Motivation and Academic ACHievement (MAACH) Laboratory

Attributional Retraining Technical Report

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What is Attributional Retraining?

A major facet of research activities of the Motivation and Academic ACHievement (MAACH) Laboratory involves attributional retraining (AR), a motivational intervention based on attribution theory, which is intended to modify cognitive schemas of students who are academically at risk. Throughout their university experiences, students continuously search for explanations (causal attributions) for their successes and failures within themselves and within the educational context (Perry, Hall, & Ruthig, 2005). The attempt to answer these "why" questions is referred to as causal search. Weiner's attribution theory of motivation and performance (1985, 1995) emphasizes that students' explanations for their successes and failures derived from this causal search process are pivotal to achievement-striving and academic performance because these explanations form the foundation for subsequent cognitions, emotions, and behaviors in future academic achievement settings.

According to Weiner (1985, 1995), all attributions resulting from causal search have three dimensions: *locus of causality*, which refers to whether the causes of success or failure reside internally or externally; *stability*, which describes whether the causes are stable or unstable; and *controllability*, which indicates whether the causes can or cannot be deliberately influenced by the individual or someone else (Perry et al., 2005). Figure 1 provides a schematic representation of these attributional dimensions. Thus, all attributions used to explain success and failure can be classified as either internal or external, stable or unstable, and controllable or uncontrollable.

For example, students who attribute academic failure to their own aptitude are making an internal, stable, and uncontrollable attribution for their failure. In contrast, students who attribute academic failure to chance are making an external, unstable, and uncontrollable attribution. Figure 2 provides some examples of commonly-used attributions for poor academic performance.

As posited by Weiner, the specific attributions students make will affect their subsequent cognitions, emotions, and behaviors, which in turn, will influence their academic performance. Using our earlier example, students who attribute failure to internal, stable, and uncontrollable causes such as lack of ability will, according to Weiner's theory, experience hopelessness and shame, lowered expectations, and exert less effort. These maladaptive cognitions, emotions, and behaviors that follow the attribution will eventually result in poor performance (see Figure 3).

Conversely, students who attribute failure to internal, unstable, and controllable causes such as lack of effort will experience emotions such as hope and guilt, greater motivation to avoid future failure, greater expectations, and exert more effort, resulting in better future performance. Similar attribution/emotion/performance paths are also posited by Weiner for success outcomes (Figure 3). As such, AR is designed to reduce the use of maladaptive attributions (e.g., lack of ability) as in the initial example and to increase the use of adaptive attributions (e.g., lack of effort) as in the latter example. Thus, AR is intended to change students' causal attributions in attempt to increase emotions, cognitions, and behaviors that are conducive to better academic performance and greater persistence. The following section of this technical report describes MAACH laboratory research which provides empirical evidence that these intended attributional changes take place due to AR.

Figure 1: Causal Search: Weiner's Attribution Theory

Dimensions of Causal Attributions
(Weiner, 1974, 1979, 1985, 1995)

```
        Internal                      External

   Stable    Unstable           Stable    Unstable

  C   UC    C   UC             C   UC    C   UC
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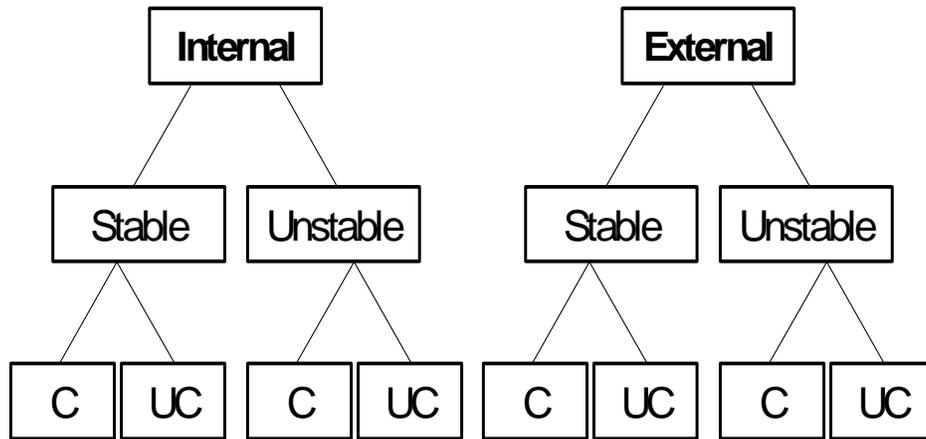
C = Controllable Attributions   UC = Uncontrollable Attributions

Figure 2: Examples of Academic Attributions for Poor Performance

	Internal		External	
	Stable	**Unstable**	**Stable**	**Unstable**
Controllable	Never studies	Didn't study for this test	Instructor is biased	Friends failed to help
Uncontrollable	Low aptitude	Sick day of test	School has hard standards	Bad luck

Figure 3: Path from performance, to attribution, to emotional, cognitive, and behavioral consequences for failure and success outcomes.

Performance	Attribution	Consequences

Failure

low ability → ↑ hopelessness & shame / ↓ expectations, effort, & performance

low effort / bad strategy → ↑ hope & guilt / ↑ expectations, effort, & performance

bad luck → ↑ disappointment / ↓ expectations, effort & performance

Success

high ability → ↑ hopelessness & shame / ↓ expectations, effort, & performance

high effort / good strategy → ↑ hope & guilt / ↑ expectations, effort, & performance

good luck → ↑ disappointment / ↓ expectations, effort & performance

Underlying Mechanisms of Attributional Retraining

Based on attribution theory (Weiner, 1985, 1995), Attributional Retraining (AR) is a cognitive/motivational intervention aimed at increasing students' propensity to use adaptive causal attributions that are conducive to achievement motivation, while at the same time, reducing students' use of maladaptive causal attributions to example academic performance-related outcomes (Perry et al., 2005). Specifically, AR is designed to replace *maladaptive* attributions such as lack of ability, luck, or test difficulty, with *adaptive* attributions such as effort and strategy, thereby enhancing students' perceptions of control over their academic performance. AR has been found to be especially effective among students who are at-risk of academic failure. The MAACH Laboratory has conducted several studies documenting the expected changes in at-risk students' academic attributions and control perceptions resulting from attributional retraining (See Table 1 for statistical details). Hall, Hladkyj, Perry, and Ruthig (2004), for example, found that students who received AR early in the academic year had significantly greater perceived control (a composite of academic, general, and desire for control) at the end of the year, compared to their no-AR counterparts. Similarly, other research (Hall, Perry, Chipperfield, Clifton, & Haynes, in press; Perry, Hall, Newall, Haynes, & Stupnisky, 2003) also shows that students who received AR made significantly fewer uncontrollable attributions (i.e., composite of ability, luck, course professor, and test difficulty) for poor academic performance by the end of the academic year.

A recent study by Stupnisky, Perry, Hall, and Haynes (2004) used structural equation modelling to assess the attributional, cognitive, and emotional consequences of attributional retraining in first-year college students as proposed in Weiner's (1985) attributional model. This research showed that for first-year college students who received AR, the predicted mediational path was observed from first- to second-semester performance through controllable attributions (effort), perceptions of responsibility, and feelings of hope. In contrast, this attributional path sequence was not found for students who did not receive AR, for whom previous performance was found to correspond instead to uncontrollable attributions (ability).

Underlying AR processes were also investigated by Perry, Hall, Newall, Haynes, and Stupnisky (2003) who explored how both low- and high-elaborating students could benefit from a writing-based AR treatment. To examine this issue more closely, the AR presentation was followed by either a writing exercise asking students to elaborate on the attributional information in an abstract manner (e.g., summarization, personal examples) or on the emotional impact of an academic failure experience. High-elaborating students showed the greatest improvement in course performance and motivation when administered the writing exercise including specific questions of an abstract nature, whereas low-elaborating students benefitted most when encouraged to elaborate more generally on their failure-related emotions.

Hall et al. (in press) also explored changes in academic control resulting from AR in the context of the dual-process model of control. For freshman students with low test scores who relied on primary control to the exclusion of secondary control, higher perceptions of secondary control (e.g., finding the "silver lining") were found, along with lower uncontrollable attributions, following a writing-based AR treatment. In sum, these studies highlight the importance of exploring how processes involving perceived control, attributions, elaboration, and stress enable AR to improve the academic motivation and performance of low-control college students.

