Psymm and Task (#17383)

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1) Have any data been collected for this study already?
It's complicated. We have already collected some data but explain in Question 8 why readers may consider this a valid pre-registration nevertheless.

2) What's the main question being asked or hypothesis being tested in this study?
We have already collected the data from Discriminate Regularity and Discriminate Color tasks (N = 26 in each). Participants viewed abstract dot patterns, and we recorded the brain response to symmetry with EEG. An ERP called the SPN scaled with proportion of symmetry in these experiments (as we expected). However, the SPNs were larger in the Discriminate Regularity than The Discriminate Color task, at all levels of Psymm (we expected this only at intermediate levels).

This these two experiments were already registered on As predicted.

We are now running three new experiments.

1) Discriminate global shape task. We predict SPNs to be similar to the discriminate regularity task.
2) Semantic-color congruence task. We predict SPNs to be similar to the Color task.
3) Sound-color congruence task. We predict SPNs to be weaker here than in any other task, because participants are partially attending to a different sensory modality.

To summarize: When the already completed and new tasks are combined, we predict SPN amplitudes to be rank ordered as follows (Discriminate Regularity = Discriminate Global Shape > Discriminate Color = Semantic Color Congruence > Sound Color Congruence).

In each experiment, we present 5 levels of Psymm (20, 40, 60, 80 and 100%) We predict some scaling with P symm in all experiments. However, intermediate Psymm levels may be below threshold, and generate no SPN in some experiments.

3) Describe the key dependent variable(s) specifying how they will be measured.
SPN amplitude = Regular - Random difference waves at electrode cluster PO7 O1 PO8 O2 from 300 - 1000 ms.

4) How many and which conditions will participants be assigned to?
Participants will complete 6 within subjects conditions (P Symm, Random, 20 40 60 80 and 100% symmetry).

There are five between subjects conditions (Discriminate regularity, Discriminate Global Shape Discriminate Color, Semantic Color congruence, Sound Color Congruence).

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
We will conduct a mixed ANOVA with SPN amplitude as the DV.

P Symm (20, 40, 60 80 or 100% symmetry) as the within subjects factor

Task (Discriminate regularity, Discriminate Color, Semantic Color congruence, Sound Color Congruence and Discriminate Global Shape) is the between subjects factor.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
Data will be low pass filtered at 25 Hz
Data will be segmented into epochs -0.5 to 1.5 seconds.
Data will be cleaned with ICA to remove blinks and gross artifacts.
Trials with Amplitude +/- 100 uv at any of the 64 scalp electrodes.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
26 participants in each of the 5 Tasks. 130 participants in total.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
Nothing else to pre-register.