# Optimism and Attributional Retraining: Longitudinal Effects on Academic Achievement, Test Anxiety, and Voluntary Course Withdrawal in College Students[1]

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A longitudinal study examined how optimism and attributional retraining (AR) influenced 256 first-year college students' test anxiety, cumulative academic achievement, and course persistence in college over an academic year. Students' optimism was assessed at the start of the academic year and they were assigned to either an AR or no-AR (control) condition. Measures of students' test anxiety, cumulative grade point average, and voluntary course withdrawal were obtained at the end of the academic year. Results suggest that although high optimism was an academic risk factor among students who did not receive AR, high-optimism students who did receive the AR cognitive intervention benefited from its effects to a greater extent than did low-optimism students.

The initial transition to college introduces a multitude of challenges into the lives of students that continues throughout their academic development. Specific institutional and situational factors combine with individual differences to influence how students adapt to the college experience, which, directly and indirectly, affects their long-term academic success. Two of these—namely, optimism, which is an individual-difference variable, and attributional retraining, a cognitive intervention—each have been found to affect college students in making the transition to university and beyond (Perry, Hechter, Menec, & Weinberg, 1993; Peterson, 2000). The current longitudinal study examines optimism and attributional retraining in terms of how, separately and in combination, they influence students' test anxiety, cumulative grade point average (GPA), and persistence in college over the course of an academic year.

[1]This study was supported by a research grant (410-99-0435) to the second author from the Social Sciences and Humanities Research Council. Parts of the research in this study were presented at the annual meeting of the American Educational Research Association in Seattle, Washington, April 2001.

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*Journal of Applied Social Psychology*, 2004, **34**, 4, pp. 709-730.




## Dispositional Optimism

As a concept, optimism has its origins in a form of folk wisdom that concerns whether people expect good (or conversely bad) things to happen to them (Carver & Scheier, 2000). This difference between individuals, representing the power of possibility, often can shape the meaning of their lives (Domino & Conway, 2000), leading Scheier and Carver (1987) to describe this "general expectation that good things will happen" (p. 171) as *dispositional optimism*. Dispositional optimism relates to positive expectations regarding possible outcomes such that optimistic individuals are confident that they will attain their goals successfully (Carver, Reynolds, & Scheier, 1994; Peterson, 2000; Scheier & Carver, 1993). Since Scheier and Carver's (1985) early work with dispositional optimism, it has gained popularity as a personality construct among psychologists who have studied its impact in various contexts, ranging from academic performance to health and aging (e.g., Helgeson, 1999; Lai & Wan, 1996; Lennings, 2000).

Being optimistic can have many positive consequences for individuals through enhancing physical and psychological well-being, decreasing traumatic distress, and increasing motivation and marital satisfaction (Dougall, Hyman, Hayward, McFeeley, & Baum, 2001; Scheier & Carver, 1987; Taylor & Brown, 1988). Dispositional optimism is also associated with active coping, effective problem solving, resilience in the presence of stressful life events, and, in the college setting, it has been associated with academic success (Aspinwall, Richter, & Hoffmann, 2000; Floyd, 1997; Kao & Tienda, 1995; Peterson, 2000; Scheier & Carver, 1987). Optimists also tend to attribute their problems to temporary, specific, external causes, rather than to stable, global, internal causes (an insidious pattern characteristic of helplessness in failure situations; Gillham, Shatte, Reivich, & Seligman, 2000).

Considering that this personality construct has a solid link to expectations, motivation, and performance, it is no surprise that individual differences in dispositional optimism are believed to be important for college students' academic development. The college experience is full of adversities and stressful situations for students to deal with, and while some students tend to give up when faced with academic hardships, optimistic students may be more persistent because they believe they can attain their goals even when difficulties arise (Peterson, 2000).

## Costs of Optimism

Although it appears that being optimistic is positive in many ways, some researchers have found that optimism can also be costly if it is too unrealistic (Peterson, 2000). For instance, Weinstein (1989) found that optimistic individuals tended to underestimate the likelihood of falling ill or having aversive events

occur in their lives. As a result, these overly optimistic individuals consequently may fail to take proper health precautions and may engage in more risky behaviors (e.g., smoking, unprotected sex), as compared to less optimistic individuals. This difference in behavior appears to be a result of the attitude of overly optimistic individuals that "bad things won't happen to me" or essentially viewing themselves as invincible (Fromme, Katz, & Rivet, 1997). Thus, while it may be beneficial not to worry needlessly about potential disaster every moment of one's life, it may also be detrimental not to be prepared when something negative does happen.

Unrealistic optimism may occur for several different reasons. Higgins, St. Amand, and Poole (1997) cite cognitive and motivational mechanisms as determinants of unrealistic optimism, two examples of cognitive mechanisms being egocentrism (i.e., believing oneself to be less vulnerable than other people) and representativeness or the salience of the prototype (Weinstein, 1980). The motivational mechanism involved in unrealistic optimism is self-deception, whereby individuals disregard or distort the possibility of bad things occurring in an attempt to reduce anxiety. Thus, unrealistic optimism may result from both cognitive and motivational mechanisms and may affect health, social, criminal, and academic outcomes (Higgins et al., 1997).

