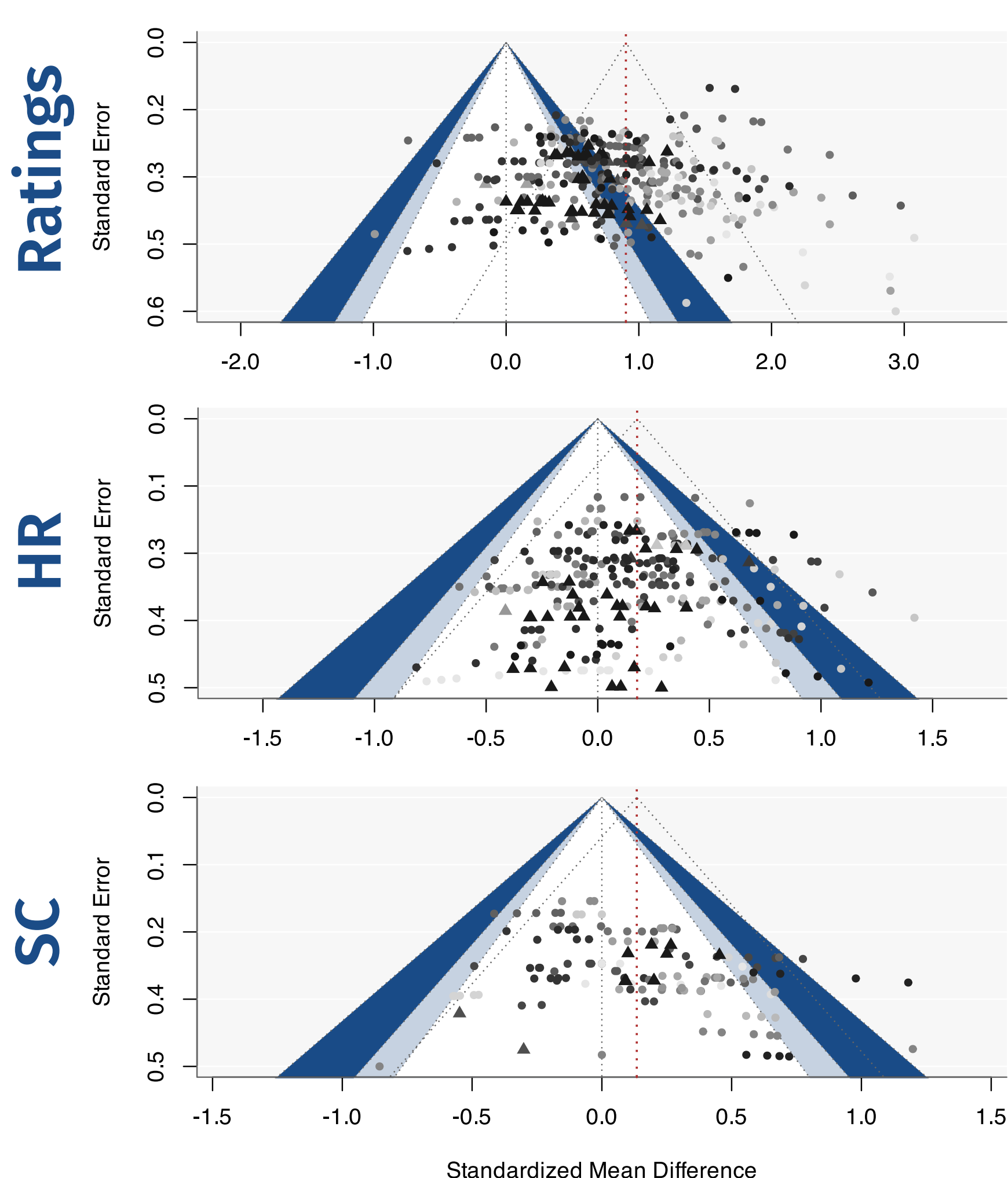


2 METHODS

- Of the **1,976 screened** papers, **146 studies** were included.
- These studies were published between 1998 and 2024.
- Effects were quantified as standardized mean differences (**Hedges' g**) between groups of high and low socially anxious individuals.
- Effect sizes were analyzed using a **three-level multivariate random-effects model**. The levels were sampling variance (Level 1), variance between effect sizes within studies (Level 2), and variance between studies (Level 3).
- Influential outliers were identified with **studentized deleted residuals** and the **Cook's distance** and then excluded.

