Unrealistic Optimism about Perceived Examination Performance

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Abstract

An examination was given in an undergraduate engineering lecture course in order to ascertain if students' predicted performance tend to be unrealistically optimistic, accurate, or pessimistic. A total of 126 students were assessed via a Fundamentals of Engineering style examination. Almost half (49%) of the students assessed over-predicted their examination performance by one or more letter grades and could be classified as unrealistically optimistic. Approximately one third (34%) of the students accurately predicted their examination performance while the remainder (17%) under-predicted their performance and may be regarded as defensively pessimistic. There was not a correlation between students predicted examination performance and time spent preparing for the examination.

Keywords

Unrealistic Optimism, Performance Estimates, Perceived Examination Performance

Introduction

Unrealistic optimism is a judgmental bias that may affect a person's subjective estimates of the probability of future events in their lives. Unrealistic optimism may result in a person's overestimation of the probability of positive outcomes and underestimation of the probability of negative outcomes[1]. It is well known that a person may abandon their optimism and become more realistic or accurate in their perceptions immediately after a personal experience with a stressful event[2]. The opposite of unrealistic optimism is defensive pessimism where a person may be more disposed to adopt a pessimistic attitude regarding future events, particularly in stressful situations[3]. In this case, an individual may be more inclined to make a pessimistic prediction regarding future events to avoid negative feelings associated with unexpected negative outcomes. If it assumed that an examination in an undergraduate engineering course is a stressful event, then one may be able to ascertain if students tend towards unrealistic optimism or defensive pessimism. It is this concept that will be explored in the present work.

Classification of Predicted Performance

In order to determine if students tend towards unrealistic optimism or defensive pessimism an examination was given in an undergraduate engineering course. The examination consisted of twenty Fundamentals of Engineering (FE) exam style questions. At the end of the examination, students were asked to identify their perceived examination performance (i.e. the letter grade they expected to receive) as well as the time they spent preparing for the exam. If their predicted performance exceeded their actual performance then their prediction may be classified as unrealistically optimistic. If their predicted performance matched their actual performance then

their prediction may be regarded as accurate. Finally, if their predicted performance was less than their actual performance then their prediction may be regarded as pessimistic.

Course and Examination Information

In order to obtain a sample size that would yield statistically significant results, student performance was evaluated across two different semesters in an undergraduate engineering course. The course, Heat Transfer, is a junior-level course in the mechanical engineering program. The pre-requisites for the course, which students must pass with a letter grade of "C" or better, are: Calculus III, Differential Equations, Fluid Mechanics, and Thermodynamics. A total of 126 students were evaluated across two different semesters and across three different sections all taught be the same instructor. Students were evaluated on the third of four examinations. The third examination was chosen as it was believed that the students would have had sufficient time to acclimate to the examination style of the instructor. In addition, students would be aware of their performance on subsequent examinations and classroom assessments.

It was believed that by allowing the students to complete the examination before predicting their performance that the predictions would tend to be accurate. This is because it has been found that an individual's confidence in performing well tends to decrease as the activity in which the individual will be evaluated nears[5]. Thus, a more optimistic prediction tends to transition to a more accurate prediction as the time of evaluation draws near. During the evaluation, or examination in this case, an individual has gained additional information, and thus should theoretically be able to make an accurate prediction of their performance. This is particularly true in regard to the style of the examination that was given. The FE exam consists of multiple choice questions. Thus, if a student did not obtain an answer that matched one of the answer choices then they should be confident that their solution procedure was incorrect.

Evidence of Unrealistic Optimism

There was a significant discrepancy between students' predicted examination performance when compared with their actual examination performance. Almost half of the students assessed over-predicted their examination performance by one or more letter grades and thus can be classified as unrealistically optimistic. Approximately one third of the students accurately predicted their examination performance while the remainder under-predicted their performance and may be regarded as defensively pessimistic. The distribution of students whose predictions may be classified as optimistic, realistic, and pessimistic can be seen in Fig. 1.

While the actual letter grades earned by students on the examination appear to follow a normal distribution, the predicted examination grades do not. This can be seen in Fig. 2 where 47.6% of students predicted that they would earn a "B" on the exam while only 24.6% of students actually did so. More significantly, only 6.4% of students predicted they would earn a letter grade of "D" or "F" on the examination while 34.1% of students did so. It was originally hypothesized that students would tend towards defensive pessimism in order to not be disappointed with unexpected outcomes, which in this case would be a poor examination grade.

