

# Determination Differences Between Men and Women in Mathematics

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## ABSTRACT

A gap between college aged men and women exist in the mathematics field, causing women to apply themselves differently compared to men. This study aims to observe the difference in levels of determination between men and women. The literature review includes studies based on Japanese and American elementary students completing a problem that had not yet been taught, and the differences experienced between the two groups when asked to solve the problem. One study examined the fact that women who took a specific math class experienced lower math confidence, which dissuaded them from continuing in the STEM field. Another study noticed a difference between the high school level and upper level university women, the gap between men and women did not appear as strongly in high school students, but did appear clearly in upper level university students. This study will be useful when attempting to rectify the gender gap between men and women in mathematics, by allowing educators to address the problem in a different manner than typically used.

## RESEARCH QUESTION

Are men or women more determined when it comes to mathematics?

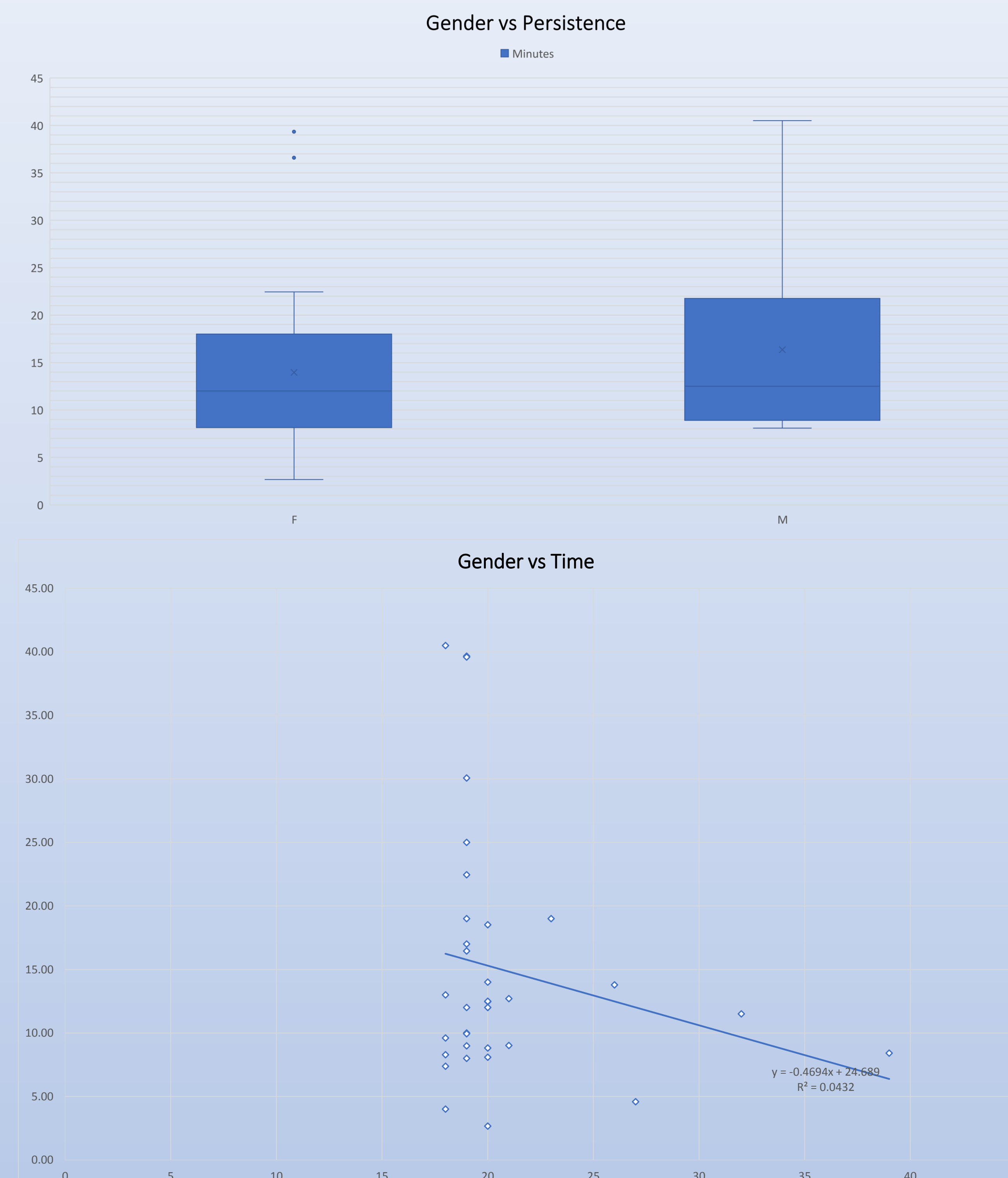
## HYPOTHESIS

Previous research leads this study to believe that there will be a gap between the persistence between men and women in mathematics. This study aims to prove that women are less persistent in Mathematics.

## METHODOLOGY

This closely resembles an experimental design. Students were given a questionnaire used to determine how the student felt toward math as a subject and to collect other data. The study will included 5 math problems of varying difficulties, and the students were timed on how long they attempted the problems. The students were given a maximum time of one hour The study uses the amount of time spent to measure what the students' level of determination was.

## RESULTS



## WORKS CITED

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## CONCLUSIONS

Based on data collected, a hypothesis test was conducted of a null hypothesis of the population mean persistence times for males and females are the same, versus an alternative hypothesis that the population mean persistence times are different. At a 5% significance level, we failed to reject the null hypothesis. This implies that although the population means may be different, we do not have sufficient evidence to claim as such.

We estimate that the mean persistence time for all males is 13.95 minutes with a margin of error of 5.99 minutes, or equivalently, that the mean persistence time for all males is between 7.96 minutes and 19.94 minutes. We also estimate that the mean persistence time for all females is 16.35 minutes with a margin of error of 4.30 minutes, or equivalently, that the mean persistence time for all females is between 12.05 minutes and 20.65 minutes. Both intervals were constructed at 95% confidence. Since the intervals overlap, we cannot conclude that the population means are different.

An analysis of variance (ANOVA) was performed on the mean persistence times based on feelings about math (strongly dislike, dislike, neither like nor dislike, like, strongly like), to test a null hypothesis of the mean persistence times for all types of feelings are equal, versus an alternative hypothesis of at least two mean persistence times are not equal. The results produced a p-value of 0.17. Since this is greater than a standard significance level of 0.05, we failed to reject the null hypothesis. As such, even though our samples produced different mean persistence times, we do not have sufficient evidence to conclude that feelings about math impact persistence times.

An analysis of variance (ANOVA) was performed on the mean persistence times for age groups 18-19, 20-21, and 22+, to test a null hypothesis of the mean persistence times for all age groups are equal, versus an alternative hypothesis of at least two mean persistence times are not equal. The results produced a p-value of 0.14. Since this is greater than a standard significance level of 0.05, we failed to reject the null hypothesis. As such, even though our samples produced different mean persistence times, we do not have sufficient evidence to conclude that age impacts persistence times.

An analysis of variance (ANOVA) was performed on the mean persistence times for various majors, to test a null hypothesis of the mean persistence times for all majors are equal, versus an alternative hypothesis of at least two mean persistence times are not equal. The results produced a p-value of 0.75.  $>0.05$ , we failed to reject the null hypothesis. As such, even though our samples produced different mean persistence times, we do not have sufficient evidence to conclude that major impacts persistence times.