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Improving the Academic Performance of College Freshmen: Attribution Therapy Revisited

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An attributional intervention was devised to help college freshmen who were concerned about their academic performance. Unlike most previous attribution therapy attempts, an effort was made to change subjects' attributions for their problems from stable to unstable causes, rather than from internal to external causes. Freshmen were given information indicating that on the average, college students improve their grades from the freshman to the upperclass years, plus they were shown videotaped interviews of upperclassmen who reported that their grade point averages (GPA) had improved since their freshman year. The effect of this GPA information was dramatic. Subjects who received the information as compared to subjects who did not: (a) were significantly less apt to leave college by the end of the sophomore year, (b) had a significantly greater increase in GPA 1 year after the study, and (c) performed significantly better on sample items from the Graduate Record Exam. As in many self-attribution studies, the self-report evidence for the cognitive processes mediating these behavioral changes was weak. None of the self-report measures of attitudes, expectancies, or mood correlated with the behavioral results. In addition, the GPA information had no effect on self-reports of mood. A more positive mood was reported only by subjects who performed a reasons analysis (i.e., who were asked to list reasons why their grades might improve). This divergent pattern of behavioral and self-report results is discussed in terms of the hypothesis that the determinants of behavioral results differ from the determinants of self-report results in self-attribution studies.

There have been many attempts to use principles of attribution theory as a therapeutic technique. Attribution therapy has typically been used with people who behave in a dysfunctional manner and attribute their problems to pejorative internal causes. These people are encouraged to reattribute their problems to an external cause, with the assumption that this will prevent additional worrying and anxiety that exacerbate the problem (Storms & McCaul, 1976; Valins & Nisbett, 1972). For example, insomniacs might assume that their sleeping problem is due to a deep-seated neurosis. This attribution to an internal cause can lead to additional worrying and anxiety, which in turn makes it even more difficult to get to sleep. Encouraging such people to attribute their insomnia to an external, nonpejorative cause might alleviate the insomnia by reducing anxiety about their mental health. Storms and Nisbett (1970) found such results. Insomniacs who were led to attribute their anxiety and arousal at bedtime to an external source (a placebo pill) reported getting to sleep quicker than did control subjects, presumably because the former subjects were no longer caught in an exacerbation cycle.

Though case reports of clinical successes corroborate the effectiveness of attribution therapy (cf. Storms & McCaul, 1976; Valins & Nisbett, 1972), the number of successful experimental demonstrations is small. The Storms and Nisbett (1970) study, the best-known source of experimental support, has been embroiled in controversy regarding its generalizability (Bootzin, Herman, & Ni-

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cassio, 1976; Kellogg & Baron, 1975; Lowery, Denney, & Storms, 1979). Attempts to use attribution therapy with other types of problems—notably depression—have not been successful (e.g., Nisbett, Borgida, Crandall, & Reed, 1976). At best, it can be concluded that the effectiveness of attribution therapy is far from proven.

The purpose of the present research was to demonstrate that attribution therapy can be successful when certain recent findings in social cognition are taken into account. First, unlike most previous studies, we attempted to change attributions from stable to unstable causes rather than from internal to external causes. A major assumption of previous research has been that it is most beneficial to change attributions for dysfunctional behavior from pejorative internal causes to external factors. It may be more beneficial, however, to get people to attribute their problems to temporary factors that are apt to change rather than to permanent, unchangeable causes.

For example, it would be of little solace to tell insomniacs that their sleeping problems were due to the sound of traffic outside their windows, even though this is an external cause, because it is a stable cause that is difficult to alter. It might be more beneficial to convince them that their insomnia is due to a temporary illness such as a cold. Although this is an internal cause, its temporary nature might prevent people from exacerbating their problem by worrying about its permanence. We are not denying that people who attribute their problem to pejorative internal causes may worry more than those who do not (cf. Storms, Denney, McCaul, & Lowery, 1979). The point is that people are often more concerned with the prognosis of their problem than with whether its cause is internal.

