The Effects of Intermittent Gaming On Word Memorization

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Introduction

In a society that has become increasingly geared towards playing video games as a pastime, it is important that we fully investigate all the effects that playing these games can have on our minds. While there has been a correlation shown between certain types of video games and negative behavior in previous research experiments, there is still more research that needs to be done to determine if that is all they are capable of.

In my experiment I sought to determine the effect of intermittently playing video games on subject's memory retention to determine whether gaming helps or hurts one's ability to memorize information.
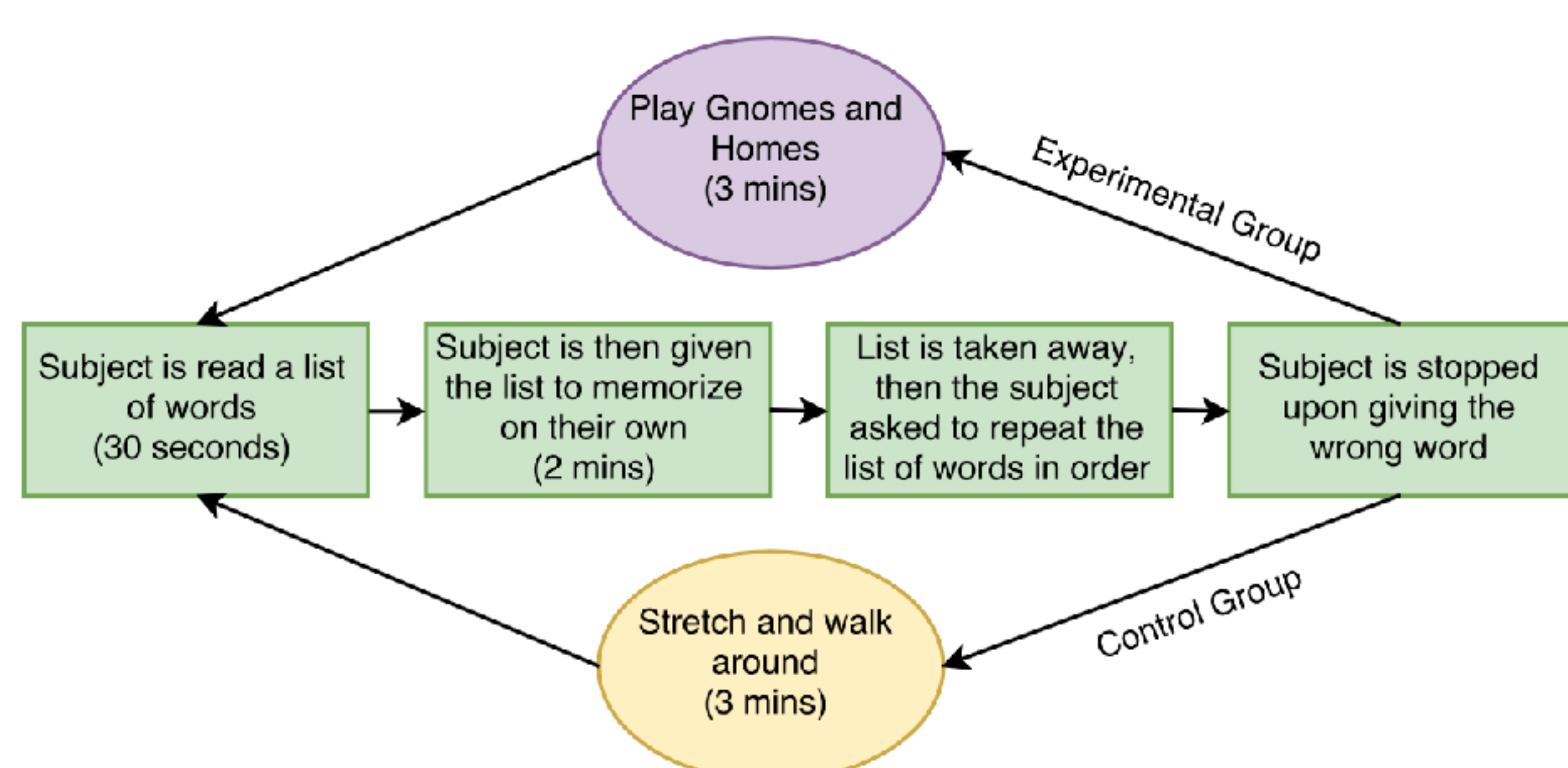

Figure 1. Word Order Game Layout

Related Work

Many researchers have found that consistent gaming can have a negative impact on grades, work ethic, and attention span [5]. These experiments used students test scores and subjects overall mood as their data to determine the overall effect of playing video games on academics [5].

Several Experimenters have deduced that the effects of playing video games are negligible. With their inability to draw a correlation between academic performance and gaming, these researchers concluded that videogames have no effect on their subjects lives [4].

Lastly, researchers have come to the conclusion that gaming can have a positive impact on academics, and be therapeutic for the subjects overall mood [1], [3].