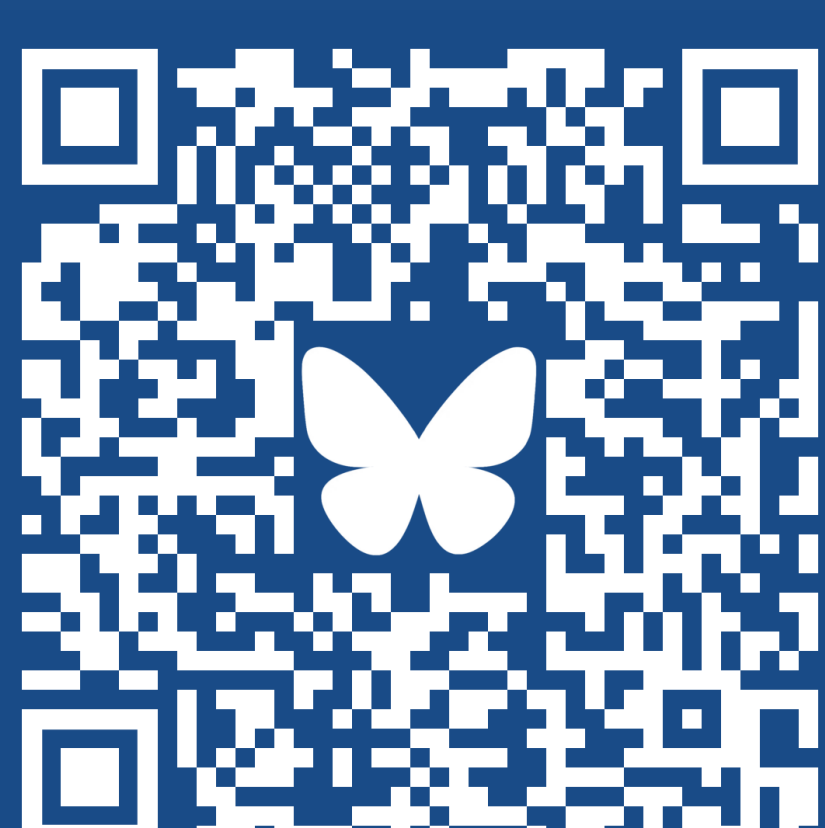
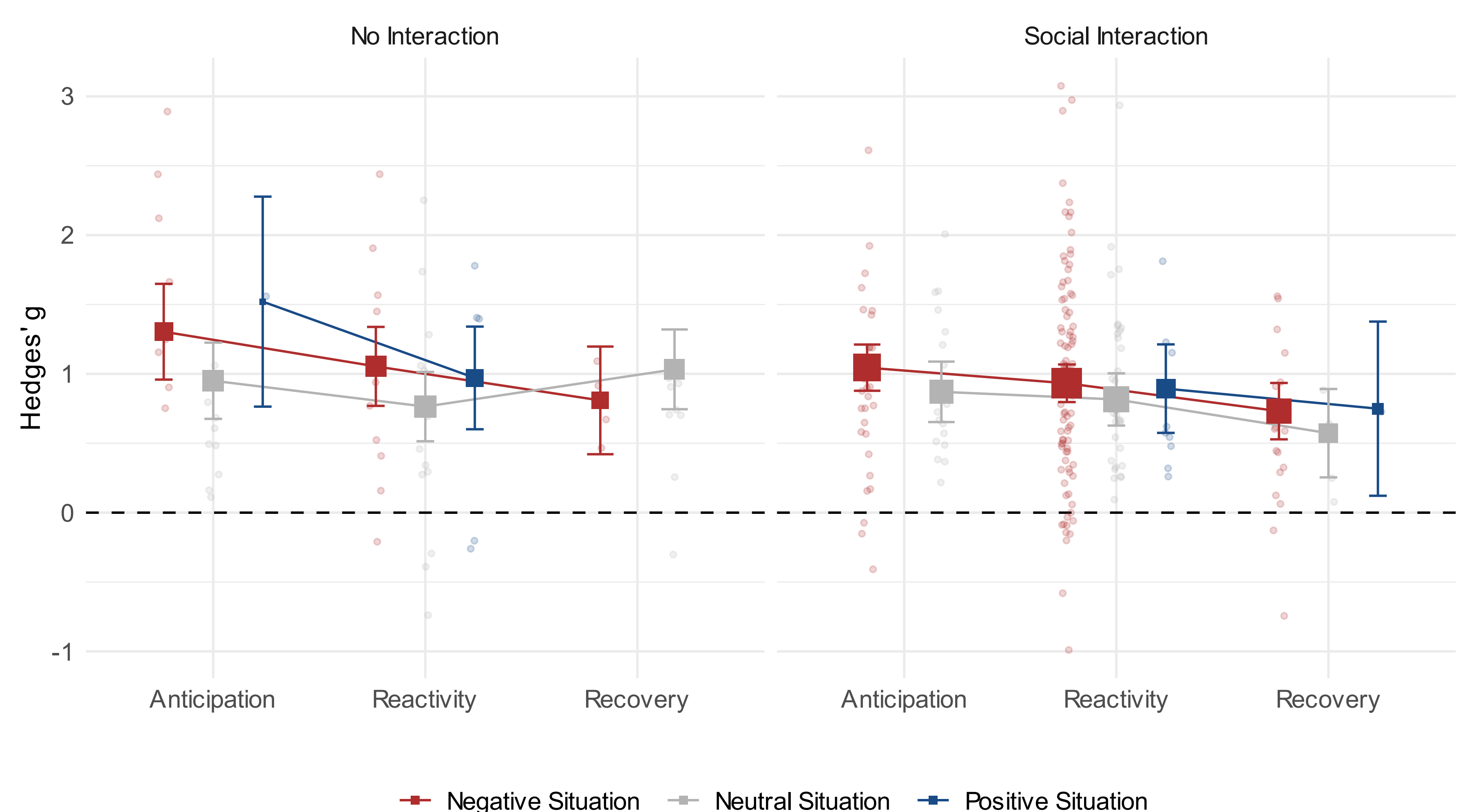
3 RESULTS

- Overall, there was a significant difference between high and low socially anxious individuals for state anxiety ratings, heart rate, and skin conductance, but not for cortisol.
- Participants with high social anxiety reported **higher state anxiety** and had **higher physiological arousal**.
- The only significant moderator was the experimental phase for the state anxiety ratings, all other moderating effects failed to reach statistical significance.
- For state anxiety, we observed a **significant interaction of phase, degree of social interaction, and aversiveness**.



4 RISK OF BIAS

- In this meta-analysis we found **no clear indications of a publication bias**.
- Still, only 11% of the studies performed an a-priori **power analysis** and just 4% were **pre-registered**.
- Notably, the **experimental setting** itself might lead to anxious reactions in socially anxious individuals.



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