

7. PERCEIVED (ACADEMIC) CONTROL AND SCHOLASTIC ATTAINMENT IN HIGHER EDUCATION*

Raymond P. Perry, Nathan C. Hall, and Joelle C. Ruthig
University of Manitoba, Canada

The geopolitical climate of late 18th century France described by Charles Dickens as “the best of times, the worst of times” is no less true today of postsecondary institutions in North America. “The best of times” are seen in the dramatic expansion of the postsecondary education system in the last 50 years — more openings are available and a greater diversity of groups have access to those openings. In Canada, for example, the number of undergraduate students increased from approximately 115,000 in 1960 to almost 850,000 in 2000, while Canada’s population grew by less than 2-fold (Canadian Association of University Teachers, 2003; Clifton, 2000; Sokoloff, 2004). During this same period, female undergraduate participation rates have risen from less than 25% in 1960, to 50% in 1980, and over 57% in 2000 (Clifton, 2000; Sokoloff, 2004). Compared to the 4-fold increase for male undergraduates, the number of female undergraduates increased by more than 14 times. Participation

* The research described here was supported by grants from the Social Sciences and Humanities Research Council of Canada (91–1296; 95–0152; 99–0435; 2003–0059), the Alexander von Humboldt Foundation (Germany), and the Max Planck Society (Germany) to the senior author, and doctoral fellowships from the Social Sciences and Humanities Research Council of Canada to the two junior authors. The efforts of Steve Hladkyj, Verena Menec, and Ward Struthers in the coordination and development of the Motivation and Academic Achievement (MAACH) Research Laboratory described here are greatly appreciated, as are the contributions of many others who participated. Raymond Currie, Dean of Arts (1991 to 1999) provided critical institutional support to the overall development of this research and Judy G. Chipperfield contributed insightful ideas concerning various research projects. Please address correspondence to Raymond P. Perry, Department of Psychology, University of Manitoba, Winnipeg, Manitoba, CANADA, R3T 2N2. Email: rperry@cc.umanitoba.ca. The MAACH research group web site can be found at the following address: <http://www.umanitoba.ca/faculties/arts/psychology/maach>

J.C. Smart (ed.), *Higher Education: Handbook of Theory and Research*, Vol. XX, 363–436.
 © 2005 Springer. Printed in Great Britain.

rates in the U.S. postsecondary education system are comparable (National Center for Educational Statistics, 2004).

With an expanding postsecondary system comes substantial economic benefits for students as well as for the broader society. According to Paulsen (1998), earnings for male college students were superior to high-school-educated males, when all fields and levels of experience are combined, by 40% in 1963, 48% in 1971, and 58% in 1989 (Murphy and Welch, 1992). Studies of identical twins indicate that earnings increase roughly 12% to 16% with each additional year of college education (Ashenfelter and Krueger, 1994; Miller, Mulvey, and Martin, 1995). Moreover, the type of college plays an instrumental role in the occupational status attained by students in professional and nonprofessional jobs (Smart, 1986) and in their eventual income levels (Smart, 1988). Within the broader societal context, Leslie and Slaughter (1992) showed that each \$1 million invested by a four-year college in its budget results in \$1.8 million in additional business spending and 53 new jobs, with similar figures reported by Creech, Carpenter, and Davis (1994).

Meanwhile, “the worst of times” are reflected in the accelerating failure rates and the decreasing quality of graduates. An unacceptable number of undergraduates leave college prematurely and many new graduates are deficient in basic numeracy and literacy skills that were commonplace decades ago. Surveys of participation rates in U.S. postsecondary institutions show that approximately 50% of graduating high school students enroll in college, but of these, 27% leave at the end of their first year, and fewer than 55% of those remaining graduate after five years (Desruisseaux, 1998; Geraghty, 1996). Of every 100 high school students in Grade 11, no more than 14 will graduate from college after five years. Figures for Canadian postsecondary institutions are equally disconcerting, as for example, at our own university, only 55% of first-year students will graduate within six years after entering their respective undergraduate programs.

More opportunity to pursue postsecondary studies, it would seem, is inextricably linked to a higher incidence of failure — an unanticipated nexus of access and failure that embraces both optimistic and pessimistic perspectives. Greater institutional choice also means that college students have more responsibility for their academic development. Never before have personal autonomy, independence, and self-reliance played such a large role in college students’ educational experiences. In this context, we view quality of educational experience broadly in terms of teaching and learning processes that promote academic motivation and

achievement-striving, as expressed in cognitive, affective, and performance outcomes in students.

The present chapter examines student differences in perceived control within higher education settings and how these differences impact students' achievement, persistence, and overall scholastic development. As part of this analysis, we consider other academic differences among college students, such as course-related emotions and perceptions of success, that interact with perceived control to enhance or impede academic motivation and achievement striving. Finally, the chapter explores the interaction between academic control in students and classroom instructional practices as a form of aptitude-treatment interaction described by Cronbach and Snow (1977). In this context, we introduce an instructional practice that is an educational treatment intervention expressly designed to assist failure-prone college students by enhancing their academic control, referred to as Attributional Retraining.

PERCEIVED ACADEMIC CONTROL: A RESEARCH PERSPECTIVE

Our main thesis in this chapter is that students who describe themselves as psychologically "in control" work harder, feel better about their studies, obtain better grades, and have more productive academic careers than their "out of control" counterparts. Simply put, two students who are equally capable intellectually may perform very differently in their courses, because of the level of control they believe they have over their academic performance. For our purposes, *perceived academic control* refers to students' beliefs about whether they possess certain attributes, such as intellectual ability, physical stamina, effort expenditure, task strategies, social skills, and educational experience, and whether such attributes make a difference to their scholastic performance (cause-effect contingencies). In this context, student differences in perceived academic control can be viewed as a continuum anchored by two distinct student groupings: *low-control students* who are failure-prone and helplessness-oriented, and *high-control students* who are academically successful and mastery-oriented. Within this framework, low-control students are expected to have very different academic trajectories than their high-control counterparts in terms of cognitive, affective, motivational, and achievement outcomes. Both types of students are assumed to be represented in a typical college classroom, along with other students (moderate-control) who occupy the middle of the control continuum.

Two fundamental questions must be addressed when considering

the role of perceived academic control in the scholastic development of college students. First, what is the effect of academic control on achievement motivation and scholastic performance when students enter college initially, and relatedly, throughout their undergraduate training? Embedded within this first research question are two related issues concerning the relative effects of perceived control compared to traditional predictors such as intelligence, prior knowledge, and socioeconomic status, and the sustainability of perceived control effects on academic development over time. These two issues are of interest not just to students, but to instructors and postsecondary institutions as well. Instructors want to know, for example, whether differences between college students in academic control influence scholastic performance separately from aptitude and other student differences pertinent to learning and performance; and if so, by how much and for how long.

The second question concerns whether classroom instructional methods can offset the deleterious consequences uniquely associated with low academic control. Low control in college students is particularly worrisome when normally effective teaching methods are ineffective with low-control students. If differences in academic control are critical, then instructors may want to tailor their teaching methods to students differing in control. The discussion method of instruction, for example, may be suitable for high-control students because of its open-ended structure, but not so for low-control students for the same reason; or, the lecture method may appeal to low-control students because of its highly structured and predictable nature, but not to high-control students because of the lack of autonomy. Control-enhancing educational interventions would have special appeal to classroom instructors if they can be readily incorporated into their teaching methods to assist low-control students in getting better grades and staying in college. In the context of this second question, we introduce *Attributional Retraining (AR)* as a control-enhancing treatment designed to assist failure-prone, low-control students which can be readily incorporated into instructors' classroom teaching methods (see Attributional Retraining: A Control-Enhancing Instructional Treatment section below).

Over the past two decades, we conducted a number of experimental studies to explore these two basic research questions in both laboratory and field settings (Perry, 1991, 2003). A common core 2 × 2 factorial design was used to test the effects of academic control (low, high) and instructional treatments (control-enhancing treatment, no treatment) on performance and achievement-related measures involving cognition,

emotion, and motivation. The first question concerning individual differences in academic control is a main effect question which statistically addresses whether high-control students perform better than low-control students in their first year of college and throughout their undergraduate studies. The second instructional treatment question is examined in two ways: first, with a control-enhancing treatment main effect which examines whether both low- and high-control students perform better after receiving the treatment, compared to those not receiving the treatment; and second, with an academic control \times treatment interaction which is a type of aptitude-treatment interaction (Cronbach and Snow, 1977). This interaction question considers whether the AR educational treatment intervention (treatment vs. no treatment) improved the performance of some students (low control), but not others. The bulk of the chapter is devoted to a detailed exploration of these research questions.

PERCEIVED CONTROL AND ACADEMIC ACHIEVEMENT SETTINGS

Although college students are selected for their intellectual and academic capabilities, surprising numbers fail, even as the criteria for admission to postsecondary institutions become increasingly stringent. As shown by Anastasi (1988) and Britton and Tesser (1991), pre-college aptitude determines only 16% to 20% of variance in college grades, a finding replicated with increasing frequency. Presumably, admissions criteria should increase students' success rates, yet college students are taking longer to graduate or are simply withdrawing from postsecondary education entirely. Perry, Hladkyj, Pekrun, and Pelletier (2001) describe this deficiency in traditional selection criteria as a *paradox of failure* to describe outwardly bright, motivated college students who subsequently fail despite having met stipulated admissions criteria. They argue that an accurate account of this paradox must include psychosocial variables, notably perceived control, in addition to typical academic and demographic selection criteria involving intellectual aptitude, disciplinary knowledge, academic skills, socioeconomic status, gender, and English-language fluency. Considerable latitude exists in the research literature in the specification of psychosocial variables, however, they are generally considered to include a host of noncognitive variables related to personality, attitudes, creativity, curiosity, motivation, emotion, and so on, but exclude sociodemographic and cognitive variables.

A wealth of empirical evidence supports the importance of psychosocial variables for scholastic attainment in college in addition to

more traditional, aptitude and cognitively-based criteria such as SATs and GREs (cf., Pascarella and Terenzini, 1991). For example, in a two-semester longitudinal study, Perry *et al.* (2001) assessed first-year college students' beliefs about their control over academic outcomes and about their preoccupation with success and failure, using covariate analysis to adjust for intellectual aptitude. Students who believed they had control over academic outcomes and who were preoccupied with failure had better grades than all other students at the end of the course, and had better GPAs in all courses taken over a three-year period (Perry, Hladkyj, Pekrun, Clifton, and Chipperfield, in press). Harackiewicz, Barron, Tauer, and Elliott's (2002) seven-year longitudinal follow-up study demonstrated the importance of achievement goals for academic success in college. As expected, ability and high school performance predicted academic success on entry to college and thereafter, but in addition, achievement goals also played a major role in students' scholastic development. Studies by Eaton and Bean (1995) and House (1995) also underscore the importance of psychosocial variables in the academic development of college students. In Robbins *et al.*'s (2004) meta-analytic review of the role of psychosocial factors in college success, perceived control (self-efficacy) and achievement motivation were the strongest predictors of college GPA and persistence (retention) of all psychosocial factors considered, and were superior to socioeconomic status, standardized achievement, and high school GPA.

Perceived (Academic) Control

What is variously labeled autonomy, independence, or self-reliance in common parlance, is viewed here as perceived control, a psychological construct that has received widespread interest in the social sciences over the last five decades. As a construct, it has evolved from Rotter's (1966) conception of it as an individual difference variable (locus of control) and Glass and Singer's (1971) depiction of it as an environmental (contextual) stressor, to a critical component in many present day social cognition theories, including competence motivation (White, 1959), personal causation (DeCharms, 1968), learned helplessness (Seligman, 1975), mastery (Dweck, 1975), reactance (Wortman and Brehm, 1975), self-efficacy (Bandura, 1977), self-determination theory (Deci and Ryan, 1985), primary/secondary control (Rothbaum, Weisz, and Snyder, 1982), action control (Kuhl, 1985), causal attributions (Weiner, 1985), and mindfulness (Langer, 1989). It is also featured prominently in research

on academic achievement (Dweck, 1975; Stipek and Weisz, 1981), health (Chipperfield and Greenslade, 1999; Thompson, Sobolew-Shubin, Galbraith, Schwankovsky, and Cruzen, 1993), stress (Folkman, 1984), depression (Garber and Seligman, 1980), aging (Rodin, 1986), and human mortality (Chipperfield, 1993).

Perceived control is a person's subjective estimate of his or her capacity to manipulate, influence, or predict some aspect of the environment. In the research literature, the prevailing view is that higher perceptions of control are more advantageous than lower perceptions of control. As Skinner's (1996) seminal review so aptly illustrates, the construct continues to evolve to an ever-expanding list of terminology and complexities. In general, perceived control refers to beliefs about the predictability of life's daily events and about the capacity to influence such events, with "perceived" reflecting subjective rather than objective capacity. This phenomenological distinction between "perceived" and "actual" capacity results in the correlation between subjective and objective control ranging from positive to negative (cf., Thompson *et al.*, 1993). Some people assume they have more or less capacity to influence and to predict events than they have in reality, whether as a stable and enduring part of their personality, or as a temporary and transient experience.

These stable and transient forms of perceived control can be thought of as being trait- and state-like manifestations of perceived control, somewhat comparable to trait/state distinctions in personality theory (cf., Eysenck, 1997; Wiggins, 1996). *Stable perceived control* is more enduring and is an integral part of an individual's personality makeup, the result of biology and past learning experiences. In contrast, *transient perceived control* is much less enduring and a product of temporary and ongoing intrusions of daily life. Within college classrooms, the learning contingencies can cause the level of transient control in students to fluctuate widely (see Academic Control and Low-Control Learning Environments section below). As such, an individual's level of stable perceived control can vary as a function of changing levels of transient perceived control created by situational factors. Research perspectives on perceived control typically differ with regard to trait generality, as for example, Bandura (1997) who considers self-efficacy to be a domain-specific entity, whereas Rotter (1975) considers locus of control to be a general attribute. These differences between individuals in perceived control, stable or transient, generate cognitive, emotional, and behavioral consequences, leading people with greater perceived control to think, feel, and respond differently than those with less perceived control.

