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Abstract

This research investigated the prevalence of "optimistic bias" (unrealistic performance expectations) among low scoring students. Possible causes and remediations are discussed. Two hundred seventy four undergraduate students were surveyed after their first course exam, and again after their second exam, to assess the effects of optimistic bias. At both survey points, each student provided (1) a performance estimate for the recently taken exam, (2) actual score for that exam after receiving it, and (3) an estimate of future exam performance. The sample was divided into quartiles based on first exam actual scores. Lowest quartile students were overly optimistic regarding their first exam performance after having taken it (but prior to receiving their actual scores). These low scoring students continued to be overly optimistic regarding performance on future exams despite the contradictory evidence they had just received in the form of their actual poor exam scores. Implications are discussed and suggestions are offered for actions the instructor can take (e.g., in class informational presentations) that might help reduce optimistic bias, other student misconceptions, and their detrimental impact on low scoring students.

Optimistic bias refers to the tendency to under-estimate one's likelihood of experiencing negative events and/or to over-estimate one's likelihood of experiencing positive events. As educators, we want students to be optimistic about their future performance. Research indicates that optimism can have benefits. For example, Nes, Evans, & Segerstrom, (2009) reported that academic optimism had positive effects on GPA and retention. Additionally, Ayyash-Abdo and Alamuddin (2007) reported a positive relationship between optimism and subjective well-being in a sample of Lebanese college students. Optimistic bias sometimes operates interactively with other variables. For example, Ruthig, Haynes, Perry, and Chipperfield (2007) suggest that high levels of academic optimism can have positive effects if combined with high "academic control cognitions" (ACC). Academic control cognitions are beliefs relating to the extent to which one can control a situation or outcome, in this case, academic performance. Social comparison may be an important factor to consider when studying the optimistic bias in academic settings. The "better than-average effect" refers to a well studied variant of optimistic bias in which predictions for others are accurate (reality based) whereas predictions for the self are optimistically biased (Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995). Cann (2005) found that university students were accurate when estimating the future letter grade distribution for their class but were overly optimistic in estimating their own future exam scores.

The present author has observed that high performing, well prepared students typically approach examinations with cautious and realistic optimism. All too often, however, we are confronted with poorly performing students who possess an "optimistic bias" (are overly and unrealistically optimistic about their future academic performance). After receiving a low grade on their first exam, these students often attribute their poor scores to a variety of factors (e.g., bad luck or bad questions) and seem certain they will somehow do much better next time. They fail to use feedback (their poor exam scores) to develop more realistic future expectations and strategies for change. They also do not recognize that in the absence of a real plan (e.g., improved attendance or other specific changes), they will, in all probability, repeat their poor performance. Yasuda, Waseda, Tokorozawa, and Sato (2000) reported that a subset of their student subjects did, in fact, have unrealistically high expectations regarding their exam results and failed to adjust those expectations in response to feedback in the form of their low exam scores. These authors concluded that unrealistic optimism is not truly adaptive.

Kruger and Dunning (1999) of Cornell University found that individuals of lower ability consistently overestimated their level of performance on tasks involving logic, grammar, and humor. For each task, these authors divided their sample into quartiles based on actual (objectively scored) performance. They then calculated an inaccuracy score for each participant (actual performance score minus a self-reported performance estimate). Lower scoring participants (and particularly those in the lowest quartile) consistently had the largest inaccuracy scores (i.e., were most unrealistically optimistic in rating their own task performance). The present study extends Kruger and Dunning's findings and methodology to the very real problem of low scoring students holding unrealistically optimistic expectations for their future academic performance. It was hypothesized that (1) low scoring college students would be more optimistically biased than their higher performing classmates and (2) that low scoring students would continue to be overly optimistic about future performance in the face of contradictory evidence (in the form of poor exam grades).

Method

Participants

The sample consisted of 274 undergraduate university students attending seven different introductory psychology and anthropology sections with three different instructors. Mean age of the sample was 20.8 years, with 71.6% being female and 28.4% being male. The study was reviewed and approved by the university's Human Subjects Research Committee.

Procedures

All data were self-reported using a brief survey. A research assistant visited each classroom twice, first when the first exam grades were returned (about one week after the exam) and again when the second exam grades were returned (again, about one week after the exam). During the first visit (visit one), students estimated their first exam grades prior to actually receiving them (post-test estimate). They then received and reported their actual first exam scores which they had just received (actual score). Finally, they provided estimates of their future performance on the second exam (future estimate). A post-test "inaccuracy" score was then computed (inaccuracy = actual score - post-test estimate). Please note, larger negative values indicate greater inaccuracy and higher optimistic bias. Students were then assigned to one of four "quartiles" (lowest, lower, higher, and highest) based on their first exam actual scores. During the second visit (visit two), the same procedure was followed. The only difference at visit two was that the post-test estimates and actual scores collected were for the second exam and the future estimates collected were for the third exam.

