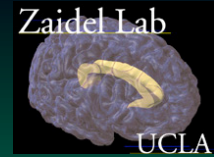




A Nonverbal Hemispheric Color-Emotion Stroop Task

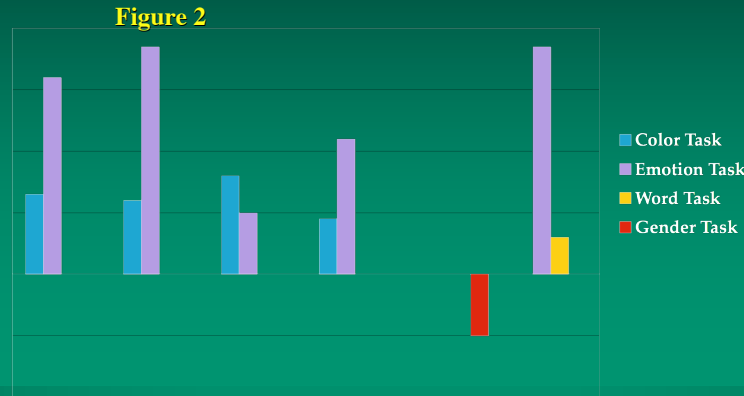


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Introduction

- The standard Stroop task pairs color names with congruent or incongruent ink colors. Decisions about ink color are faster for congruent than for incongruent pairs (Stroop effect).
- A common account of the Stroop effect is that processing color names is faster and more automatic than processing ink color. The former interferes with the latter.
- The verbal Stroop precludes testing illiterate participants and biases against measuring the Stroop effect in the right cerebral hemisphere.
- We developed a nonverbal lateralized Stroop task that paired colors and emotional expressions and required nonverbal responses.
- Question:* Does the faster task or the more automatic task affect the slower (speed account) or less automatic one (automaticity account)?
- We expect the spatial separation between color and expression, as well as the nonverbal response, to dilute the Stroop effect.



Experiment 4 (n = 29) (Figure 1.3, Table 1, Figure 2)

- Rationale:* Replace the **association** between the two stimulus dimensions with **identity**.
- Stimuli:*
 - Same faces as in Experiment 5.
 - Replace the background color by the name of the emotion, printed next to the face.
- Results:* The Stroop effect was largest.

Experiment 5 (n =) (Figure 1.3, Table 1, Figure 2)

- Rationale:* Replace the **association** between the two stimulus dimensions with **identity**.
- Stimuli:*
 - Same faces as in Experiment 5.
 - Replace the background color by the name of the emotion, printed next to the face.
- Results:* The Stroop effect was largest.

Experiments

Participants were right-handed UCLA undergraduates, half male and half female.

Experiment 1 (n = 33) (Figure 1.1, Table 1, Figure 2)

- Stimuli:* Lateralized cartoon faces (happy, angry) paired with color backgrounds (yellow, red).
- Tasks:* Identify the color of the stimulus or the emotion of the stimulus.
- Response:* Bimanual two-choice button presses.
- Results:*
 - Color identification was faster than emotion identification.
 - There was a larger Stroop effect in the slower, emotion task, and there was a significant correlation between the difference in speed of the two tasks and the size of the Stroop effect in the emotion task (speed effect).

Figure 1.1

Congruent stimuli



Incongruent stimuli



Figure 1.2

Incongruent stimuli



Experiment 2 (n = 26) (Figure 1.1, Table 1, Figure 2)

- Participants repeated Experiment 2.
- Participants also rated how much the faces engaged the relevant emotions.
- Results:* Emotional engagement did not correlate with the Stroop effect.
- Discussion:* Stereotyped cartoons may not be as engaging than real emotional faces.

Experiment 3 (n = 36) (Figure 1.2, Table 1, Figure 2)

- Stimuli:* Cartoon faces were replaced with pictures of real faces.
- Discussion:* Real faces did not increase the Stroop effect, and this also argues against the automaticity account.

Figure 1.3



Table 1

Experiment	Stroop Effect	Speed Effect	Automaticity Effect	Visual Field Effect
1 Colors-Cartoons	+	+	N/A	-
2 Colors-Cartoons	+	-	-	-
3 Colors-Cartoons	+	+	-	-
4 Colors-Faces	+	+	-	-
5 Gender Colors-Faces	-	-	N/A	N/A
6 Words-Faces	+	+	N/A	-

Conclusions

- The color-emotion Stroop tasks exhibited a significant but modest effect
- The “speed account” of the Stroop effect is generally supported.
- The “automaticity account” of the Stroop effect is not supported.
- The two hemispheres have similar Stroop effects suggesting that they are each equally capable of conflict resolution.
- A non-verbal Stroop can be useful for measuring executive attention in pre-literate children, illiterate populations, or in cases where language use must be avoided.

References

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