In achievement settings, we view *perceived academic control* as a

relatively stable psychological disposition affecting students' motivation and achievement-striving as revealed in class tests, term assignments, course grades, GPA, etc. It is deemed to be "relatively" stable because assessments of trait perceived control may include the effects of transient elements as well, assuming that periodic environmental intrusions can affect a person's general sense of control to some degree (e.g., Rotter, 1975; Skinner, Connell, and Zimmer-Gembeck, 1998). Initially, we assessed academic control using a single-item, domain-specific measure (Perry and Dickens, 1984), but subsequently expanded this to a multi-item scale (Perry, Hladkyj, and Pekrun, 1998; Perry *et al.*, 2001) incorporating primary academic control, secondary academic control (Rothbaum *et al.*, 1982), and desire for control (Burger, 1989). This reconfiguration follows from the social cognition literature in which perceived control has been defined with a variety of single- and multiple-item measures (Skinner, 1996).

Within this framework, perceived academic control is deemed to be a personal attribute students bring to the classroom that interacts with various aspects of the classroom environment, the most salient being the teaching methods employed by instructors. In addition to academic control beliefs, other dispositional (stable) student characteristics that contribute to students' scholastic development would include constructs such as optimism, self-worth, perceptions of success, and so on. How these stable, personality-like variables relate to academic control goes beyond the scope of this chapter, however, in our own studies academic control has been found to relate positively to: optimism ($r_s = .26-.34$), self-esteem ($r_s = .40-.44$), cognitive elaboration ($r_s = .22-.26$), desire for control ($r_s = .34-.51$), procrastination (.18), and Big 5 Personality constructs involving Extraversion (.17), Agreeableness (.18), Openness to Experience (.23), and Conscientiousness (.16).

Desire for Control

In considering pre-existing dispositional differences in control among students, it is important to recognize that students' "perceptions of control" differ from their "desire for control" (Burger, 1995; Schulz and Heckhausen, 1996). Despite individual differences in levels of perceived academic control, both low- and high-control students share a common *desire* to influence their scholastic endeavors, although the level of desire may vary across academic tasks. Some students may believe they can control certain academic outcomes, yet view that control as

unimportant (i.e., high control/low desire), as in the case of students taking a “practice test,” completing an assignment not worth any formal marks, or taking an elective course. These students believe they will perform well on the practice test, but this control is of little value (low desire) to them because the outcome (test score) is unimportant. Similarly, students taking piano lessons or engaged in an athletic sport, but who have little interest in the activity, may perform poorly, even though they have ample talent to excel in the task. In such cases, students having little interest in or desire for their academic endeavors (low desire) does not necessarily imply a lack of control in those circumstances.

The reverse is also the case, however, where students want to influence academic outcomes (high desire), but perceive themselves as having little control over those outcomes, no matter how badly they may want more control (i.e., low control/high desire). Many students, for example, want to perform well in their courses, but are nevertheless uncertain about how to achieve optimal outcomes. Moreover, because academic performance is such an important aspect of their lives, students are likely to desire a considerable amount of control over their achievement outcomes. This desire for control fuels the development of perceptions of control by regulating the type of goals and situations that individuals pursue and their capacity to deal with those situations (Burger, 1995; Burger and Cooper, 1979).

Covington (1992) has argued persuasively that students’ self-worth is intricately interwoven with their desire to do well in academic settings. He points out that students tend to equate their own sense of worth with their competitively determined academic accomplishments (e.g., grades assigned by their instructors). As such, the top priority among these students is to strive for academic success and avoid failure, the latter viewed as a sign of incompetence. Thus, a key assumption in academic control research is that students generally want to control their educational experiences. Instances in which this is not the case are of special interest.

Academic Failure

Academic failure, its consequences, and its remediation are critical not just to perceived control researchers, but also to the students themselves, their instructors, and the institutions they attend. For college students, the psychological consequences of failure can threaten their

self-worth, erode their perseverance, and undermine their career goals. Moreover, the financial burden of failing a course or changing programs can lengthen graduation completion time substantially, adding thousands of dollars in direct educational costs, as well as indirect costs in lost wages. In contrast, highly motivated students with good academic skills and who receive effective instruction complete their education in much less time, incur far fewer personal and institutional expenses, and have better career options available to them when they graduate. For postsecondary institutions, student failure can amount to tens of thousands of dollars per year in administrative costs for course and program changes, for counseling services, for remedial skills courses, and so on. When academic failure leads to withdrawal from the university, lost tuition revenues for as few as 100 students can add up to \$500,000 a year, based on a conservative estimate of tuition costs of \$5,000 per year.

Weiner’s theory of achievement motivation and emotions (1985, 1995; see below) provides insight into academic failure in college classrooms. Academic failure initiates a causal search in students to identify the reasons (i.e., causes, explanations) for poor performance. The resulting causal attributions can have significant consequences for students’ more immediate scholastic performance and for their overall academic career development. A student who attributes a series of failures on course tests to a lack of effort has a better prognosis academically than a student who attributes such failures to a lack of ability. The “low ability” student will experience a loss of perceived control, negative emotions, lack of motivation, and an increased probability of failing subsequent tests and withdrawing from college. Unfortunately, failure is all too common in college, particularly in the first year when students are making the transition from the comfortable realities of high school to the unknown realities of college. How students’ perceptions of academic control are affected by both success and failure experiences is discussed in greater detail below in the context of Weiner’s theory of achievement motivation (see *An Attributional Framework for Perceived Control in College Classrooms*).

The remediation of failure is pertinent to all students who struggle at some point in their academic careers, but more so for those who fail repeatedly. Furthermore, postsecondary institutions are also becoming more concerned about failure remediation because of its relevance to student access and attrition. Many colleges and universities have implemented remedial programs to assist failure-prone students and access programs designed for students whose qualifications and experiences may impede entry into higher education. Obviously then, policies and

procedures intended to reduce student failure are of significant financial value to and practical importance for postsecondary institutions. In a later section, we examine in detail how Attributional Retraining can offer a viable failure-remediation solution for college students and post-secondary institutions alike.

Academic Control and Low-control Learning Environments

For over three decades, perceived control researchers have demonstrated how unpredictable or noncontingent events can produce loss of perceived control and helplessness in animals and humans (see Skinner, 1996 for a review). When outcomes and events in the environment are unpredictable and/or cannot be influenced by a person, perceived control is reduced, giving rise to helplessness and hopelessness (Garber and Seligman, 1980; Glass and Singer, 1971; Weiner, 1980). The emphasis on “perceived” in perceived control means that the objective realities of predictability and contingency are inferred by the person in a given situation. Thus, a situation that is objectively predictable or controllable may be perceived as a low-control situation by one person and as high-control by another. Or, a situation that is objectively unpredictable and/or uncontrollable may nevertheless be perceived as a high-control situation. In most instances, the correspondence between the objective and subjective reality of a given situation is reasonably isomorphic, although perceived differences between objective and subjective reality can exist for a given individual or between individuals in the same situation. Situations which limit perceived predictability and/or the perceived capacity to influence events create optimal conditions for observing the impact of academic control on scholastic attainment.

Though academic experiences in college may be “objectively” controllable, students’ subjective (phenomenological) or perceived controllability is the operative reality here (Weiner, 1985, 1995), sometimes causing objectively controllable learning experiences to be perceived as uncontrollable, or objectively uncontrollable learning situations as controllable. For some students, any number of academic demands and tasks can be sufficiently novel and unfamiliar as to create unpredictable and noncontingent conditions, that in combination, generate a highly aversive, control-threatening classroom learning environment. But for other students, these same classroom conditions are commonplace, having been part of previous academic experiences, and are seen as reasonably predictable and contingent. Each occurrence can represent

some combination of unfamiliarity, challenge, unpredictability, or failure, any one of which portending a loss of perceived control (Skinner, 1996; Weary, Gleicher, and Marsh, 1993).

Thompson *et al.* (1993) describe life situations which inundate individuals with objectively unpredictable events and outcomes as *low-control environments* because they create a psychological state of being “out of control.” Perry (1991, 2003) argues that such low-control environments can develop at different levels of the educational system when a disproportionate number of unpredictable and/or uncontrollable achievement events occur in classrooms and other academic contexts. The first year of college can be a prototypic control-threatening learning environment to the extent that students’ academic and social experiences undermine their perceived control as a result of heightened academic competition, increased pressure to excel coupled with more frequent failure, unfamiliar academic tasks, critical career choices, new social networks, etc. To the extent that these experiences occur within classrooms, they can be described as low-control learning environments. Because of this, in college classrooms, in contrast to high school classrooms, failure experiences can be more common. At the same time, however, the potential for control, and related successes, is also greater, which in itself may pose a threat to control for some students.

These experiences are assumed to occur with greater regularity during transition periods throughout students’ educational development, such as the first year of college, and create more low-control perceptions relative to other years in college (Perry, 2003). Within the K-16 education system, such classroom conditions are more likely during transition years, as might occur in kindergarten, grade 1, grade 7, grade 10, or first-year university. These low-control transition periods, in turn, can have a direct, though temporary, influence on students’ perceived academic control. For students continuing their education beyond K-16, additional low-control transition periods would include the first year of graduate or professional school and beginning a new job or career (cf., Bess, 1973; Menges *et al.*, 1999; Perry *et al.*, 1997, 2000; Smart, 1990).

In contrast to these episodic, educationally-contextualized experiences, perceived control has stable and enduring qualities that the student brings to an achievement setting, low-control or otherwise. In transition periods characterized by a high frequency of unpredictable achievement episodes, stable differences between students in personal control and transient control will jointly determine achievement motivation and performance, with students high in academic control outperforming

their low-control counterparts. How state- and trait-like factors contribute to overall perceived control is not precisely clear in the literature (cf., Skinner, 1996), however, both are obviously important. Aside from affecting students' transient academic control, repeated experiences with low-control classroom settings likely are incorporated into their more enduring sense of control. In our research discussed below, we focused on the first year of college as a "low-perceived-control" experience in which student differences in perceived academic control are expected to be more pronounced.

AN ATTRIBUTIONAL FRAMEWORK FOR PERCEIVED CONTROL IN COLLEGE CLASSROOMS

Our perspective on perceived academic control in college students begins with the conventional position that perceived control is determined by two broad categories of variables, namely the characteristics of the individual and the properties of the environment. In achievement settings, perceived control is deemed to be a personal quality that students bring to the classroom, like intellectual aptitude, gender, socioeconomic status, discipline knowledge, intrinsic motivation, etc., which is influenced by, yet separate from, the properties of the classroom itself (Glass and Singer, 1971; Perry, 1991, 2003). Perceived academic control is considered to be one such characteristic that students bring to the classroom and a major individual difference directly affecting motivation and performance. Classroom properties also can contribute to a student's sense of academic control and would include not just the physical aspects of the setting, but also such factors as instructional quality, instructor's grading standards, classroom discipline, course level, curriculum structure, class composition and size, and so on.

Within this dichotomy of student characteristics and classroom properties, we adopt an attributional perspective on perceived academic control which focuses on the causal attributions students use to explain their academic successes and failures (cf., Weiner, 1985, 1995). Assuming that college students are actively engaged in trying to make sense of their classroom experiences in order to succeed, they will search for explanations (causal attributions) of their successes and failures within themselves and within the educational context. The personal characteristics of students offer a rich source of possible causes for their successes and failures, the most salient being intelligence, prior knowledge, motivation, and personal goals (Van Overwalle, 1989, 1997). For college students, their quest for causal explanations is manifest in a preoccupation

with their personal attributes, reflected in such questions as, "Am I smart enough?" "Can I hang in there long enough?" and so on. Such questions highlight students' concerns about how their attributes affect their performance in comparison to other students, or to some absolute standard. The classroom properties category also presents numerous possibilities for explaining academic success and failure, the most prominent being instructional quality, content difficulty, and grading criteria, but also class size, temperature, lighting, etc. (Van Overwalle, 1989).

According to control theory, perceptions of control depend on perceived contingency between action and outcome (Rothbaum *et al.*, 1982; Rotter, 1966). Thus, within an academic context, perceived control refers to students' perceived influence over and responsibility for their academic performance (Perry, 1991) which involves a perceived contingency between the student's actions (e.g., studying) and subsequent academic outcomes (i.e., success or failure). Perceived contingency between actions and outcomes is inferred by students from their attributions for those outcomes. Consequently, to influence an outcome students must perceive the outcome as being dependent on their own actions or personal qualities. In this sense, perceived control is a product of a student's belief in the contingency between his or her actions and an outcome, with the contingency relation being determined by the causal attributions selected. The stronger the perceived contingency, the greater the sense of control. If success on a class test is attributed to internal, controllable causes (e.g., one's own effort), for example, a student is likely to view performance on a task as dependent on his actions, resulting in an increase in perceived control, motivation, and performance (Weiner, 1986). Thus, in terms of motivation, students' subjective indicators of control are often more important than objective indicators of their actual control (Shapiro, Schwartz, and Astin, 1996).

The phenomenological basis of perceived academic control can be understood from the perspective of Weiner's attribution theory of motivation and performance (1985, 1995) which has had a major impact on several areas of psychology, including clinical, educational, social, developmental, and learning (cf., Fiske and Taylor, 1991). Weiner argues that students' explanations for their successes and failures are pivotal to achievement-striving and academic performance. Weiner proposes that people routinely seek to understand why they succeed and fail in life's challenges. They are constantly trying to explain the world around them with such questions as: "Why did that happen?" "Why did she say that?" "Why didn't he do that?" People's answers to these "why" questions are the basis for their subsequent thoughts, feelings, and actions in future

situations. The process of identifying explanations or reasons for these “why” questions is referred to as *causal search*. Within this perspective, we would expect that students who explain their successes and failures using controllable causes should have more perceived control than those who attribute such outcomes to uncontrollable causes.

According to Weiner, all attributions resulting from causal search have three properties or dimensions: *locus of causality*, which refers to whether the causes of success or failure reside within (e.g., aptitude) or outside (e.g., chance) the individual; *stability*, which describes whether the causes are stable (e.g., industriousness) or transient (e.g., fatigue); and *controllability*, which indicates whether the causes can or cannot be influenced by the individual or someone else (e.g., laziness versus economic recession). In its simplest representation, the three dimensions of the taxonomy can be dichotomized and depicted as a locus (internal, external) by stability (unstable, stable) by controllability (uncontrollable, controllable) $2 \times 2 \times 2$ factorial matrix, although in reality each dimension represents a continuum and not a dichotomy. Given that every causal attribution possesses these three properties, any attribution can be placed within one of the eight cells of this simple framework.

