the STROOP effect

Is the Stroop Effect still as effective when naming the ink color of nonsense words, compared to the normal Stroop Effect?

Introduction

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The Stroop Effect is a psychological phenomenon that shows the interference between automatic cognitive processing and controlled cognitive processing. The effect got its name after American psychologist John Ridley Stroop first tested and published this phenomenon in 1935. This effect happens when the name of a color is printed in a color that is different from the word, such as the word “red” written in blue ink. People tend to take longer and make more mistakes when naming the ink color of incongruent color words compared to congruent color words (when the word and the color match).

This project investigates how the Stroop Effect changes when people name the ink colors of nonsense words instead of actual color words. This will help determine whether the Stroop Effect depends on automatic word recognition or if it also happens with meaningless text. This project is interesting because it tests how the human mind is able to control its cognitive processing, even though it may be challenging.

Problem and Predictions

When people are asked to name the ink color of nonsense words, the response will be faster and with less mistakes than when naming the ink color of incongruent color words, because nonsense words are meaningless, therefore they do not trigger automatic word reading.

In response to the question, the Stroop Effect was proven to be less effective when naming the ink color of incongruent color words because it was easier, faster, and with little to no mistakes; while an effective Stroop Effect is the complete opposite - harder, slower, and with many mistakes.

Procedure

1. Prepare your materials: Have two sheets of paper (or the folded sheet of paper) and on one sheet write color words in incongruent colored ink. For example: Red, Yellow, Purple. On the other sheet, write nonsense words in different colors also. For example: Qbtsrj, hgH, rJfla.
2. Choose your participants: Choose a group of volunteers that are all fluent or good at reading.
3. Explain the task: Tell participants to name the color of the ink that the word is written in, ignoring the actual word. Make sure the participants are naming the colors as quickly as they can, but not so fast that they focus on their reading speed and not the actual activity/project.
4. Test incongruent color words (the normal Stroop Effect): Show each participant the incongruent color word sheet. (The sheet with color words written in different colored ink.) Use a stopwatch or timer to time how long it takes them to name all colors and record any mistakes.
5. Test nonsense words: After a short break, show participants the nonsense word sheet. Again, time and record any mistakes.
6. Collect data: Record the time and number of mistakes of each participant for both sheets.
7. Analyze Results: Compare the average time and mistakes between the incongruent color word sheet and the nonsense word sheet to see if the Stroop Effect is weaker for nonsense words.

Materials and Variables

- A blank sheet of white paper folded in half (or you can use two sheets of paper, it doesn't matter)
- An electronic device capable of showing a digital Stroop Effect sheet (ex: computer, tablet, phone)
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- At least 5 different colored coloring tools (if you choose to hand write the test sheet)
- Stopwatch or timing app
- Data recording sheet or notebook
- Pen or pencil for data recording
- Quiet testing place (room with no distractions)
- Either the digital, printed, or handwritten Stroop Effect test sheets containing:

  -Incongruent color words

  -Nonsense words in colored ink

- Minimum of 8 research participants

Independent Variables:

1. Type of Stroop Task
   - Regular Stroop Task (incongruent color words)
   - Nonsense Word Stroop Task (made up words in colored ink)
2. Age Group of Participants
   - Adults
   - Young Teens

Dependant Variables:

1. Time (in seconds)
   How long it took each participant to complete:
   - The regular Stroop Task
   - The Nonsense Word Stroop Task
2. Number of Mistakes
   How many mistakes each participant made during:
   - The Regular Stroop Task
   - The Nonsense Word Stroop Task