Other MAACH research has directly assessed within-group changes resulting from AR. In particular, Haynes, Ruthig, Perry, Stupnisky, and Hall (2005) examined pre- and post-AR academic attributions and (general) perceived control and found that among overly-optimistic college students, those who received AR at the start of the academic year significantly increased their use of controllable attributions (e.g., effort) and significantly increased in their control perceptions by the end of the year. Although this AR group's use of uncontrollable attributions remained unchanged, overly-optimistic students who did not receive the intervention *increased* their use of uncontrollable attributions (i.e., test difficulty and teaching quality), while their controllable attributions and control perceptions remained unchanged (Table 1). A similar study of highly optimistic first-year students by Ruthig, Hladkyj, Hall, Haynes, and Perry (2003) also showed that receiving AR resulted in significantly higher post-AR perceived control relative to pre-AR perceived control. In contrast, among high-optimism students in the no-AR group, perceptions of control remained unchanged. Furthermore, students who received AR had significantly higher post-AR perceived control than their no-AR counterparts (Table 1). Thus, attributional retraining can benefit students' motivation and performance via one or more of the assumed underlying mechanisms: by increasing their use of controllable attributions, decreasing their use of uncontrollable attributions, and/or by increasing their perceptions of control. Now that the conceptual processes underlying AR have been described and empirical evidence has been provided, the structure of AR treatments, as developed by the MAACH laboratory, is subsequently described.

Table 1

MAACH Research on the Underlying Mechanisms of Attributional Retraining

	Hall et al. (2004):			
	Writing AR Group	Aptitude Test AR Group	No-AR Group	
Dependent Measure	*M*	*M*	*M*	*F*
Perceived Control (composite)	63.42	62.44	61.02	3.45*

	Hall et al. (in press):		
	AR Group	*no-AR Group*	
Dependent Measure	*M*	*M*	*F*
Uncontrollable Attributions (composite)	14.69	18.71	7.07*

	Haynes et al. (2005, over-optimists):					
	No-AR Group			*AR Group*		
Dependent Measure	*M (pre-AR)*	*M (post-AR)*	*t*	*M (pre-AR)*	*M (post-AR)*	*t*
Test Difficulty Attribution	6.43	7.19	-2.06*	6.32	5.65	1.67
Teaching Quality Attribution	5.24	6.95	-3.96***	4.90	4.29	1.22
Effort Attribution	7.00	7.51	-1.24	6.65	8.10	-2.90**
Perceived Control (general)	26.97	26.85	0.25	26.70	27.93	-2.16*

	Ruthig et al. (2003; high-optimists):					
	No-AR Group			*AR Group*		
Dependent Measure	*M (pre-AR)*	*M (post-AR)*	*t*	*M (pre-AR)*	*M (post-AR)*	*t*
Perceived Control (general)	26.02	25.76	1.41	26.06	26.57	3.18**
post-AR between group comparison		25.76	$F(1, 796) = 8.45**$		26.57	

*p < .05.   **p < .01.   ***p < .001

The Structure of Attributional Retraining

As developed within the MAACH laboratory, attributional retraining consists of six main components that are sequentially linked together (see Figure 4). The first and second components, *pre-testing* and *causal search activation*, are largely intertwined and occur about one month into the academic year. *Pre-testing* involves groups of introductory psychology students completing a questionnaire asking about their academic experiences in their introductory psychology course and in university so far that year. Within this questionnaire, students are asked to report their attributions for their academic performance up to that point in an attempt to identify factors that can potentially put some students at risk of academic failure. Embedded within the questionnaire are a number of measures assessing student-difference factors such as optimism, cognitive elaboration, failure preoccupation, and so on.

Causal search activation pertains to students' first introductory psychology course test and as a part of pre-testing, students are asked to reflect on their performance on that course test. Together, these first two AR components are intended to get students thinking about their academic performance so far that year and their explanations and attributions for that performance. Specifically, these initial components are aimed at attempting to get students to engage in a causal search process as specified by Weiner (1995) to identify explanations for why they received the mark they did on their first test.

The third and fourth components of AR take place immediately following the causal search activation component and are considered to be the treatment portion of the cognitive intervention. This treatment portion of AR is administered to a subsample of introductory psychology students who have completed the first two components (i.e., AR group). The *induction* component lasts between 45 minutes to one and a half hours and is typically provided in two formats (videotape and/or handout) in which students are explicitly encouraged to make adaptive rather than maladaptive attributions for their academic performance (see Attributional Retraining: Induction and Consolidation Techniques).

The induction component is followed by the consolidation component. During the *consolidation* component, the AR information provided to students is solidified by having them complete writing assignments or aptitude tests or participate in group discussions. These consolidation exercises are intended to have students apply the AR information to their own academic experiences. In particular, written assignments require students to summarize the main points of the AR videotape, list reasons for why the student did not perform well, and apply the main points of the video to their own academic experiences. For consolidation exercises involving an aptitude test, students are given a difficult time-limited test of various scholastic skills, allowing the opportunity to apply the attributional information provided in the videotape. Within small discussion groups, students are instructed to think about a time in their previous academic experiences when they performed worse than expected on an academic task and to discuss several possible explanations or attributions for their performance. See Figure 5 for an overview of AR treatments used in MAACH research over the last several years.

The fifth component of AR occurs several months after the treatment portion. This *follow-up* component consists of a self-report questionnaire for students who completed the initial questionnaire during the sensitization component and who return to complete a similar questionnaire that reassesses their academic attributions (in addition to various other academic perceptions). This reassessment of attributions in the follow-up component allows for

comparisons between pre- and post-AR attributions and perceived control to determine whether the intervention influenced students' use of attributions in the expected manner (i.e., increased controllable attributions, decreased uncontrollable attributions).

The sixth and final component of AR consists of various outcome measures used to examine the effects of AR by comparing students who received all five of the prior components (i.e., AR group) with a control group of students who were only involved in the first, second, and fifth components of the AR process (i.e., no-AR group). These outcome measures include achievement indicators such as introductory psychology course grades, term GPA, and cumulative GPA from that year and up to eight years after the intervention was provided; and indicators of persistence and attrition in terms of voluntary course withdrawal for that year and up to eight years following the AR intervention. This concludes a brief overview of all components involved in the AR intervention process. What follows is a detailed description of the treatment portion of AR, namely the induction and consolodation portions.

Figure 4: Components of Attributional Retraining (AR)

1	Pre-testing	Risk Identification Questionnaire
2	Causal Search Activation	First Intro Psych Course Exam
3	Induction	AR Videotape / Handout Presentation
4	Consolidation	Discussion / Writing / Aptitude Test
5	Follow-up	Self-report Questionnaire
6	Treatment Assessment	Grades / GPA / VW / Study Habits / Persistence
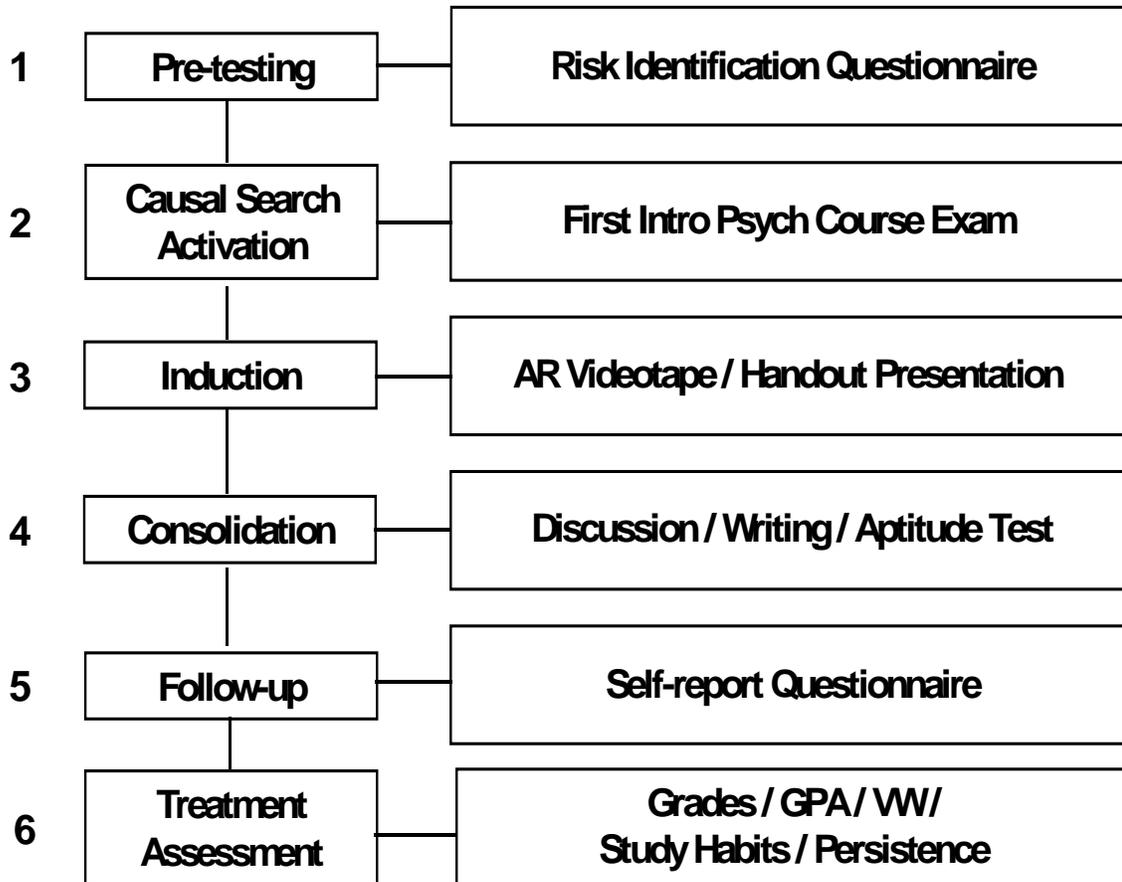
Attributional Retraining: Induction and Consolidation Techniques

Over the past several years, the pre-testing, causal search activation, and follow-up components of AR have remained consistent within MAACH research, however, two formats of induction and eight different consolidation techniques have been used in various combinations to allow for comparison of the relative effectiveness of these treatment methods on numerous academic outcomes. Following is a detailed description of MAACH's AR induction and consolidation techniques that are summarized in Figure 5.