These dimensional properties of causal attributions determine subsequent cognitions, affect, and motivation, all of which, in turn, contribute to action. For instance, the stability dimension influences future expectations: a stable attribution (aptitude) about an outcome implies that it is more likely to reoccur than would an unstable attribution (chance). Each of the three dimensions also determines specific emotions which, in combination with expectations generated by the stability dimension, lead to motivated behavior. Feelings of guilt occur when a controllable attribution (low effort) is used to explain failure, or feelings of hopelessness can result if a stable attribution (low ability) is used to explain failure. Thus, the unique locus, stability, and controllability properties of an attribution can substantially alter a person's motivation and behavior regarding future actions. A more complete account of this model is provided elsewhere (Weiner, 1985, 1986, 1995).

Consider Weiner's theory applied to an achievement setting in which a student fails an important test and, in seeking an explanation, attributes the poor performance to lack of ability. Because ability is typically viewed as an internal, stable, and uncontrollable cause, the student would regard himself/herself as personally responsible for the negative outcome and would experience shame, sadness, lowered self-esteem, and in extreme cases, depression. These negative emotions would make the course much less attractive to the student and lead to avoidance. Coupled with high

expectations of continued failure, assuming lack of ability is perceived as stable, these negative emotions would undermine the student's motivation to succeed, thereby jeopardizing future performance and continuation in the course. In contrast, internal, unstable, and controllable attributions, such as effort, would have very different academic consequences. Similar to a lack of ability attribution, a lack of effort attribution for failure would generate negative affect (guilt vs. shame) because the student feels responsible for the poor performance, but it would be far less harmful. Shame is less likely to occur, self-esteem is less threatened, and other negative emotions are infrequent. More importantly, expectations about future success versus failure would be more positive because lack of effort is regarded as an unstable and controllable cause that can be modified. This suggests an optimistic scenario in which failure resulting from lack of effort can be changed to success by trying harder (more effort) next time. Thus, the student may not feel good about the course, but will strive to do better anyway.

This stability/controllability difference between ability and effort, and any other causal attributions, lies at the heart of achievement motivation and performance. Although both are internal attributions for failure, helplessness is more likely to result from a lack of ability attribution (stable/uncontrollable factor), whereas mastery is more probable from a lack of effort attribution (unstable/controllable factor). External attributions, such as fate or task difficulty, would create less negative affect, less harm to a student's self-esteem, and less helplessness. Simply put, the more in control we feel, the more motivated we are; conversely, the less control, the less motivated. Thus, our explanations, or causal attributions, for why we succeed and fail directly affect our motivation because they imply that our academic performance is either controllable or uncontrollable. So, when “lack of ability” (low intelligence) or “poor instruction” are deemed to be the cause of failure, attributions which are not controllable by us and are stable, we experience a loss of control which, in turn, leads to low motivation and weak performance.

In contrast, “lack of effort,” “bad strategy,” or “poor note-taking,” are all controllable and changeable causes of failure. They can be altered by trying harder, using a better strategy, or taking clearer notes, thereby enhancing perceived control and strengthening motivation and performance. Controllable attributions give students a greater sense of personal control over academic performance, and in turn, more motivation to achieve; uncontrollable attributions engender less personal control and less motivation to succeed. Thus, differences in perceived control result from the three dimensional properties of attributions acting together

such that an internal, stable, and uncontrollable attribution (ability) for failure would lead to a loss of perceived control, whereas an internal, unstable, and controllable attribution (effort) for the same failure would enhance perceived control.

In sum, perceived academic control is a function of causal attributions which provide students with the specific reasons for various achievement outcomes. Weiner's theory explicitly describes the cognitive, affective, and motivational consequences of controllable and uncontrollable attributions which underpin students' belief patterns of perceived control. Weiner's attribution theory is particularly well-suited for deriving manipulations, measures, and predictions related to academic performance and has several major advantages for studying linkages between academic markers and teaching and learning processes: a primary emphasis on achievement; a broad range of cognitive, affective, and motivational outcomes; and, a clearly delineated framework for testing their sequential developments. This explicit sequencing of variables lends itself to unraveling the complexities underpinning perceived academic control and the scholastic attainment of college students.

The remainder of the chapter is devoted to two main themes: first, that perceived academic control is a critical individual difference in students (academic marker) affecting their scholastic attainment; and secondly, that Attributional Retraining (AR), designed as a cognitive intervention to enhance students' academic control, can be viewed as an instructional treatment that positively influences achievement motivation and performance.

ACADEMIC CONTROL IN ACHIEVEMENT SETTINGS

Thus far, the chapter has dealt with the conceptual foundation of perceived control within higher education settings. We shift now to focus on student differences in academic control and how they affect the motivation, performance, and overall scholastic development of college students. In the process, we examine other academic differences among students, such as course-related emotions and perceptions of success, that interact with perceived control to enhance or impede academic motivation and achievement striving. Finally, we consider students' academic control in relation to classroom instructional practices as a form of an aptitude-treatment interaction (Cronbach and Snow, 1977).

ACADEMIC CONTROL IN ELEMENTARY AND HIGH SCHOOL STUDENTS

Beginning in the early school years through to high school, perceived academic control has been found to positively affect several aspects of students' educational development (Musher-Eizenman, Nesselroade, and Schmitz, 2002; Stipek and Weisz, 1981; Yamauchi, Kumagai, and Kawasaki, 1999). For example, in a series of studies conducted by Skinner and her colleagues (e.g., Skinner, Wellborn, and Connell, 1990; Skinner *et al.*, 1998), school-age children's achievement and perceived control were found to be reciprocal in nature: greater perceptions of control enhanced subsequent academic achievement, and achievement, in turn, enhanced perceptions of control over future academic outcomes. Moreover, children who had teachers described as warm and contingent were more likely to develop optimal profiles of control that emphasized internal causes, resulting in greater classroom engagement and achievement. Conversely, unsupportive teaching was associated with less perceived control, which predicted academic apathy and lower achievement. These findings indicate that teachers can actively shape children's control beliefs and academic motivation by providing a warm and contingent learning environment (Clifton and Roberts, 1992; Skinner *et al.*, 1990).

Other research involving school-age children reveals that greater academic control enables children to understand course content better and use more effective learning strategies (Yajima, Sato, and Arai, 1996). These benefits of academic control are not limited to the general school population, but extend to learning-disabled children as well. Specifically, perceived control can enhance achievement motivation among children with learning disabilities or those who are at risk academically (Dev, 1998). Dicintio and Gee (1999), for example, found that among unmotivated students who were deemed to be at risk academically, perceived control was associated with greater task involvement and feelings of competency, and conversely, with less boredom, confusion, and interest in doing other things. Thus, even among school-age children who experience academic failure due to learning or motivational difficulties, perceived control can improve their educational development.

Of note, perceived control may be more critical than other factors previously thought to influence children's scholastic development. In a longitudinal study, Ross and Broh (2000) examined both perceived control and self-esteem among 10th grade children in an attempt to determine which individual difference factor was a stronger predictor of academic achievement in grade 12. While prior academic achievement

and parental support assessed in grade 8 enhanced both self-esteem and perceived control in grade 10, only perceived control influenced subsequent academic achievement in grade 12. Similar results were found by Leondari and Gialamas (2000), where high perceived control was associated with better performance and no direct link was found between self-esteem and achievement. Together, these findings show that perceived control can be more critical than self-esteem to students' academic achievement. More generally, the research findings in K-12 students point to the significance of perceived control for their overall academic development and serve to highlight its potential importance for college students. Notably, levels of perceived control do appear to increase somewhat from one grade to the next, but then stabilize during high school. And because intellectually capable high school students are most likely to advance to college (Rotter, 1975; Stipek and Weisz, 1981), perceived academic control is likely to play a larger role in their scholastic development in college than in high school (Cassidy and Eachus, 2000; Perry, 2003).

ACADEMIC CONTROL IN COLLEGE STUDENTS

Although perceptions of control over academic outcomes are important for school-age children, they may be even more critical for students making the transition from high school into college. At this critical point in their lives, college students are free to pursue various career options; parental authority and influence are reduced, as are relationship or familial restraints — all of which enhance students' focus on autonomy and independence, more so than in primary, middle, or secondary school. At the same time, college students must assume responsibility for their education and contend with a greater emphasis on academic competition and success. It is also during this transition phase that a stronger tie develops between self-concept and achievement, so that one's identity is linked to one's academic performance (Perry, 1991).

Because perceived control over academic-related outcomes is especially crucial to college students' scholastic success, this transitional period from high school into college can be particularly problematic to the extent that it constitutes a low-control learning environment (Perry, 2003). Low-control situations are not uncommon within the education system, particularly when certain grades or transition years are infused with a disproportionate number of unpredictable achievement events or

episodes. The first year of college is notable in this regard because it can undermine students' efforts to gain a sense of control and autonomy by repeatedly exposing them to novel and unexpected experiences such as increased emphasis on performance, heightened competition, pressure to excel, more frequent failure, unfamiliar academic tasks, new social networks, and critical career choices (Perry, 1991, 2003).

Thus, while perceived academic control is key to success in college, maintaining that sense of control presents an enormous challenge to first-year college students in particular. Students who have a higher sense of academic control are more likely to conquer many of the challenges presented to them in their first year of college because they believe the onus is on them to invest more effort, to adjust their study strategies, and to seek assistance from their instructors as needed. In contrast, students with a lower sense of academic control often feel utterly helpless when faced with the daunting challenges of their first year at college. We have chosen to focus on this struggle to maintain a sense of control in low-control situations faced by college students, and in research conducted in both laboratory and field settings, we have consistently found that academic control benefits first-year college students in terms of their academic-related emotions, cognitions, motivation, and achievement. The following sections review this research, and consequently, address one of the fundamental questions posed at the beginning of this chapter concerning the positive impact of academic control on student scholastic development.

Emotional Consequences

Academic control has been found to positively influence college students' emotional experiences in their courses. Schönwetter, Perry, and Struthers (1993), for example, showed that academic control affected students' achievement-related emotions in their introductory psychology course wherein students with greater levels of control felt more pride and less shame concerning their course performance compared to students with less control. Aside from shame, other negative course-related emotions are also minimized by academic control, as seen in Perry *et al.*'s (2001) study in which high-control students reported less course-related anxiety and boredom than their low-control counterparts. Research by Wise and colleagues (Wise, 1994; Wise, Roos, Leland, Oats, and McCrann, 1996; Wise, Roos, Plake, and Nebelsick-Gullett, 1994) revealed that students' desire for control within testing situations,

coupled with a greater sense of control over the situation, was associated with less test anxiety. Similarly, students who have a greater sense of control over questions that would be potentially included on their introductory psychology tests experience less stress than students who feel they have no control over the test questions (DasGupta, 1992). Thus, perceptions of control over course exams and other academic outcomes can enhance both the positive emotions *and* reduce the negative emotions that students experience toward their college courses.

Cognitive and Motivational Consequences

In addition to influencing their academic-related emotions, perceived control also enhances students' cognitive and motivational experiences within the college setting. Academic control can bolster achievement motivation so that high-control college students put more effort into academic tasks, are more motivated to learn, believe they are more successful in their courses (Perry *et al.*, 2001), and are more likely to persist in their college courses than students with less control (Ruthig, Hladkyj, Hall, Pekrun, and Perry, 2002). Furio (1987) also found that higher perceptions of control were associated with increased learning and motivation to work and study. Finally, research by Cassidy and Eachus (2000) showed that students with higher academic control engaged in more effective study strategies involving time management and organization, which in turn, predicted better academic achievement.

In the realm of metacognitive strategies, academic control is positively associated with cognitive elaboration and self-monitoring. High-control students tend to engage in more cognitive elaboration strategies such as finding common themes throughout their courses and relating new course material to prior knowledge, as well as active learning and more self-monitoring (i.e., capacity to determine how well they understand course material) than their low-control counterparts (Cassidy and Eachus, 2000; Perry *et al.*, 2001). Taken together, these research findings indicate that perceptions of academic control contribute significantly to students' emotional, cognitive, and motivational experiences during their college education.

Achievement Consequences

Aside from these affective and cognitive benefits, academic control positively influences students' academic performance in terms of class tests, assignments, and final grades in college courses. For example, in

a one-year longitudinal field study involving academic control, we found a dramatic difference between high- and low-control students in their final introductory psychology course grades. Students with a greater sense of academic control at the start of the year obtained a final grade of B+ in the course at the end of the year, in comparison to their low-control counterparts who obtained a C+ (Perry *et al.*, 2001). This variation in students' perceptions of control resulted in a performance difference of roughly two letter grades. Our academic control research has included both single-course achievement measures (i.e., final course grades) and performance indicators from all courses in which students enroll over an entire academic year, namely cumulative grade point average (Hall, Perry, Ruthig, Hladkyj, and Chipperfield, 2005; Ruthig, Hladkyj, Perry, Clifton, and Pekrun, 2001). In these longitudinal studies involving large, diverse samples, high-control students had greater overall GPAs than low-control students, providing evidence that academic control benefits student achievement, both at the course-specific level ($r = .18$) and across numerous courses and different classroom situations ($r_s = .18-.25$).

In addition to academic performance, we have examined the relation between academic control and college persistence as reflected in students' intentions to remain in or withdraw from these courses. Ruthig *et al.* (2002), for example, showed that academic control significantly predicted persistence in an introductory psychology course, where the more academic control students felt they had at the beginning of the term, the less likely they were to subsequently drop their introductory psychology course. In keeping with this focus on cumulative measures of academic achievement, our recent research efforts have examined the effects of perceived academic control on attrition from students' cumulative voluntary withdrawal from all courses taken during the academic year. To this end, Hall, Perry, Ruthig, Hladkyj, *et al.* (2005) found that students with higher levels of perceived academic control were also less likely to withdraw from other courses during their first year of college than were low-control students. Thus, academic control not only contributes to better achievement in first-year courses, it also increases students' persistence in those courses (e.g., Ruthig *et al.*, 2005; Perry *et al.*, in press).

