

A Brief Intervention to Aid Struggling Students: A Case of Too Much Motivation?

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Abstract: This study examines two interventions for altering achievement goals in an effort to enhance academic success in struggling Introductory Psychology students. The procedures involved an in-class lecture and an interactive computerized tutorial. Both procedures were successful in altering motivation. This led to changes in study activities and increased examination and course grades. In fact, the rate of failure was cut in half in the students who completed the interventions. However, the procedures were not as successful at attracting students who were at risk for academic failure. Only 12% of the target students completed the first intervention while 55% of the target students completed the computerized tutorial. Participation in the computerized intervention was enough to markedly reduce the number of failing grades earned by the class as a whole. Additions and alterations to the interventions are proposed to extend their efficacy. Keywords: achievement goals, goal orientation, academic success, mastery, performance

I. Introduction

Many teachers firmly believe that motivation is important to the learning process. Most teachers believe that a minimal amount of motivation is necessary and that higher amounts of motivation are better. Teachers often attribute problems in the learning process to a lack of motivation. In this paper, we explore some of the links between motivation and academic success. Our work is informed by a theory, alternatively known as Achievement Motivation Theory or Goal Orientation Theory, which posits that multiple varieties of motivation exist and that moderate levels of some varieties are preferable to high levels of other varieties. In fact, some of the problems in the learning process may result from high levels of particular kinds of motivation.

Goal orientation theory suggests that when students engage in a class, they strive to reach one or more goals (Ames & Archer, 1988; Dweck & Leggett, 1988; Harackiewicz, Barron, & Elliot, 1998; Hidi & Harackiewicz, 2000). Two goals are of primary importance: mastery goals and performance goals. Students who adopt mastery goals are interested in learning the material in the class and strive to master that material (Ames, 1992; Blumenfeld, 1992; Dweck & Leggett, 1988). Students who pursue performance goals are interested in demonstrating their competence, especially relative to other students (Dweck & Leggett, 1988; Urdan, 1997).

Mastery and performance goals are multidimensional motivational constructs. That is, these goals provide a framework through which a variety of behavioral, cognitive and affective responses are energized and directed (Ames, 1992; Dweck & Leggett, 1988; Blumenfeld, 1992). For instance, research under a variety of laboratory and classroom settings has found that students who pursue mastery goals display a wide variety of largely adaptive behaviors and

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attitudes not seen in all students. Mastery oriented students seek to improve their competence through acquiring new skills and knowledge and by surmounting novel and difficult problems. Mastery goals have been found to be associated with increased interest, the enjoyment of challenge and challenging tasks, and the belief that competence is obtained incrementally through effort. Students who pursue mastery goals commonly use effective learning strategies such as elaboration and organization, have developed multiple strategies, are interested in developing new skills, become involved in the learning process, display greater persistence, and are likely to respond to challenges through the use of greater effort and the exploration of alternative learning strategies (Albaili, 1998; Ames, 1992; Ames & Archer, 1988; Blumenfeld, 1992; Elliot & Harackiewicz, 1994; Graham & Golan, 1991, Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Harackiewicz & Elliot, 1998; Pintrich, Zusk, Schiefele, & Pekrum, 2001).

The pursuit of performance goals is more complex, but sometimes has been associated with a less adaptive set of academic outcomes such as self-aggrandizing, task aversion, the pursuit of effort minimizing strategies, a reluctance to seek help, impaired problem solving, greater feelings of self-consciousness, self-handicapping, and helplessness. Students who adopt a performance goal orientation seek to elicit favorable judgments of their competence and avoid negative evaluations. These individuals tend to prefer and to seek out easier tasks where success and validation can be obtained and view competence as static and unaffected by effort. The maladaptive behaviors are more likely to appear when validation is not available (Albaili, 1998; Dweck, 1999; Dweck & Leggett, 1988; Graham & Golan, 1991; Harackiewicz, Barron, & Elliot, 1998; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000, Harackiewicz & Elliot, 1993; Kong & Hau, 1996; Midgley, 1993; Pintrich & Schunk, 1996; Pintrich, Zusk, Schiefele, & Pekrum, 2001; Ryan, Gheen, & Midgley, 2000; Somuncuoglu & Yildirim, 1999; Urdan, Kneisel, & Mason, 1999; Urdan & Maehr, 1995; Urdan, Midgely, & Anderman, 1998).