Of interest to us is empirical evidence indicating that unrealistic optimism occurs within the achievement context. Although common sense would suggest that optimistic students would strive harder to reach their goals than would less optimistic students, and thereby do better, it is also possible that overly optimistic students are more likely to disengage from academic work because they set unrealistically high goals or inflate their perceived academic abilities. Robins and Beer (2001), for example, found that some overly optimistic students withdraw psychologically from the academic context (i.e., view grades as progressively less important) in order to protect themselves from the negative effects of failure, but they also may need to disengage because they initially set unrealistically high goals. Further, these unrealistically high goals may be based on uncontrollable causal attributions (e.g., luck, ability), resulting in reduced feelings of control over academic outcomes. Providing attributional retraining in these circumstances may allow overly optimistic students to transform their maladaptive casual attributions into adaptive causal attributions. Specifically, by replacing uncontrollable, stable causal attributions with controllable, unstable attributions (e.g., effort, strategy), the disengaging tendencies of unrealistic optimists may be minimized and their feelings of control restored. More will be said about the possible benefits of attributional retraining in a later section of this paper.

Another drawback to unrealistic optimism is the possibility that students may expect only good things to happen and thus fail to formulate a backup plan when less desirable outcomes occur. In addition, highly positive illusions have been found to decrease ego involvement, self-esteem, and well-being during the



academic year, though they may be beneficial to students in the short term as an ego-protection mechanism (Colvin & Block, 1994; Paulus, 1998). Robins and Beer (2001), for example, showed that a self-enhancement bias did not promote superior academic performance among college students, and optimistic students did not receive higher grades than did less optimistic students. Thus, they argue that many of the positive effects of optimism discovered by researchers "may reflect a general tendency to bolster self-esteem by denying information that threatens self-worth, . . . reflecting defensive denial rather than actual psychological adjustment" (p. 340).

Although there is empirical support for both perspectives on optimism, the existing research has not yet fully resolved under what circumstances optimism is a benefit or a liability. Thus, the extent to which positive illusions are functional remains open to debate. Adapting Weiner's (1986, 1995) attribution theory to examine optimism in terms of causal attributions may provide some clarification of the issue. Specifically, it is possible that optimism is *beneficial* because high-optimism students may attribute positive and negative academic outcomes to controllable, unstable causes, such as effort or strategy. These attributions will enhance achievement striving because they enable those conditions producing success to be repeated and those producing failure to be changed. Optimism may be *harmful*, however, if high-optimism students instead attribute positive and negative outcomes to uncontrollable, stable causes, such as ability. In the latter case, it may be a benefit to attribute success to high ability, which is an uncontrollable, stable cause, but in the event of failure, which is much more common in the first year of college, a similar uncontrollable, stable attribution (low ability) can be very detrimental to further achievement striving. Thus, previously disparate research findings regarding optimism may be due to differences in causal attributions for positive and negative outcomes.

It is important to note that the current study involves a unique group of participants; namely, first-year college students, whose experiences with the realities of university life can be extremely limited. These low-control environments (Thompson, Sobolew-Shubin, Galbraith, Schwankovsky, & Cruzen, 1993) are comprised of a variety of novel experiences, depending on the student, such as (a) an emphasis on success–failure, (b) heightened academic competition, (c) increased pressure to excel, (d) more frequent academic failure, (e) unfamiliar academic tasks, (f) critical career choices, and (g) new social networks. Thus, the transition from high school into college can be extremely stressful on students when considering their naïveté in terms of what to expect academically. In this regard, Perry, Hladkyj, Pekrun, and Pelletier (2001) proposed a paradox of failure in which bright enthusiastic high school students often are unable to adjust to the increased demand for self-initiative and autonomy. Thus, it is possible that high optimism can be a risk factor for this population because they have little previous experience on which to base their positive academic expectations. If so, high

optimism may be a greater risk factor among students with no previous college experience compared to second- or third-year college students, who may be high in optimism, but who also have more realistic expectations, having experienced previous academic successes and failures. Further, if highly optimistic students attribute their academic outcomes to uncontrollable, stable causes (e.g., ability), they run the risk of experiencing severe disappointment and apathy once they begin to encounter failure with some regularity. Consequently, by altering the maladaptive (uncontrollable) causal attributions of optimistic first-year college students to adaptive (controllable) causal attributions, the benefits of optimism may be maximized and the costs nullified, resulting in fewer subsequent failure experiences.

