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The Correlation of the Order Effect and Anxiety in Relation to the Carbon Dioxide Challenge and Screaming Lady Task

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INTRODUCTION

Previous research shows that the order effect relates to anxiety. The current study randomized the order of the Screaming Lady (SL) and CO₂ tasks. It is hypothesized that the anxiety generated by the CO₂ task could lead to greater distress and anxiety during the SL task. This would be demonstrated by higher SUDS (Subjective Units of Distress Scale) ratings during the SL task by those who did the CO₂ task first. SUDS ratings will be used to examine if indeed such an order effect exists for these tasks, and these analyses will be used to inform study procedures in the future.

METHODS

Sample: Juvenile twins aged 9-13 (n = 178 twins from 89 families, 43% monozygotic) were recruited from the Mid-Atlantic Twin Registry. Complete data was available for 60 individuals.

Measures:

Carbon Dioxide Task
In the CO₂ challenge, participants were asked to breathe enriched air for eight minutes that contained 7.5% CO₂. Subjective anxiety was assessed every two minutes during a baseline (6 minutes), CO₂ inhalation (8 minutes), and recovery period (5 minutes) using the SUDS. The Correlation of the Order Effect and Anxiety in Relation to the Carbon Dioxide Challenge and Screaming Lady Task

Screaming Lady Task
The Screaming Lady task was designed to assess a fear-potentiated startle response. Participants were exposed to a classical conditioning paradigm in which loud screams were paired with images of a woman’s face. Air puffs delivered to the forehead were used to induce a startle response, and participants were unaware of when either stimulus (scream or air puff) would be administered. A SUDS rating was taken before the SL task began, after the acquisition period, and after the extinction period.

Statistical Method:
A paired samples T-test was used to examine the order effect between the CO₂ challenge and the Screaming Lady task.

RESULTS

<table>
<thead>
<tr>
<th>T-Test Results</th>
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<tbody>
<tr>
<td>CO₂ Baseline</td>
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<tr>
<td>SUDS Mean</td>
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<tr>
<td>Phase of Task</td>
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</table>

Table 1

Results of the paired samples T-test are presented in Table 1. This table shows the statistical significance (p-value) of the order effect for the baseline, CO₂ breathing, and recovery phases of the CO₂ challenge as well as the pre-acquisition, post-acquisition, and post-extinction of the SL task. A bar graph was used to examine the comparison of the mean SUDS for CO₂ first or SL first for all 6 phases of the tasks.

DISCUSSION

The results showed that there was no order effect present for the CO₂ challenge and the SL task. However, it is observed that the mean SUDS for the baseline, CO₂, and recovery phases of the CO₂ challenge and the mean SUDS for the pre-acquisition, post-acquisition, and post-extinction phases of the SL task were higher when the CO₂ challenge was completed before the SL task. This trend can be used to conclude that those participants that underwent the CO₂ challenge first were more prone to rate their anxiety higher for all six variables, whereas those that underwent the SL task first were more prone to rate their anxiety lower for each of these variables. Although this correlation was found, there was no statistical significance suggesting that the order effect is relevant. However, the baseline SUDS of the CO₂ task were approaching significance. This demonstrated that if the SL task was done before the CO₂ challenge, the SL task sensitized the participant and he or she was less anxious during the CO₂ challenge. Though these results were found, a huge limitation present was the small sample size. Data for only 33.7% of the twins that completed this study was relevant for this particular analysis. Much of the data collected from all participants could not be used due to many participants opting out of either the CO₂ challenge or SL task. Due to the incredibly small sample size, it is difficult to completely eradicate that the order effect is irrelevant, and thus it is suggested that it be reviewed further once a greater sample size is attained. The results of this research propose future studies to look into the order effect for tasks, as it may be a variable that is not controlled.

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REFERENCES


*Complete references available upon request