Induction techniques. The induction component of AR, during which students are encouraged to make adaptive rather than maladaptive attributions for their academic performance, has been administered in two different formats. The *AR videotape*, as described in Menec and Perry (1995), is a summation of two undergraduate students discussing their first-year university experiences. One student explains that he performed poorly on several tests and started to doubt his academic abilities. The student then reveals that after doubting his abilities, he realized that he had not studied enough and thus, began to put more effort into his courses and his performance improved. The second student shares a similar recollection of academic failure and discusses how she focussed on changing her study strategies, which improved her academic performance. After the students' discussion, a psychology professor summarizes the importance of using controllable versus uncontrollable attributions for academic failure. This videotape format has been the most commonly used AR induction technique and was administered within MAACH from 1992 to 2001.

The other form of induction is a one-page *AR handout* listing commonly-used maladaptive attributions for poor academic performance on the left side of the page and adaptive attributions (which students are encouraged to use) on the right side of the page (see Figure 6). In 1992, students were each given a handout and asked to read the it carefully while thinking about their own academic experiences and attributions for their performance. In 2003, this same AR induction was administered online. In 1995, 2001, and 2004 the experimenter distributed the AR handout to students and displayed it on an overhead projector, briefly presenting it to the students by describing several examples and encouraging discussion. The objective of the induction simulation is to highlight the importance of controllable factors in academic achievement and to downplay the role of uncontrollable factors. The goal is to have students embrace these controllable factors as legitimate causes of their future academic performance so that they may make adjustments to their academic strategies, efforts, and planning as needed in order to maximize their achievement potential.

Consolidation techniques. Four different consolidating techniques have been used to encourage students to apply the AR information to their own academic experiences. The *group discussion* technique follows one of two induction techniques involving the experimenter describing the AR handout or the students watching the AR videotape. In both cases, students are subsequently organized into small groups (i.e., 2-6 students per group). The groups of students are instructed to think about a time in their previous academic experiences when they performed worse than expected on an academic task. Each group is then asked to generate the three most important reasons for their poor academic performance. The students are told they would have five minutes to discuss these reasons, at the end of which time a spokesperson from each group reports the reasons to the experimenter and the other discussion groups.

The experimenter makes a composite list of attributions generated by the groups, places them on an overhead, and goes through them with the students, identifying which attributions are

adaptive (controllable) and which are potentially maladaptive (uncontrollable). For each uncontrollable attribution, the experimenter and students discussed possible alternate controllable attributions to replace the uncontrollable one. This group discussion technique was administered by MAACH in experimental sessions outside of students' introductory psychology class from 1992 to 1995 and in 1998. In 1996, the group discussion sessions were held during class time.

Another consolidation technique employed by MAACH involves students completing an *aptitude test* called the Abstract Reasoning and Performance Test (ARPT, Perry & Dickens, 1984, 1987) following the AR videotape. The aptitude test is comprised of three sections: verbal analogy, quantitative, and sentence completion, which contain 10, 5, and 10 questions respectively (see Appendix A). Students are given a time limit of approximately five minutes to complete each section of the aptitude test, which is designed to be quite difficult to ensure that some students experience failure. Providing students with a failure experience immediately following an AR induction allows them an opportunity to practice what they have just learned in terms of endorsing controllable attributions in explaining their failure. Following the aptitude test, the experimenter briefly summarizes the AR videotape in order to further strengthen the AR message. This aptitude test consolidation technique was administered by MAACH in 1997 and 1998 using a paper and pencil method; and in 2003, using a web-based administration.

A third consolidation method is a *writing assignment* following the AR induction that lasts ten to twelve minutes. Three different types of writing assignments were designed to either encourage deeper processing of the AR induction (*elaboration*), greater awareness of past reactions to failure experiences (*emotion*), or both *elaboration & emotion* (see Figure 7 for all three writing assignments).

The *elaboration writing assignment* included three items that were explicitly based on the three tenets of elaborative processing as described by Entwistle (2000). These tenets are depth (i.e., interconnections fostering summarization), breadth (i.e., considering a variety of related information), and personal structure (i.e. personally relevant examples). Thus, this writing assignment required students first to summarize the main points of the videotape in their own words, then to list a number of important reasons for why students may not perform as well as they could in their courses, and to list examples of how the main points of the videotape could be applied to their personal approach to their studies.

The *emotion writing assignment* requires students to recall an instance in which they performed poorly, or didn't perform as well as expected, on an important course exam or assignment. Students are then asked to write about how the event made them feel, and to explain how they were able to either learn from the event or reinterpret it in a positive way.

Finally, the *elaboration and emotion writing assignment* is intended to give students an opportunity to both elaborate on the AR material and to become more aware of their past reactions to failure experiences.

In addition to being a method of induction, the *AR Handout* has also been used for consolidation. Beginning in 1994, at the end of every AR administration students were given the AR handout and were encouraged to keep the handout in a place they would see it when they are studying (e.g., in their introductory psychology note book or above their desk). In this manner, the handout would serve as a constant reminder for students to make adaptive attributions for their academic performances.

Figure 5: History of AR Treatments used in MAACH Data Collections

Year	Induction	Consolidation
1992	1. AR Video	None
	2. AR Video	Group Discussion
	3. AR Handout (Read)	Handout
1993	1. AR Video	Group Discussion
1994	1. AR Video + AR Handout (Presentation)	Handout
1995	1. AR Video	Group Discussion
	2. AR Handout (Presentation)	Group Discussion
1996	1. AR Video	Group Discussion (in-class)
1997	1. AR Video	Aptitude Test
1998	1. AR Video	Writing Assignment (Elaboration)
	2. AR Video	Aptitude Test
	3. AR Video	Group Discussion
2001	1. AR Video	Writing Assignment (Elaboration & Emotion)
	2. AR Handout (Presentation)	Writing Assignment (Elaboration & Emotion)
	3. AR Handout (Presentation)	Writing Assignment (Emotion)
2003	1. AR Handout (Read Online)	Online Aptitude Test
2004	2. AR Handout (Presentation)	Writing Assignment (Elaboration & Emotion)

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Figure 6: AR Treatment Handout

Didn't do as well on a test as you wanted?
Feeling frustrated, depressed, angry?

Here are some suggestions as to how you can change the way you *think* about negative experiences in your life:

Rather than thinking...   **Instead...**

- I'm stupid.

  - Everybody can succeed - you just have to work at it. Here are some examples as to how you can study more effectively:
    - read chapters several times
    - review notes several times
    - use your study guide
    - study with someone

    Note: Counseling Services offers various study skills courses

- The test was too difficult.

  - Tests can appear difficult when you're not well enough prepared. Study more for the next test.

- My professor is lousy.

  - If you are having problems with a professor, talk to him or her about your difficulties. If that doesn't help, you may have to work extra hard to do well in the course.