The argument that it might help people to attribute their problems to unstable causes is similar to Weiner's (1974) discussion of attributions about the causes of success and failure. Weiner argues that the stability/instability dimension of causal attribution is orthogonal to the internal/external dimension, and that the former type of attribution is critical in determining a person's expectations about future performance, affect (cf. Weiner, 1980; Weiner, Russell, & Lerman, 1978), and actual task performance. People who have done poorly on a task and who attribute this failure to enduring, stable factors such as a lack of ability or the insurmountable difficulty of the task, should expect to do poorly in the future, should experience negative affect, and should perform poorly on the task. Encouraging people to attribute their poor performance to temporary causes should increase expectations about future performance, reduce anxiety and feelings of helplessness, and lead to better task performance.

We chose as our target group college freshmen who were concerned about their academic performance. This group of people would seem to be particularly susceptible to damaging attributions about the permanence of their problems. Most freshmen enter college with trepidation about whether they can handle the work, and many are dismayed to discover that the amount of studying required far exceeds that needed to do well in high school. When academic problems first occur, as they do with many freshmen, students may see this as confirming their worst fears about their inability to succeed at college. Such attributions may cause additional worrying and anxiety, making it even more difficult to study. Thus, convincing freshmen that their problems are caused by temporary rather than permanent inhibitory factors may well have beneficial effects.

There have been very few studies that have both encouraged people to attribute their problems to unstable factors and examined the effects of these attributions on subsequent behavior. The few studies that have accomplished this have found encouraging behavioral results (e.g., Andrews & Debus, 1978; Dweck, 1975). However, these studies usually involved teaching people to attribute failure specifically to a lack of effort. We wished to avoid such a direct attributional manipulation, since attributing one's failure to a lack of effort can lead to additional negative affects such as guilt and shame (Weiner et al., 1978). We simply pointed out to subjects that many people experience academic problems as freshmen, but do better in the upperclass years (i.e.,

in Kelley's [1967] terms we presented them with both consensus and consistency information about academic problems). Subjects could thus infer that their own problems were due to unstable causes. The unstable causes they used to explain their difficulties were up to them, and could include such factors as having to learn the ropes in a new environment or temporary homesickness.

Attributing one's problems to such factors should lead to increased expectations about future performance and enhanced affect (i.e., to a sense of relief that the problems are not permanent). These increased expectations and positive affects should in turn lead to less anxiety about academic tasks, increased effort, and hence better performance. The dependent measures were thus subjects' expectations about their future performance, their self-reported affects, and their actual performance.

Self-Report Versus Behavioral Dependent Variables

Though both self-report and behavioral dependent variables were included in the design, there is reason to believe that changes in attributions and affect are more apt to be detected by behavioral measures. It is very common in self-attribution research for behavioral evidence for attributional changes to occur in the absence of self-reported changes in the internal states (e.g., attitudes, affects, traits) mediating the behavior (cf. Nisbett & Wilson, 1977; Wilson, Hull, & Johnson, 1981). Because people have imperfect access to their cognitive processes and internal states, attributional changes are more apt to be detected by behavioral measures. Even when self-report effects are found they are often weaker than the behavioral effects, and the self-report measures rarely correlate very highly with the behavioral measures.

For this reason, unlike most other attribution therapy studies, the chief dependent measures were behavioral: subjects' performance on sample items from the Graduate Record Exam (GRE), whether or not they were still enrolled in college 1 year after the study, and their actual performance in their courses following the study. It was predicted that subjects who received the information indicating that academic problems in the freshman year are temporary would perform better on the GRE items, be more likely to stay in college, and perform better in their courses than would subjects who did not receive this information. Because of the unreliability of self-report effects in previous studies, our predictions about the self-report measures were much less firm. It is not clear when self-report effects that are consistent with behavioral effects will occur in self-attribution studies.