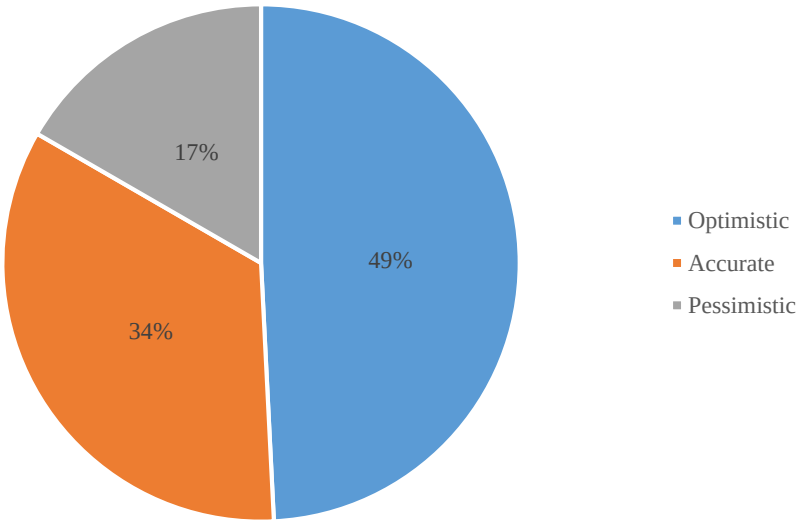

Figure 1. Distribution of Predicted Performance

In addition, there has been shown to be an inverse relationship between anxiety and optimism[6,7]. It has been observed, albeit qualitatively, that students often exhibit anxiety before and during classroom examinations. In spite of this, and upon completing the examination which may be classified as a stressful event, almost half (49%) of the students could be classified as unrealistically optimistic.

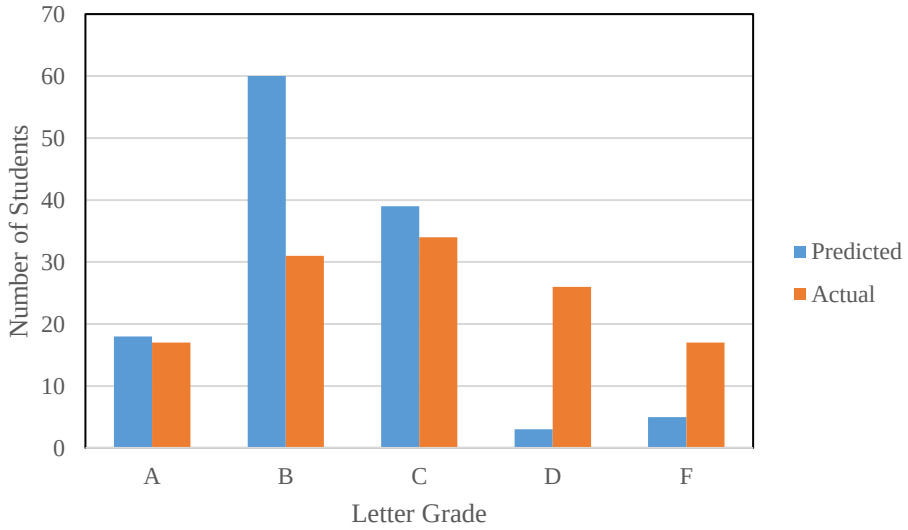

Figure 2. Letter Grade Distribution of Predicted and Actual Examination Performance

Impact of Preparation Time on Actual Performance

In order to assess if students tended towards unrealistic optimism as the amount of time they spent preparing for the examination increased, students were asked to report the time they spent

preparing for the exam in five different time intervals: 0 to 2 hours, 2 to 4 hours, 4 to 6 hours, 6 to 8 hours, and 8 to 10 hours. Unfortunately, while the majority of students (76.0%) of students spent between 0 and 4 hours studying for the exam (Fig. 3), there was not a statistically significant correlation between examination performance and time spent in preparation (Fig. 4).