- I had a bad day.

  - We all have bad days once in a while, but make sure that you study enough for the next test to improve your grade.

- I panicked.

  - If you have a problem with text anxiety, try to relax under stress (see your psychology text for relaxation methods or check the Counseling Services for courses on stress management).

The next time you don't do as well on a test or assignment as you wanted, remember that most reasons for doing poorly are under your control and can be changed.

Figure 7: AR Writing Assignment Consolidation Techniques

Elaboration Writing Assignment

1.   Discuss and summarize the main points of the video in your own words.

2.   Discuss and describe several **important and controllable** reasons for why university students may not perform as well as they could in their courses, and provide an example of each.

3.   Discuss and describe several examples of how **you** could apply the main points of the video to the way you currently approach your university courses.

Emotion Writing Assignment

1.   Try to recall a recent instance where you performed poorly, or didn't perform as well as expected, on an important course exam or assignment.   Discuss as openly and honestly as you can **how the event made you feel (e.g. anxious, regretful, angry, ashamed, helpless, guilty, etc.)**. If possible, also explain how you were able to **learn** from this event, or how you were able to **reinterpret** the event in a positive way. All your writing is completely confidential.

Elaboration and Emotion Writing Assignment

1.   Discuss and summarize the main points of the video in your own words.

2.   Discuss and describe several **important and controllable** reasons for why university students may not perform as well as they could in their courses, and provide an example of each.

3.   Try to recall a recent instance where you performed poorly, or didn't perform as well as expected, on an important course exam or assignment.   Discuss as openly and honestly as you can **how the event made you feel**. If possible, also explain how you were able to **learn** from this event, or how you were able to **reinterpret** the event in a positive way. All your writing is completely confidential.

4.   Discuss and describe several examples of how **you** could apply the main points of the video to the way you currently approach your university courses.

Effects of Attributional Retraining

By providing the AR treatments, MAACH has been are able to boost students' use of controllable attributions, reduce their use of uncontrollable attributions, and increase their perceived control (see *Underlying Mechanisms of AR* section for details). As a result of these cognitive changes, MAACH research has consistently shown that providing students with AR improves their *academic performance,* particularly among students who are at risk of academic failure. These empirical findings are discussed in detail and are organized in terms of laboratory and field research.

Laboratory Findings

Within a laboratory setting, both Perry and Penner (1990) and Menec et al. (1994) found that AR was particularly helpful among students who has an external locus of control regarding their academic outcomes. Among these external locus of control students, those who were given AR outperformed their no-AR counterparts and experienced better academic adjustment. In particular, Perry and Penner found that administering a videotape AR treatment to students with an external locus of control resulted in them outperforming their no-AR counterparts on a subsequent homework assignment (Ms = 4.88 vs. 4.30, $F(1,190) = 4.07$, $p < .05$) and achievement test (Ms = 16.21 vs. 14.94, $F(1,190) = 6.56$, $p < .01$) following the intervention (see Figure 8). This study is one of the first to demonstrate the effectiveness of AR primary for low-control students, in this case as defined by an external locus of control.

Menec et al. (1994) administered a videotape AR treatment (either once or twice) to students who had experienced either failure or success before hearing a high- or low-expressive lecture. They found that AR only interacted with the pre-lecture success or failure experience for students who received a high-expressive lecture. The failure students in this session displayed enhanced performance relative to the control group after receiving one AR administration, Ms =15.25 vs. 11.00, $t(69) = 3.09, p <.05$; or two AR administrations, Ms =16.25 vs. 11.00, $t(69) = 3.38, p < .05$ (see Figure 9). No significant AR effects were found for students who had experienced pre-lecture success, indicating that AR is especially beneficial to at-risk students (in this case those who had experienced academic failure).

Figure 8: Attributional Retraining x Academic Control Interaction Effect (adapted from Perry & Penner,1990: low academic control = external locus; high academic control = internal locus)
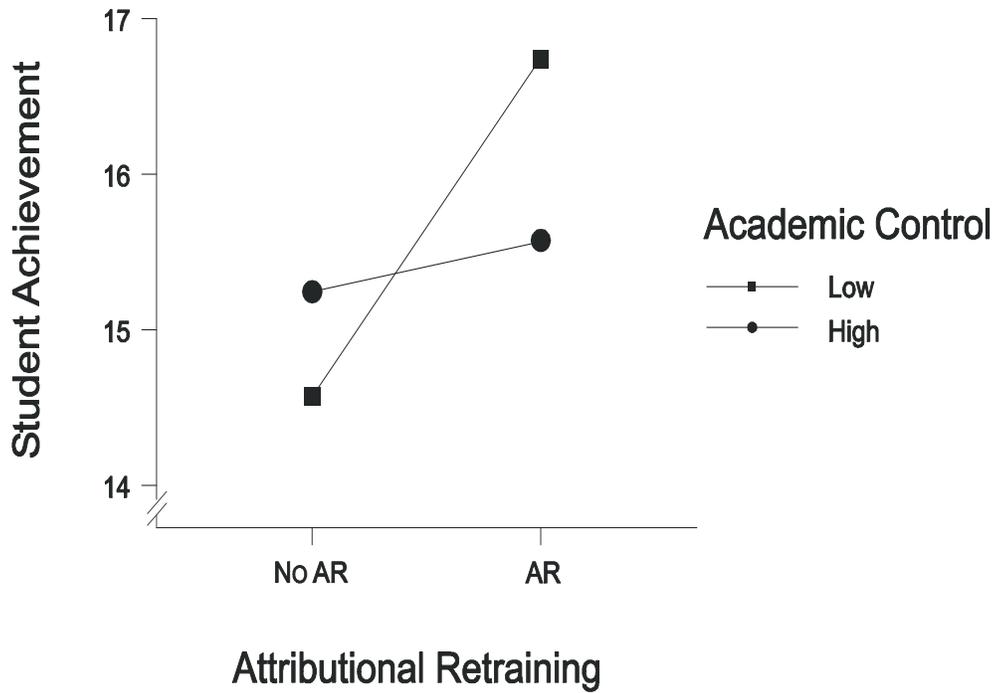

Figure 9: Attributional Retraining x Pre-lecture Experience (adapted from Menec et al. 1994)
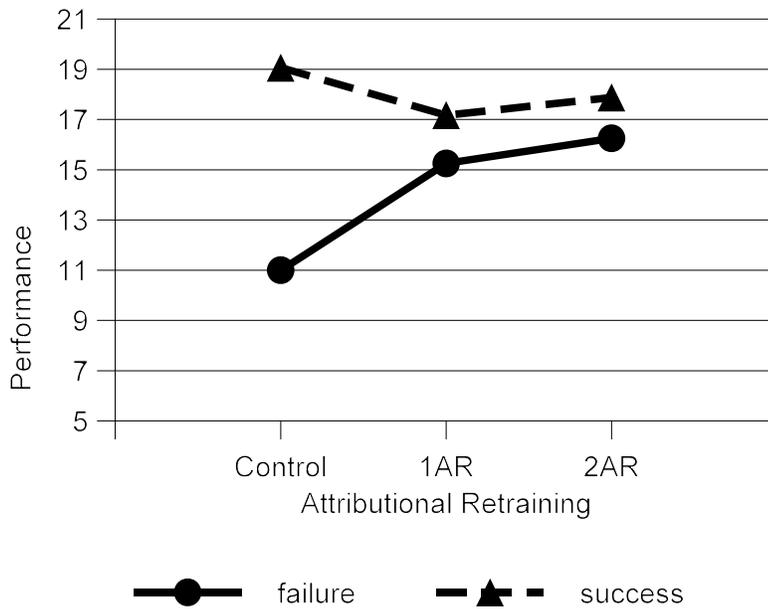
Field Studies

The benefits of AR found within laboratory settings, have also been replicated within actual classroom settings in terms of enhancing students' perceived success over academic outcomes, their actual final course grades, cumulative grade point averages (GPAs), and academic persistence (VW). See Table 2 for a summary of main effects of AR on academic performance among cohorts from 1992, 1993, 1998, and 2001. Additional findings of main and interaction effects for AR on academic performance are subsequently described.

Perceived success. Hall et al. (2004) observed a main effect for AR on year-end perceptions of academic success. Students who received the AR treatment consisting of a videotape followed by the aptitude test perceived themselves as more successful at the end of the academic year ($M = 32.89$) than did students in the no-AR group ($M = 29.29$), $F(2, 137) = 3.07$, $p < .05$.