The adoption of mastery goals should be associated with academic accomplishment. In the college classroom, this would translate into better examination and course grades and a higher Grade Point Average. One would expect that a mastery oriented student who monitors comprehension, connects new information with old, can discriminate more important information from less important information, who sets goals, uses elaboration and other adaptive learning strategies should attain higher levels of academic success than a performance oriented student who procrastinates and self-handicaps. However, most studies employing an objective measure of academic performance in the classroom have not found a consistent or robust advantage. Only a third of these studies have reported higher grades for mastery oriented students (Bouffard, Boisvert, Vezeau, & Larouche, 1995; Eppler & Harju, 1997; Pintrich, Zusk, Schiefele, & Pekrum, 2001; Schraw, Horn, Thorndike-Christ, & Bruning, 1995; Wolter, Yu, & Pintrich, 1996) and about two thirds have obtained null results (Beck, Rorer-Woody, & Pierce, 1991; Elliot & Church, 1997; Harackiewicz & Elliot, 1998; Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Harju & Eppler, 1997; Greene & Miller, 1996; Pintrich & Garcia, 1991; Pintrich & Garcia, 1993; Roedel & Schraw, 1995). No studies have found that pursuing mastery goals is associated with declining academic success.

We have identified a set of conditions under which the relative pursuit of mastery and performance goals plays a potent role in academic success. One goal orientation theory (Dweck, 1999; Dweck & Leggett, 1988) suggests that the effects of these goals can be altered or amplified during stress or challenge. We can identify an obvious and frequent source of stress in

our students, failure on an examination. To see how relevant achievement goals are in this situation, we tracked students to see what happened on the subsequent examination after an objective failure. Students who endorsed mastery orientation enjoyed a 15-point increase on the next examination. Students who pursued performance goals suffered a 10-point decrease. Not only did different patterns of goal orientation lead to an effect on academic performance, but it was very robust and consistent. A 25-point difference in examination scores can lead to a difference of two or three letter grades. Further, ninety-five percent of the mastery-oriented students attained a higher examination grade on the subsequent test. About half of the performance-oriented students had a decrease on their test grade on the subsequent examination (Hoyert & O'Dell, 1999; 2000; 2001a; 2001b; 2004a, 2004b; O'Dell & Hoyert, 2000, 2002).

As a result, we developed an intervention to aid struggling Introductory Psychology students. We measured goal orientation at the onset of the semester and invited students who primarily pursued performance goals to attend brief tutorial sessions after they had failed an examination. Student peers led the sessions. The goal of the intervention was to alter goal orientation in order to prevent the decrement sometimes seen in highly performance-oriented students. The tutors' coached students on a variety of techniques including orientation modeling from several different perspectives, discussion of multiple study techniques, goal setting, and value referencing. The intervention provided students with knowledge about and practice expressing mastery goals. It must be pointed out that the tutorials only address motivational issues. We did not cover classroom material. The intervention produced clear benefits: students in the intervention began to endorse mastery goals to a greater extent and earned higher examination and course grades. The average student achieved a 15-point increase on their next examination. Further, the effects persisted over the duration of the semester even though the intervention ended. The D/F failure rate was nearly cut in half (to 47%). These improvements are even more impressive when their performance is compared to that of the control participants. One could view the control group as a predictor of what could have happened to the intervention group participants without the intervention. These two groups of participants had the same goal orientation profile and the same grades on the first examination. Both sets of students endorsed performance goals more than mastery goals. After the first examination, the control students' grades declined precipitously. The failure rate (D, F) was 78%.