Results

All statistical analyses were conducted using SAS statistical software (SAS Institute, 1985).

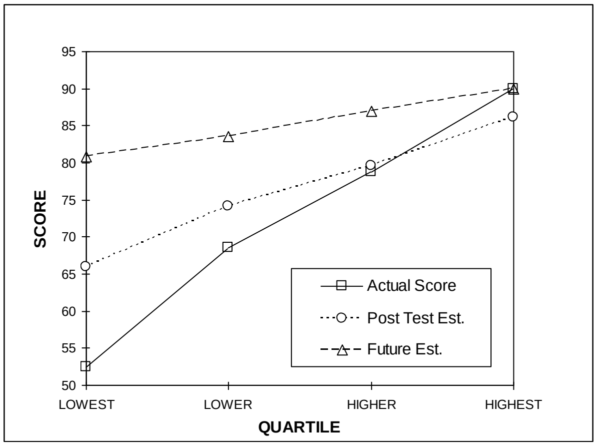
Exam 1

Table 1 contains exam 1 post-test estimates, actual scores, inaccuracy scores, and future (exam 2) estimates, by quartile. Lowest quartile students had the largest inaccuracy scores (*M* = 13.2) being least accurate and most overly optimistic in their post-test estimates [$F(3,270) = 40.4$, $p < .0001$]. Lowest quartile students also had the largest exam 1 actual vs. future (exam 2) estimate discrepancy at 29.1 points.

Table 1 Means for Exam 1 Post-test Estimate, Actual Score, Inaccuracy Score, and Future Estimate (exam 2)

Quartile	Lowest	Lower	Higher	Highest
n	70	70	71	63
Post-test est.	65.9	74.9	80.4	86.4
Actual Score	52.4	69.3	79.3	90.3
Inaccuracy	-13.4	-5.5	-1.0	+3.7
Future est.	81.5	83.9	86.7	90.4

Figure 1. Exam 1 Actual Scores, Post-test Estimates, and Future Estimates for Exam 2 by Quartile Mean



Overall, there was an inverse relationship between actual performance and estimate inaccuracy (actual score - post-test estimate) across the quartiles (see Figure 1). Exam 1 inaccuracy score (actual score - post-test estimate) means are inversely related to actual score means across quartiles. Inaccuracy score means for the four quartiles (from lowest to highest) are -13.4, -5.5, -1.0, and +3.7 respectively.

Exam 2

Table 2 contains quartile means for exam 2, post-test estimates, actual scores, inaccuracy scores (actual score – post-test estimate), future (exam 3) estimates, actual score change from exam 1, and "attrition" (decrease in number of students present to provide data at visit two). When exam 1 and exam 2 actual scores were compared across quartiles, a significant interactive effect (actual score change x quartile) was observed [$F(3,192) = 9.59$, $p < .0001$]. Mean actual score increased considerably (from exam 1 to exam 2) for the lowest quartile (9.1 points). In contrast, there was little change in means from exam 1 to exam 2 for the remaining three quartiles.

Also notable was a lowering of optimistic bias for future exam performance from visit one to visit two. Overall, exam 3 future estimate vs. exam 2 actual score differences (at visit two) were smaller than the exam 2 future estimate vs. exam 1 actual score differences from visit one [$F(1,195) = 37.1$, $p < .0001$]. This reduction in optimistic bias was greatest for the lowest quartile.

It is important to view the visit one vs. visit two differences reported above in light of the fact that many students who provided data at visit one were not present to provide data at visit two. Whereas 274 students were present at visit one, only 196 were present at visit two. The specific reasons for these student absences remain unknown due to the anonymous self-report design of this study. Possibilities include course withdrawal, student stopped attending, or simply absent on that day. Whatever the reason, students not present to receive their exam 2 grades or provide data at visit two were considered "lost to attrition." What is notable, and perhaps not surprising, is that attrition was greatest for the lowest quartile and decreased in ascending order for the remaining three quartiles (see Table 2).