Final course grades. Hall et al. (2004) found that students who viewed the AR videotape and then completed either a writing assignment ($M = 70.18\%$) or an aptitude test (M = 69.85%) received a final introductory psychology grade of 5% higher than students in the no-AR group ($M = 64.27\%$), $F(2, 168) = 5.41$, $p < .01$. Similarly, in an on-line study of AR, Hall, Perry, Ruthig, Haynes, and Stupnisky (2005) also found a significant main effect for the AR treatment on students' final course grade, $F(1, 744) = 5.09$, $p < .05$: students in the AR condition (M = 70.55%) outperformed students in the no-AR condition (M = 68.19%).

Perry and Struthers (1994) assigned low-control students to one of three conditions: no-AR (control), AR in the form of a handout, or an AR videotape followed by a group discussion that required students to reflect on the attributional process in a meaningful way. The latter group outperformed the no-AR group in terms of their final psychology course grade ($Ms = 5.11$ vs. 3.81), $F(1, 166) = 2.89$, $p < .05$ (see Figure 10). This study demonstrates that AR interventions require a consolidation activity during which students actively reflect on the attributional information with their existing achievement-related perceptions.

In a study by Struthers and Perry (1996), low-control students were defined as those who routinely made uncontrollable and unstable attributions to explain academic failure. Following an AR treatment involving a group discussion, these low-control students obtained significantly higher grades in their introductory psychology course, $F(3, 244) = 3.07$, $p < .05$, $\omega^2 = .06$. Similar academic performance improvements were not found following AR treatment for students with an uncontrollable and stable attributional style, again supporting the notion that AR works best among at-risk students.

Haynes et al. (2003) found that over-optimists who received AR achieved significantly higher final course grades than their no-AR counterparts ($Ms = 77.56\%$ vs. 67.01%, $t(68) = 3.32$, $p < .001$), see Figure 11a. This difference of over 10% is compelling in that it approximates the difference between a C+ and a B. Over-optimists in the no-AR group had the lowest performance of all four groups and there no significant difference was observed between the low optimists who received AR and those who did not.

Finally, Newall, Haynes, Hladkyj, and Chipperfield (2003) found that students who had both low academic control and a low desire for academic control benefited most from AR in terms of their academic achievement. Specifically, these low-low students who received AR differed 6.4% in tests scores ($M = 74.70\%$) from their no-AR low-low counterparts ($M = 68.34\%$). This difference was significantly greater than the AR/no-AR differences between any other academic control/desire for control combination, $F(1,271) = 6.22$, $p < .05$).

GPA. AR has also been found to significantly enhance students' cumulative GPAs, a more robust measure of academic achievement that incorporates all of students' tests, essays, assignments, final exams, and courses for that academic year, in the case of Year 1 GPA and up to 5 years of courses in the case of Year 5 GPA. Students who receive AR tend to attain significantly higher GPAs than students who do not receive the cognitive intervention. See Table 2 for a summary of AR main effects on GPA for cohorts from 1992 through 2001. (Note: 4.0 = A, 3.5 = B+, 3.0 = B, etc.)

In addition to the above main effects of AR on students' GPAs, student characteristics have been found to interaction with AR to affect GPA. For instance, overly-optimistic students were found to benefit from AR in a study by Haynes et al. (2005). In particular, overly-optimistic students who received AR outperformed overly-optimistic students who did not receive AR: $F(1, 130) = 4.39$, $p < .05$, $\eta^2 = .033$. Overly-optimistic students who received AR achieved significantly higher GPAs than over-optimists who did not receive AR ($Ms = 2.98$ vs. 2.37), $t(67) = 2.84$, $p < .01$). Over-optimists in the no-AR group had the lowest GPAs of all four groups, and no differences were found among the low who received AR and their No-AR counterparts (see Figure 11b). Similarly, Ruthig et al. (2004) found that among high optimism students, those who received AR had higher cumulative GPAs ($Ms = 2.82$ vs. 2.22, $t(94) = 2.56$, $p < .05$), than those who did not receive AR (the no-AR/high-optimism group also had lower GPAs than the low optimism students in both the AR and no AR groups. See Figure 12a.

Academic persistence (VW). Aside from enhancing academic achievement, AR has also consistently been found to benefit academic persistence. That is, students who receive AR drop significantly fewer course credit hours compared to students who do not receive AR. This AR main effect has been found as early as Year 1 and as late as Year 5 (see Table 2; Note: 6 credit hours = 1 full course, 3 credit hours = 1 half course).

Ruthig et al. (2004) also found a significant optimism by AR interaction effect on first-year students' course attrition. Specifically, over-optimists who were at risk of academic failure and who received AR experienced significantly less course attrition ($Ms = 2.34$ vs. 7.26, $t(98) = 3.19$, $p < .01$) than their no AR counterparts (Figure 12b) during their first year of college.

Table 2: Main Effects of AR on Academic Performance (Final course grade, GPA, VW)

Cohort	Covariate	DV	no-AR group (M)	AR group (M)	F
1993	hspercent	Final Intro Psych %	65.62%	67.25%	3.71[+]
2001	none	Final Intro Psych %	70.47%	72.76%	7.30**
1992	hspercent	GPA 3 years later	2.68	2.93	3.97*
1992	none	GPA 4 years later	2.54	2.87	3.65[+]
1993	hsgrade	GPA for that year	2.28	2.48	3.79[+]
1993	hsgrade	GPA 1 year later	2.46	2.7	6.07*
1993	hsgrade	GPA 2 years later	2.63	2.86	6.79*
1993	hspercent	GPA 4 years later	2.67	2.99	5.63*
1993	hspercent	GPA 5 years later	2.99	2.46	4.76*
2001	none	GPA 1 year later	2.73	2.9	2.85*
1998	none	VW 1 year later	2.79	2.01	4.58*
1998	none	VW 4 years later	1.2	0.53	4.12*
2001	none	VW for that year	2.54	1.65	3.00*

[+] $p = .05$ * $p < .05$ ** $p < .01$.