Wilson et al. (1981) have provided some preliminary answers about when self-report effects will occur. They argued that attributional processes can mediate changes in internal states that lead to behavioral changes, but since people have poor access to these processes and states, a verbal explanatory system that attempts to infer the nature of cognitive processes and internal states also operates. If this model is correct, then it should be possible to manipulate the verbal explanatory system independently of the processes mediating behavior. Wilson et al. (1981) accomplished this in two self-attribution studies. For example, in an overjustification study some subjects were rewarded for playing with an interesting puzzle and some were not. Cross-cutting the reward manipulation, some subjects were asked to consider various reasons why they were playing with the puzzle. Subjects in the reward condition subsequently played with the puzzle less in a free-time period, regardless of whether they had reflected on why they initially played with it. That is, rewarded subjects behaved as if they liked the puzzle less than did nonrewarded subjects. Self-reported differences in liking for the puzzle, however, were found only with subjects who had reflected on why they had initially played with the puzzle (i.e., only when the verbal explanatory system was primed by the reasons manipulation).

It thus appears that self-reports of internal states occur under different conditions than behavioral effects, possibly because self-reports and behavior are generated by independent means. Since it is important in the present context to improve not only performance but self-reports as well, an explora-

tory reasons analysis manipulation was included in the design. Cross-cutting the attribution manipulation, half of the subjects were asked to list reasons why they might improve their grades in their upperclass years. In a sense this was an additional attribution manipulation, because it forced subjects to consider why their problems might be due to temporary causes. Following Wilson et al. (1981), however, it was predicted that this verbal attribution manipulation would influence only the self-report dependent measures, by priming the verbal explanatory system. Subjects who were induced to think about why their grades might improve were expected to report more positive moods. Since this explanatory system is hypothesized to be relatively independent of those cognitive processes mediating behavior, the reasons analysis manipulation was not expected to influence the behavioral measures of performance.

Method

Overview

Subjects were college freshmen who were concerned about their academic performance. The experiment employed a 2 (grade point average [GPA] information, no information) × 2 (reasons analysis, no reasons analysis) design. Subjects in the GPA information condition were shown statistical data and videotaped interviews with upperclassmen indicating that most freshmen improve their GPA when they become upperclassmen. Subjects in the reasons analysis condition were asked to list reasons why freshmen might improve their GPA and to indicate the factors that currently affected them. It was predicted that the GPA information would improve their performance on an academic-type test, reduce the number of students who left college in the following year, and improve course performance. The reasons analysis manipulation, by stimulating the verbal explanatory system, was expected to produce improved self-reports of mood but to have no influence on behavior.

Subjects

At the beginning of the second semester of the academic year, all students in the psychology department subject pool at Duke University were given a questionnaire asking for their GPA for the previous semester, the extent to which they worried about their academic performance, how they thought they compared intellectually to their peers, and whether or not they thought they had done as well as they could have in their first semester courses. Subjects were selected only if they were second-semester freshmen who met all of the following criteria: (a) Their response to the question about worrying was equal to or above the median, (b) their first semester GPA was less than or equal to 3.50, (c) they said they had not done as well as they could have in their first semester courses, and (d) they did not say they compared intellectually much better than average to their classmates. Of the 200 freshmen in the subject pool, 71 (22 males, 49 females) met all of these criteria. Of these 71 freshmen, 40 were contacted several weeks after filling out the initial questionnaire and scheduled to participate in the study. No connection was made between the study and the initial questionnaire. Three males and seven females were randomly assigned to each of the four cells of the design.

Procedure

Subjects were seen individually in a small conference room. The experimenter explained to all subjects that she and a faculty member were conducting a large-scale survey of students about their college experiences. Data had already been collected from upperclassmen, she explained, and now they were beginning a survey of freshmen. Subjects were told that they were scheduled individually because "we like to begin by interviewing people in depth before we conduct a mass survey." Subjects were not told how or on what basis they had been selected for the study nor were they told that its purpose was to improve their academic performance. All subjects thought they were participating in a survey.