## Attributional Retraining

Attributional retraining, based on Weiner's (1986, 1995) theory of achievement motivation and emotion, is designed to enhance academic motivation and achievement striving. According to Weiner's theory, individuals continuously seek to explain outcomes and events in their daily lives. Within the college setting, these explanations or causal beliefs about academic performance influence subsequent motivation and achievement among students (Perry et al., 1993). Poor performance on a test attributed to lack of ability, an uncontrollable and stable cause, will lead to lower motivation to perform in the future. In contrast, if poor performance is attributed to low effort, a controllable and unstable cause, motivation to invest more effort into future performance is enhanced. Thus, attributional retraining focuses on inducing effort attributions for failure and related unstable, controllable causes, thereby increasing students' perception of control over their academic performance (Menec et al., 1994).

Research by Perry and his colleagues (Menec et al., 1994; Perry et al., 1993; Perry & Struthers, 1994; Struthers & Perry, 1996) has shown that attributional retraining leads to enhanced motivation, increased perceived control, and better academic performance among college students in both laboratory and actual classroom settings. Although some research suggests that attributional retraining should benefit all types of students, Wilson and Linville (1982, 1985) found individual differences among students in terms of the effectiveness of this psychotherapeutic intervention. Subsequent research has revealed that attributional retraining is most effective when applied to at-risk students (Perry & Penner, 1990). Menec et al., for example, found that college students who had low perceived control (external locus of control) over their academic performance performed better following attributional retraining, while high-control (internal locus of control) students did not. Similarly, Perry and Struthers found that college students with low perceived success regarding academic performance benefited from attributional retraining, whereas their high perceived-success



counterparts did not. That is, for low-success students, those who received attributional retraining (AR) outperformed a no-AR control group by more than one letter grade in a full-year psychology course. Thus, it appears that while AR can have positive effects on subsequent academic performance of college students in general, those students who are at risk academically may benefit the most from this cognitive intervention.

The current study examines whether optimism is adaptive in an academic setting when combined with a psychotherapeutic intervention involving AR. Based on past findings that AR is beneficial for certain at-risk students (Menec et al., 1994; Perry & Struthers, 1994), we predicted that if high (unrealistic) optimism is a risk factor among college students, AR would benefit these students in comparison to their counterparts who did not receive AR. Specifically, overly optimistic students who received AR would have less test anxiety, higher cumulative grade point averages, and withdraw from fewer courses than would overly optimistic students who did not receive AR. Thus, the optimism trait itself would not change; rather, achievement-related causal attributions would be altered so that the positive expectations of overly optimistic students would gain a more realistic basis. Further, if high optimism is a risk factor, we also expected that the positive impact of AR would apply to highly optimistic students, but not to less optimistic students. Specifically, high-optimism students who received AR would differ significantly in outcome measures, compared to those high-optimism students who did not receive the intervention; whereas low-optimism students who received AR would not differ significantly in outcome measures, compared to low-optimism students who did not receive AR.

## Method

### *Participants*

A sample of 236 (156 female, 57 male, 23 gender not specified) first-year students from a large, midwestern university was recruited from several sections of an Introductory Psychology course in exchange for experimental credit. Participants' ages ranged from 17 to 42 years (*Mdn* = 19).

### *Measures*

*Dispositional optimism.* At the beginning of the academic year, students completed seven items adapted from Scheier and Carver's (1985) Life Orientation Test (LOT), a Likert-style measure of dispositional optimism. The LOT is a well-established measure that has been used to assess the role of optimism in a wide variety of domains, such as health, athletic, and academic settings (Chang, 1998; Hellandsig, 1998; Stoecker, 1999). Four of the items of the LOT are worded in a positive way (e.g., "In uncertain times, I usually expect the best"), and three of

the items are worded in a negative way (e.g., "I hardly ever expect things to go my way"), with responses ranging from 1 (*strongly disagree*) to 10 (*strongly agree*; Cronbach's internal reliability, $\alpha = .78$; test–retest reliability after 13 weeks, $r = .72$; Scheier & Carver, 1985). Responses for the negative items were reverse-coded, and then scores on each item were summed so that high scores reflect high levels of optimism and low scores reflect low levels of optimism ($M = 36.59$, $SD = 9.62$: low-optimism group, $M = 28.65$, $SD = 6.26$; high-optimism group, $M = 43.84$, $SD = 5.55$.

*Attributional retraining (AR)*. Students were assigned to either an AR condition ($n = 184$) or no-AR control condition ($n = 52$), based on the section of the Introductory Psychology course from which they were recruited. The AR condition consisted of an informational session emphasizing the positive effects of effort attributions on college performance, as opposed to ability attributions, and that ability-related performance is unstable and would likely improve throughout their educational development (Menec et al., 1994; Wilson & Linville, 1982). AR was presented to students in one of three ways: via videotape; videotape followed by a brief group discussion; or a handout. Participants in the videotape-only AR condition ($n = 70$) viewed a brief 8-min film about two students discussing their academic failure experiences. One student explained to the other that after performing poorly in his courses, he began to put more effort into studying and his grades improved accordingly. At the end of the video, the importance of increasing effort to enhance performance is emphasized.