Figure 10: Effects of Attributional Retraining Among Low Control Students
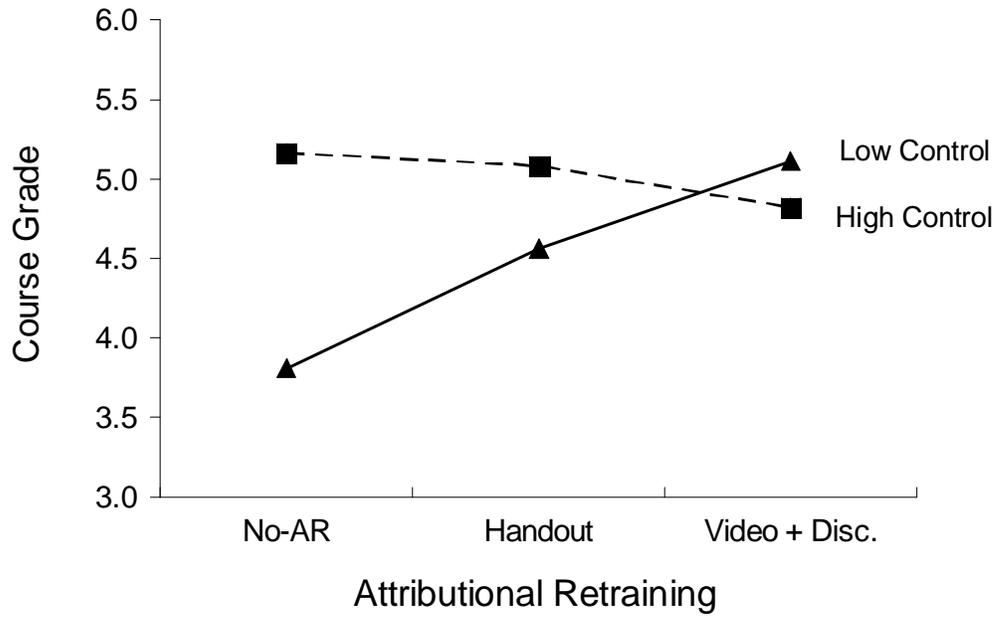
Figure 11a: Effects of Optimism and Attributional Retraining on Final Introductory Psychology Percentage

Final Introductory Psychology Percentage
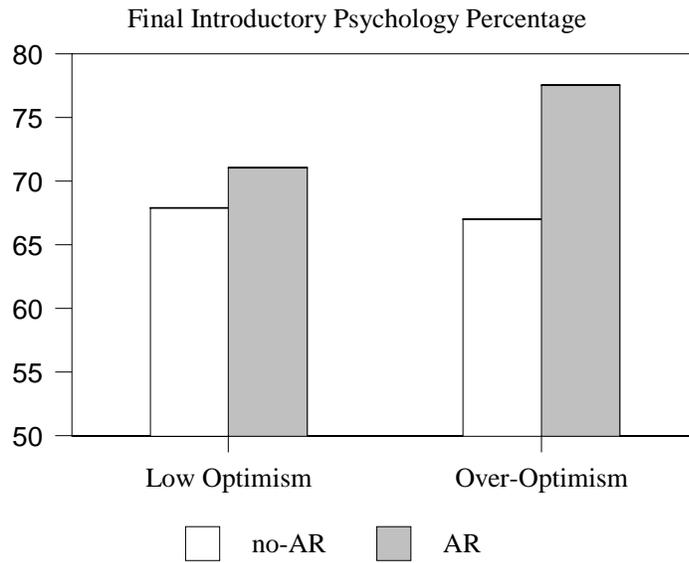
Figure 11b: Effects of Optimism and Attributional Retraining on Second Semester GPA

Second Term Grade Point Average
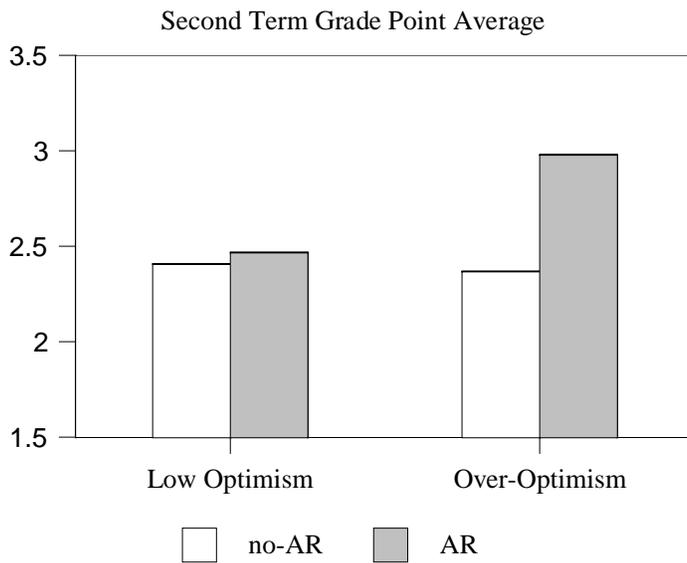
Figure 12a: Effects of Optimism and Attributional Retraining on Students' Cumulative GPA (F(1, 180) = 4.12, p < .05).
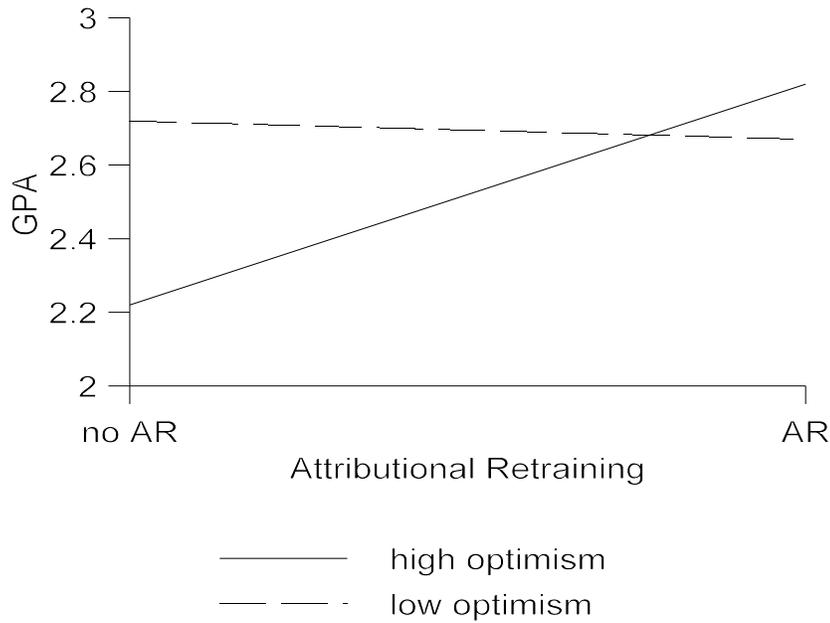
12b: Effects of Optimism and Attributional Retraining on Students' Voluntary Course Withdrawal (F(1, 189) = 6.35, p < .05)
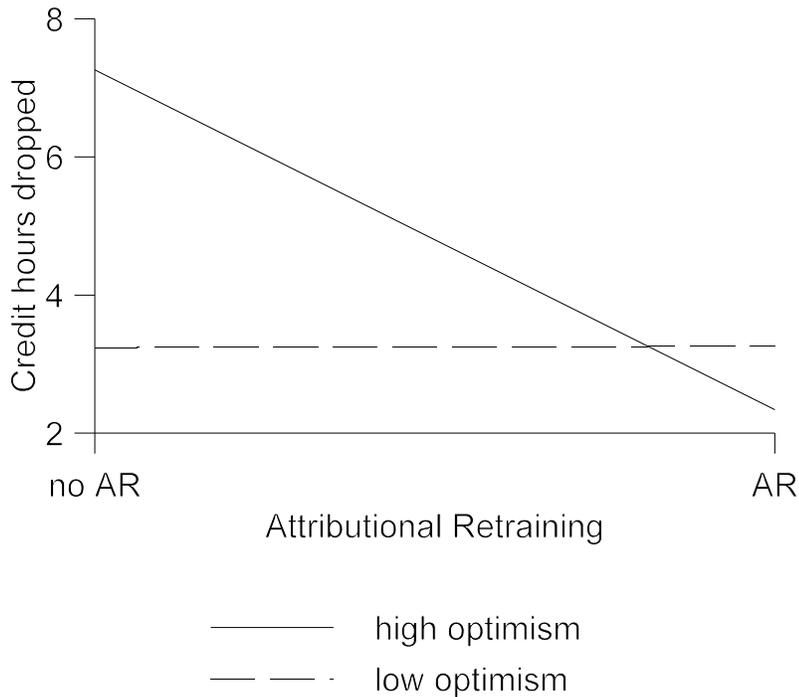
AR versus institutional supports. In a study examining the relative efficacy of different academic interventions, Perry (2003) compared the contributions made by attributional retraining to those made by institutional supports in regard to 983 introductory psychology students' motivation and academic achievement. A comparison of effects for students' motivation, perceived control, and final introductory psychology course grade are presented in Table 3. These results show significant and consistently positive effects of AR in each outcome domain relative to the effects of institutional supports.

Table 3: A Comparison of AR versus Institutional Supports

Predictor	Motivation		Perceived Control		Final Grade	
	beta	t	beta	t	beta	t
Skill Development Cluster						
Attributional Retraining	.09	2.77**	.09	2.68**	.09	2.85**
Study skills seminar	.12	2.75**	-.01	-0.23	.01	0.29
Writing skills seminar	-.03	-0.81	-.09	-2.27*	-.04	-0.94
Math skills seminar	-.04	-1.11	.02	0.61	.00	0.23
Reading skills seminar	-.04	1.08	.01	0.18	.00	-0.19
Verbal skills seminar	.06	1.63	-.03	-0.88	-.05	-1.22
Computer skills seminar	.00	0.07	.02	0.67	.05	1.19
Library use seminar	-.07	-1.79	-.03	-0.69	.00	-0.15
Time management seminar	-.02	-0.41	-.03	-0.76	-.11	-2.39*
Stress management	.08	1.85	-.01	-0.14	.05	1.14
Motivation Development Cluster						
Attributional Retraining	.09	2.65**	.08	2.44*	.08	2.42*
Career counseling	.03	0.71	.03	0.73	.04	0.96
Career aptitude testing	-.03	0.74	-.09	-2.66**	-.08	-2.23*
Academic program advising	-.01	-0.28	-.04	-1.17	-.06	-1.81
Informal advice from professor	.13	3.80***	.11	3.36***	.08	2.22*

$* p < .05.$ $** p < .01.$ $*** p < .001.$

Future Directions

Much of the ongoing and future attributional retraining research within the MAACH Laboratory will center on three main issues: (a) identifying combinations of student risk factors for academic failure which may be alleviated by AR; (b) greater understanding of the cognitive and motivational processes underlying AR; and (c) large-scale administration of AR treatments.