The successes of this intervention are heartening. However, the procedure reached a relatively small number of students and was labor intensive. Over the course of three semesters we were able to involve a little over 60 students. We believe that there are many more students who could benefit from the intervention. In any particular class, we estimate that about half of the students are predominantly performance-oriented and that about half of the students who are predominately performance-oriented will fail at least one examination. This amounts to several hundred students each year at our school. In this research, we explored two techniques for extending the intervention to reach all struggling performance-oriented students enrolled in sections of Introductory Psychology in an effort to alter the success profile in the class as a whole.

II. Method

A. Instruments

Goal orientation was measured using a locally developed inventory modeled after Roedel, Schraw, and Plake's (1994) Goals Inventory. This instrument consists of 24 statements

rated on a 5-point Likert-type scale for strength of agreement. Students were asked to consider how much each of the statements applies to themselves within the Introductory Psychology class. The statements assess attitudes and behaviors towards learning and performance goals as described by Dweck and Leggett (1988).

B. Procedure

Intervention 1: Guest Lecture. During the first day of the semester and after the final examination, the goal inventory was administered to all students. One hundred eighteen students were enrolled in the class. Many of these students experience an academic challenge over the course of the semester. Eleven students did not take the first examination. Twenty-eight students received a failing grade on the first examination. Sixty students failed at least one examination over the course of the semester. Eighty-three students received a grade that was less than a C on at least one examination over the course of the semester.

The intervention occurred during the class immediately after the first examination and took the form of a lecture and discussion. In the intervention, we provided information about goals and the meaning of failure, and practiced setting mastery goals. All of the exercises were aimed at increasing the adoption of mastery orientation. The techniques included orientation modeling from several different perspectives, discussion of multiple study techniques, goal setting, and value referencing. Following the class, students were instructed to write a paper defining the two goals, describing individuals who exemplify the traits of each goal, and considering their own experience with goal orientation. Seventy-two students attended the class and 19 wrote and submitted the paper. At the end of the academic term, the students' introductory psychology examination and course grades were obtained from the instructor.

Intervention 2: Interactive Computerized Tutorial. This intervention occurred with a different class during a different semester. Following the first examination all students received a CD ROM containing the goals inventory and the intervention. The intervention provided students with information about goals and the meaning of failure and practiced setting mastery goals. It took the students 35 to 55 minutes to complete the tutorial. Two hundred-twelve students were enrolled in the class. Many of these students experienced an academic challenge during the semester. Eighty-two failed the first examination. One hundred fifty-six failed at least one examination over the course of the semester. One hundred eighty-three received a grade that was less than a C on at least one examination over the course of the semester. One hundred thirty-seven (65% of the class) students completed the intervention; 75 did not. There were 147 students who were performance-oriented and failed at least one examination. Eighty-two out of the 147 (56% of the group) target students completed the intervention.

III. Results

A. Intervention 1

Nineteen students completed the motivational intervention. Nine of these were not struggling or were not high-performance oriented students. Ten were students that we predict could struggle in the class. In this study, we are primarily interested in struggling students. We predict that a student will be at risk for academic failure when they pursue performance goals more than learning goals and when they fail an examination or are otherwise challenged. We will refer to these students as the "target" students. Because the 10 struggling students in the

intervention group and the 9 other students responded to the intervention approximately the same we will display the group data because it is based on more observations. Ninety-nine students did not participate in the intervention. Of these 72 were at risk for failure because of grades and goal orientation. Thus 12% of the target students completed the intervention. The students who completed the intervention did not differ from the students who did not complete the intervention in goal orientation or grades on examination 1. The students who wrote the paper had a mean Mastery score of 3.69 (SD=0.79) (both goal orientation scores can range from 1 to 5). The students who did not write the paper had a mean Mastery goals score of 3.86 (SD=0.88). These did not differ ($t(94)=-.612, p=.542$). The same pattern holds for Performance goals (Intervention: $M=3.59, SD=0.61$; Comparison: $M=3.75, SD=1.06$; $t(94)=-.425, p=.672$). The scores on the first examination also did not differ (Intervention Group: $M=74.63, SD=14.00$; Comparison: $M=71.18, SD=14.19, t(105)=0.963, p=.338$). Because the two groups were similar, the students who did not complete the intervention can be treated as a convenience control group or a comparison group.

