Does Emotion Slow Us Down?

Ridha Alrubaye, Alp Eren Akyüz, Muhammet Öztürk, Alperen Çağlar, Berker Eriş
Department of Artificial Intelligence and Data Engineering, Istanbul Technical University
ISBCS 2025 Bahçeşehir University

1. Abstract

We explored how emotional valence affects speed and accuracy in a simple image classification task. Participants viewed indoor/outdoor scenes labeled as positive, neutral, or negative and quickly indicated the setting. While outdoor images led to faster responses overall, emotional differences were more subtle. Only the contrast between neutral and positive images showed a significant slowdown. This suggests that valence has a limited—but measurable—impact on visual decision-making. However, the stronger influence of scene context highlights how low-level perceptual features often override emotional content.

2. Research Question & Hypothesis

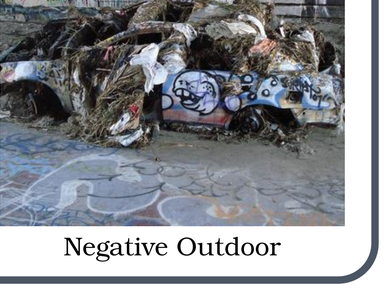
- **Main Question:** Does the emotional valence of an image impact how quickly people can categorize it as indoor or outdoor?
- **Hypothesis:** Emotionally charged images (positive or negative) will elicit slower response times than neutral images.

4. Background & Rationale

Emotion affects attention and memory—but does it also slow us down? Most research focuses on high-arousal stimuli. Here, we isolated emotional valence while keeping arousal moderate, to see whether emotional "coloring" alone alters perceptual processing.

Stimulus Examples


Positive Indoor


Positive Outdoor

Neutral Indoor


Neutral Outdoor

Negative Indoor

Negative Outdoor

3. Experimental Design

- **Participants:** 75 university students (gender-balanced, average age 22)
- **Task:** Binary classification — participants viewed images and indicated whether they were taken indoors or outdoors.
- **Stimuli:** 180 images pre-labeled with emotional valence (positive, neutral, negative) and environment (indoor/outdoor).
- **Procedure:** Stimuli were balanced across classes; reaction times and accuracy were logged using PsychoPy.
- **Data Handling:** Data anonymized; outliers removed. ANOVA and Tukey's HSD were used to test effects of emotion and category on reaction time and accuracy.

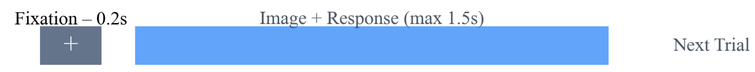
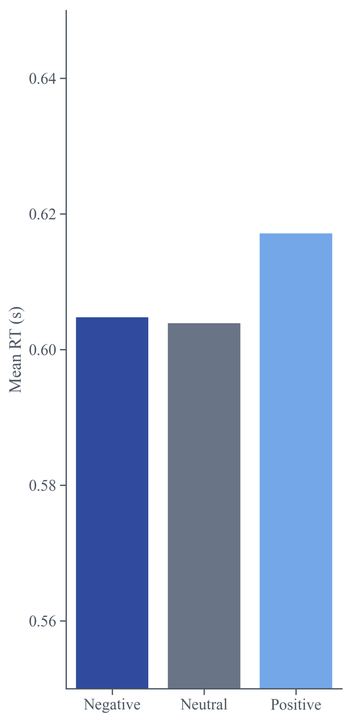


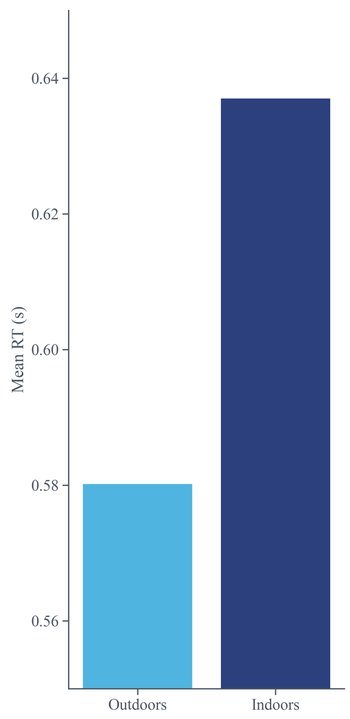
Figure: Trial flow in PsychoPy (fixation, image, response window)

5. Results & Analysis

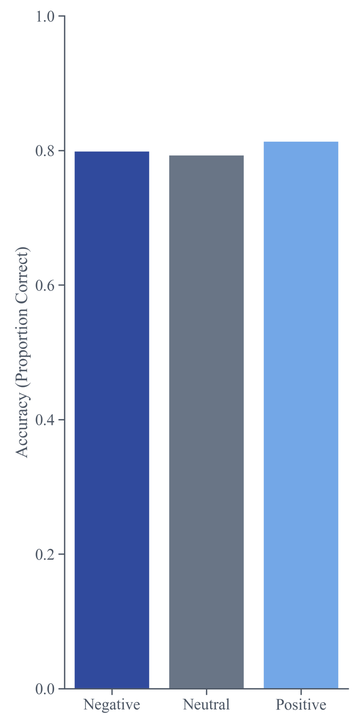
- **ANOVA:** Reaction time was significantly affected by emotional class ($p = 0.02$) and scene category ($p < 0.001$); no significant interaction found.
- **Accuracy:** Only category influenced accuracy significantly ($p < 0.001$); emotional class showed no effect.
- **Tukey's HSD:** Only the Neutral vs. Positive contrast in RT was statistically significant ($p = 0.037$).
- **Descriptives:** Mean RT ranged from 0.573s (Negative Outdoors) to 0.648s (Positive Indoors), with SD 0.24s.
- **Conclusion:** Environment strongly influences both RT and accuracy. Emotional effects are present but subtle.



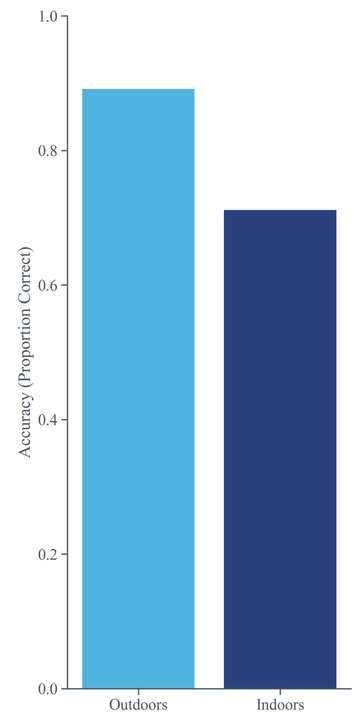
RT by Emotional Class



RT by Scene Category



Accuracy by Emotional Class



Accuracy by Scene Category

6. Discussion & Conclusions

Our results suggest that while emotional valence influences reaction time, the effect is modest. Only positive images slowed responses relative to neutral ones. The type of scene—indoor vs. outdoor—had a much stronger effect on both speed and accuracy. No interaction between emotion and scene type was found.

7. Authors & Acknowledgements


Ridha Alrubaye


Alp Eren Akyüz


Muhammet Öztürk


Alperen Çağlar


Berker Eriş

Acknowledgements: Special thanks to Didem Gökçay and Şeyma Takır for their feedback and support.