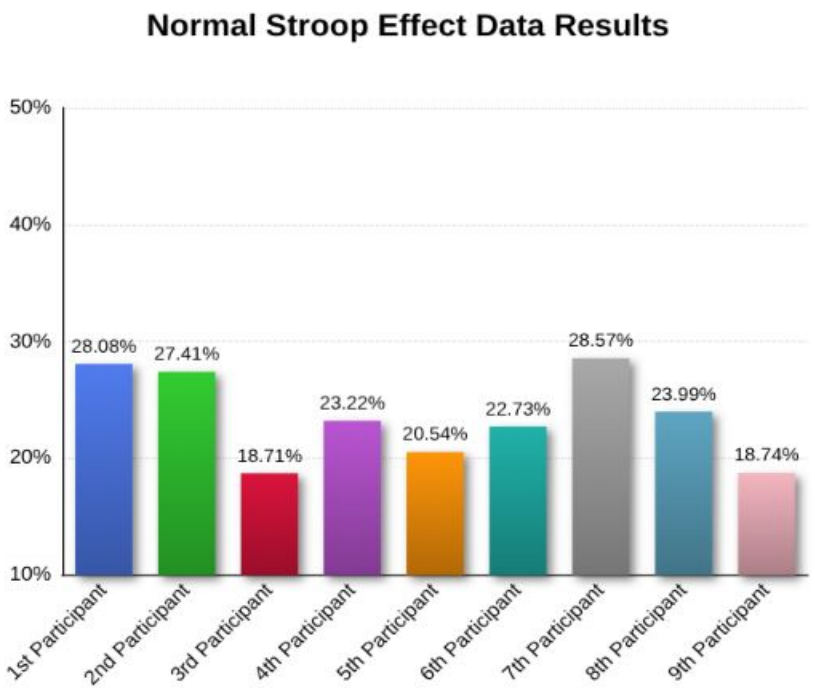
Controlled Variables:

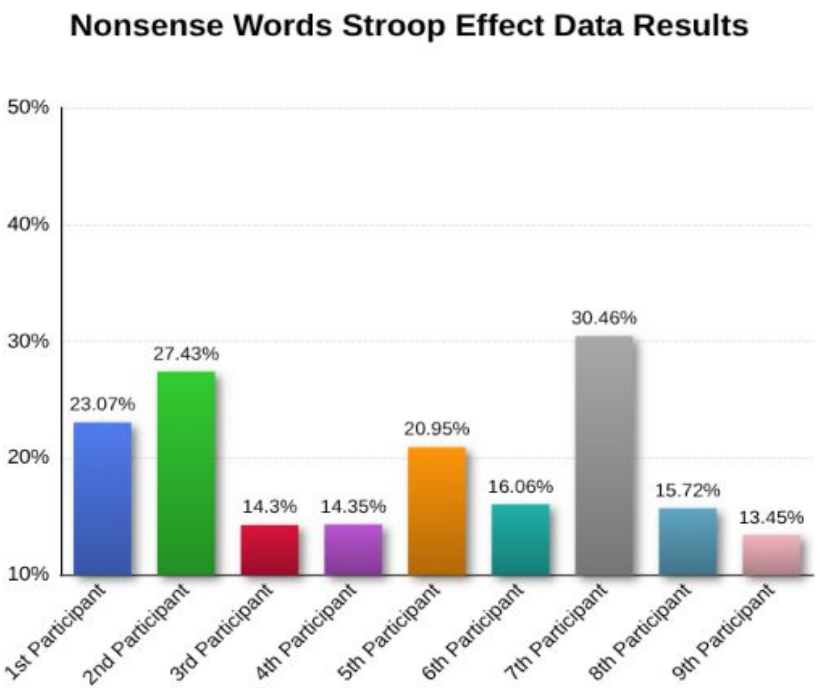
- Number of words on each page
- Ink colors used
- Instructions given to each participant
- Testing environment (quiet space)
- Timing Method (stopwatch)

Results

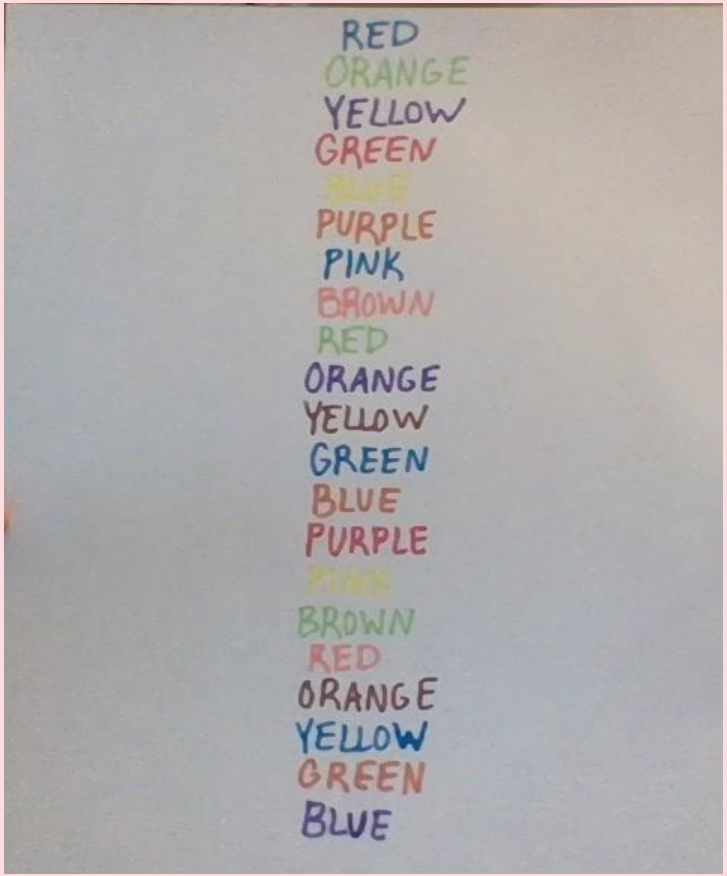
The results of this experiment showed a clear difference between naming the ink color of incongruent color words and naming the ink color of nonsense words. On average, participants took more time to name the ink color of incongruent color words than they did for nonsense words. Participants also made more mistakes when naming the ink color of incongruent color words. The average time to complete the incongruent color word sheet was 23 seconds and 55 milliseconds, 4 seconds and 20 milliseconds longer than the average time for the nonsense word sheet. The number of mistakes were also like this, with incongruent color words having an average of 2.1 mistakes, half the number more than on the nonsense word sheet, which had an average of 1 mistakes.