GPA information manipulation. Half of the subjects were randomly assigned to the GPA information condition. The experimenter explained to these students that she wanted to familiarize them with the type of questions asked and the results of the survey of upperclassmen, in order to "give you a better idea of the kinds of questions we are asking, and to get your reactions to what the upperclassmen said." She instructed them to attend to the information carefully because they would later be questioned about it. The subjects first received a booklet containing a page of results from the survey of upperclassmen. These results, which were selected from an actual survey conducted the summer prior to the experiment, conveyed the fact that many students have problems as freshmen, but that these problems get better (e.g., "67% said their freshman grades were lower than they had anticipated; 62% of the students said their GPA had improved significantly from the first semester of their freshman year to their upperclass years, and 51% said their GPA had improved from the first semester of their freshman year to their sophomore year"). To make this statistical data more vivid and concrete (cf. Nisbett & Borgida, 1975), GPA information subjects were also shown videotaped interviews of upperclassmen who reported that their GPAs had increased since their freshman year. The tapes were of actual interviews with Duke upperclassmen relating accurate personal information (except for GPA), thus resulting in authentic and believable presentations. The format of each interview was identical. First the students (two juniors, two seniors; two males, two females) reported their GPAs for the first semester of their freshman year, the second semester of their freshman year, and for the semester they had just completed. These GPAs were selected so that each respondent reported a steady in-

crease in GPA over time. For example, one person said his GPA went from a 2.0 to a 2.6 to a 3.2. To increase the plausibility of the cover story that this was a general survey, each interviewee was also asked about his or her major, career plans, hometown, leisure-time activities, and favorite books and movies. In addition, subjects in the GPA information condition saw a brief videotape of a psychology professor discussing other results of the survey of upperclassmen. These results were filler items consisting of attitudes about social issues and were unrelated to academic performance.

Subjects in the no-information condition neither received any of the results of the upperclassmen survey nor viewed any videotapes. After receiving the general introduction to the study, they were randomly assigned to either the reasons analysis or no reasons analysis condition.

Reasons analysis manipulation. Half of the subjects in both the GPA and no-information conditions were randomly assigned to the reasons analysis condition. Just prior to filling out the dependent measures, these subjects were given a questionnaire that asked them to list all the reasons they could think of why some students improve their grades from their freshman to their upperclass years, and to indicate which of these reasons applied to them at that time (i.e., which ones helped explain "any academic difficulties you might be having this year"). Subjects in the no-reasons analysis condition were given a questionnaire asking them to write about a filler question, namely to list all the reasons they could think of why the divorce rate is declining in some states. The experimenter was blind to the reasons analysis condition of the subject.

Dependent Measures

To examine both the immediate and the long-term effects of the manipulations, the dependent measures were assessed at several points. At the first session, subjects filled out a questionnaire that contained items about their attitudes toward their performance, their expectations about their future performance, and their mood. They also completed two short-term behavioral measures. All subjects returned 1 week later and completed the same questionnaire and the short-term behavioral measures a second time. Finally, two long-term behavioral measures were assessed: whether subjects remained in college up to 1 year following the study and their performance in their courses in the year following the study. Each of these measures is described in detail below.

Attitudes toward performance. Four items were asked about subjects' attitudes toward the freshman year and toward their own performance. The first question, which was a check on the GPA information manipulation, asked how difficult they felt it was for the "'average' freshman to adjust to the academic and social demands at Duke." The next question asked how pleased subjects were with the way their freshman year was going, while the second and third were identical to two of the pretest questions used for subject selection; namely, how much subjects worried about their academic performance and how they felt they compared "academically and intellectually" to their peers. All questions were answered on 7-point scales with appropriate labels at the endpoints.

Expectations about future performance. Subjects were asked what they thought their GPA would be for the current semester, the following semester, and when they graduated.

Mood scales. Four mood scales were taken from Wessman and Ricks (1966). These scales asked how the person felt "right now" on four dimensions: Elation versus depression, self-confidence versus feelings of inadequacy, alertness versus dullness of thought, and tranquility versus anxiety. For each dimension, subjects circled 1 of 10 statements that best described their mood.

Short-term behavioral measures. After finishing the questionnaire, subjects completed two behavioral measures of performance. First, subjects answered questions taken from a study book for the GRE (Brownstein & M. Weiner, 1978). They were given 2 minutes to read a brief paragraph, after which they completed six multiple-choice questions testing their reading comprehension. Finally, subjects were given 4 minutes to solve 12 anagrams, all names of animals.