Students assigned to the video-and-discussion AR group ($n = 44$) watched the same film as the previous AR group, which was followed by a 20-min discussion. The discussion consisted of the students talking about their own success and failure experiences, while the experimenter explained the importance of using adaptive attributions, such as effort and strategy, to explain their academic performances. The third AR group (handout only; $n = 56$) was given a one-page handout that summarized the benefits of changing dysfunctional causal attributions for failure (i.e., lack of ability) to functional attributions (i.e., lack of effort) and was instructed to read the handout carefully. The control group completed a filler questionnaire that took approximately the same amount of time to complete as the AR sessions. A similar AR design has been used successfully in previous academic research (Perry & Penner, 1990).

*Graduating high school percentage*. At the beginning of the year, high school achievement was assessed by obtaining the mean percentage of all course grades from the students' senior year of high school ($M = 75.81\%$, $SD = 8.65$). High school percentage was calculated by averaging students' final grades in their college entrance courses (English, mathematics, chemistry, and physics), which were obtained from institutional records. The overall high school percentage ranged from 57% to 95%. Previous research has shown that self-reported high school grades correlate strongly with students' final course grades in college



($r = .54$; e.g., Perry et al., 2001). By using students' actual high school averages, rather than their estimates, we hoped to improve the accuracy of our estimates of students' aptitudes.

*Test anxiety.* Toward the end of the academic year, the students completed a 37-item true/false measure of test anxiety adapted from Sarason's (1975) Test Anxiety Scale, a widely used indicator of test anxiety in academic settings (e.g., Hammermaster, 1989; Jain, 1986). The Test Anxiety Scale includes items such as "I wish exams did not bother me so much" ($M = 53.54$, $SD = 7.03$; $\alpha = .80$). Responses for each item were summed so that high scores reflect high test anxiety and lower scores indicate lower test anxiety.

*Cumulative grade point average (GPA).* Academic achievement was defined as students' cumulative GPA at the end of the school year (e.g., 4.5 = A+, 4.0 = A, 3.5 = B+; $M = 2.51$, $SD = 1.06$). GPA is calculated by summing and averaging final grades for each of the courses in which students were enrolled. Final grades, in turn, are determined by averaging test scores, assignment marks, and final exam scores within each course. Thus, GPA represents an aggregate of students' academic achievements across all courses for the entire school year.

*Voluntary course withdrawal (VW)*. Attrition was assessed by the number of credit hours students dropped during the year, where 3 credit hours were equivalent to a one-semester course and 6 credit hours were equivalent to a two-semester course ($M = 3.29$, $SD = 5.12$). Generally, students are permitted to enroll in a minimum of one 3-credit-hour course (3 hours) per academic year, or a maximum of five 6-credit-hour courses (30 hours) per academic year. Prior to dropping any courses, students in the current study were enrolled in an average of 22.5 credit hours for the academic year.

### *Procedure*

The current study was conducted in three phases. *Phase 1* took place approximately 1 month into the academic year, timed intentionally to ensure that all students had written and received feedback on their first Introductory Psychology test. All participants signed up for a session time to complete the surveys, which were administered to groups of 25 to 50 students per session. The questionnaire used in the first phase of the experiment included a measure of dispositional optimism.

In *Phase 2* (approximately 1 month later), all participants were assigned to either an AR condition or to a no-AR control condition. Depending on the condition to which they were assigned, participants attended an AR session or completed a filler questionnaire.

In *Phase 3*, which took place toward the end of the academic year, all students completed a questionnaire that included a measure of students' test anxiety. At the end of the academic year, participants' cumulative GPA and VW were obtained from institutional records.

## Results

### *Rationale for Analyses*

Because we were interested in examining unrealistic optimism as a potential risk factor, we sorted students into two categories: low and high (unrealistic) optimism groups. For all median splits, scores at or above the median were classified as high. Median splits were chosen as our analytic approach because we were primarily interested in examining the more distinct categories of low or high optimism, since they are of greatest interest to the research literature.[3] Although a dropped median would have been optimal for these analyses, it was not possible in the current study because when the median was dropped, sample sizes in the low- and high-optimism groups were too small.

Optimism (Low vs. High) by AR (AR vs. No AR) 2 × 2 factorial ANCOVAs were used, with cumulative GPA and VW as dependent measures, and high school percentage as the covariate. The effects of optimism and AR on students' test anxiety were assessed using an Optimism (Low vs. High) × AR (AR vs. No AR) 2 × 2 factorial ANOVA without high school percentage as a covariate. High school percentage was not included as a covariate for the test-anxiety analyses for two reasons. From a statistical standpoint, because it was uncorrelated with test anxiety, including high school percentage as a covariate in the Optimism × AR interaction would have decreased the power of the *F* statistic. Moreover, while high school achievement may be a good indicator of future academic achievement or course withdrawal (e.g., Perry et al., 2001), it does not necessarily predict students' test anxiety to the same extent. Because this study is in part exploratory in nature, a liberal significance level (*p*) of .10 was adopted for the analyses due to our concern that a more conservative significance level would result in committing Type II errors, thus obscuring important effects.

