# The Effects of Emotionally-Salient Stimuli in Stop-Signal Tasks

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## INTRODUCTION

- **Stop-signal task** (SST) scores and related measures are among the most powerful neurocognitive **correlates of psychopathology** trans-diagnostically.
- A growing body of work suggests the **importance of emotion** in disrupting cognitive processes, or "**hot**" cognitive control.
- Here, we begin to evaluate an emotional stop-signal task (**ESST**) against the well-known **SST**.

## METHODS

- Sample: 23 undergraduate students
- **SST:**
  - Each trial begins with a fixation screen (+ sign)
  - Participants respond to the **arrow** presented on the screen during each trial, by pressing the **arrow key** on the keyboard indicating its direction, **except when they hear the "stop-signal"**.
  - "**Go**" trials: The correct response involves a **key press**
  - "**Stop**" trials: **Inhibit** response
  - Stop-signal occurs with **adaptive timing** based off participant's performance.
- **ESST:**
  - Each trial begins with a fixation screen (+ sign)
  - Participants respond to the **picture** presented on the screen during each trial, by pressing the green labeled key (the 'F' key) if the **picture is judged** as positive, and the red labeled key (the 'J' key) if the picture is judged as negative.
  - Similar to the SST, the participants are instructed to **inhibit their response when they hear the "stop-signal"**
  - Pictures: from the IAPS and include XX blocks , which vary in the number of **positive images or negative images.**
  - Stop-signal occurs with **adaptive timing** based off participant's performance
- Our analyses use the calculated variable stop-signal reaction time (SSRT) as an indirect measure of response-inhibition latency.
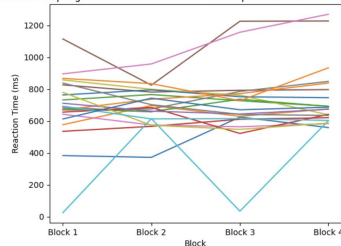
| Spearman's correlation | SSRT | ESSRT (neg) |
|---|---|---|
| **ESSRT (neg)** | -0.213 | |
| **ESSRT (pos)** | -0.377 | 0.589 |

All p-values > .28

| Spearman's correlation | Depression | Euphoria | Dysphoria |
|---|---|---|---|
| **SST** | 0.027 | -0.160 | 0.125 |
| **ESST (neg)** | -0.235 | 0.236 | -0.230 |
| **ESST (pos)** | -0.028 | 0.018 | -0.089 |

All p-values > .28



Emotional Stop Signal Reaction Time Across Blocks per Individual for Positive Stimuli



Emotional Stop Signal Reaction Time Across Blocks per Individual for Negative Stimuli
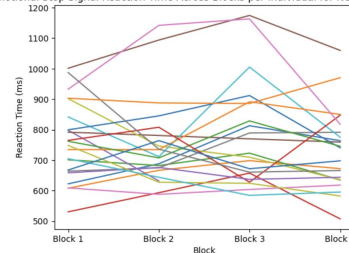
## RESULTS

- SSRT, ESSRT-positive and ESSRT-negative are **all statistically separable.**
- Pilot data suggests that **neutral and negative scores are showing a differential profile.**
- There is **little correlation between ESSRT-positive and psychopathology** indices.

## DISCUSSION

- As expected, **performance** on the **SST, ESST-negative & ESST-positive** are statistically separable.
- Early pilot data suggests that the **neutral and negative scores** are showing **differential links to depression, dysphoria, and euphoria,** although in **counter-intuitive directions.**
- There is little evidence that positive stimuli show links with mood disorder syndrome scores, which is in line with current research that **positive stimuli has little effect on cognition.**
- We plan to gather data from fifty more individuals to further look into these effects.

REFERENCES

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