Identification of student risk factors. MAACH research has demonstrated that examining combinations of control-related risk factors will enable the identification of students at risk of academic failure and in need of AR. For example, Menec et al. (1994) defined at-risk students as having not only an external locus of control, but also poor performance on a GRE-type exam. Pelletier, Hladkyj, Moszynski, and Perry (1999), deemed students to be at risk according to their goal orientation and in terms of failure-avoidance. Hall, Perry, Ruthig, Hladkyj, and Chipperfield (2005) outlined how maladaptive perceptions of control involving high primary control and low secondary control predispose initially unsuccessful students to serious deficits in end-of-year academic performance. Each of these studies identify a potential for academic failure that may be reduced if students possessing such risk characteristics were provided with AR.

Similarly, Newall et al. (2003) assessed the utility of a writing-based AR treatment for students differing in perceived academic control and desire for control over academic outcomes. This research showed that some students had congruent perceptions of academic control and desire for control (i.e., low or high in both). Conversely, some students felt in control yet did not value it (high control/little desire), whereas others desired a sense of control that they did not possess (low control/high desire). Following AR, significant improvements in course performance were found only for students who were either low or high in both academic control and desire for control. AR was not effective for students who were incongruent on these factors: those who did not value the control they felt they had, or those who wanted more control than they felt they had.

Recent MAACH research has also examined the manner in which optimism and perceived academic success interact with AR to improve college student achievement. Haynes, Ruthig, Newall, and Perry (2003) found that, following a writing-based AR treatment, course grades increased only for students with incongruent levels of optimism and perceived success: students who were not optimistic but perceived themselves as successful; and those who did not feel successful but were optimistic. Conversely, AR did not benefit students who felt both successful and optimistic (i.e., "non-risk" students) nor those who felt neither successful or optimistic (i.e., helpless students). Together, these recent findings suggests that exploring the interactive effects between combinations of control-related student characteristics and AR on performance, will provide insight into student characteristics that are beneficial or risky for academic development, and how AR can be used to help students at risk of failing during their first year of college.

Underlying AR processes. Although the process of attributional change presumed to occur in college students following AR treatments has been assessed in previous MAACH research (Hall et al., in press; Menec et al., 1994; Perry & Penner, 1990), there is a need to examine why AR treatments are effective for low-control students. For example, a recent study by Stupnisky et al. (2004) assessed the attributional, cognitive, and emotional consequences of AR in first-year college students as proposed in Weiner's (1985) attributional model. This research showed that for first-year college students who received AR, the predicted mediational path was observed from first- to

second-semester performance through controllable attributions (effort), perceptions of responsibility, and feelings of hope. In contrast, this attributional sequence was not found for students who did not receive AR, for whom previous performance was found to correspond instead to uncontrollable attributions (ability).

Underlying AR processes were also investigated by Perry et al. (2003) who explored how both low- and high-elaborating students could benefit from a writing-based AR treatment. The AR presentation was followed by a writing exercise asking students to elaborate on either the attributional information in an abstract manner (e.g., summarization, personal examples) or on the emotional impact of an academic failure experience. High-elaborating students showed the greatest improvement in course performance and motivation when given the writing exercise including specific questions of an abstract nature, whereas low-elaborating students benefitted most when encouraged to elaborate more generally on their failure-related emotions.

Similarly, Ruthig et al. (2003) found that control and stress-related processes may underlie the effectiveness of AR for overly-optimistic students. Specifically, overly-optimistic students who received AR increased their control perceptions and use of controllable attributions (effort), decreased their use of uncontrollable attributions (luck, instructor, test difficulty), and reduced their feelings of stress by the end of the academic year. Hall et al. (in press) also explored changes in academic control resulting from AR in the context of a dual-process model of control. For freshman students with low test scores who relied on primary control to the exclusion of secondary control, higher perceptions of secondary control (e.g., finding the "silver lining") were found, along with lower uncontrollable attributions, following a writing-based AR treatment. Together, these studies highlight the importance of examining how processes involving perceived control, attributions, elaboration, and stress enable AR to improve the academic motivation and performance of low-control college students.

Large-scale AR administration. By making AR techniques more efficient to administer, the large-scale application of brief, yet effective AR treatments in the college classroom is quickly becoming a reality. MAACH research shows that AR involving consolidation exercises, which are independently completed and administered en masse (e.g., writing assignment, aptitude test), are effective in improving academic performance in college students: reporting poor high school grades (Hunter & Perry, 1996); having a performance as opposed to mastery orientation (Pelletier et al., 1999); relying on primary, relative to secondary, control in failure situations (Hall et al., 2001; Hall et al., in press); and other identified risk combinations (Haynes et al., 2003; Newall et al., 2003).

Although previous laboratory-based AR research has shown that group discussion consolidation activities benefit certain groups of low-control students (Perry & Struthers, 1994; Struthers & Perry, 1996), large college classrooms make it difficult for instructors to monitor the content and direction of group discussions or to ensure equal student participation. In contrast, AR consolidation activities that are independently completed allow students to elaborate on the AR message in an efficient, yet highly personal manner, while minimizing the negative effects of group dynamics. For example, discussion consolidation techniques may be ineffective for some students when administered within classroom settings because of students' concerns about discussing personal failure experiences in the presence of their peers (Hladkyj, Hunter, Maw, & Perry, 1998). The administration of individually-oriented consolidation treatments also avoids difficulties posed by attempting to externally regulate an unstructured classroom discussion, and requires much less

direct instructor supervision. AR treatments could also be administered entirely over the Internet. Online AR methods allow this intervention to be provided not only to traditional college students, but also to other student groups who are often overlooked, including rural, mature, physically disabled, and deaf students.

Preliminary MAACH research shows that a web-based AR session requiring students to read attributional information and complete an online aptitude test results enhances subsequent test scores and final course grades for first-year students (Hall, Perry, Ruthig, Haynes, & Stupnisky, 2005). As such, AR techniques involving independently-completed consolidation exercises hold considerable promise for use in actual as well as virtual classroom settings by allowing large numbers of students to reflect on the attributional process in a structured yet meaningful way, while at the same time reducing distractions and instructor supervision.

Finally, including additional training modules alongside the standard attributional retraining session may improve its effectiveness. For instance, the findings of Hall et al. (2004) highlight the potential applicability of elaboration training in the college classroom. The results of this study suggest that by encouraging elaborative learning through explicit instruction, low-elaborating students may benefit from AR in not only course-specific but also overall first-year performance.

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Appendix A

AR Treatment: Aptitude Test

Abstract Reasoning and Abilities Test

Canadian Educational Testing Service

Toronto, Canada

September, 1991
(revised, 1994)

GENERAL INSTRUCTIONS

The Abstract Reasoning and Abilities Test (ARAT) has been developed for use in universities and schools across Canada as a measure of student ability and is more culturally appropriate than other similar aptitude tests such as the Scholastic Aptitude Test, Graduate Record Examination, or Millers Analogies Test.

The ARAT is composed of three separate sections, each with a different type of question. The first section is composed of 10 verbal analogy questions. You will be allowed 5 minutes to complete the first section. The second section is made up of quantitative questions and the time limit for the 5 questions is 5 minutes. Sentence completion questions are found in the third section. Again you will be allowed 5 minutes to answer the 10 questions.

Please remember to choose the one response that best answers the question. Think carefully before answering because questions having more than one response selected will be considered incorrect.

There is no penalty for an incorrect answer, as it is advisable to answer all questions.

DO NOT WRITE IN TEST BOOKLET

Please turn to the instructions for section 1.

SECTION 1:

<u>VERBAL ANALOGIES</u>

<u>Directions</u>: Each of these questions consists of two capitalized words which have a certain relationship to each other, followed by five lettered pair words. Choose the lettered pair of words which are related to each other in the <u>same</u> way as the words of the capitalized pair are related to each other.

An example of an analogy question is:

SHIP : HARBOUR

1.   flower : garden
2.   village : people
3.   nest : bird
4.   editor : newspaper
5.   car : garage

The correct response is e) car : garage.

PLEASE WAIT FOR INSTRUCTIONS TO BEGIN.