### *Preliminary Analyses*

In order to ensure that differences in grading practices or teaching methods between course instructors were not confound with the effects of optimism and AR on the dependent measures, a preliminary one-way ANOVA was run with course instructor as the independent variable; and cumulative GPA, VW, and test anxiety as the dependent measures. No significant differences were found between course instructors of different Introductory Psychology classes on any of the dependent measures: cumulative GPA, $F(5, 197) = 0.45$, *ns*; VW, $F(5, 211) = 0.87$, *ns*; and test anxiety, $F(5, 123) = 1.60$, *ns*, indicating that the effects of the main analyses would not be due to instructor effects.

[3]For those readers interested in a three-group optimism analytic model, preliminary analyses revealed that splitting students into three optimism groups (low, moderate, and high optimism) did not add any new information to our findings. Specifically, all three groups were similar in academic achievement ($M = 2.84$, 2.44, and 2.62 for low, moderate, and high optimism, respectively), $F(2, 42) = 0.84$, *ns*; test anxiety ($M = 3.00$, 4.88, and 5.57, respectively), $F(2, 45) = 0.49$, *ns*; and VW rates ($M = 54.44$, 53.50, and 55.25, respectively), $F(2, 29) = 0.12$, *ns*.



*Attributional retraining (AR) conditions*. Preliminary one-way ANOVAs revealed no significant differences between the three types of AR conditions (video, video-and-discussion, handout) on any of the dependent variables. Specifically, for GPA, the handout group, video group, and video-and-discussion group did not differ significantly ($M = 2.55$, 2.78, and 2.83, respectively), $F(2, 167) = 1.73$, *ns*. Similarly, these groups did not differ on either VW ($M = 3.75$, 2.85, and 2.35, respectively), $F(2, 181) = 1.54$, *ns*; nor did they differ on test anxiety ($M = 55.5$, 52.59, and 51.67, respectively), $F(2, 104) = 2.95$, *ns*. Thus, all three groups were combined to create our single AR condition, which was compared to the no-AR (control) condition.

*Correlations*. The correlations between all variables are presented in Table 1. Optimism was negatively related to test anxiety ($r = -.26$, $p < .01$), so that the more optimistically students rated themselves, the less test anxiety they reported throughout the academic year. In addition to its relation to optimism, test anxiety was correlated negatively with students' academic achievement, as might be expected: The more anxiety they experienced, the lower was their cumulative GPA ($r = -.29$, $p < .01$). An expected positive correlation between high school percentage and cumulative GPA ($r = .61$, $p < .001$) and a negative correlation with VW ($r = -.15$, $p < .05$) indicated that higher achievement in high school was associated with higher college achievement and greater course persistence. Finally, students' GPA and VW rates were negatively correlated, so that the better their academic performance, the fewer courses they dropped ($r = -.20$, $p < .01$). It is important to note that the absence of correlations between high school percentage with either AR or optimism validates the random assignment of students into either AR or control groups, and confirms that optimism was not related to students' academic aptitude (Table 1).

### *Main Analyses*

*Academic achievement*. Table 2 presents the means and standard deviations of the study variables. As indicated in Table 3, there was no main effect for optimism on cumulative GPA, $F(1, 180) = 0.77$, *ns*, but AR did have a significant main effect, $F(1, 180) = 3.19$, $p = .08$, qualified by an interaction with optimism, $F(1, 180) = 4.12$, $p < .05$. Interestingly, in the control (no AR) condition, high-optimism students had a lower GPA ($M = 2.22$) than did low-optimism students ($M = 2.72$), $t(36) = 1.81$, $p = .08$, indicating that high optimism may be a risk factor for students who do not receive AR. This effect is notable because it was detected despite the fact that it occurs with a global measure of cumulative GPA,

Table 1

*Zero-Order Correlations Among Study Variables*

| Variable | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 1. Optimism | — | .03 (220) | .06 (218) | -.26** (137) | .06 (204) | -.03 (220) |
| 2. Attributional retraining | | — | .02 (221) | -.17 (141) | .10 (219) | -.13* (236) |
| 3. High school percentage | | | — | -.15 (137) | .61** (207) | -.15* (221) |
| 4. Test anxiety | | | | — | -.29** (130) | .16 (141) |
| 5. Grade point average | | | | | — | -.20** (219) |
| 6. Voluntary course withdrawal | | | | | | — |

*Note.* Values in parentheses refer to *n* sizes.
*$p < .05$. **$p < .01$.