All subjects returned 1 week later and completed the dependent measures a second time. The questions from the GRE and the anagrams were different from the ones that subjects answered at Week 1.[1]

Long-term behavioral measures. A few weeks after the second session, a brief description of the study was sent to all subjects, along with an appeal to sign and return a consent form permitting us to examine their academic transcripts. Thirty-six of the 40 subjects (90%) signed and returned the consent form. The GPAs were computed for these subjects for four different semesters: the first semester of their freshman year (a baseline measure, since this was before the study was conducted), the second semester of their freshman year (the time at which the study was conducted), the first semester of their sophomore year, and the second semester of their sophomore year. In addition, a record was kept of the percentage of all the subjects in each condition who left college up to 1 year after the study was completed.

Results

Our main prediction was that the GPA information would significantly increase performance on the behavioral measures. This prediction was confirmed on the GRE per-

[1] The questionnaire that subjects filled out at Week 1 and Week 2 also included several "behavioroid" measures (e.g., a question asking subjects how many classes they cut during the previous week). In addition, at the end of Week 2, subjects were asked if they were doing as well as they should in all of their classes, the extent to which their academic problems were due to unstable and stable factors, and to estimate the percentage of students at Duke who increase their GPA from their freshman to their upperclass years. These measures did not yield useful information and thus will not be discussed further.

formance measure as well as the long-term behavioral measures.

Short-Term Behavioral Effects

The GPA information improved performance on the sample GRE items. Each subject was assigned a score from 0 to 6 according to the number of reading comprehension questions answered correctly at each session. A 2 (GPA information) × 2 (reasons analysis) × 2 (Week 1 versus Week 2) between–within analysis of variance (ANOVA) revealed a significant main effect of the GPA information, $F(1, 36) = 4.48$, $p < .05$, reflecting the fact that subjects in the GPA information condition answered more of the questions correctly than did subjects in the no-information condition (cf. Table 1). No other effects were significant. Subjects who received the GPA information answered 70% of the GRE items correctly on the average, whereas those in the no-information condition answered only 58% correctly. There were no effects of the manipulations on the number of anagrams solved. This may have been due to a ceiling effect, since subjects solved an average of 9.0 of the 12 anagrams.

Long-Term Behavioral Measures

The effects of the GPA information on the long-term behavioral measures were dramatic. As seen in Table 1, 25% (5 of 20) of the students in the no-information condition had left college by the end of their sophomore year, but only 5% (1 of 20) had left college in the GPA information condition. The difference between these percentages is significant ($z = 1.89$; $p = .059$, two-tailed) using the arcsin transformation for proportions (cf. Langer & Abelson, 1972). Thus, the GPA information reduced the percentage of subjects who left Duke by 80%. The reasons analysis manipulation had no detectable effect on the the dropout rates.

Table 1
Behavioral Results

Condition	GRE[a]	Dropouts[b]	GPA[c]
No information	3.50	25	−.05
GPA information	4.18	5	.34

Note. GRE = Graduate Record Examination; GPA = grade point average.

[a] Average number of sample GRE questions answered correctly, averaged over Weeks 1 and 2.

[b] Percent no longer enrolled as of the second semester of the sophomore year.

[c] Average increase in GPA between the second semester of the sophomore year and the first semester of the freshman year. These figures do not include those who dropped out by the second semester of the sophomore year.

Furthermore, of those students who remained at Duke, those in the GPA information condition improved their grades more 1 year following the study. There were no differences between the GPA and no-information conditions on the baseline measure (i.e., their GPAs for the first semester of the freshman year were not significantly different: Ms = 2.58 and 2.87 for the two conditions, respectively, $p > .10$).[2] Therefore three GPA increase scores were computed by subtracting each subject's baseline GPA from his or her GPA for (a) the second semester of the freshman year, the time at which the study was conducted; (b) the first semester of the sophomore year; and (c) the second semester of the sophomore year. By the end of the second semester, freshman year subjects in the GPA information condition had improved their grades slightly (M increase = .11), whereas subjects in the no-information condition showed a slight drop in their grades ($M = -.14$). These increases were not significantly different, which is not surprising since the study was not conducted until midway through the second semester of the freshman year. Subjects in both conditions received better grades in the first semester of their sophomore year as compared to the first semester of their freshman year. The increase in the GPA information condition was larger ($M = .35$) than it was in the no-information condition ($M = .17$), but again this difference was nonsignificant.