When comparing the results from these experiments to what I hope to accomplish in my own work, it is important to note that few of these experiments focused on the subjects study habits, and how they are affected by playing video games. My experiment focused mainly on the effects that intermittent gaming while studying can have.

Figure 2. Gnomes and Homes Level Breakdown

Experimental Design

In my experiment I had subjects play the memory retention game I created called "Word Order" several times with two different "study breaks" in between rounds in order to analyze the effects that the breaks have on the subjects results. The control group of this experiment was told to stretch and walk around during the break, while the experimental group was given the game "Gnomes and Homes" to play during theirs.

During the experiment I recorded how successful they were at memorizing the list of words in order over several trials. Using Word Order as an example of memorization studying, I wanted to emulate the act of learning vocabulary words for class. I then performed several statistical analyses on the data recorded to determine whether a group was more successful at playing word order than the other.
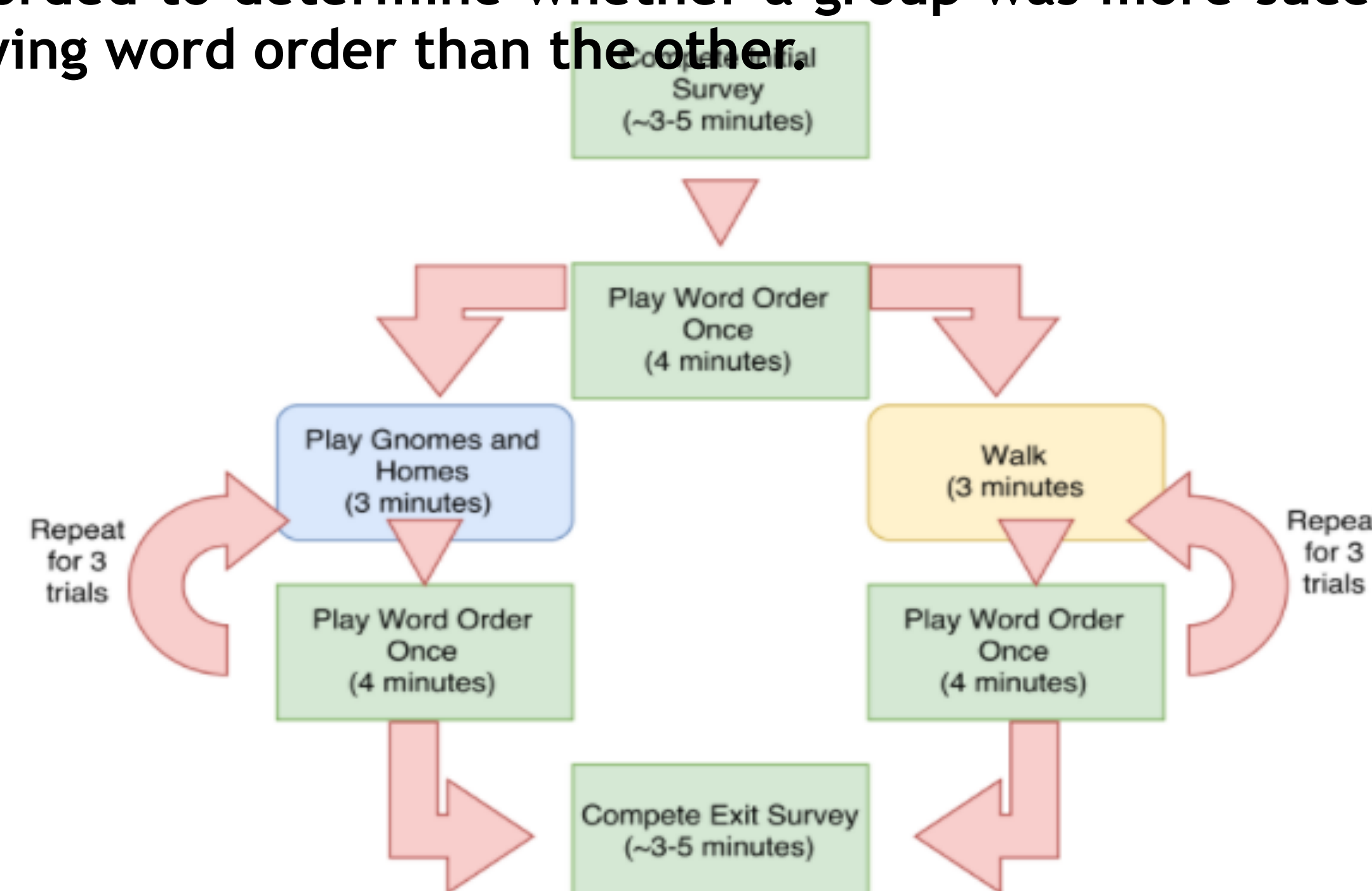

Figure 3. Experimental Design Flowchart

Game Development

For my experiment I decided to create my own video game called "Gnomes and Homes" for the subjects to play. I made this game for a PC platform, making it easy to incorporate into my experiment. I used Unity 5.04 as the engine and coding environment for development, and C# as the programming language.