The intervention produced an increase in the pursuit of mastery goals. Before the intervention the Mean was 3.69 (SD=0.79) and after it had increased to 3.78 (SD=0.54) However, the increase was not statistically significant ($t(18)=0.527, p=.604$). The intervention also produced a decrease in performance goals (first day: $M=3.86, SD=0.89$; Last day $M=3.77, SD=0.92$; $t(18)=-.749, p=.463$). In contrast, students who had not completed the intervention displayed dramatic decreases in both mastery (first day: $M=3.58, SD=0.55$; last day $M=3.18, SD=1.00$; $t(37)=2.40, p=.021$) and performance (first day: $M=3.76, SD=1.07$; last day $M=3.37, SD=0.70$; $t(37)=2.31, p=.026$) goals over the course of the semester.

Students who completed the intervention displayed steadily but slightly increasing examination grades (exam 1 $M=74.63, SD=14.00$, exam 2 $M=75.89, SD=14.60$, exam 3 $M=76.44, SD=12.53$, exam 4 $M=80.94, SD=12.79$, exam 5 $M=78.09, SD=10.11$). The gradual increase is not statistically significant ($F(4,64)=1.11, p=.358$). The scores on Examination 1 for students who did not complete the intervention were very similar to the students who completed the intervention. However, after the first examination, the grades for the students who did not complete the intervention declined precipitously (exam 1 $M=71.18, SD=14.25$, exam 2 $M=68.33, SD=15.98$, exam 3 $M=65.42, SD=13.77$, exam 4 $M=64.75, SD=19.96$, exam 5 $M=57.96, SD=13.57$). This decline is significant ($F(4,144)=6.01, p<.001$). The overall pattern of increasing grades for the students who completed the intervention is different from the pattern of decreasing grades for the comparison students ($F(1,204)=3.42, p=.010$). Figure 1 presents the difference in mean examination grades between students who completed the intervention and those who did not. On Examination 1 the difference was less than 3 points. With each subsequent exam, the disparity widened. By examination 5, there was a 20-point difference between the test scores of the two groups.

The intervention also led to improvements in their final course grades. Table 1 displays the percentage of grades in the two groups. We compared the semester average for the two groups. Students who completed the intervention earned higher average grades than the other students (intervention: $M=78.9, SD=19.47$, comparison: $M=46.89, SD=27.99$; $t(116)=4.75, p<.001$).

Because we are primarily interested in the effects of the intervention on the target students who are highly performance-oriented and who fail an examination, we report their scores separately. The pattern of results was similar for these target students as for the overall sample. The intervention led to slight increases in mastery goals (first class: $M=3.62, SD=0.83$;