By the second semester of their sophomore year, subjects in the GPA information con-

[2] These mean first semester GPAs were computed only on those students who stayed in college through the second semester of their sophomore year and who gave us permission to examine their transcripts ($n = 30$). The mean first semester GPA for all students who gave us permission to examine their transcripts ($n = 36$) was 2.63 in the GPA information condition and 2.82 in the no-information condition, $p = .25$.

dition obtained GPA increases that were significantly higher than they were in the no-information condition, *M*s = .34 and −.05, respectively, $F(1, 26) = 4.27$, $p < .05$. Thus, 1 year after the completion of the study, subjects who had received information indicating that grades increase after the freshman year did in fact increase their grades more than did subjects who did not receive this information. The reasons analysis manipulation had no effect on any of the GPA increases.

It should be noted that the increases in GPA are conservative estimates of the difference between the information conditions. These calculations do not include those subjects who left college by the end of the sophomore year, and more subjects left in the no-information condition. If it is assumed that students who left would not have performed as well in the sophomore year as those who stayed, then the difference between the conditions in GPA increases is smaller than it would be had all students remained in college.[3]

Self-Report Results

Expectations. Two measures were calculated to reflect subjects' expectations about their future academic improvement. Short-term expectations were computed by taking the difference between subjects' predicted GPA for the current semester and for the following semester (first semester of the sophomore year). Long-term expectations were computed by taking the difference between subjects' predicted GPA for the current semester and their predicted GPA at graduation. 2 (GPA information) × 2 (reasons analysis) × 2 (time at which the questions were answered; i.e., Week 1 vs. Week 2) ANOVAs were performed on both measures. There were no significant effects of the manipulations or of time on the short-term predictions. There was, however, a significant main effect of the GPA information on long-term expectations, $F(1, 34) = 5.20$, $p < .05$. Over the long run, subjects in the GPA information condition expected to improve their GPA more than did subjects in the no-information condition (*M*s = .45 and .24, respectively).

Mood results. It was predicted that subjects in the reasons analysis condition would report a more positive mood, since they had been induced to think about why their grades might improve. This prediction was supported by the mood results, at least at Week 1. An overall mood index was formed by summing each subject's score on the four individual mood scales. A 2 (GPA information) × 2 (reasons analysis) × 2 (Week 1 versus Week 2) between–within ANOVA revealed a significant Reasons Analysis × Time interaction, $F(1, 36) = 4.47$, $p < .05$. This interaction reflected the fact that at Week 1, subjects in the reasons analysis condition reported a significantly more positive mood than did subjects in the no-reasons analysis condition, but that there were no differences between the conditions at Week 2 (cf. Table 2). Separate 2 (GPA information) × 2 (reasons analyis) ANOVAs on the mood index at Week 1 and at Week 2 revealed a strong main effect of the reasons analysis manipulation at Week 1, $F(1,$