In studying the effects of academic control on first-year achievement and persistence we have controlled for aptitude differences in students. A confound can arise when the relationship between academic success and control is reciprocal: academic success promotes academic control which, in turn, fosters academic success. For instance, high-aptitude

students are more successful and their successes contribute to higher levels of perceived control (e.g., Barling and Snipelisky, 1983; Edmonds, 2003; El-Hindi and Childers, 1996; Yan and Gaier, 1991). Accordingly, a measure of high school performance is routinely included as a covariate in our analyses to account for potential differences in aptitude upon entering college. Thus, we can be confident that differences in academic performance after the first year of college are less likely due to preexisting differences in high school aptitude.

Because our research is based on Canadian university students who are not required to write SATs, we have relied on other measures of high school aptitude. High school achievement has been assessed using self-reported high school grade, a subjective average of students' grades in their final year of high school, which correlates strongly with students' final course grades in college, $r_s = .39-.54$ (e.g., Hall, Perry, Chipperfield, Clifton, and Haynes, in press; Perry *et al.*, 2001). We have also incorporated a more objective measure of high school aptitude as a covariate in our analyses, namely students' actual high school percent, calculated by averaging students' final grades in their college entrance courses (e.g., Hall, Hladkyj, Perry, and Ruthig, 2004; Ruthig, Perry, Hall, and Hladkyj, 2004). Thus, by incorporating a measure of high school aptitude, whether self-reported or actual grades, we have been able to distinguish achievement differences in college due to academic control perceptions from those due to prior aptitude in high school.

ACADEMIC CONTROL AND OTHER INDIVIDUAL DIFFERENCES

Although academic control has a variety of positive benefits for college students, the consequences are not always straightforward because other individual differences among students may actually enhance or nullify the effects of academic control. Within our own research program, we have examined differences in the emotional and cognitive experiences of students in relation to their perceptions of control to determine how they jointly impact scholastic development. Ruthig *et al.* (2005), for example, explored whether certain achievement-related emotions, namely enjoyment, boredom, and anxiety, moderated the effects of academic control on scholastic performance and persistence. At the start of the academic year, students were identified as having either low or high academic control and low or high levels of learning-related enjoyment, boredom, and anxiety. An academic control (low/high control) \times learning emotion (low/high emotion) 2×2 factorial design

was used to examine the effects on students' introductory psychology course grade, overall cumulative GPA, and cumulative course withdrawal.

Positive emotions appeared to "enable" academic control to increase students' course grades and GPAs and decrease their course withdrawal. Conversely, negative emotions seem to "disengage" the positive impact of perceived control. Specifically, high-control students who reported high levels of course enjoyment (or low levels of course boredom or anxiety), had the highest final psychology course grade, cumulative GPA, and lowest attrition rates. However, among students with low enjoyment, having high control did not significantly impact their academic development, such that low- and high-control students had similar achievement and attrition levels. Similarly, for students with high boredom or anxiety, high control did not enhance academic achievement or persistence, meaning that low- and high-control students again had comparable levels of achievement and attrition. These findings indicate that various negative emotional states (e.g., high boredom, high anxiety, low enjoyment) can eliminate the advantageous effect of high academic control. Thus, it is in combination with more favorable emotional experiences in the classroom, either stronger positive emotions or weaker negative emotions, that students' perceptions of academic control foster achievement striving, performance, and persistence in their courses.

In keeping with our phenomenological focus on academic control, we have also examined perceptions of academic success as an important student difference, which potentially can modify the effects of academic control on scholastic performance. Weiner's attribution theory (1985, 1995) asserts that subjective evaluations of academic performance outcomes are an important precursor to causal search, which in turn, has a significant effect on students' perceptions of controllability concerning their course grades. Schönwetter *et al.* (1993) found that students' perceptions of success interacted with their academic control so that students with high control/high success had the highest level of achievement out of the four possible combinations of perceived control, (low/high) and success (low/high). Interestingly, students with low control and high perceived success demonstrated the poorest academic performance, followed by students with high control and low perceived success. These seemingly counterintuitive findings may be explained by the fact that low-control/high-success students believe that, although they are successful, they do not have control over academic outcomes. In contrast, high-control/low-success students believe they have control, yet see themselves as unsuccessful. These findings indicate that, similar

to research on academic control and emotions, perceived control and success can interact to predict achievement, thereby providing a valuable perspective on the role of academic control in relation to other individual difference variables. Hence, it is often not adequate to examine academic control or perceptions of success alone when attempting to determine academic achievement. Rather, perceptions of both control and success are necessary for optimal academic performance.

Self-regulation is another individual difference among college students that has been considered in combination with academic control. Defining self-regulation as preoccupation with failure or persistent focusing on negative events, Perry *et al.* (2001) found that students with both high preoccupation with failure and high academic control obtained better course grades than students with low preoccupation with failure, regardless of their control level. Although being preoccupied with failure would appear negative at first glance, high-control, high-failure-preoccupied students outperformed the other three groups by two full letter grades in their introductory psychology course. When paired with a sense of control over academic outcomes, students with high failure preoccupation are able to give sufficient attention to monitoring and assessing the causes of failure, and thus more likely to prevent the recurrence of failure. Again, this research highlights the importance of evaluating the benefits of perceived academic control in the context of other individual differences, in this case, involving students' self-regulatory capacity to maintain their focus on and overcome academic failure experiences.

The academic control by failure preoccupation findings from Perry *et al.* (2001) were replicated and extended in a three-year longitudinal study designed to examine the generalizability of this interaction (Perry *et al.*, in press). A similar interaction pattern was found for grade point average (GPA) and voluntary course withdrawal across three academic years. That is, high academic control, high failure-preoccupied students had better GPAs and had dropped fewer courses after three years than the other three groups. These results provide stronger and consistent support for how self-regulation variables such as failure preoccupation can interact with academic control to affect college students' achievement and persistence over a prolonged period.

The empirical evidence presented so far highlights the importance of academic control in the scholastic development of college students. Student differences in control perceptions, often interacting with other academic factors, can translate into significant disparities in learning-related cognitions, emotions, motivation, and performance.

Consequently, our analysis of the academic development of college students would not be complete without including a central contextual determinant of classroom settings, namely quality of instruction. Both logic and empirical evidence suggest that teaching is very important to the motivation and performance of college students, yet social cognition researchers often omit instructional variables from their studies. In most studies, teaching is simply assumed to be a random background variable and the focus is primarily on student attributes as predictors of learning and performance (cf., Aspinwall and Taylor, 1992; Pascarella and Terenzini, 1991). In the next section, we explore the consequences of this association between academic control and the quality of college instruction.

ACADEMIC CONTROL AND QUALITY OF INSTRUCTION

In response to increasing attrition in postsecondary institutions, stakeholders argue that the panacea for failing students — and any other plight afflicting higher education today — is “to have the professors teach better”! This commonly held “one size fits all” effective-teaching remedy is supported, in part, by extensive research during the past 80 years showing that students do benefit from effective college teaching (cf., Feldman, 1998; Marsh and Dunkin, 1992; McKeachie, 1997; Murray, 1991; Perry and Smart, 1997). While this evidence is supportive, it is incomplete because research also shows that certain students do not profit from effective instruction, notably those low in perceived academic control (Perry, 1991). A profile of learned helplessness (low motivation, negative affect, and poor performance), characteristic of failure-prone students, can occur despite the presence of effective instruction. Simply put, the students most in need of enriched educational opportunities (e.g., effective teaching) are least likely to profit from them.

Faculty members are concerned not just with teaching more effectively, but with how certain teaching methods affect students differently, specifically with which methods are most effective for certain types of students (Perry, 1997). When meeting a class for the first time, college instructors are often confronted with pronounced differences between students. Race, gender, age, social class, ethnicity, and religion are but a few overt signs of that diversity, augmented by less apparent, but equally important differences in intelligence, motivation, impulsivity, and boredom. Alongside enthusiastic, determined, and responsible students sit apathetic, bored, and failure-prone students, intermingled with still

others possessing various attributes of the first two groups. Not surprisingly, this complex diversity represents a fundamental challenge for college instructors who must ensure that learning opportunities are optimized for all students. This issue highlights the differential impact that a certain teaching method can have in relation to specific attributes that vary between students, generally referred to as an aptitude-treatment interaction (Cronbach and Snow, 1977). This section deals with this aptitude-treatment interaction in terms of academic control and effective teaching in college classrooms.

Effective Teaching in College Classrooms

It has long been recognized by classroom instructors, students, and policymakers alike that some teaching methods are more effective in promoting learning and performance. The common wisdom that “teaching makes a difference in college classrooms” is supported by correlational and causal evidence from laboratory and quasi-experimental studies dating back over 80 years. The correlational evidence consistently reveals that specific college teaching behaviors associated with lecturing, such as organization, knowledge, clarity, and expressiveness, are directly related to better student performance. In a prototypical study, Sullivan and Skanes (1974) randomly assigned students and instructors to multiple sections of an introductory psychology course at the beginning of year, and at the end of year students evaluated their instructors on a standard questionnaire. Student ratings were moderately correlated with course grades based on tests prepared by instructors from all sections. The student ratings/final grades correlation was .42 for all instructors combined, and .60 for senior instructors.

Meta-analytic reviews of multi-section validity studies (e.g., Cohen, 1981, 1983; Feldman, 1989) show that specific college teaching behaviors, defined in terms of student ratings, are significantly correlated with end-of-term final grades. Instructor organization, for example, defined by items such as “presents and organizes course material” and “plans class activities in detail,” is correlated .55 with end-of-course final grades. This means that roughly 30% of the achievement variance in final grades is explained by instructor organization. Instructor clarity, denoted by such items as “makes good use of examples of illustrations” and “synthesizes and summarizes the material” is correlated .51 with final grades, and consequently accounts for 25% of the variance in course grades. Student ratings of instructor interaction, feedback, stimulation,

and elocution are correlated .45, .29, .38, and .35 respectively with final grades. Clearly then, empirical evidence from correlational studies supports the position that teaching does make a difference to scholastic attainment in college classrooms.

To put these teaching behaviors/final grades correlations in perspective, consider construct validity studies in other research domains. In a comprehensive review of more than 125 meta-analytic validity studies, Meyer *et al.* (2001) analyzed 800 samples using multimethod assessment procedures. In Table 1 of their study, they present small and large correlations between well-established variables in the health domain: aspirin and reduced risk of death by heart attack, $r(22,071) = .02$; antihypertensive medication and reduced risk of stroke, $r(59,086) = .03$; calcium intake and bone mass in premenopausal women, $r(2,493) = .08$; gender and weight for U.S. adults, $r(16,950) = .26$; weight and height for U.S. adults, $r(16,948) = .44$.

In another set of analyses, Meyer *et al.* (2001, Table 2) report validity coefficients for various types of physical and psychological tests, including: fecal occult blood test screening and reduced death from colorectal cancer, $r(329,642) = .01$; ultrasound examinations and successful pregnancy, $r(16,227) = .01$; decreased bone density and hip-fracture risk in women, $r(20,849) = .25$; mammogram results and breast cancer detection after two years, $r(192,009) = .27$; extraversion and subjective well-being, $r(10,364) = .17$; Graduate Record Exam (quantitative) performance and graduate GPA, $r(5,186) = .22$; neuroticism and decreased subjective well-being, $r(9,777) = .27$; information processing speed and reasoning ability, $r(4,026) = .55$.

In relative terms, the teaching behaviors/final grades correlations compare favorably to those involving commonly known psychological and medical tests in other areas of research. Correlations between .20 and .55 for teaching behaviors (e.g., instructor organization or clarity) and final grades are similar to correlations involving GRE/GPA (.22), mammogram/breast cancer (.27), weight/height (.44), and information processing/reasoning (.55), and are substantially higher than widely-accepted correlations for aspirin intake/reduced heart attacks (.02), blood pressure medication/reduced risk of stroke (.03), and extraversion/well-being (.17). Furthermore, teaching behavior correlations between .20 and .55 are statistically meaningful according to Cohen (1988) who considers correlation coefficients below .10 of little interest, but between .10 and .20 as small, .20 and .40 as moderate, and above .40 as large. In practical terms, this means that college teaching behaviors such as instructor organization or instructor clarity can explain roughly 25% of

final grades in a course, and have an effect size that is of the same magnitude as widely recognized associations between intelligence tests and performance (e.g., GRE/GPA = .22) and height and weight (.44).

Academic Control and Effective Teaching

We turn now to how instructional treatments in relation to academic control affect the scholastic development of college students. Instructional treatment is broadly defined here as a systematic application of pedagogical methods and procedures to facilitate learning and performance which would include lecture-related teaching behaviors, course structures, grading standards, and curriculum design, though all may not occur in a single teaching episode, nor be used by a specific instructor. We focus on lecturing because it has been the subject of extensive empirical investigation that shows it is typically comprised of several discrete teaching behaviors, namely expressiveness, organization, clarity, etc. (cf., Perry and Smart, 1997). Our interest is in instructor expressiveness as a teaching behavior because it is a key element of the lecture method and has received detailed scrutiny in both laboratory and field settings (e.g., Murray, 1991, 2001; Perry, Abrami, and Leventhal, 1979; Perry, Leventhal, and Abrami, 1979).

Our analysis of the relation between academic control and college teaching takes an aptitude-treatment interaction approach (cf., Cronbach and Snow, 1977) in which the quality of college instruction interacts with either transient or stable academic control. In a series of analog studies of the college classroom (cf., Perry, 1991), teaching effectiveness was examined in terms of the lecture method which is made up of specific teaching behaviors such as instructor expressiveness, organization, and clarity (cf., Feldman, 1989; Murray, 2001), recognizing that college teaching encompasses a variety of teaching methods. Transient academic control is deemed to be a component of perceived academic control determined by the college classroom, as opposed to the student, the result of episodic events which create low- and high-control learning environments. Low-control classrooms are those which are infused with unpredictable, noncontingent associations between students' achievement-striving behaviors and subsequent performance outcomes, creating a helpless orientation in students. High-control classrooms are those which involve contingent relations between achievement behavior and performance, thereby encouraging a mastery orientation in students. Stable academic control is an attribute of students which they bring to

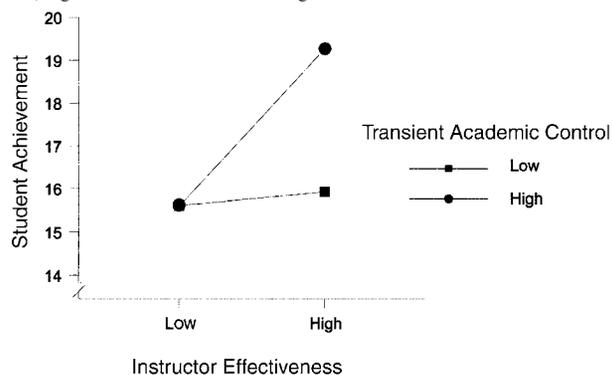
the classroom separately from the transient control aspects of the classroom setting.