Table 2 Means for Exam 2 Post-test Estimate, Actual Score, Inaccuracy Score, Future (exam 3) Estimate, and Actual Score Change; and Student Attrition

Quartile	Lowest	Lower	Higher	Highest
n	39	49	55	53
Post-test est.	68.8	74.8	77.4	84.3
Actual Score	61.5	69.7	77.8	87.9
Inaccuracy	-6.9	-5.1	+0.4	+3.6
Future est.	73.4	79.2	84.1	88.7
Change	9.1	-0.8	1.5	2.4
Attrition	31	21	16	10

Note. Change is the difference between exam 1 and exam 2 actual scores. Attrition = visit one *n* - visit two *n*.

To determine if students “not present” at visit two (those lost to attrition) differed in some way from students who were "present" for both visits, between groups *t* tests were conducted on the exam 1 actual and future exam 2 estimate data collected at visit one (see Table 3). Students lost to attrition had lower exam 1 post-test estimates and lower exam 1 actual scores. Students lost to attrition also showed greater exam 1 post-test estimate inaccuracy (exam 1 actual score - exam 1 post-test estimate) though not at a statistically significant level. Notable in Table 3 is the large (-18.7) mean future inaccuracy score (exam 1 actual score - future exam 2 estimate) for students lost to attrition (not present at visit two). The mean future inaccuracy score for students present at visit two was only -10.1. This difference reached a high level of statistical significance [$t(272) = 4.45$, $p < .0001$].

Table 3 Exam 1 Data Comparisons Between Students “Present” and “Not Present” (lost to attrition) at Visit Two

	Means			
Variable	Not present	Present	*t*	*p*
Post-test est.	72.1	78.4	4.10	<.0001
Actual Score	67.1	74.9	4.05	<.0001
Future Est.	85.8	85.0	0.45	.4514
Inaccuracy (post)	-5.0	-3.5	0.91	.3393
Inaccuracy (future)	-18.7	-10.1	4.45	<.0001

Note. Inaccuracy (post) = Exam 1 actual score -Exam 1 post-test estimate. Inaccuracy (future) = Exam 1 actual score – future Exam 2 estimate. *df* for all tests = 272.

Discussion

The results of this study do suggest that optimistic bias is alive and well in the university classroom. Lowest quartile students did, indeed, display greater “optimistic bias” than did higher scoring students. They felt they had done much better on their first exam than they actually did. After receiving their low grades, many of these students still held high, possibly unrealistic, estimates for their future performance. The optimistic bias held by these students may have contributed to disappointment and academic failure. However, lacking data on final course grades (due to the self-report anonymous design of this study), we cannot be sure this was the case. The exam 1 mean future inaccuracy score (exam 1 actual score - future exam 2 estimate) for students "not present" to receive their exam 2 scores (lost to attrition) was nearly twice as large (-18.7) as the mean for students "present" to receive their exam 2 scores (-10.1).

The anonymous, self-report "quasi-experimental" design of this study was used in order to limit time demands on instructors, allowing for greater access to participants. Unfortunately, this design does not allow us to separate out how much of the reduction in optimistic bias observed among lowest quartile students was due to attrition and how much was due to an adjusting of expectations to be more in line with reality. A replication using a true experimental design, comparing a group exposed to the data collection process with one not exposed to it, would help better determine if simply calling one's attention to one's own inaccuracy can significantly reduce the optimistic bias. Obtaining additional information such as attendance records and final course grades from the instructor (esp. frequency and timing of course withdrawals) would help clarify the extent to which reduction of inaccuracy scores among low scoring students was due to attrition or reduction in optimistic bias.

It is possible that the self-reporting process utilized in the research reported here did draw the attention of some low scoring students to the inaccuracy of their estimates, lowering their optimistic bias. If this were the case, then the instructor, could use a classroom presentation to help dispel the optimistic bias and other misconceptions held by low scoring students (e.g., that their first low exam grade was just bad luck). Such a presentation might employ data of the type presented in this study (e.g., as in Tables 1 and 2) to help make students aware of the optimistic bias and the problems it can cause. This author is unaware of any research to date that addresses the effectiveness of this particular method. Feedback techniques such as this, and perhaps other educative strategies, might help low scoring students adjust their future estimates to a more realistic level, might increase their sense of personal control and responsibility, and might motivate them to put forth greater effort.

In conclusion, student retention and academic success are currently among the most frequently discussed topics in higher education. The results of this study suggest that the optimistic bias may be one factor warranting further attention. Future research could be directed both at gaining a more complete understanding of the factors underlying the optimistic bias (and other student misconceptions) and to applying that knowledge to classroom practices aimed at decreasing the optimistic bias and other student misconceptions. The result could be increased retention and academic success for many low scoring students. I hope interested educators will consider it for their classrooms.

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