

Gender differences in a negative priming Stroop task

Abstract

The evolved inhibition hypothesis proposes that women should outperform men on inhibition tasks due to sex differences in mating strategies. Specifically, females of any given species inhibit their mate choice more often than males, ensuring that the father of her offspring has the best possible genes. One measure to investigate inhibition is the Stroop Colour-Word task, where previous research has found a small female advantage. However, it is unclear whether this advantage reflects superior inhibition or verbal abilities in females. We propose a comparison of performance between a standard Stroop task and a negative priming Stroop task. In the negative priming version, the colour to-be-named on one trial is identical to the colour ignored in the previous trial. The difference in performance between the tasks gives an insight into inhibition abilities. Results showed a significant female advantage on both tasks, and performance for both sexes was lower in the negative priming task. No significant interaction between gender and Stroop task type was found. These results suggest that the female advantage on the Stroop task is not due to women expressing superior inhibition abilities compared to men. Instead, it is likely that women possess better verbal abilities and can name the ink colours faster.

BROWN RED GREEN BLUE
BROWN BROWN WHITE RED

vs.

BLUE GREEN WHITE BLUE
RED BROWN WHITE BLUE

The standard version of the Stroop Colour-Word task (**CW condition**), with colour names printed in incongruous ink colours. Each trial had 30 such items.

The negative priming version of the Stroop Colour-Word task (**NP condition**), where the colour in one item is identical to the ignored colour in the immediately preceding trial. 30 items per trial.

Introduction

Ever since the first Stroop (1935) study, evidence for any gender difference on the task has been equivocal. A recent meta-analysis by Sjöberg & Cole (in prep) found a small to moderate female advantage on the Stroop Colour-Word (CW) task.

However, it is still unclear *why* any gender difference should exist on the task. The most common hypothesis is that women have better verbal abilities than men (Golden, 1974). This is reflected from the fact that women tend to outperform men in the colour naming subtask of the Stroop task, meaning that any female advantage on the CW task occurs because women can verbally express the colours faster.

An alternative hypothesis is the evolved inhibition hypothesis (Bjorklund & Kipp, 1996), which claims that women should outperform men because sexual selection has caused women to evolve stronger inhibition abilities.

The negative priming (NP) version of the Stroop task (Neill, 1977) is an ideal way to measure this. In this version of the task, the colour to-be-named in one trial is identical to the ignored colour in the previous trial, thus adding an additional layer of inhibition to the task (Neil & Westberry, 1987). Comparing performance between the CW and the NP condition should give insight into the verbal vs. inhibition debate.

Only a few previous studies have looked at gender effects using the negative priming version, but none have compared performance on CW vs. NP (Christiansen & Oades, 2010; Claridge et al., 1992; Harnishfeger et al., 1995; Steel et al., 1996).

Predictions:

Previous research suggests that a *small to moderate* female advantage is expected, which possibly does not reach significance.

- If the female advantage is due to verbal abilities, the extra layer of inhibition in the NP task should *not affect any gender differences*.
- If the female advantage is due to inhibition, we would expect the female advantage to increase in the NP condition compared to the CW condition. In other words, we would expect *an interaction between Stroop condition and gender*.

Method

Participants: A homogenous sample of 32 males and 32 females, average age 30.

CW condition: A colour-word (CW) trial consisted of 30 quasi-randomized items with incongruous colour words (e.g. The word "red" in blue ink).

NP condition: A negative priming (NP) trial consisted of 30 quasi-randomized items with incongruous colour words, presented in an order so that the printed colour in one trial was identical to written colour name in the trial immediately preceding it (except for the first item).

In each trial there were five colours, each repeated six times.

There were 15 CW trials and 15 NP trials. The order of the trials were randomized.

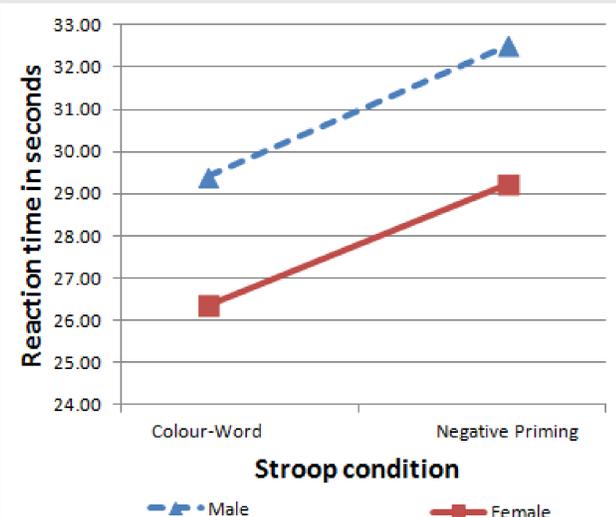
Dependent variable: The *time taken* to complete the 30 items, averaged across all the trials.

Results

A significant female advantage was found in both the CW ($t = 2.01, p < .05, d = 0.5$) and the NP condition ($t = 1.98, p < .05, d = 0.5$), but no interaction was found between gender and Stroop condition ($F = 0.33, p = .57, \eta_p^2 = .005$).

Men and women did not differ in amount of errors made ($F = 0.6, p = .44, \eta_p^2 = .10$).

Performance significantly correlated with age in both the CW ($r = .39, p < .002$) and NP condition ($r = .30, p < .02$).



Discussion

These results suggest that the female advantage in the Stroop CW task is not the result of superior inhibition abilities in women.

Most likely any observed female advantage in the Stroop task is due to faster colour naming in women as predicted by the verbal abilities hypothesis (Golden, 1974).

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