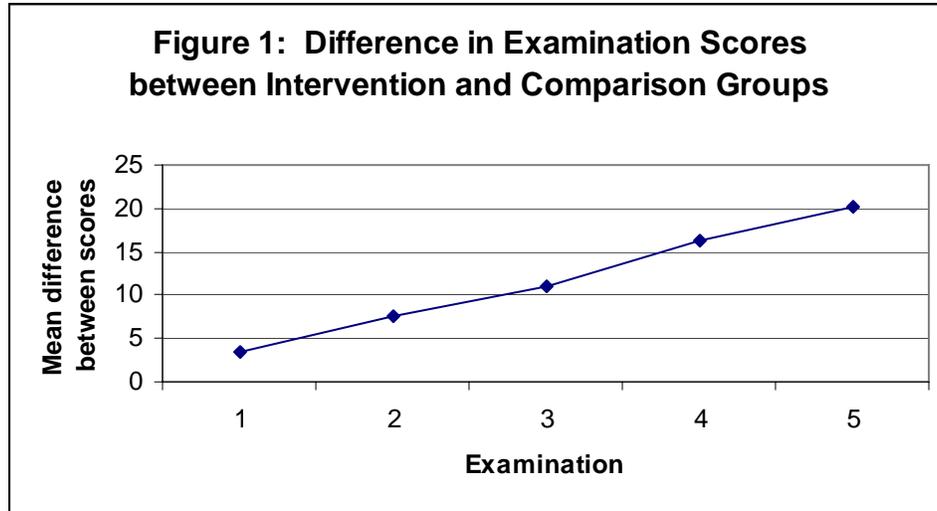


Table 1: Grade Distributions for Students Completing Intervention 1 and for the Comparison Group

	Grade				
	A	B	C	D	F/W
Completed Intervention	26.3	31.6	31.6	5.3	5.5
Comparison Group	5.2	15.6	17.7	15.6	45.8

last class: $M=3.74$, $SD=0.53$; $t(17)=0.594$, $p=0.560$) and slight decreases in performance goals (first class: $M=3.89$, $SD=0.90$; last class: $M=3.78$, $SD=0.84$; $t(17)=0.868$, $p=0.398$). Target students who failed an examination and did not complete the intervention demonstrated considerable decreases in mastery goals (first class: $M=3.58$, $SD=0.55$; last class: $M=3.18$, $SD=1.00$; $t(17)=2.40$, $p=0.021$), and performance goals (first class: $M=3.76$, $SD=1.07$; last class: $M=3.37$, $SD=0.70$; $t(17)=2.31$, $p=0.026$). As can be seen in Table 2, the target students who completed the intervention also maintained higher grades.

Table 2: Grade Distributions for Performance-Oriented Students Completing Intervention 1 and for the Comparison Group

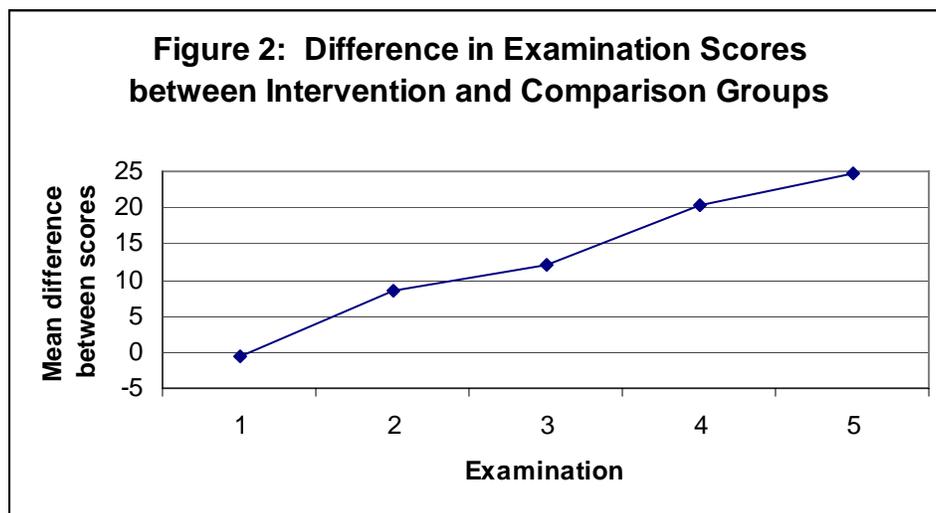
	Grade				
	A	B	C	D	F/W
Completed Intervention	0.0%	30.0%	60.0%	0.0%	10.0%
Comparison Group	0.0%	6.8%	23.3%	19.2%	50.7%

B. Intervention 2

One hundred thirty-seven students completed the motivational intervention. Fifty-five of these were not struggling or were not high-performance oriented students. We predict that 82 of these students would struggle in the class because of goal orientation. Seventy-five students did not participate in the intervention. Of these, 66 were “at risk” because of grades and goal orientation. Thus about 55% of the target students completed the intervention. The scores of students who completed the intervention did not differ from the students who did not complete the intervention on examination 1 (Intervention, $M=54.5$, $SD=14.12$; Comparison, $M=55.0$, $SD=14.56$; $t(197)=0.23$, $p=0.749$). Because the two groups were similar, the students who did not complete the intervention can be treated as a comparison group.