The laboratory analog is an improvement over correlational studies of college teaching which have not systematically manipulated the quality of teaching directly and which have not tested cause-effect relations between teaching and learning. It is also an improvement over studies in the social cognition literature which have virtually ignored the role of teaching variables in exploring academic motivation and achievement-striving. Based on previous research using this classroom analog (Perry, Abrami, and Leventhal, 1979; Perry, Leventhal, and Abrami, 1979), we paired either transient or stable academic control (low, high) with videotape lectures varying in the quality of instruction (ineffective, effective) within a 2×2 factorial design.

In one study, transient academic control was manipulated using falsified test performance results prior to the videotape lecture to create either a transient low-control (unpredictable failure feedback), or high-control (predictable failure feedback) experience for students (Perry and Dickens, 1984). Aside from the transient control main effect, a transient control \times instructional quality interaction emerged. Not unexpectedly, transient high-control students who received effective instruction performed better on the post-lecture test compared to their low-control counterparts who received ineffective instruction. Converting the performance of high-control students to a percentage scale reveals that their achievement is 12% better with the effective, compared to the ineffective instructor, which translates into almost a one and a half letter grade difference. More interestingly, however, low-control students did not do any better with the effective instructor than with the ineffective instructor.

In subsequent research, we found that this interaction was not limited to a brief, single-lecture episode, but extended to a second lecture one week later (Perry and Magnusson, 1987). After students participated in the first lecture, they returned to the laboratory a week later to view a second videotape lecture and to take a test on the lecture material. In both Lecture 1 and Lecture 2, transient high-control students performed better following effective instruction, compared to ineffective instruction, whereas low-control students did no better following effective instruction. The basic form of the transient academic control \times instructional quality (aptitude-treatment) interaction has been consistently replicated in other studies as well (Perry and Dickens, 1987; Perry, Magnusson, Parsonson, and Dickens, 1986) and is seen in Figure 7.1. Consistent with the research literature on college teaching, the effective instructor

Figure 7.1: Academic control \times instruction interaction effect, adapted from Perry and Magnusson (1987). Transient control assessed: low academic control = noncontingent feedback; high academic control = contingent feedback



produced more learning than the ineffective instructor, but only for transient high-control students. For transient low-control students, having effective instruction produces no better performance than having ineffective instruction. Consequently, students who are at risk and failure prone (low control) do not benefit from enriched learning experiences (effective instruction).

In extending these transient academic control \times instructional quality interaction findings, Magnusson and Perry (1989) paired stable academic control with quality of instruction (ineffective, effective). Stable academic control was measured in terms of locus of control (internal, external), wherein internal locus implies stable, high academic control and external locus reflect stable, low academic control. The aptitude-treatment interaction previously found for transient academic control was replicated for stable academic control and instructional quality as well. Internal-locus (high-control) students learned more from the effective compared to the ineffective instructor, even when they experienced a temporary loss of control. External-locus (low-control) students, however, did not perform better following effective instruction. Once more, those students most at risk were least likely to benefit from optimal (effective teaching) learning conditions.

Taken together, these simulated classroom laboratory studies indicate that student differences in experiencing *transient* low and high academic control have important implications for the effectiveness of

classroom instruction. If such experiences are inherent to low-control situations, the first year of college being a prime example, then good teaching facilitates performance only in students who have a temporary increase in their sense of control. Good teaching, however, is of no avail to students who experience a temporary loss of control: they performed equally poorly whether they received effective or ineffective instruction. This same pattern of results was replicated for *stable* academic control, as well, in which high-control students did better after receiving effective instruction, yet their low-control counterparts did not. Paradoxically then, and contrary to common wisdom, students who are most in need of academic assistance are *least* likely to benefit from effective teaching.

WHEN GOOD TEACHING FAILS: PRIMARY AND SECONDARY ACADEMIC CONTROL

To this point, we have argued that both academic control and effective instruction can greatly enhance college students' academic development. Unfortunately, effective teaching can fail to foster achievement striving for either low-control students or students who experience temporary, environmentally-induced losses of control. What then keeps such students from simply giving up and withdrawing from college altogether? A possible explanation is that some low-control students possess certain cognitive capabilities that allow them to avoid feeling completely helpless in low-control learning environments and to persist in their academic endeavors. One such cognitive factor that has become a major focus in our own research is *secondary* academic control, a type of perceived control which is distinct from the traditional concept of academic control discussed thus far, namely *primary* academic control. In general, primary control refers to attempts by students to directly influence outcomes in academic settings, such as performance on achievement tests. In contrast, secondary control involves attempts by students to adjust to academic challenges involving failure, noncontingent feedback, lack of information, or unpredictability (Rothbaum *et al.*, 1982).

To maintain a sense of control within low-control achievement settings, some students resort to secondary control beliefs and strategies involving the cognitive reconstrual of negative learning experiences. Having failed a test, for example, secondary control strategies may include focusing on the positive aspects of the experience (e.g., "My performance helped me see where I can improve"), downgrading its

importance (e.g., “The test is only worth 20% of my grade”), or downward social comparisons (e.g., “At least I did better than some of the other students”). Conversely, primary control involves attempts to modify external outcomes to attain or regain desired goals (Heckhausen and Schulz, 1998; Rothbaum *et al.*, 1982). For example, if the desired goal is to pass an exam, primary control strategies may include taking lecture notes, asking the instructor for assistance, or participating in a study group.

Hladkyj, Pelletier, Drewniak, and Perry (1998) designed a measure of secondary academic control to assess students’ attempts to adjust to the many control-eroding episodes experienced during their first year of college, a typically low-control transition period. This measure was derived from Rothbaum *et al.*’s (1982) two-process model of perceived control where, in addition to primary control, individuals may maintain an overall sense of control by reinterpreting uncontrollable events to make them less negative. Using this conceptual model, Hladkyj, Pelletier, *et al.* devised a 7-item Likert-style measure of secondary control (e.g., “When bad things happen to me, I make an intentional effort to understand how they fit into the rest of my life”) which was positively correlated with elaborative learning ($r = .36$), self-monitoring ($r = .18$), intrinsic academic motivation ($r = .19$), course enjoyment ($r = .24$), feelings of success ($r = .14$), and end-of-year feelings of adjustment to college ($r = .16$). Although the magnitudes of some of the effect sizes are relatively small, they indicate a systematic involvement of secondary control in supporting greater academic engagement and adjustment to the college experience.

Subsequent research (e.g., Hladkyj, Perry, and Pelletier, 2000; Hladkyj, Taylor, Pelletier, and Perry, 1999) involved both examining how this new measure corresponds with students’ adjustment to their first year of college and how it relates to a more domain-specific measure of secondary academic control. In a multi-sample study involving data obtained from 3,973 introductory psychology students from five separate cohorts (1996, 1997, 1998, 2000, and 2001), higher levels of secondary control were associated with greater academic mastery ($r = .31-.36$), metacognitive engagement ($r = .32-.44$), and adjustment to college ($r = .12-.16$), and was positively correlated with a domain-specific measure of secondary academic control ($r = .32-.38$) across three different samples of first-year college students (Hladkyj, Perry, Hall, Ruthig, and Pekrun, 2003).

Together, this research suggests that secondary control protects students from threats to their primary academic control, but not without

some cost. Specifically, when faced with excessive failure during their first year of college, high secondary-control students exhibited a mastery orientation in their achievement-related cognitions, emotions, and strategies, similar to high primary-control students, yet their course grades were no different from low secondary-control students. Thus, by changing their *internal* reality, secondary control may limit students’ effectiveness to influence the *external* situation to their favor. Moreover, other research (Hall, Perry, Ruthig, Hladkyj, and Chipperfield, 2005; Hall *et al.*, in press) indicates that there is virtually no relation between secondary control and achievement in terms of final grades ($r = -.08$ to $.01$) or GPA ($r = -.07$), suggesting that having greater secondary control is not advantageous in terms of academic performance.

Given that primary or secondary control can alleviate the negative effects of feeling out of control, is it more beneficial to perceive oneself as having high levels of *both* types of academic control? Hall, Perry, Ruthig, Hladkyj, *et al.* (2005) found that it is indeed optimal to have high levels of both types of academic control. Specifically, unsuccessful students with high primary and high secondary control had higher cumulative GPAs, lower course attrition, higher expected academic success, lower stress, and more positive learning-related affect (i.e., pride, happiness, anger) compared to students with high primary but low secondary control. In fact, the combination of high primary and low secondary control may actually put students at risk academically if they are initially unsuccessful in their first year of college. Hall, Perry, Ruthig, Hladkyj, and Chipperfield (in press) explain that the positive consequences of relying only on primary control may be limited to successful students, and do not occur among students experiencing repeated failure. These findings for secondary control provide further evidence of the importance of investigating the effect of (primary) academic control on achievement with respect to other individual difference variables (see Academic Control and Other Individual Differences). Fortunately, high primary-/low secondary-control students who are initially unsuccessful in college tend to benefit academically from Attributional Retraining, a cognitive intervention technique which is aimed at changing students’ maladaptive attributions for their academic performance (e.g., Hall *et al.*, in press). This intervention strategy is discussed in detail in a subsequent section of this paper.

Further research by Hall, Hladkyj, Ruthig, Pekrun, and Perry (2002) provides an explanation for why students with high levels of both primary and secondary control are more successful than their counterparts who have different combinations of primary and secondary control.

Hall, Hladkyj, Ruthig, *et al.* posit that students who are high in both types of control are in the enviable position of maximizing their sense of control if they are able to “switch” their emphasis from one type of control to the other as necessary. For instance, in failure situations when primary control is low, if these students are able to switch over to rely more on secondary control strategies, then they would retain or regain a sense of control in the situation. Thus, having high levels of both types of academic control allow students to retain their overall sense of control if they can switch their control orientations as they negotiate their way through the many challenges presented in the college setting (e.g., Hall, Hladkyj, Chipperfield, and Perry, 2002; Hall, Hladkyj, Chipperfield, and Stupnisky, 2003).

Based on this body of research showing academic control to be a considerable asset for academic adjustment and performance in the context of higher education, it follows that increasing perceptions of control in low-control students should produce consequent favorable outcomes. To assist in the ongoing effort to increase perceptions of academic control and achievement in college students, motivational researchers have developed a control-enhancing instructional treatment, referred to as Attributional Retraining, which consistently results in improved academic motivation and performance for low-control students. Unlike traditional teaching methods involving quality of instruction, this remedial psychotherapeutic treatment based on Weiner’s attribution theory (1985, 1995) represents an effective means of improving academic development in these otherwise disadvantaged students by encouraging them to reflect on the controllable nature of failure experiences. The following section provides an overview of previous and recent research on attributional retraining in college students, and discusses in greater detail how this treatment is administered and how it interacts with student differences in academic control to impact academic achievement.

ATTRIBUTIONAL RETRAINING: A CONTROL-ENHANCING INSTRUCTIONAL TREATMENT

To this point in our discussion, we have focused on the first set of research questions posed at the start of this chapter: whether perceived academic control, as an individual difference, directly affects achievement motivation and scholastic performance; and, whether the effects of academic control vary depending on other individual differences and the

quality of instruction in college classrooms. As we have seen, the empirical answer to these questions is unequivocally affirmative. Despite the abundance of positive empirical findings demonstrating the efficacy of certain teaching methods, the evidence presented here consistently shows that what is deemed to be effective instruction is not beneficial to all students (Perry, 1991, 2003). Specifically, students who have lower academic control do poorly, despite receiving high-quality instruction (see Figure 7.1). Ironically then, it is the most vulnerable college students who do not benefit from enriched instructional treatments. If traditional teaching methods like lecturing are not effective for certain students such as those low in academic control, then other, more effective instructional treatments must be considered.

For over 15 years, we have examined an educational treatment intervention designed to enhance perceived academic control based on Weiner’s attribution theory (1985, 1995), referred to as *Attributional Retraining (AR)*. The AR intervention modifies dysfunctional causal attributions for academic performance to attributions that are more conducive to achievement motivation and performance. Specifically, AR is a control-enhancing teaching method that replaces dysfunctional attributions for success and failure with functional attributions, and as such, complements traditional teaching methods such as lecturing. The relation between academic control and college instruction is examined in the following sections in terms of AR which is intended primarily for low-control students. In addressing this academic control-AR combination, we view AR as a type of instructional treatment in keeping with other aptitude-treatment interactions described earlier involving academic control-instructional quality interactions.

As discussed in previous sections, the first research question concerning academic control-instructional quality interactions was addressed by examining the effectiveness of lecturing (treatment) for low- and high-control students (aptitude) and was tested using an academic control \times quality of lecturing interaction (Perry, 1997). This aptitude-treatment interaction is confirmed if high-control students performed better when receiving effective, as opposed to ineffective instruction and low-control students show no comparable improvement following effective instruction. However, in addressing our second research question involving an instructional treatment specifically intended to enhance academic control in low-control students, a different pattern of findings would be expected. That is, following the control-enhancing AR treatment, low-control students should perform better compared to their low-control/no-AR treatment counterparts, without

similar treatment gains occurring for high-control students. The remainder of this section explores the effectiveness of AR techniques in college classrooms and whether this control-enhancing AR instructional treatment can be of benefit to low-control students.