I incorporated what I believed to be important features in a fully immersive video game, including a time limit for each level, in-game music, main and side objectives. All these aspects were included to keep the user fully engaged in the task of completing each level.

Results

Based on the results of the data collected from 40 student subjects, the effect of video games on short term memory and word memorization is considered equal to that of the control group. While the mean result of each round from the experimental group was marginally higher than that of the control, statistical analysis of the data shows that this difference is not large enough to be considered relevant.

However, because both a Chi Square as well as a Two-Sample T-Test both determined that these two distributions are equal, this can be interpreted as a result in itself. The data collected shows that playing this video game had equal impact on the subjects ability to memorize the list of words, meaning that gaming may not necessarily be detrimental to studying after all.

Word Order Average Results By Round

Round #
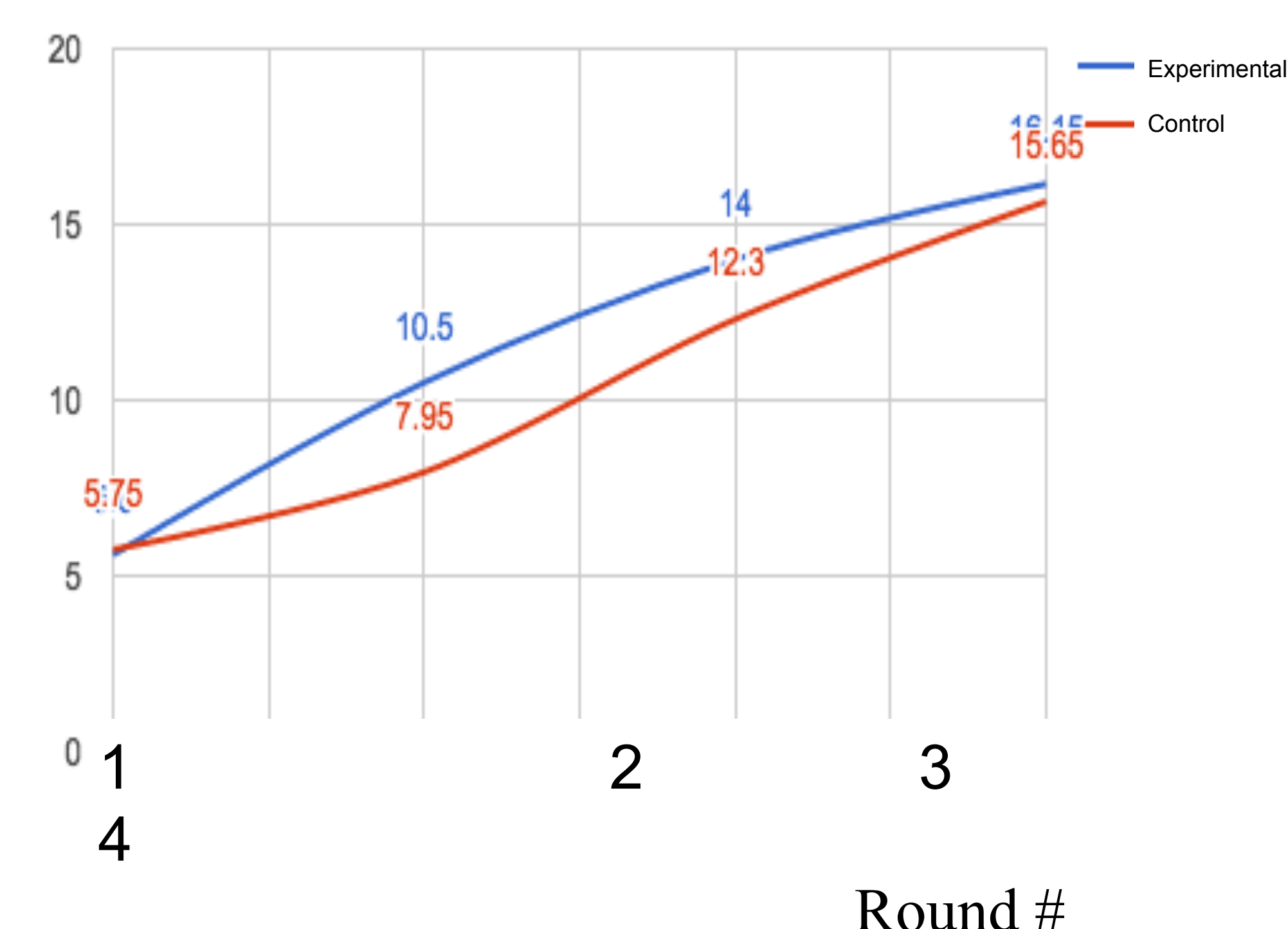
References

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