Table 2

*Means and Standard Deviations of Study Variables*

| Measures | *M* | *SD* |
|---|---|---|
| High school percentage | 75.81 | 8.65 |
| Optimism | 36.59 | 9.62 |
| Cumulative grade point average | 2.51 | 1.06 |
| Voluntary course withdrawal | 3.29 | 5.12 |
| Test anxiety | 53.54 | 7.03 |




*Figure 1.* Effects of optimism and attributional retraining on students' cumulative grade point average.

a compilation of many tests and assignments in numerous courses, which potentially contains a large amount of error. In fact, high-optimism/no-AR students had the lowest GPA of the four groups (Figure 1). However, high-optimism students also benefited the most from the positive effects of AR: high-optimism students who received AR performed significantly better ($M = 2.82$) than did high-optimism students who did not receive AR ($M = 2.22$), $t(94) = 2.56$, $p < .05$ (Figure 1). Of note is that this difference translates into more than a letter grade difference between highly optimistic students who received AR and those who did not (e.g., a grade of B vs. C+). For low-optimism students, no differences in GPA emerged between control ($M = 2.72$) and AR conditions ($M = 2.67$), $t(87) = 0.25$, *ns*.

Table 3

*Main and Interaction Effects of Optimism and Attributional Retraining (AR) on Cumulative Grade Point Average (GPA), Voluntary Course Withdrawal (VW), and Test Anxiety*

| Variable | GPA | | | VW | | | Test anxiety | | |
|---|---|---|---|---|---|---|---|---|---|
| | *df* | *MS* | *F* | *df* | *MS* | *F* | *df* | *MS* | *F* |
| High school percentage | 180 | 45.79 | 104.60*** | 189 | 84.13 | 3.26† | — | — | — |
| AR | 180 | 1.40 | 3.19† | 189 | 168.67 | 6.53* | 133 | 14.29 | 0.98 |
| Optimism | 180 | 0.34 | 0.77 | 189 | 67.27 | 2.61 | 133 | 46.11 | 0.30 |
| AR × Optimism | 180 | 1.80 | 4.12* | 189 | 164.05 | 6.35** | 133 | 197.19 | 4.19* |

*Note.* Numerator *df* = 1 for all *F* tests.
†$p < .10$. *$p < .05$. ***$p < .001$.






*Figure 2.* Effects of optimism and attributional retraining on students' voluntary course withdrawal.

*Voluntary course withdrawal (VW).* Although optimism produced no significant main effect, $F(1, 189) = 2.61$, *ns*, AR had a significant main effect on voluntary course withdrawal, $F(1, 189) = 6.53$, $p < .05$, where students who received AR dropped fewer credit hours than did those who did not receive AR (Table 3). The interaction between AR and optimism was also significant, $F(1, 189) = 6.35$, $p < .05$. Multiple-comparison *t* tests reveal that for low-optimism students, AR compared to no AR made no difference in number of credit hours dropped ($M$ = 3.26 vs. 3.24), $t(92) = 0.02$, *ns*, yet for high-optimism students, receiving AR resulted in greater course persistence, when compared to high-optimism students who did not receive AR ($M$ = 2.34 vs. 7.26), $t(98) = 3.19$, $p < .01$ (Figure 2). The difference between high- and low-optimism groups in the no-AR condition was not statistically significant ($M$ = 7.26 vs. 3.24), $t(37) = 1.47$, $p = .15$, however, high-optimism students in the no-AR group dropped more than twice as many credit hours as did low-optimism students in the control group—a matter of practical significance to many college administrators. Thus, similar to achievement findings, high optimism appears to be a potential risk variable for course attrition, yet the risk is significantly decreased when high-optimism students are given AR.

*Test anxiety.* There were no significant main effects for test anxiety, but again the interaction between optimism and AR was significant (Table 3), $F(1, 133) = 4.19$, $p < .05$. Multiple-comparison *t* tests reveal that high-optimism students who received AR experienced less test anxiety ($M$ = 51.6) than did high-optimism students who did not receive AR ($M$ = 56.23), $t(103) = 3.40$, $p < .01$ (Figure 3). Further, low-optimism students in the control group did not differ in reported test anxiety from low-optimism students who received AR ($M$ = 53.96 vs. 56.22),

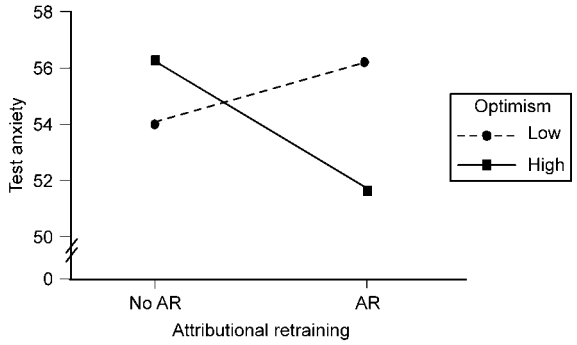


*Figure 3.* Effects of optimism and attributional retraining on students' test anxiety.

$t(62) = 1.12$, *ns*. In the control group, students with high optimism did not differ on test anxiety from students with low optimism, $t(30) = 0.58$, *ns*. In this case, unlike achievement and voluntary course withdrawal, optimism was not a risk factor for test anxiety, but similar to achievement and VW, highly optimistic students' test anxiety benefited from the positive effects of AR.