Data Results/Bar Chart

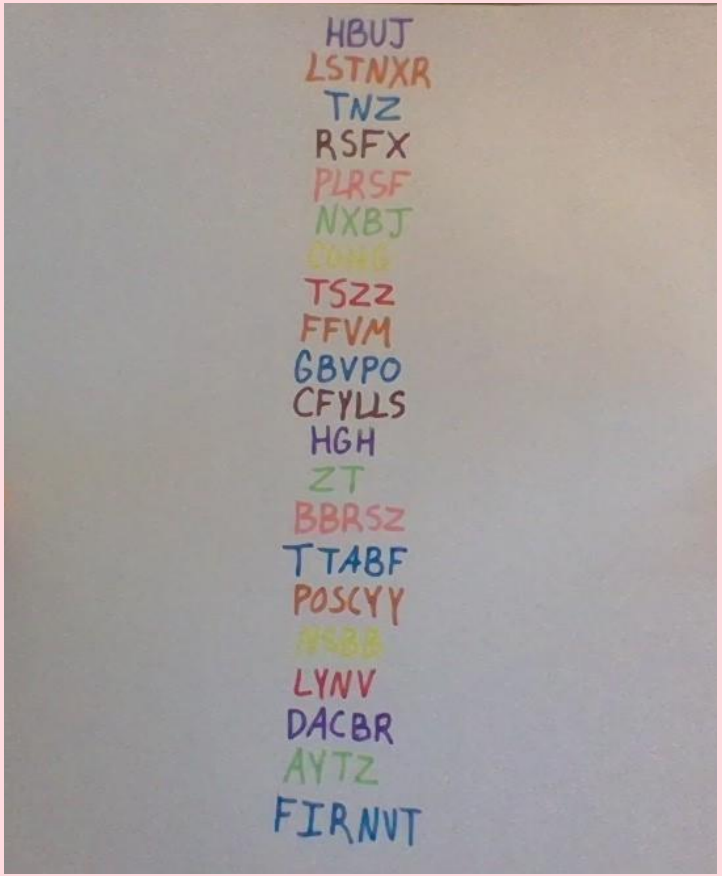




The Normal Stroop Effect



The Nonsense Word Stroop Effect



Conclusion

The results of this experiment support the hypothesis that naming the ink color of nonsense words is easier than naming the ink color of incongruent color words. Participants completed the nonsense word task faster and with less mistakes than the incongruent color words. This shows that the Stroop Effect was reduced when real color words were replaced with nonsense words.

These results shows that the Stroop Effect was weaker with non-color words; or at least with nonsense words. When nonsense words were used, interference was reduced, proving that automatic cognitive reading is a huge part of the Stroop Effect.

Implications and Ideas for Future Research

This project is useful in real life situations because it is used to study attention, brain function, and mental control. The Stroop Effect is also used to diagnose Attention Deficit Disorder (ADHD) dementias, brain injuries, and psychological disorders including schizophrenia, Obsessive Compulsive Disorder (OCD) and depression. This effect is also used to help enable automatic reactions and shift attention between competing mental processes at once. Testing the Nonsense Word Stroop Effect for future research helps isolate automatic reading processes from task-relevant and task-irrelevant information. When competing at the same time, task irrelevant information often triggers cognitive interference.

Sources

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