ATTRIBUTIONAL RETRAINING: AN OVERVIEW

Research consistently shows that effective instruction in higher education positively influences student development with respect to achievement, emotions, and motivation (Perry and Smart, 1997). However, this research also indicates that a pattern of low perceived control, negative affect, and poor performance characteristic of failure-prone students can occur despite the presence of high-quality teaching, as seen in Figure 7.1 (see Perry, 1991, 2003, for reviews). Research on achievement motivation accounts for these developments in terms of maladaptive attributions for academic performance made by college students. Specifically, Weiner's attribution theory of achievement motivation (1985, 1995) suggests that the reasons that students use to explain academic outcomes can significantly influence subsequent learning-related emotions and cognitions, and in turn, achievement-striving behaviors (see An Attributional Framework for Perceived Control in College Classrooms section above). According to Weiner, causal attributions for poor performance to uncontrollable or stable causes, such as lack of ability or task difficulty, engender disengagement and a sense of hopelessness because these factors cannot be changed and are expected to continue to negatively affect one's performance. In contrast, failure attributions made to controllable or unstable factors, such as lack of effort or unfamiliarity, foster feelings of hope and persistence in students by generating perceptions of control over academic performance.

Over the past 30 years, research based on Weiner's attribution theory (1985, 1995) has consistently demonstrated the effectiveness of attributional interventions in helping individuals deal with failure. More specifically, ongoing research has concerned the development and evaluation of a psychotherapeutic cognitive treatment, referred to as Attributional Retraining (AR), which assists individuals by encouraging controllable and unstable attributions (e.g., effort, strategy) primarily for negative experiences. The benefits of AR techniques for improving performance are well known and have been illustrated in a variety of domains involving personal development and achievement. In terms of psychological and physical health outcomes, attributional retraining has been found

to be effective in the areas of group counseling (Green-Emrich and Altmaier, 1991; see Försterling, 1986, for review), health and aging (Weinberg, 2001), as well as the clinical treatment of psychosomatic disorders (i.e., Kaaya, Goldberg, and Gask, 1992; Morriss and Gask, 2002; see Garcia-Campayo, Sanz Carrillo, Larrubia, and Monton, 1997, for review). AR has also been found to correspond with better performance in achievement settings involving athletic competition (Miserandino, 1998; Sinnott and Biddle, 1998), persuasion (Anderson, 1983; Miller, Brickman, and Bolen, 1975), and job satisfaction (Curtis, 1992).

In an academic achievement context, research examining the effectiveness of attributional retraining techniques has provided considerable empirical support for the use of this remedial intervention to improve student development at all levels of the education system. In elementary school classrooms, AR has been found to be an effective means of reducing aggressive behavior (Hudley *et al.*, 1998), improving social skills (Aydin, 1988; see also Carlyon, 1997), and increasing learning strategy use (Borkowski, Weyhing, and Carr, 1988; Borkowski, Weyhing and Turner, 1986; Ho and McMurtrie, 1991). AR techniques have also been shown to improve problem solving, motivation, self-esteem, and academic achievement in elementary school students (Andrews and Debus, 1978; Craske, 1985, 1988; Dweck, 1975; Heller, 2003; Heller and Ziegler, 1996; Miller *et al.*, 1975; Okolo, 1992; Schunk, 1983; Ziegler and Heller, 2000; see also Heller, 1999). Research exploring the benefits of attributional retraining for high school students is encouraging, with AR treatments resulting in greater perceptions of control in depressed adolescents (Dieser and Ruddell, 2002), as well as improved self-esteem and academic performance (den Boer, Meertens, Kok, and Van Knippenberg, 1989).

In addition to AR studies with younger students, attributional retraining researchers have focused extensively on college students and their scholastic development, particularly the transition from high school to college. The bulk of research on AR in higher education has been directed toward improving students' academic development in terms of motivation and performance, as is the mandate of course instructors and academic administrators alike. Research aimed at facilitating overall career development has also found AR techniques to be effective in increasing students' perceptions of control concerning career-related decision making (Luzzo, Funk, and Strang, 1996) as well as career exploration (Luzzo, James, and Luna, 1996). Because enriched learning interventions are periodically ineffective for low-control college students

(Perry, 1991), motivational researchers have focused on AR treatments which can compliment traditional classroom teaching practices by enhancing students' perceptions of control over their academic achievement, and in turn, their academic career.

Previous reviews of research on attributional retraining in college students have repeatedly underscored the effective nature of the AR treatment in improving academic motivation and performance in low-control college students (Försterling, 1985; Menec and Perry, 1995; Perry, Hechter, Menec, and Weinberg, 1993; Wilson, Damian, and Sheldon, 2002). The following section provides an overview of findings from previous research on AR and achievement in college students, highlighting the results of classic studies as well as recent research from our laboratory.

ATTRIBUTIONAL RETRAINING IN THE COLLEGE CLASSROOM

Given the substantial differences between college and high school settings with respect to appropriate study strategies, note-taking, time-management, autonomy, etc., the extent to which academic success is controllable may not be immediately evident to first-year college students. In order to circumvent feelings of guilt that, according to Weiner's theory, can result from internal and controllable attributions for having failed, these students may choose maladaptive reasons for failing to absolve themselves of academic responsibility (i.e., attributions to test difficulty, or the professor), rather than directly alleviating feelings of guilt by exercising control over their learning activities. Thus, first-year students, particularly those having a low-control or helpless orientation, are considered to be "at risk" of developing motivational deficits due to dysfunctional attribution patterns. However, as freshman college students' attributions for academic failure are more malleable during this transition phase (Perry *et al.*, 1993), these students are well suited to benefit from attributional retraining.

To provide a conceptual framework for the following review of research on attributional retraining and academic achievement in college students, a chronological overview of AR research from classic studies such as Wilson and Linville (1982) to recent research by our laboratory is provided in Table 7.1. This table presents the specific intervention format employed in each study in terms of the induction technique employed (e.g., videotape) and the subsequent "consolidation exercise" intended to help students understand the attributional information.

Observed improvements on various measures of academic performance (e.g., lecture-based exams, final course grades, GPA) as well as the specific student risk groups found to improve most following the AR treatment are outlined as well. For example, the study conducted by Perry and Penner (1990) is described in Table 7.1 as including an AR treatment consisting of a videotape presentation (AR induction) and aptitude/achievement tests (AR consolidation) and as improving lecture-based test scores (outcome) for students with an external locus of control (risk condition). This table provides a useful overview of the sections below which describe in greater detail the impact of AR treatments on academic motivation and performance in college students, and particularly those students predisposed to academic failure due to control-related factors.

Early Attributional Retraining (AR) Research

Försterling (1985) classified attributional retraining methods in terms of informational approaches, operant methods, vicarious learning methods such as persuasion, and indirect communication. In early research with children, repeated exposures to face-to-face AR techniques, such as verbal performance feedback, have typically been employed in order to ensure the induction of AR information (e.g., Dweck, 1975; Miller *et al.*, 1975; Schunk, 1983). For the most part, however, only informational methods, usually involving written information or staged videotaped interviews, have been employed in studies with college students. In contrast to research with younger samples, studies on AR in college students have largely used these more abstract induction methods in order to capitalize on students' level of education and because these techniques are more efficient and can be administered en masse in larger college classrooms. As such, an AR intervention provided to college students typically consists of a videotaped discussion between graduate students or with a professor discussing the benefits of controllable or unstable attributions for failure, followed by an activity allowing students to personally elaborate on the information, either in a concrete fashion (e.g., by completing a difficult aptitude test) or in a more abstract manner (e.g., small group discussion; see Table 7.1). Researchers utilizing such attributional retraining techniques have shown modest, yet consistent, improvements in academic motivation and the performance of college students (Perry *et al.*, 1993).

As presented in Table 7.1, an early study by Wilson and Linville

(1982) found male first-year students increased their GRE and GPA performance as a result of videotaped interviews in which senior students described how low grades, being *unstable* in nature, often improve significantly after the first semester. Wilson and Linville (1985) presented failure as unstable, as opposed to controllable, arguing that attributing failure to a lack of effort may give rise to feelings of guilt which would inhibit future achievement striving. Weiner (1988) supports this approach, noting that encouraging students to adopt unstable attributions for poor performance should result in increases in expectancies of future success similar to the promotion of controllable attributions.

Block and Lanning (1984) undertook a secondary analysis of Wilson and Linville's data and found evidence contradicting their claims in that the GPAs of students who withdrew from college were actually higher than those of remaining students. They also noted that the improvements resulting from the intervention could be explained by regression toward the mean, among other factors. However, Wilson and Linville (1985) replicated their initial findings after considering these arguments, effectively illustrating the benefits of AR for motivation and performance in students. These results were also replicated by Van Overwalle *et al.* (1989) and Van Overwalle and De Metsenaere (1990) who used a videotape intervention to present academic success as a product of *controllable* achievement striving behaviors. The videotape consisted of students presenting reasons for their failure such as lack of peer cooperation, lack of effort, or ineffective study strategy, and then describing attempts to prevent failure in the future. Exposure to the intervention resulted in higher GPA scores at the end of the academic year.

In a review of attributional retraining techniques administered to college students, Perry *et al.* (1993) identify two studies showing that the inclusion of a written handout in addition to a videotape intervention is effective as well. Jesse and Gregory (1986-87) gave students AR in both handout and videotape formats, presenting GPA as an unstable phenomenon which generally improves over time. Students exposed to the intervention maintained stable GPA scores throughout the academic year, whereas students who did not receive the intervention experienced a decline in their second term GPA scores. Noel, Forsyth, and Kelley (1987) also used the combination of both the videotape and written AR formats. After viewing the videotape depicting poor performance as unstable and receiving a handout summarizing the main points of the videotape, students showed marked improvements in exam scores and final course grades. Thus, attributional retraining interventions in which failure is presented as either controllable or unstable have shown positive

Table 7.1: Chronological Overview of Methods and Achievement Outcomes in AR Research in College Students

AR induction	AR consolidation	Outcome	Risk conditions
Wilson and Linville (1982, 1985) Written report and video	Aptitude test, anagram task, and reason analysis	GPA*, GRE*	Concern over performance; low course exam scores
Jesse and Gregory (1986-87) GPA video	Written information on attributions	Stable GPA in second term	N/A
Noel <i>et al.</i> (1987) Video	Written summary	Final grade*	N/A
Van Overwalle <i>et al.</i> (1989); Van Overwalle and De Metsenaere (1990) List performance attributions and video interviews	Written and verbal reports	Exam score*	Low course exam scores
Perry and Penner (1990) 8 minute video	Aptitude test and achievement test	Achievement test*	External locus of control
Menc <i>et al.</i> (1994) 1. 1 or 2 video sessions 2. 1 or 2 video sessions	Achievement test Achievement test	Achievement test* Achievement test*	Low aptitude test scores Low aptitude test scores, external locus of control
Perry and Struthers (1994) Written handout 8 minute video	<ul style="list-style-type: none"> • None • None • Group discussion 	<ul style="list-style-type: none"> None None Final grade* 	Low perceived success

Continued

AR induction	AR consolidation	Outcome	Risk conditions
Hunter and Perry (1996) 8 minute video	<ul style="list-style-type: none"> • None • Aptitude test • Achievement test • Group discussion 	<ul style="list-style-type: none"> None Final grade* None None 	Low high school grades
Struthers and Perry (1996) 8 minute video	Group discussion	Final grade*	Uncontrollable attributions
Pelletier et al. (1999) 8 minute video	Aptitude test	Final grade*	Performance-orientation
Haynes et al. (2003) Written handout	<ul style="list-style-type: none"> • Written assignment 	Final grade*	High optimism, low perceived success; low optimism, high perceived success
Newall et al. (2003) Written handout	<ul style="list-style-type: none"> • Written assignment 	Final grade*	Low academic control and low desire for control
Hall et al. (2004) 8 minute video	<ul style="list-style-type: none"> • Aptitude test • Written assignment 	Final grade and GPA* Final grade and GPA*	N/A
Hall et al. (in press) 8 minute video	<ul style="list-style-type: none"> • Aptitude test • Written assignment 	None Final grade*	Low course exam scores, high primary control, low secondary control
Ruthig et al. (2004) Written handout 8 minute video	<ul style="list-style-type: none"> • None • None • Group discussion 	GPA* GPA* GPA*	High optimism
Supinsky et al. (2004) 8 minute video	<ul style="list-style-type: none"> • Aptitude test 	Exam score*	N/A

Note: * = Increase.

results in college students with respect to both course-specific and cumulative measures of academic performance.

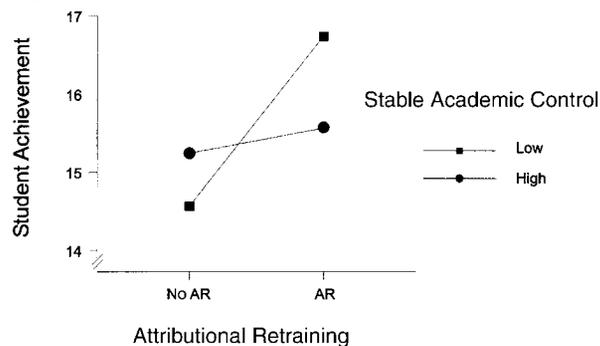
Assisting Low-control College Students

Despite the generally effective nature of attributional retraining (AR) in the college classroom, continuing research has been directed toward students who are most likely to benefit from an AR intervention, namely low-control students at risk of academic failure. As discussed in previous sections, individual differences in students' perceptions of control have important implications for performance in the classroom. Specifically, students lacking perceived academic control exhibit lower academic motivation, more negative emotions, diminished persistence, and poorer achievement (Perry et al., 2001, in press; Schönwetter et al., 1993). Our research also indicates that, although quality of instruction is largely beneficial for college student learning and performance (Perry, Leventhal, and Abrami, 1979; Perry and Smart, 1997; Perry and Williams, 1979), low-control students are least likely to benefit from effective classroom instruction (Magnusson and Perry, 1989; Perry and Dickens, 1984, 1987; Perry and Magnusson, 1987; Perry et al., 1986). As such, ongoing research in our laboratory has focused on how students' perceptions of control interact with not only other individual differences and quality of instruction, but also instructional treatments involving AR techniques.