## Discussion

The current study makes an important contribution to the research on the positive benefits of AR (Menec et al., 1994; Perry & Penner, 1990; Perry & Struthers, 1994) by showing that, for overly optimistic students, AR led to their improved academic performance in a college setting. Significantly, the current study extends our knowledge beyond previous AR research that used more limited measures of academic achievement (final course grade) to include outcome measures of cumulative achievement (GPA) and voluntary course withdrawal across all courses for that year. This is particularly important because academic performance is not based on a single course outcome, but includes all of the students' courses for that year. Thus, the AR effect appears to have been powerful enough to positively influence students' performance and retention, not only in their Introductory Psychology course, but in all of their courses for that academic year, as reflected in their cumulative GPA and VW rates. Further, this study extends earlier research to include an important dispositional variable (optimism) not commonly regarded as having academic risk qualities. Therefore, this study contributes to previous research by suggesting that AR can lead to higher achievement, lower test anxiety, and greater persistence in college courses among high-optimism students.



The current study also extends past research regarding the benefits and liabilities of optimism. For instance, previous researchers have stated that positive illusions may be beneficial in the short term, but not in the long term (Colvin & Block, 1994; Paulus, 1998). We addressed the long-term merits of optimism by examining its effects on distal scholastic outcomes, such as students' cumulative academic achievement and voluntary course withdrawal over a full year in college. Robins and Beer (2001) also expressed a need for more external criteria to measure the benefits of positive illusions. We addressed these concerns by again using voluntary course withdrawal and cumulative academic achievement as outcome measures, in addition to self-report measures of test anxiety. Thus, our study demonstrates the diverse long-term consequences of optimism by comparing highly optimistic students and less optimistic students in terms of their test anxiety, VW, and cumulative GPA over an entire academic year.

Accordingly, the possible benefits of AR are quite notable in view of the current findings. That is, without AR, high-optimism students had the lowest cumulative GPA and the highest VW rates of all four groups in the study. However, simply giving high-optimism students a single AR session resulted in high-optimism students achieving the highest cumulative achievement (GPA), the lowest VW rates, and the lowest level of test anxiety, compared to the other three groups of students.

### *Optimism and Attributional Retraining*

It is notable that high optimism appeared to be a risk factor for the college students in our study. For instance, high-optimism students who did not receive AR had the lowest cumulative GPA of all groups and the highest VW rates. Further, the difference between high- and low-optimism students who did not receive AR translated into a whole letter grade difference (i.e., the difference between a C+ and a B) and twice as many credit hours dropped! However, when high-optimism students were given AR, their GPA significantly increased, their VW significantly decreased, and their test anxiety significantly decreased. These findings are consistent with previous research that suggests that AR is most effective among students who are at risk (Menec et al., 1994; Perry & Struthers, 1994). Thus, in the current study, high-optimism students were at risk in terms of their academic achievement and course withdrawal, but AR was also the most effective among this risk group, compared to less optimistic students. These findings suggest that teaching optimistic students that controllable factors such as effort or strategy are responsible for their academic achievement, rather than uncontrollable factors such as ability can help these students to significantly improve their academic performance, lower their test anxiety, and persist in their college courses.

The current findings give further insight into the ongoing optimism debate. Specifically, although we induced AR in a laboratory setting, its application was

designed to unfold in actual classroom settings. Once high-optimism students are attributionally retrained and learn to make controllable, unstable causal attributions, they may then apply these adaptive causal attributions to future positive and negative academic outcomes and even to outcomes in their daily lives. Thus, these individuals may come to realize that controllable causes are responsible for their success. However, without the positive effects of AR, these same individuals may not have the necessary "grounding" to help prevent unrealistic expectations in their daily lives. Specifically, Higgins et al. (1997) suggest that unrealistic optimism is mediated by perceived control. Therefore, AR can help high-optimism individuals gain more control by inducing controllable attributions thus attenuating the potential harm of unrealistic optimism.

Recall that the current study involved first-year college students, whose experiences with the realities of university life can be extremely limited. As Perry et al. (2001) note, the transition to university is particularly fraught with unaccustomed failure for a variety of reasons, including an inability to adjust to the increased demand for self-initiative and autonomy. Therefore, it is possible that optimism during this novel transition period would be a greater risk factor, compared to optimism in situations where individuals have previous experience on which to base their expectations for success. By altering the maladaptive (uncontrollable) causal attributions of optimistic first-year college students to adaptive (controllable) causal attributions via AR, the benefits of optimism may be maximized and the costs greatly reduced, resulting in fewer subsequent failure experiences.