The intervention produced an increase in the pursuit of mastery goals in both the target students as well as the general body of students who completed the intervention. Since our primary interest is in the target students we will present these data first. Before the intervention the Mean was 4.10 ($SD=0.09$) and after it had increased to 4.29 ($SD=0.10$) ($t(80)=3.34$, $p=0.002$). The intervention also produced a decrease in performance goals. Before the intervention, the mean was 4.07 ($SD=0.42$) and after it had decreased to 3.06 ($SD=0.91$) ($t(80)=8.69$, $p<0.001$).

Target students who completed the intervention displayed steadily increasing examination grades (exam 1 $M=54.4$, exam 2 $M=55.9$, exam 3, $M= 56.0$, exam 4 $M=57.9$, exam 5 $M=55.6$). In contrast, the students who did not complete the intervention earned increasingly lower grades (exam 1 $M=55.0$, exam 2 $M=47.3$, exam 3, $M= 43.8$, exam 4 $M=37.7$, exam 5 $M=31.0$). The grade on examination 1 for the two groups is not statistically significant. However, the overall pattern of increasing grades for the students who completed the intervention and decreasing grades for the comparison group is significant ($F(1,109)=43.06$, $p<0.001$). Figure 2 presents the difference in mean examination grades between students who completed the intervention and those who did not. On examination 1, the students who did not complete the intervention maintained a higher mean exam grade than the students who would later complete the intervention. After completing the intervention, the intervention students outscored the comparison group by nine points. With each subsequent exam, the disparity widened. By examination 5, there was a 25-point difference between the two groups.



The intervention also led to improvements in their final course grades. The DFW rate in Introductory Psychology is typically similar to the percentage of students who received an F on any one test. In this class the percentage of students who received an F was 74%. Thus, we could expect a very high DFW rate. The comparison group resembled this historical pattern. Table 3 reports that 76% of these students failed the class. In contrast, in the intervention group, only 37% of the students received an F for the course. The pattern of grades in the intervention group is statistically different from the comparison group ($\chi^2(4)=12.38, p<0.001$).

Table 3: Grade Distributions for Students Completing Intervention 2 and for the Comparison Group

	Grade				
	A	B	C	D	F/W
Completed Intervention	1.2%	9.9%	21.0%	30.9%	37.0%
Comparison Group	0.0%	1.5%	9.1%	13.6%	75.8%

We are also interested in the overall effect on grades in the class. Table 4 displays the effects on course grades. Given the historical pattern and the pattern of goals and examination scores we would expect that 156 students would have earned less than a C. After the Intervention, we found that 123 students received a D, an F, or withdrew.

Table 4: Overall Effect on the Grade Distribution Students Completing Intervention 2 and the Predicted Grade Distribution

	A, B, or C	D, F, or W
Intervention	42.0%	58.0%
Predicted	26.4%	73.6%

IV. Discussion

Teachers are frequently puzzled by the disparate reactions of students to challenge. After failing an examination some students will react with despair and will give up. Other students will react to the same challenge by buckling-down, increasing their effort, and developing better study habits. The study of goal orientation seems to provide some insight into patterns of reactions such as these (Dweck, 1999; Dweck & Leggett, 1988; Hoyert & O'Dell, 1999; 2000; 2001a; 2001b; 2004a, 2004b; O'Dell & Hoyert, 2000, 2002). The interventions assessed here attempt to encourage students who may have been prone to despair to adopt a more positive approach to challenge.