For instance, Perry and Penner (1990) administered AR using a videotape presentation in which a male psychology professor presented ability as unstable and encouraged students to attribute poor performance to effort (see Table 7.1). Contrary to Wilson and Linville (1985), Perry and Penner suggested that, in fact, external locus of control students do perceive effort as a salient explanation for performance following attributional retraining, thus allowing for increased confidence, motivation, and subsequent achievement striving (see Weiner, 1985). This premise was supported by findings showing significant improvements in students' performance on a homework assignment and achievement test following the intervention. This study is noteworthy because it was one of the first to demonstrate the effectiveness of attributional retraining primarily for low-control students, in this case as defined by an external locus of control.

This stable academic control × attributional retraining (aptitude-treatment) interaction presented in Figure 7.2 has been replicated repeatedly in subsequent research by this laboratory on providing AR to low-control students. Consistent with Perry and Penner (1990), our research

Figure 7.2: Academic control \times attributional retraining interaction effect, adapted from Perry and Penner (1990). Stable control assessed: low academic control = external locus; high academic control = internal locus



has since demonstrated that, although high-control students perform well and generally do not benefit from the AR treatment, low-control students improve significantly following the intervention. However, in the absence of attributional retraining, low-control students perform more poorly than their high-control counterparts and risk more serious long-term academic failure experiences.

For instance, research conducted under similar laboratory conditions by Menec *et al.* (1994) showed significant improvements on a lecture-based achievement test following the first AR session in which the videotaped intervention depicted a student discussing how poor academic performance was the result of ineffective study strategies and a lack of effort. In keeping with Perry and Penner's (1990) focus on control-related risk factors, Menec *et al.* found that such improvements were evident only for students who had performed poorly on a pre-lecture GRE-type aptitude test, and further, for low-achieving individuals having an external locus of control. Thus, this study also found the positive impact of attributional retraining primarily to be observed for low-control students, assessed in this study using multiple academic risk factors related to academic control including poor test performance and an external locus of control. Although this study also addressed the potential for increased academic performance as a result of multiple AR sessions, the results showed no further increase in performance when two additional AR sessions were administered after the first session. As such, these results served to further highlight the effectiveness of brief

AR interventions in college student populations — a finding replicated repeatedly in research conducted since the classic work of Wilson and Linville (1982). See Wilson *et al.* (2002) for an elaborated discussion concerning the efficacy of brief attributional treatments for college student populations.

Following from Menec *et al.* (1994), a longitudinal field study by Struthers and Perry (1996) also utilizing a more complex classification of low-control students, showed that an AR treatment involving a group discussion resulted in higher grades in a psychology course for college students who initially used uncontrollable and unstable attributions for academic failure. However, despite increases in motivation and hope after AR for students with a stable/uncontrollable attributional style, similar improvements in performance were not found for these students. Pelletier, Hladkyj, Moszynski, and Perry (1999) also examined other groups of students that could benefit from attributional retraining, in this case, involving the completion of an aptitude test to allow students to more deeply reflect on the attributional content of the videotape presentation (see AR Consolidation Techniques below). Students were classified as at-risk based on previous goal orientation research showing that performance-oriented college students, who study course material primarily to achieve success and make ability attributions (see Atkinson and Feather, 1966; Covington, 1993) are likely to feel helpless and perform poorly after academic failure experiences. For students enrolled in a one-year psychology course, the AR intervention produced significant improvements in final course grades only for low-control students.

Matching AR Treatments to Low-control Students

Ongoing research in attributional retraining has also involved the manipulation of AR procedures in order to determine which techniques are best suited for specific groups of low-control college students. For instance, Perry and Struthers (1994) contrasted several AR procedures in a longitudinal field study in order to find the most effective intervention technique for students reporting low levels of perceived success in college at the beginning of the academic year (see Table 7.1). As discussed earlier, perceived success is an important precursor for perceived academic control in college students (Schönwetter *et al.*, 1993) and represents an intriguing avenue for investigating aptitude-treatment interactions in AR research. Attributional retraining was administered in three formats: written handout only, videotape only, and videotape and

small group discussion. The videotape depicted two graduate students discussing how adopting controllable explanations for poor performance following a difficult exam contributed to increased motivation and performance on subsequent tests. Results indicated that only students low in perceived success did better on in-class psychology tests and psychology final grades at the end of the year, and only in the videotape plus discussion condition.

Other student risk factors related to academic control described in earlier sections of this chapter have also been assessed in combination with AR intervention techniques. Hunter and Perry (1996) contrasted various AR techniques in attempting to find an effective intervention format for students having poor high school grades. Compared were four attributional retraining procedures: videotape only, videotape and aptitude test, videotape and achievement test, and videotape and small group discussion. The results showed marked improvements in psychology final grades only for students with poor high school grades following the videotape and aptitude test condition (see Table 7.1). Similarly, based on earlier research showing infrequent use of elaborate learning strategies to predispose college students to academic failure (Hladkyj, Hunter, Maw, and Perry, 1998), Hall *et al.* (2004) compared two AR procedures in an effort to establish an intervention technique most appropriate for these low-elaborating students. Specifically, we compared the effectiveness of the videotape and aptitude test condition used in Hunter and Perry (1996) with a videotape and AR-related writing assignment condition. Findings indicated that, for students who infrequently used elaborate learning strategies, both AR techniques were effective in improving psychology final grades. Surprisingly, both AR techniques also proved effective in increasing final course grades for high-elaborating students who were not at risk of academic failure (see Underlying AR Processes section below).

More recent studies have also involved the administration of AR procedures to students who are demotivated and failing because of overly-confident control beliefs. In a longitudinal field study, Ruthig *et al.* (2004) explored the effectiveness of the three AR techniques developed by Perry and Struthers (1994) for freshman college students who were potentially failure prone due to overly optimistic beliefs about success. Ruthig *et al.* found that all AR methods resulted in higher cumulative GPAs, lower test anxiety, and decreased course attrition for overly optimistic students. Hall, Chipperfield, Perry, Pekrun, and Schönwetter (2001) compared two AR treatment methods, involving either an aptitude test or a writing assignment, for unsuccessful students

who had a maladaptive combination of primary- and secondary-control beliefs. These students were unusual in that they had failed, but had high primary-control beliefs (e.g., effort, persistence) coupled with low secondary-control beliefs (e.g., reinterpretation of failure in a positive way). They found that only after the writing AR treatment were significant improvements in end-of-year course performance observed. These findings were replicated in a large-scale study by Hall *et al.* (in press) which showed an increase of approximately 10% or one full letter grade (i.e., D to C) in these students' course performance over the academic year following the writing-based AR intervention.

In sum, a major research focus in the literature has involved efforts to find appropriate attributional retraining methods for specific groups of students deemed to be prone to academic failure because of control-related factors (cf., Perry *et al.*, 1993; Menec *et al.*, 1994), as students' academic performance can be influenced by both the method of attributional retraining and student characteristics. Our research has found that AR can be particularly effective for certain students, namely those who are academically at risk of failure due to both dispositional and situational factors such as poor performance (Hunter and Perry, 1996; Menec *et al.*, 1994), maladaptive perceptions of control (Hall *et al.*, in press; Perry and Penner, 1990), low perceptions of success (Perry and Struthers, 1994), having performance goals as opposed to learning goals (Pelletier *et al.*, 1999), and overly optimistic beliefs (Ruthig *et al.*, 2004). In addition, this research demonstrates how the overall effectiveness of AR techniques may be improved by the explicit manipulation of treatment methods in order to find the most effective approach for specific types of low-control students (e.g., Hall *et al.*, 2001; Hall *et al.*, 2004; Hunter and Perry, 1996; Perry and Struthers, 1994; Ruthig *et al.*, 2004). However, it is through examining the specific components of the attributional retraining treatment that the processes presumed to underlie the effectiveness of this intervention may be more fully explored.

AR Consolidation Techniques

In attributional retraining research involving college students, the procedure typically consists of a videotaped "treatment" followed by a consolidation exercise intended to facilitate the cognitive integration of the attributional principles presented in the videotape. When contrasting the findings of research conducted by Perry and Struthers (1994) and Hunter and Perry (1996) with Jesse and Gregory (1986–87), Menec

et al. (1994), Van Overwalle and De Metsenaere (1990), Van Overwalle *et al.* (1989), and Wilson and Linville (1982, 1985), inconsistent results concerning the effectiveness of the videotape-only attributional retraining condition are evident. The former studies indicate that videotape-only attributional retraining does not lead to significant improvements in academic performance. However, neither Perry and Struthers nor Hunter and Perry required students to engage in any further activities following the attributional retraining videotape, whereas studies showing the videotape-only technique to be effective do indicate that some form of consolidation exercise was included (see Table 7.1).

For instance, both Perry and Penner (1990) and Menec *et al.* (1994) note that following the videotape presentation, the completion of either an achievement or GRE-type exam was included to allow students to put the attributional information presented in the videotape into practice (see Table 7.1). Wilson and Linville (1982, 1985) also indicate that immediately following attributional retraining, students were required to complete both an anagram task and GRE-type exam. In addition, these authors required half of the students to record as many reasons as possible for why grades improve following the first year of college. Similarly, the studies conducted by Van Overwalle *et al.* (1989) and Van Overwalle and De Metsenaere (1990) had participants describe in writing what they perceived to be the important aspects of the attributional retraining session and to discuss their comments with others in their experimental group. Such written accounts are similar in nature to the small group discussions employed in both Perry and Struthers (1994) and Hunter and Perry (1996) in that both activities require students to reflect on the attributional process in a meaningful way.

These studies clearly demonstrate that attributional retraining interventions require some sort of consolidation activity to be effective in which students are given an opportunity to either reflect about or act upon the information presented. Perry and Struthers (1994) suggest that such activities augment the influence of the intervention by encouraging students to actively reflect on and consolidate the attributional information with their existing achievement-related perceptions. In an earlier study in which attributions for academic performance were manipulated, Perry and Magnusson (1989) also noted that a lack of significant findings was most likely the result of not allowing students an opportunity for cognitive restructuring following the intervention.

Research on cooperative learning and academic achievement (i.e., group discussion; see Slavin, 1996, for review) suggests that cognitive elaboration processes may, in fact, be responsible for the effectiveness of

such post-videotape exercises. Further to this point, Hall *et al.* (2004) suggest that consolidation activities facilitate the impact of attributional retraining by encouraging greater elaborative processing of the information presented. Similar to explanations such as cognitive restructuring or consolidation (Perry and Magnusson, 1989; Perry and Struthers, 1994), *elaborative learning* involves the construction of meaningful cognitive interconnections between new and previously learned information, and is revealed in attempts to explain personal experience according to a new conceptual framework (Entwistle, 2000; Pintrich, Smith, and McKeachie, 1989). As such, our most recent research suggests that consolidation activities facilitate a greater understanding of the attributional process through elaborative mechanisms which allow students to relate their own life experiences to attribution theory, either through abstract thinking or more practical means.

IMPLICATIONS AND FUTURE DIRECTIONS

The significance of perceived control in human discourse is recognized by social scientists and laypersons alike when discussing personal relationships, job success, academic performance, or physical and psychological health. Simply put, people who believe that they have greater control over life's challenges seem to enjoy more of life's benefits, a reality reinforced by several decades of research evidence. In our attempts to understand the complexities of perceived control and the scholastic development of college students, our paradigm of choice has been social cognition, notably Weiner's (1985, 1995) attribution theory which provides a powerful explanatory framework for understanding perceived control in achievement settings.

From our research, it is clear that perceived academic control can have both short-term and long-term consequences for college students' scholastic development based on evidence from both laboratory and field studies. In seeking to optimize internal validity, laboratory studies afford strong experimental control in which subjects are randomly assigned to experimental conditions and independent variables are systematically manipulated. In our laboratory studies, perceived academic control was experimentally manipulated using attribution theory principles, either through failure/success feedback (Menec *et al.*, 1994), attributional inductions (Perry and Magnusson, 1989), or attributional retraining (Perry and Penner, 1990), or it was measured as a dependent variable

(Perry *et al.*, 1984). In our field studies, perceived control was manipulated with attributional retraining and was measured using questionnaires (Perry *et al.*, 2001; Ruthig *et al.*, 2004). In seeking to maximize external validity, the field studies complement the laboratory studies by observing the effects of perceived academic control in actual classroom conditions. AR has consistently been found in these field trials to increase perceptions of control in low-control students and to improve their scholastic performance.

Our research shows that, in times of academic uncertainty, such as the transition from high school into college, higher perceptions of control are beneficial to first-year students' scholastic development. Students who have a higher sense of academic control are better equipped to conquer the challenges of the first year of college likely because they believe the onus is on them to invest more effort to adjust their study strategies, and to seek their instructor's assistance as required. These high-control students generally experience more positive emotions and fewer negative emotions, such as shame, anxiety, and boredom than their low-control counterparts (Perry *et al.*, 2001; Schönwetter *et al.*, 1993). Students with higher academic control also tend to be more motivated to learn, putting more effort into academic tasks and persisting in their college courses to a greater extent than students with less academic control (Ruthig *et al.*, 2002) and to engage in more active learning, self-monitoring, and cognitive elaboration (Cassidy and Eachus, 2000; Perry *et al.*, 2001).

These positive academic-related emotional, cognitive, and motivational outcomes experienced by high-control students put them at a distinct advantage over their low-control counterparts in terms of achievement performance, ranging from higher introductory psychology course grades (Perry *et al.*, 2001), to cumulative GPAs (Hall, Perry, Ruthig, Hladkyj, and Chipperfield, 2005; Ruthig *et al.*, 2001), to persistence in first-year courses (Ruthig *et al.*, 2005; Perry *et al.*, in press). In contrast, students with a lower sense of academic control often feel completely overwhelmed when faced with the daunting challenges of first-year college, unable to make the connection between their own efforts and strategies and subsequent academic outcomes. Thus, having a sense of academic control is instrumental to surpassing the challenges of first-year college and can mean the difference between a mastery and helpless orientation in their scholastic development (e.g., Skinner, 1996; Thompson *et al.*, 1993).