1.   SYMPHONY : COMPOSER

      1.   bricks : builder
      2.   policeman : law
      3.   music : singer
      4.   airplane : stewardess
      5.   sonnet : poet

2.   IMPLY : INFER

      1.   lower : raise
      2.   question : remark
      3.   emit : receive
      4.   swindle : detect
      5.   remove : carry

3.   CHRONOMETER : SUNDIAL

      1.   reduction : enlargement
      2.   watch : ray
      3.   chronology : analogy
      4.   measurement : visibility
      5.   computer : abacus

4.   OXYGEN : RESPIRATION

      1.   improvement : care
      2.   camera : photography
      3.   sunlight : photosynthesis
      4.   hydrogen : digestion
      5.   drama : acting

5.   REQUEST : REFUSAL

      1.   eat : obesity
      2.   deny : affirmation
      3.   try : failure
      4.   swim : sinking
      5.   struggle : victory

6.   SHACKLED : UNFETTER

      1.   land : sea
      2.   omen : sign
      3.   give : take
      4.   hurt : comfort
      5.   chain : link

7.   CRITICIZE : CALUMNIATE

      1.   slap : wallop
      2.   sentimentalize : slobber
      3.   plan : plot
      4.   ruminate : ponder
      5.   socialize : fraternize

8.   GARGANTUAN : MINUSCULE

      a)   positive : negative
      b)   throaty : hoarse
      c)   microscopic : enormous
      d)   obese : spare
      e)   scintillating : vapid

9.   INIQUITOUS : DISOBEDIENT

      a)   inflammable : flammable
      b)   quiescent : lethargic
      c)   adult : child
      d)   inequitable : equitable
      e)   hostile : cool

10.   LULLABY : BARCAROLE

      a)   birth : marriage
      b)   cradle : gondola
      c)   song : poem
      d)   carol : sonneteer
      e)   night : morning

END OF SECTION 1.

PLEASE STOP AND WAIT FOR FURTHER INSTRUCTIONS.

SECTION 2:

MATH ITEMS

<u>Directions</u>: Each of the problems in this section is followed by 5 alternatives lettered (a) through (e). Solve each problem and then choose the correct answer.

An example of a math question is:

>A certain type of siding for a house costs $10.50 per square yard. What does it cost for the siding for a wall 4 yards by 60 feet long?
>
>a) $800
>b) $840
>c) $2520
>d) $3240
>e) $1950

The answer is b) $840

The area of the wall = 4 yds. x (60 ft./3) = 4 yds. x 20 yds. = 80 sq. yds.
The cost = 80 x $10.50 = $840.

PLEASE WAIT FOR INSTRUCTIONS TO BEGIN.

11.   A large field of 700 acres is divided into 2 parts. The difference of the areas of the 2 parts is one fifth of the average of the areas. What is the area of the smaller part?

        a)   225 acres
        a)   300 acres
        b)   335 acres
        c)   315 acres
        d)   cannot be determined from the information given

12.   Given that [y] means that greatest integer less than or equal to y, find the value of [-1/4] + [5 1/2] + [7].

        a)   12 1/4
        a)   12
        b)   12 1/2
        c)   11
        d)   10

13.   Anne has 3 blouses, 4 skirts, and 2 pairs of shoes. How many different outfits can she wear, if an outfit consists of any blouse worn with any skirt and either pair of shoes?

        a)   8
        b)   12
        c)   24
        d)   9
        e)   48

14.   Car **A** runs at constant speed of 30 kilometers per hour (kph), and car **B** at a steady rate of 5 kph. Starting from the same spot, car **B** drives due west, while car A drives due north for 1 hour and then turns due east (maintaining speed) for 2 hours. How far apart are the cars 2 hours after they both started out originally?

        a)   72 kms
        b)   60 kms
        c)   55 kms
        d)   50 kms
        e)   36 kms

15.   Bill can mow 200 sq. ft. of lawn in 12 minutes and Fred can mow 300 sq. ft. in 15 minutes. What is the ratio of Bill's mowing rate to Fred's rate?

        a)   6/5
        b)   5/6
        c)   5/4
        d)   4/5
        e)   5/3

END OF SECTION 2.

PLEASE STOP AND WAIT FOR FURTHER INSTRUCTIONS.

SECTION 3:

SENTENCE COMPLETIONS

<u>Directions</u>: Each of these sentences has 2 blank spaces, each blank indicates that a word has been omitted. Beneath the sentence are 5 sets of words. You are to choose the set of words which, when inserted in the sentence, best fits in with the meaning of the sentence as a whole.

An example of a sentence completion is:

Legal _____ initiated by the government necessitates that manufacturers use _____ in choosing food additives.

a)   entanglements .... knowledge
b)   devices .... intensification
c)   talents .... decretion
d)   proclivities .... moderation
e)   restraints .... caution

The answer is e) restraints .... caution.

PLEASE WAIT FOR INSTRUCTIONS TO BEGIN.

16.   Some people respond to a threat of rejection by becoming very _____ while others
       _____ and become again like little dependent children.

       a)   concise .... objectify
       a)   militant .... regress
       b)   impulsive .... diminish
       c)   indignant .... revive
       d)   amiable .... procrastinate

17.   While the _____ goal is to meet the specific learning needs of each child, the long-range
       aim is to develop his ability to assume the _____ for his own learning.

       a)   real .... initiative
       b)   supposed ... requirements
       c)   immediate .... responsibility
       d)   apparent .... desire
       e)   innate .... preparation

18.   In spite of its limited _____, the magazine had a strong _____ on political thought in the
       country.

       a)   dimension .... intensity
       b)   appeal .... repression
       c)   values .... survival
       d)   insights .... reminder
       e)   circulation .... influence

19.   They talk a good deal about using _____ but deep down they seem to expect that society
       will treat them with _____ if they do so.

       a)   theology .... reverence
       b)   violence .... indulgence
       c)   intellect .... appreciation
       d)   machinations .... relish
       e)   insubordination .... revulsion

20.   Not only did he display _____ manners but his whole attitude betrayed his _____ for these
       people whom he considered his inferiors.

       a)   elegant .... frustration
       b)   peculiar .... anxiety
       c)   revolting .... indignation
       d)   abominable .... contempt
       e)   benign .... attrition

21.   After remaining _____ for some time the objective began to move _____ upward.

       a)   stationary .... imperceptibly
       b)   illuminated .... variously
       c)   invisible .... partially
       d)   secondary .... rapidly
       e)   fragile .... undulatingly

22.   _____ may conceivably be a virtue, if it is not _____.

    a)   frugality .... invalidated
    b)   ambition .... traditional
    c)   rivalry .... skeptical
    d)   nobility .... inevitable
    e)   inconsistency .... habitual

23.   Increased _____on school systems do not necessarily bring results _____with money spent.

    a)   communications .... applicable
    b)   implementations .... consistent
    c)   evaluations .... persistent
    d)   expenditures .... commensurate
    e)   objectives .... relating

24.   An attitude toward other races or religions that is _____ will only succeed in arousing more _____on either side.

    a)   sympathetic .... harmony
    b)   indigent .... analysis
    c)   bombastic .... euphony
    d)   militant .... inevitable
    e)   antagonistic .... hostility

25.   Since the salary increases each year were _____, his action in cancelling them was considered highly _____.

    a)   mendacious .... laudatory
    b)   mandatory .... arbitrary
    c)   exorbitant .... pecuniary
    d)   contested .... polemical
    e)   monetary .... philosophical

END OF SECTION 3.

PLEASE STOP AND WAIT FOR FURTHER INSTRUCTIONS.

PLEASE ANSWER THE FOLLOWING QUESTIONS IN REGARDS TO THE ARAT YOU HAVE JUST COMPLETED. INDICATE YOUR ANSWER BY SELECTING THE MOST APPROPRIATE NUMBER.

26.   How successful do you feel you were on this test?

	1	2	3	4	5	6	7	8	9	10
	VERY UNSUCCESSFUL									VERY SUCCESSFUL

27.   What percentage (%) of responses do you think you answered correctly?

1	2	3	4	5	6	7	8	9	10
<10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	90<

28.   How successful do you feel the other students were on this test?

	1	2	3	4	5	6	7	8	9	10
	VERY UNSUCCESSFUL									VERY SUCCESSFUL

29.   What percentage (%) of responses do you think the other students answered correctly?

1	2	3	4	5	6	7	8	9	10
<10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	90<

30.   How important was the test to you?

	1	2	3	4	5	6	7	8	9	10
	NOT AT ALL IMPORTANT									VERY IMPORTANT

31.   How hard did you try on the test?

	1	2	3	4	5	6	7	8	9	10
	NOT HARD AT ALL									VERY HARD

THANK YOU FOR YOU COOPERATION