[3] A possible alternative explanation for the behavioral results is that random assignment failed (i.e., that those in the GPA information condition were initially brighter than those in the no-information condition). An examination of the students' Scholastic Aptitude Test (SAT) scores (obtained from their transcripts) and their GPAs from the first semester of their freshman year indicates that this was not the case. There were no significant differences between the conditions on these measures. Furthermore, analyses of covariance on the behavioral measures (sample GRE items, dropout rates, GPA increases 1 year after the study), using SAT scores as covariates, left the results virtually unchanged. These analyses revealed that (a) in no case did the effects of the manipulations interact significantly with SAT scores (as computed with regression techniques, cf. Nie et al., 1975, pp. 381–383); (b) in no case did SAT scores correlate significantly with the behavioral measures, with the exception of the correlation between verbal SAT scores and sample GRE items, $r(34) = .45$, $p < .01$; and (c) after adjusting for SAT scores, the effects of the GPA information on the behavioral results were virtually identical to those reported above. We should mention, however, one other alternative explanation for the increase in grades in the GPA information condition. Since subjects in this condition started out at a lower point than did no-information subjects (i.e., their first-semester freshman-year GPA was lower), the fact that they increased their grades, but no-information subjects did not, could simply reflect regression to the mean. This alternative seems unlikely, since (a) the difference in first semester GPAs was not significant and (b) the first semester GPA in the no-information condition was not very high ($M = 2.87$), allowing ample room for an increase. However, this interpretation can not be entirely ruled out.

36) = 10.08, $p = .003$, but no effect of the reasons analysis manipulation at Week 2, $F(1, 36) < 1$, *ns*. There were no significant main effects or interactions involving the GPA information manipulation on any of these ANOVAs. Thus, the reasons analysis manipulation improved the subjects' mood at Week 1, but this effect had worn off by Week 2.

Other questionnaire responses. Subjects answered four questions about their attitudes toward their freshman year and their academic performance. The first question asked how difficult they thought it was for the average freshman to adjust to college life. A 2 × 2 × 2 between–within ANOVA revealed that subjects who received the GPA information thought that it was more difficult for freshmen to adjust than did those who did not receive this information, *M*s = 3.08 and 3.86, respectively; $F(1, 36) = 8.79$, $p < .01$. This result may be viewed as a confirmation of the effectiveness of the GPA information manipulation. Telling subjects that freshmen typically improve their grades once they become upperclassmen convinced them that the freshman year is a difficult one. There were no other significant effects on this measure.

Subjects also rated how pleased they were with their own freshman year, how much they worried about their performance, and how they felt they compared academically to their peers. These were intended as exploratory items on which no firm predictions were made. Convincing people that their academic problems are caused by temporary factors might cause a sense of relief. On the other hand, this does not change the fact that they are having problems. In fact, the GPA or reasons analysis manipulations might focus attention on current problems and thus make people feel temporarily worse about their work.

Table 2
Self-Reported Mood

Condition	Week 1	Week 2
No reasons analysis	23.25	25.10
Reasons analysis	26.30	24.95

Note. These scores represent the sum of responses to four separate mood scales. A higher number indicates a more positive mood.

The results of the question about how pleased subjects were with the way their freshman year was going suggests that the latter effect occurred, at least at Week 1. A 2 × 2 × 2 between–within ANOVA revealed a significant main effect of the GPA information manipulation, $F(1, 36) = 4.80$, $p < .05$, which was qualified by a GPA Information × Time interaction, $F(1, 36) = 4.38$, $p < .05$. At Week 1, subjects in the GPA information condition reported being less pleased than did those in the no-information condition (*M*s = 3.65 and 4.85, respectively). This difference was less pronounced at Week 2 (*M*s = 4.20 and 4.75, respectively).

Since the questions about how much subjects worried and how they thought they compared to their classmates were identical to ones asked several weeks earlier, 2 (GPA information) × 2 (reasons analysis) × 3 (initial ratings, Week 1 ratings, Week 2 ratings) between–within ANOVAs were performed on these questions. These ANOVAs failed to reveal any effects of the manipulations on either measure. There was a significant main effect of time on the question about how much subjects worried about their performance, $F(2, 72) = 6.56$, $p < .005$, reflecting the fact that all subjects tended to worry less over time.

Discussion

The results of the present study were nothing less than dramatic. By giving freshmen information indicating that academic problems during the freshman year are temporary, we succeeded in (a) improving their performance on sample GRE items, (b) lowering the percentage of these students who left college, and (c) improving their GPA 1 year after the completion of the study. The magnitude of these behavioral effects may seem large, especially considering that the GPA information was a one-time manipulation. It should be noted, however, that the magnitude of these effects are similar to the findings of other studies that have used one-time interventions to help college students. Hanusa and Weiss (1979), for example, had a group of incoming freshmen participate in a one-session social skills training program. They found that these students significantly

improved their grades over the course of their first semester, whereas a control group did not. In the present study, a simple and straightforward attributional intervention has been identified that had similar long-term effects.