We have now attempted three variants of the intervention. The first involved peer-tutors. It was not successful in reaching large numbers of students. However, when students participated, they enjoyed changed goals and increased academic success (Hoyert & O'Dell, 2004b). To an extent, goal orientation theory suggests a reason for the lack of participation. Highly performance-oriented students tend to avoid evidence of a lack of competence. To a

performance-oriented student, seeking help from a tutor is an admission that they are not capable of completing the task without assistance, something that a truly competent student could have done. As a result, we developed two variants of the intervention that can be embedded in the course structure so that participation will not carry any perceived stigma.

Providing the intervention through a guest lecture was similar in effect to the peer-tutors. Not very many students were willing to participate. However, when they completed the intervention, they enjoyed a changed pattern of goals, greater persistence, and higher grades. One unique finding occurred during this particular class. Mastery and performance goals tend to remain rather stable over time. Typically, when we measure these goals at the beginning and the end of a class without an intervention, they are approximately the same for each student and for the class as a whole. In this class, goals changed dramatically. Both mastery and performance goals declined significantly over the semester. We have not observed this before and suspect that it may have been related to messages provided by the instructor or to the pattern of academic success experienced by the students (Hoyert & O'Dell, 1999; 2000; 2001a; 2001b; 2004a, 2004b; O'Dell & Hoyert, 2000, 2002). Given the backdrop of declining goals, the increase in mastery goals observed in the students who completed the intervention provides strong evidence for the efficacy of the intervention.

The intervention occurred once, early in the semester, and lasted about 45 minutes. However, the effects of the intervention persisted for the duration of the semester. It is noteworthy that the average examination grades of these students increased over the course of the semester in much the same way as the mastery goals. The students who completed the intervention passed the class and earned high grades at far higher rates than the students who did not. The major drawback of this intervention is that it did not attract many students. Only 12% of the target students completed the intervention. One of our goals in this research is to determine whether we can alter the pattern of academic success in a whole class. Because we did not attract many students to complete the intervention, we were not able to decrease the proportion of students who did not pass the class (DFW rate).

The computerized tutorial has been the best procedure for involving students in the intervention to date. Over half of the students who we predicted could be at risk for academic failure participated in the intervention. After completing the brief intervention, they pursued mastery goals to a greater extent and were less interested in pursuing performance goals. The change in goals led to changes in studying and increased academic success over the duration of the semester. One of our interests is in trying to decrease the rate of failure in individual students. The students who completed the intervention earned failing course grades at less than half the rate of the historical pattern and at less than half the rate of the comparison group. Another interest is in altering the rate of failing grades in an entire class. It appears that the intervention was successful in decreasing the rate of the F grade by about 25%.

The present interventions produce positive results. However, they still can be improved. Both procedures could be more fully integrated into the class structure to encourage more students to participate. For instance, making the programs mandatory components of the classes could be explored. In addition, the intervention has only been attempted within Introductory Psychology classes. An interesting extension could be to try to introduce the intervention in other introductory level courses in other disciplines. The success profiles in many mathematics and science classes are lower than introductory psychology. This would suggest that they are prime candidates for this type of intervention.

Finally, this study contained a troubling methodological flaw. Both interventions may have a selection problem. The students determined who would participate in the intervention. We have identified goal orientation and challenge as important variables in course success. We have observed that these variables are similar in the two groups. Thus, we believe that it is reasonable to use these students as a comparison group. To a certain extent, this was unexpected in the first intervention. However, we would predict that in the event of a low rate of participation, more learning-oriented students would participate in the intervention than performance-oriented students. Regardless, because students could determine participation, it could be that the differences in grades, persistence, and changes in grades are related to the self-selection. Another important future study could involve a procedure in which students are randomly assigned to the intervention or to one of several control conditions. We are optimistic that these changes will further strengthen our findings that the intervention positively alters goal orientation, examination scores and course grades in a college setting.

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