Although the mean level of optimism among the high-optimism group in this study was not exceptionally high on our scale ($M = 43.84$), nevertheless it allowed us to differentiate the optimism variable and to demonstrate consistent and reliable results. Therefore, we would expect that whatever negative patterns occurred for our definition of "high" optimism would be more pronounced had we been able to specify a high-optimism group having an even higher mean score on our scale (e.g., $M = 60$). Unfortunately, in order to retain sufficient statistical power, given our sample size, we had to restrict our specification of "high" optimism. It should be noted that our findings for such a "moderate" level of high optimism are restricted to those groups having the unique features of our transitional first-year students. It may be that the potential risks of being overly optimistic are especially prevalent during certain transition periods in individuals' lives. If this is the case, one would expect to find similar results among high-optimism first-year graduate students, newly hired faculty members (Perry et al., 1997), or other populations where individuals have no previous experience on which to base their achievement expectations. Further research focusing on optimism levels in different life transitions would be helpful in increasing our understanding of when optimism is a potential risk factor and when it is beneficial.



Thus, the current study provides additional insight into the optimism debate in that whereas high optimism may be a risk factor among college students, the risk can be ameliorated through AR by giving students the tools to ground their unrealistic expectations and change their attributions from uncontrollable (i.e., luck, ability) to controllable ones (i.e., effort) for which they are responsible. So, instead of thinking "I will be successful this year" and not believing that this positive outcome is within one's own control, attributionally retrained students who are high in optimism can change their thinking to "I will be successful because I will study hard, take good lecture notes, and work hard throughout the academic year."

This study also extends previous test anxiety research (Bembenutty & McKeachie, 2000; Choi, 1998; Hembree, 1988) by linking it to optimism and AR, thereby examining the possibility that test anxiety may partially account for students' course withdrawal. That is, the optimism–AR interaction on voluntary course withdrawal may be the result of a decrease in test anxiety reported by the high-optimism students who received AR. Specifically, providing AR to high-optimism students led to both decreased voluntary course withdrawal and decreased test anxiety. Interestingly, a subsequent regression analysis revealed that, of the different academic variables (optimism, AR, test anxiety), test anxiety was the best predictor of voluntary course withdrawal ($\beta = .25$), $t(213) = 3.54$, $p < .001$.

Knowing that test anxiety significantly predicts voluntary course withdrawal, it is possible that optimistic students who received AR persisted in their courses because they also experienced a decrease in test anxiety. Recall that AR is designed to change dysfunctional, uncontrollable causal beliefs (e.g., "I lack the ability") to functional, controllable causal beliefs (e.g., "I need to study more") in the presence of failure. Consequently, this shift in thinking may provide attributionally retrained students with both cognitive strategies and a feeling of control over their academic performance needed to alleviate their test anxiety. Subsequently, these cognitive strategies and perceptions of control may help students persist in their courses. In contrast, low-optimism students and students who did not receive AR may have withdrawn from their courses because they did not experience a shift in their causal beliefs or gain a sense of academic control, and thus their test anxiety was not reduced over the course of the academic year.

### *Limitations*

Although the results of the current study provide further insight into the benefits of AR, they should be interpreted with some caution. Specifically, all three types of AR were combined to form the single AR condition in this study. Thus, the videotape condition, videotape-and-discussion condition, and handout condition were all summed together as one AR condition. Although it was

appropriate to combine AR conditions in the current study, it is important to note that past research has focused on finding the most effective AR intervention for different at-risk groups (e.g., Menec et al., 1994; Perry & Struthers, 1994). For example, Hunter and Perry (1996) found that a combination of an AR videotape followed by an aptitude test was most effective for students with low high school grades. Hall, Hladkyj, Perry, and Ruthig (in press) found that an AR videotape paired with a related written assignment was most effective among low elaborative-learning students. Thus, past research on the effectiveness of AR conditions indicates that for different risk groups, certain types of AR are more effective than are others. Consequently, further research is needed to determine which of these specific conditions is the most effective type of AR for students with high optimism or if, in fact, a new form of AR would be more appropriate.

A second limitation of the current study is that only low and high levels of optimism were addressed, rather than low, moderate, and high levels. The reason for including only two groups in the current study was that the cell sizes became too small when split into three separate groups. Perhaps future studies can provide a preliminary test of optimism to ensure that there are sufficient numbers of participants in each of the low, moderate, and high optimism groups before recruiting them to participate in an AR study. This addition of a moderate optimism group may provide insight into the optimal level of optimism where students may have positive academic prospects without having unrealistic expectations.

Keeping these limitations in mind, this study clearly illustrates the possible benefits of AR among first-year college students in terms of improving their cumulative academic achievement, lowering their test anxiety, and reducing their course withdrawal. Furthermore, the current findings also indicate that AR is particularly effective when combined with optimism. In this instance, being optimistic is an asset because students already have positive expectations for the future, and AR provides the reality check by stressing that it is up to the student to make those successful outcomes happen. Peterson (2000) summed up this idea of *realistic* optimism by suggesting that the benefits of optimism exist, if approached in an evenhanded way. Providing high-optimism students with AR appears to be an effective means of approaching optimism in this evenhanded way and thus transforming unrealistic optimism into realistic optimism.

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