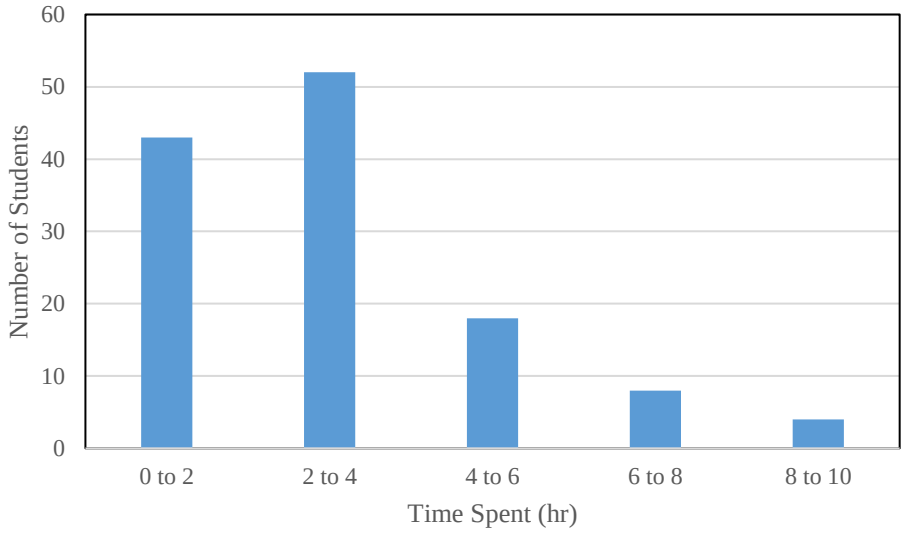

Figure 3. Self-Reported Preparation Time for Classroom Examination

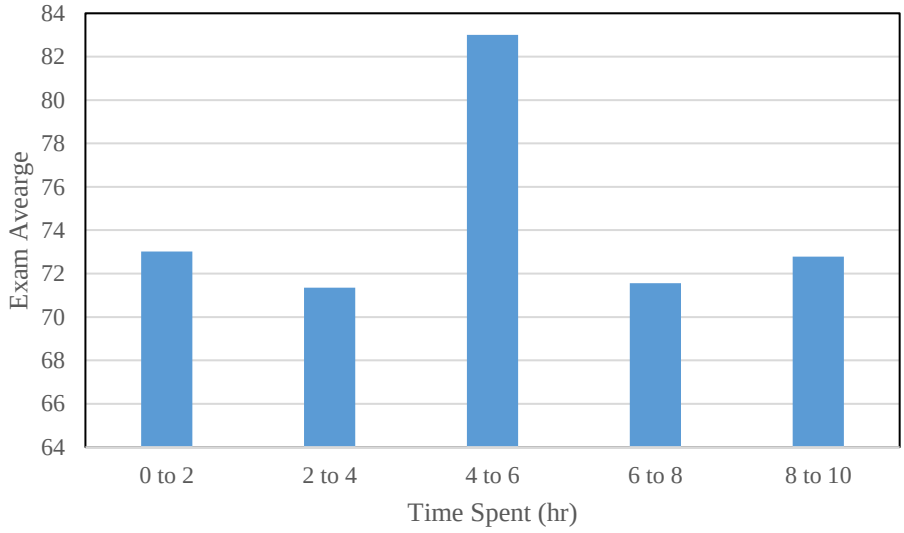

Figure 4. Examination Performance as a Function of Preparation Time

In addition, there was no correlation between the accuracy of the students' predicted performance and the amount of time spent preparing for the examination. In other words, students who spent more time studying for the examination could not be classified as more optimistic or realistic in regard to their predictions. Similarly, students who spent less time studying for the examination could not be classified as more pessimistic.

Conclusion

A total of 126 students in an undergraduate mechanical engineering course were assessed to identify if, upon completing an examination, students could accurately predict their examination performance. Almost half (49%) of students over-predicted their actual letter grade by one or more letter grades and could be classified as unrealistically optimistic. Conversely, 17% of students under-predicted their examination grade by one or more letter grades and could be classified as defensive pessimists. Over half (61.9%) of students predicted they would receive a letter grade of "A" or "B" on the exam while only 38.1% did so which is further evidence of unrealistic optimism. Similarly, only 6.4% of students predicted they would receive a letter grade of "D" or "F" on the exam while over one-third of students (34.1%) did so. There was not a correlation between time spent in preparation of the exam and predicted grade nor actual grade. Thus, students are not necessarily more optimistic about their examination grade upon spending more time in preparation. Similarly, students are not necessarily more pessimistic about their predicted examination grade when preparing for the exam for a shorter duration of time.

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