As in most other self-attribution studies, evidence for the attributions and internal states that were mediating the behavioral results is hard to come by (Nisbett & Wilson, 1977). Consistent with Weiner's (1974) model of attribution, subjects who received the GPA information reported higher expectations of future academic success, which, according to Weiner (1974), can mediate actual improvement in performance. The GPA information did not, however, produce reports of enhanced mood, which might also have mediated the behavioral results.

On the face of it, this pattern of results seems to support the notion that subjects' expectations mediated the changes in academic performance but their moods did not. The correlations between the self-report and behavioral measures, however, indicate that even the self-reported expectations may not have had a causal influence on behavior. Of the dozens of correlations computed between the self-report (i.e., the expectations, mood, and all other questionnaire measures) and the performance measures (i.e., GRE scores, dropout rates, GPA increases), no more were significant than would be expected by chance, and the significant correlations were evenly divided in a positive and negative direction. Even the correlations between the expectancy and the performance measures were low. Subjects' long-term expectations about grade improvement, for example, correlated −.03 with the scores on the sample GRE items, .21 with whether or not the student was enrolled 1 year later, and −.31 with the increase in grades 1 year later. None of these correlations was significant. Thus, the present study, along with dozens of other self-attribution studies, found powerful behavioral effects in the absence of self-report evidence for the mediating cognitive processes and internal states.

The fact that none of the self-report measures correlated with the performance measures is consistent with the idea that self-reports are generated by an explanatory system that is at least partially independent of the processes mediating behavior. Furthermore, the fact that the reasons analysis manipulation improved subjects' mood (at least at Week 1), but had no effect on the behavioral results at any time, suggests that the explanatory system can be manipulated independently of the behavioral system. Self-reports of new internal states (i.e., traits and attitudes in Wilson et al. [1981], mood in the present study) are more likely to be found when subjects are asked to deliberate about the reasons for their actions.

Unfortunately it is not yet clear which types of self-reports are most apt to be changed by reasons analysis manipulations. Asking subjects to think about reasons led to reports of more positive moods in the present study but did not influence expectations about future performance or reports of attitudes about performance. It is becoming increasingly clear, however, that the conditions under which people will change their behavior in accord with attributional predictions differ from the conditions under which people will change self-reports of internal states. Thus, practitioners interested in using attribution therapy should decide whether their goal is to change behavior or self-reports and choose their techniques accordingly.

This position bears some similarity to Leventhal's (1970) parallel response model of attitude change. The traditional attitude model holds that a stimulus such as a persuasive communication triggers emotional and attitudinal responses which then cause changes in behavior. In contrast, Leventhal (1970) argues that attitudinal, emotional, and behavioral responses are not linked in a sequential chain but instead occur in parallel, each with its own set of antecedents. We are proposing a similar alternative to the traditional view of self-attribution processes. The traditional attribution model states that attributional manipulations (e.g., the GPA information in the present study) lead to causal inferences about the self (e.g., "The causes of my academic problems are unstable and temporary"), which lead to new internal states (e.g., increased expectations or improved moods), which lead to changes in behavior (e.g., improved academic performance). We are not disputing that such a process occurs; indeed, we hold that such a

process accounts for our behavioral results. However, we argue that people's ability to *report* these attributions and internal states is limited, and that people thus rely on an explanatory system to generate verbal reports. As implied by the present results, these reports by the explanatory system do not always correctly represent the attributions and the states mediating behavior.

These theoretical matters, though important, should not obscure the practical significance of the present results. An inexpensive, simple procedure has been found to help people concerned about their academic performance. Videotaped interviews with upperclassmen who report that they had temporary problems as freshmen could easily be shown as part of a freshman advising program, or even shown on a mass scale at freshman orientations. The present results imply that such viewings would lead to considerable academic improvement.

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