# The Role of Intermittent Breaks on Attention During an Effortful Processing Task

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## Introduction

In 2016, approximately 9.4%, or 6.1 million children, between the ages of 2 and 17 were diagnosed with ADHD ("Data and Statistics," 2018). Of those 6.1 million children, only 62% were taking ADHD medication. Because many children with ADHD do not take medication, there is a critical need for alternative methods targeting symptoms of ADHD.

Prior research has examined potential alternative methods for increasing attention. Kopardekar and Mital (1994) found that work performance decreased with longer working periods, but breaks prevented decreases in performance. There are inconsistencies in the research regarding which types of breaks are most beneficial. Eisenbeck, Luciano, and Valdivia-Salas (2018) found that Focused Breathing did not increase attention, although it did enhance memory. Other research on yoga with students with attentional difficulties suggested that yoga increased attention (Peck, Kehle, Bray, & Theodore, 2005). Schmidt, Benzig, & Kamer (2016) found that physical activity did not have a significant impact on focused attention, whereas Palmer, Miller, & Robinson (2013) found that motor control activities increased preschoolers' attention levels. Prior research has shown that breaks can improve attention, but there are greater inconsistencies in which type of break is the most successful.

The current study investigated whether breaks had an impact on an attention task. In addition, attention levels for breathing breaks and physical activity/stretch breaks were contrasted. Attention was measured through an effortful processing task that required participants to encode words.

## Method

**Participants:**
A sample of 19 females, 3 males, and 1 nonbinary individual (N=23) was utilized. Ages ranged from 18-22 years old (*M*=19.91, *SD*=1.00). No participants had knowledge of the German language.

**Materials:**

- List of 30 German words with corresponding English translations
- Scripted breathing instructions and scripted stretching instructions
  - -Breathing: "Close your eyes, relax your body, and focus on your breathing"
  - -Stretching: "Stand up, move around a little bit, and stretch your arms and legs"
- Index cards with German words

**Procedure:**
An informed consent sheet was read and signed before participating. Participants in the control group were given 6 uninterrupted minutes to study the German words and English translations. Participants in the breathing break condition and the stretch break condition studied the words for two minute increments for a total of 6 minutes, with 30 second breaks at the 2-minute mark and the 4-minute mark. A 1-minute test phase followed the study phase. Participants were asked to provide the English translation to the word written on the index card, or to say "pass" if they were unsure of the translation. The number of words correctly translated were totaled for each participant and means for each condition were calculated.

## Method continued

Table 1. List of German Words and English Translations

| GERMAN | ENGLISH |
|---|---|
| die Stadt | city |
| der Nebel | fog |
| der Vogel | bird |
| lernen | to learn |
| wichtig | important |
| faul | lazy |
| laufen | to run |
| genug | enough |
| schwimmen | to swim |
| der Frühling | spring |
| weinen | to cry |
| beshäftigt | busy |
| schicken | to send |
| das Geburtstag | birthday |
| bauen | to build |
| schmutzig | dirty |
| die Schildkröte | turtle |

## Results

A one-way ANOVA was used to analyze the relationship between various intermittent breaks and attention. The means and standard deviations are presented in Table 1.

Table 2. Descriptive Statistics for Attention

| | Mean | SD |
|---|---|---|
| Control | 9.86 | 3.80 |
| Breathing | 9.70 | 4.19 |
| Stretching | 12.50 | 5.72 |

There was not a significant impact of intermittent breaks on attention $F(2,20)=.815$, $p=.457$, $\eta^2=.075$. LSD post hocs were conducted to evaluate pairwise differences among the conditions and all comparisons were nonsignificant (all ps >.05). There were no significant differences in the number of correctly identified words between the control condition, the breathing break condition, and the stretch break condition.

## Discussion

Findings did not align with my hypotheses, suggesting that breaks did not have a significant impact on attention. There were no significant differences between the control, breathing, and stretch conditions.

It is likely that there is a break length threshold that must be met in order to detect attentional differences. In general, breaks longer than 1-minute are more likely to result in significant differences for attention between those who take breaks and those who do not (Lim and Kwok, 2015). It is possible that the break lengths totaling 1-minute in the present study did not reach the break length that was needed to achieve this threshold.

Results were inconsistent with research regarding the length of breaks. Due to time constraints, the present research used a 6-minute study phase rather than an extended study phase. It is possible that the study phase involving the effortful processing of German words and English translations in my study was too short to fully measure attention. It is also possible that the measure of attention was too difficult, as participants were only given 1 minute to test the thirty translations. Not a single participant made it through the entire list of words, even with passing unknown translations.

Because this study was conducted with typical functioning college students, there is low external validity. This study cannot generalize to school-age children both with and without ADHD. The setting of this experiment was not realistic as participants were confined to a room with few distractions. Extensions of this study could simulate classroom distractions by including noises from a pencil sharpener, chair movement, and the shuffling of papers.

## References

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