

# How manipulated perceptions of the difficulty of a test affect scores

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## Abstract

We did research to determine if one's perceptions about the difficulty of a task can possibly affect one's performance on that task. We hypothesized that students would do better on a test labelled easy than a test labelled hard. We gathered 24 systems of equations to solve, and then tested them on ourselves to determine the difficulty level of each problem, chose similar problems, and made three comparable tests that we gave 15 students from Algebra 1. When administering the tests, we hinted at the difficulty of the tests through casual remarks. After grading, we collected scores and averaged them to see on which test the students did better, finding that the data supported our hypothesis, as people did, on average, best on the "easy" test, and worst on the "hard" one.

## Introduction

Looking into the previous research, we saw a plethora of information on questions like ours, but none addressed manipulated expectations of tests directly. The closest research is the Pygmalion effect, or the effect of parents'/teachers' expectations on students' test scores. Studies have shown that the expectations of teachers and parents can affect test scores. For example, when a student is told that they are probably not going to do well on their next test, their scores are worse, and vice versa. We are expanding upon that data to try and examine how a kid's perceptions of a test will affect the scores.

## Purpose

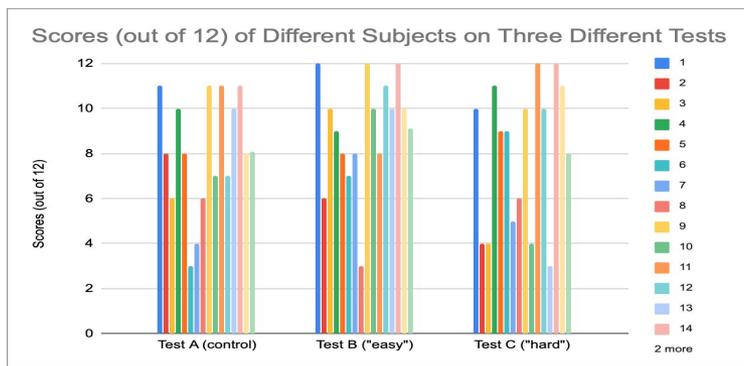
In our grade especially, right after taking a test, everyone will say whether the test was easy or hard, even though our Marlborough honor code says that when asked about a test, we should respond 'it was fair.' We decided to investigate whether that rule is there to simply draw a clear line on what you can or can't say, or if the test scores can be altered because of it. We hypothesized that students would average best on the "easy" test, and worst on the "hard" test. That may help reinforce the policy in our minds, or at least help us learn to ignore those reports on tests to get us to be more psychologically ready for exams.

## Materials and methods

Our subjects were students from Mrs Uribe's H period Algebra 1 class. Mrs. Uribe suggested that a quiz on systems of equations, their most recent unit, would be appropriate for our research study. We first used Math Aids.com, and worked through them ourselves to gauge how similar in difficulty level they were. We then compiled problems of the same difficulty into three tests of four questions each, giving them four minutes per test. When administering the tests, we told them phrases like 'don't worry about this one, it will be much easier,' or 'don't worry if you can't finish, this is the hardest out of the three.' We graded on a three point system, one for the answer of x, one for y, and one for showing work.

## Results

Whilst there was a large range of scores for all three tests, the students averaged slightly higher on the "easy" test, and lowest on the "hard" test. Individual data points differed on which test they did best on. Overall, there was a 1.1 difference between the scores on the easy and hard test, measuring 9.1 and 8, but only a 0.1 difference between the hard test and the control group. We concluded that the harder the test is perceived to be, the worse subjects will do on it. There was a lot of variability in the results, meaning that some students actually did better on the test labeled hard, but on average our hypothesis was correct.



Scores (out of 12)

Subject	Test A (control)	Test B ("easy")	Test C ("hard")
1	11	12	10
2	8	6	4
3	6	10	4
4	10	9	11
5	8	8	9
6	3	7	9
7	4	8	5
8	6	3	6
9	11	12	10
10	7	10	4
11	11	8	12
12	7	11	10
13	10	10	3
14	11	12	12
15	8	10	11
Averages	8.1	9.1	8

## Discussion

We found that students on average did better on the easy test than the hard test by one point, and worse on the hard test than the control by 0.1 points. While this is not enough of a difference for us to conclude that labelling a test "hard" negatively affects students' scores, we can conclude that students are more likely to do well on a test they are told is easy. Our research question was how manipulated expectations of the difficulty of a test affect its scores. This data supports our answer by showing that the more difficult the test is expected to be, the worse the students do. If we were to repeat this again, we would definitely try to collect more data points, as well as make a more in-depth script. Also, we weren't able to take into account how students would be based on how hard they thought the test would be, which makes our data difficult to translate to real life test situations.

## Acknowledgements

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