EARLY IDENTIFICATION OF ACADEMIC CONTROL DIFFERENCES

An early identification of students' level of academic control is advantageous in assisting them to make the transition from high school into college because normally effective instruction often can be ineffective for low-control students (Magnusson and Perry, 1989; Perry and Dickens, 1984). The discussion method of instruction, for example, may be quite suitable for high-control students because of its open-ended structure, but less suitable for low-control students for the same reason. Alternately, the lecture method may appeal to low-control students because of its highly structured and predictable nature, but not to high-control students because of the lack of autonomy. Therefore, instructors may want to tailor their teaching methods early in the academic year to better accommodate students with differing levels of control.

Aside from the opportunity to adjust teaching methods to meet the learning-related needs of low-control students, early identification of students' level of academic control would enable instructors to provide intervention techniques to bolster students' sense of control. Research has repeatedly shown that providing low-control students with attributional retraining early in the academic year results in better performance on homework assignments, achievement tests (Menec *et al.*, 1994; Perry and Penner 1990), and final course grades by the end of that academic year (Pelletier *et al.*, 1999; Struthers and Perry, 1996). Consequently, modifying classroom instruction methods to incorporate AR techniques can serve to enhance the adjustment of low-control students to their first year of college. Thus, assessing students' level of academic control early in the school year, perhaps after receiving feedback on their first test or assignment, would allow for the opportunity to identify the particular needs of each student and maximize their likelihood of success during this critical transition period.

ACADEMIC CONTROL AND OTHER STUDENT DIFFERENCES

Although clearly positive, the consequences of academic control are not always as straightforward as initially thought. Instead, academic control often interacts with other individual differences between students to affect both the short-term (e.g., course grades) and long-term (e.g., GPA three years later) achievement of college students. Failure preoccupation, for example, enhances the effects of academic control (Perry *et al.*, 2001, in press), so that students with high academic control who are preoccupied with failure outperform high-control students who are

less preoccupied with failure. In addition, various academic emotions appear to moderate the effects of academic control. Higher levels of positive emotions, such as course enjoyment, or lower levels of negative emotions, such as course boredom or anxiety, tend to maximize the effects of high academic control on students' final course grades, cumulative GPA, and course attrition (Ruthig *et al.*, 2005). Conversely, low levels of positive emotions and high levels of negative emotions tend to nullify the effects of high academic control on achievement and attrition outcomes.

Evidently, knowing more about students' emotional states is critical to fully appreciate the role of academic control in persistence and achievement in college. Thus, further research focusing on the interactive effects of academic control and other commonly-experienced academic emotions such as pride (e.g., in achievement), hope (e.g., to succeed academically), shame (e.g., for poor performance), and guilt (e.g., for lack of effort) is needed to provide greater insight into how emotions enhance or impede the effects of academic control on achievement. Based on our own research, greater levels of positive emotions like pride or hope and lower levels of negative emotions like shame or guilt would likely maximize the benefits of high academic control. Conversely, lower levels of pride or hope and greater levels of guilt or shame would likely diminish the positive consequences of academic control.

Aside from learning-related emotions and failure preoccupation, perceived success is another major student difference that can modify the effects of academic control on scholastic performance. When paired with high academic control, perceptions of success are associated with greater achievement, yet when paired with low academic control, these same perceptions of success are associated with worse levels of achievement than having low perceived success (Schönwetter *et al.*, 1993). These findings are attributed to the fact that low-control/high-success students believe that, although they are successful, they do not have control over their academic outcomes. Thus, perceptions of success appear to only be adaptive if that success is believed to be within one's control.

The same may also be true of future expectations of success. Research by Ruthig *et al.* (2004), for example, explored the effects of high optimism on first-year students' GPA, test anxiety, and attrition, and drew similar conclusions. That is, highly optimistic students were thought to be at-risk academically if they did not have control perceptions in keeping with their optimistic expectations (e.g., "I expect to achieve an A+ in this course and my achievement depends on my own

hard work"). Currently, we are testing this assumption in a study in which highly optimistic students were randomly assigned to either an AR or no-AR condition and their pre- and post-treatment perceptions of control were examined along with their year-end academic outcomes (Ruthig, Hladkyj, Hall, and Haynes, 2003; see Underlying AR Processes section below). These findings, in combination with the results of Ruthig *et al.* (2004), show that high-optimism students who received AR developed increased perceptions of control and consequently obtained better grades than their no-AR counterparts. These preliminary findings support the notion that optimistic expectations are only adaptive among first-year students if they believe that making those positive expectations a reality is within their own control.

Although these recent studies provide some support, additional research is needed to confirm that both perceived success and positive future expectations are adaptive only when accompanied by perceptions of academic control. Future academic control research needs to consider additional student differences such as failure preoccupation, emotions, and current and future success expectations, which have been shown to interact with control perceptions to differentially affect students' scholastic achievement and persistence.

ACADEMIC CONTROL AND STUDENT HEALTH

Because the physical and psychological health of college students can potentially have serious academic consequences, health factors must be taken into account when considering students' scholastic development. In this connection, some of our recent findings indicate that academic control measured at the beginning of the first year of college significantly predicts health outcomes, with higher levels of control corresponding to better self-reported physical health and psychological well-being five months later (Ruthig *et al.*, 2002). Other research shows that the advantages of having *both* primary and secondary academic control extend beyond academic achievement into student health. Among female college students, for example, those who were proficient in both primary- and secondary-control strategies reported the best physical health and psychological well-being compared to students in three other groups who were deficient in either primary- or secondary-control strategies, or both (Hall, Chipperfield, Clifton, Ruthig, and Perry, 2002). These results can be explained, in part, by the fact that high-primary/high-secondary control students appear to switch between primary- and secondary-control beliefs when necessary in response to success and failure experiences.

This explanation is supported in a follow-up study by Hall, Hladkyj, Chipperfield, and Perry *et al.* (2002) which revealed that, among high-primary/high-secondary control students, those who were also capable of switching from primary to secondary control in failure situations reported the lowest occurrence of headaches, appetite loss, weight gain, indigestion, muscle tension, and fatigue. Thus, being able to switch between primary and secondary control as needed bolsters students' physical and psychological health, in addition to their motivation and academic performance (Hall, Hladkyj, Ruthig, *et al.*, 2002). Finally, additional recent research suggests that gender and perceived stress may moderate the effects of perceived control on student health (Hall, Chipperfield, Perry, Ruthig, and Götz, 2005). Although primary control related to better self-reported health among male students, and secondary control related to better health mainly among female students, the health benefits of both control approaches were largely due to their positive effects on students' perceptions of stress.

Future research can contribute to our preliminary academic control and student health findings in several ways. For instance, the study by Hall, Chipperfield *et al.* (2005) emphasized the importance of assessing the impact of primary and secondary control on more objective measures of physical health, such as the number of classes missed due to illness and number of physician visits, as well as the frequency of observable health risk behaviors (e.g., smoking, drinking, unprotected sex, drug use, etc.). In addition to more subjective measures of perceived health, these objective health measures would provide a more comprehensive representation of student health outcomes. It would also be useful for future research to examine long-term effects of perceived control on student health, over the course of a year or longer, to determine whether the benefits of control extend beyond the five-month duration assessed in our preliminary research. Finally, these health-related findings are encouraging in that perceptions of academic control are largely malleable. They suggest that increasing students' primary and secondary academic control through attribution-based AR treatments can enhance their physical health and psychological well-being, along with their academic motivation and achievement, and in doing so, potentially forestall the progression of more serious future health problems for low-control students. These recommendations underline the need to gain greater insight into the impact of primary and secondary academic control in the physical and psychological well-being of college students, as highlighted in our preliminary findings.

ACADEMIC CONTROL AND ATTRIBUTIONAL RETRAINING

Based on the rapidly expanding literature on attributional retraining in a higher education context, several promising areas for future research are apparent. Consistent with these previous studies, ongoing research in our laboratory on AR in college students is directed toward three main issues: (a) identifying other low-control student groups, (b) specifying the cognitive and motivational processes underlying the effectiveness of AR, and (c) administering AR treatments on a larger scale. Findings discussed below highlight the need for future research in each of these areas to further our understanding of how these techniques work, for whom they are best suited, and how they can be improved to benefit specific groups of low-control students.

Identification of Student Risk Factors

Recent research has found that examining combinations of control-related risk factors will enable the identification of students most at risk of academic failure and in greater need of attributional retraining. Such research is not new to attributional retraining researchers as exemplified by Menec *et al.* (Study 2, 1994) who defined at-risk students as having not only an external locus of control, but also poor performance on a GRE-type exam. In Pelletier *et al.* (1999), students were deemed to be at risk not only according to their goal orientation, but also in terms of failure-avoidance. Hall, Perry, Ruthig, Hladkyj, and Chipperfield (2005) also outlined how maladaptive perceptions of control involving high primary control and low secondary control predispose initially unsuccessful students to more serious deficits in end-of-year academic performance.

In a similar vein, recent research by Newall, Haynes, Hladkyj, and Chipperfield (2003) assessed the utility of a writing-based AR treatment for students differing in their perceptions of academic control and their desire for control over academic outcomes. As discussed earlier in this chapter (see Desire for Control section), some students have congruent perceptions of academic control and desire for control (i.e., high or low in both), but other students may feel in control yet not value it (high control/little desire), or conversely, they may desire a sense of control that they do not possess (low control/high desire). Following an AR treatment, significant improvements in course performance were found only for students who were either high or low in *both* academic control and desire for control. Further, this study found that AR was not effective

for students who were “mismatched” on these factors, that is, those who did not value the control they felt they had, or those who wanted more academic control than they felt they had.

Recent research has also examined the manner in which perceptions of academic success and feelings of optimism interact with AR to improve academic achievement in college students. Haynes, Ruthig, Newall, and Perry (2003) found that, following the administration of a writing-based AR treatment similar to that used in Newall *et al.* (2003) and Hall *et al.* (in press), course grades increased only for students with mismatched levels of optimism and perceived success. Specifically, AR was effective for students who were not optimistic but perceived themselves as successful, or did not feel successful but were optimistic, whereas it was *not* beneficial for students already feeling both successful and optimistic (i.e., “non-risk” students) or feeling neither successful nor optimistic (i.e., helpless students). Taken together, these findings suggest that by exploring how specific combinations of control-related student characteristics interact with attributional retraining to influence performance, we can obtain greater insight into what types of student dispositions are most beneficial or risky for academic development, and how AR can be used to help those students most 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 research (Hall *et al.*, in press; Luzzo, James, and Luna, 1996; Menec *et al.*, 1994; Noel *et al.*, 1987; Perry and Penner, 1990), studies are needed that examine why AR treatments are effective for low-control students. For example, 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 attributional retraining, administered using the videotape and aptitude test format employed in Pelletier *et al.* (1999), 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, 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; see Entwistle, 2000) or on the emotional impact of an academic failure experience (Pennebaker, 1997). 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 benefited most when encouraged to elaborate more generally on their failure-related emotions.

Similarly, findings from Ruthig *et al.* (2003) indicate that control- and stress-related processes may underlie the effectiveness of AR for overly optimistic students, as found in Ruthig *et al.* (2004). The AR treatment encouraged more attributions to controllable causes (effort) and fewer attributions to uncontrollable causes (luck, instructor, test difficulty) in these overly optimistic students, and also increased perceptions of control and reduced 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 Rothbaum *et al.*’s (1982) 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.

Large-scale AR Administration

By making attributional retraining techniques more user-friendly and efficient to administer, the large-scale application of brief yet effective AR treatments in the college classroom is quickly becoming a reality. Our 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 and 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 recently identified risk combinations (Haynes *et al.*, 2003; Newall *et al.*, 2003). Although previous AR research in laboratory settings has shown group discussion consolidation activities to be of benefit to certain groups of low-control students (Perry and Struthers, 1994; Struthers and Perry, 1996), large college classrooms make it difficult for instructors to adequately monitor the content and direction and group discussions, ensure equal and motivated student participation, and minimize factors such as noise level, unequal group sizes, and gender-heterogeneity within groups (Slavin, 1996).

In contrast, AR consolidation activities that are completed more independently 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, psychological processes involving social comparison and self-presentation (Tesser and Campbell, 1983) may render discussion consolidation techniques ineffective for some students when administered in actual intact classrooms because of students' concerns about discussing personal failure experiences in the presence of their peers (Hladkyj *et al.*, 1998; Weiner, Graham, Taylor, and Meyer, 1984). 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. Furthermore, due to the development of web-based research technologies, 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. In this connection, computer-based AR methods have been found to promote mathematics skill development in children with learning disabilities (Okolo, 1992).

Preliminary research on the use of Internet-based AR techniques to facilitate career decision making in college students is also encouraging (Tompkins-Bjorkman, 2002). For more information on AR and career uncertainty in college students, see Luzzo, Funk, and Strang (1996) and Luzzo, James, and Luna (1996). Moreover, our own preliminary research

shows that a web-based AR session requiring students to read attributional information and complete an online aptitude test results in significantly higher subsequent test scores and final course grades for first-year students (Hall, Perry, Ruthig, Haynes, and 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.

In terms of assisting students on an individual basis, attributional retraining techniques could be implemented by peer counselors and academic advisors who regularly come into contact with college students who are demotivated, performing poorly, and are tempted to withdraw from a course or their academic program. By providing academic counselors with an understanding of Weiner's attribution theory (1985, 1995) so that they could encourage students to make controllable and unstable attributions for poor performance, these counselors would assist students in adjusting to the college environment, particularly during their first year. However, considering that many students in need of academic support do not seek professional assistance, another important potential application of AR in the college classroom involves the training of course instructors. Menec and Perry (1995) provide details for training college instructors to incorporate AR techniques into everyday classroom activities to assist the academic development of students who would otherwise perform poorly (see also Schönwetter *et al.*, 2001).

In terms of enhancing the efficacy of existing AR administration methods for college students, previous research suggests that 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 (see Stark, Mandl, Gruber, and Renkl, 2002, for review). 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.

As done in previous AR research with college students (Van Overwalle and De Metsenaere, 1990) and elementary school students (Borkowski *et al.*, 1986, 1988; Miranda, Villaescusa, and Vidal Abarca, 1997; see also Pearl, 1985, for a review), strategy training based on a domain-specific skill set can also be incorporated into the attributional retraining intervention. For example, following the motivational AR

treatment, students can be provided an opportunity to learn the skills and behaviors required to succeed in a given course (e.g., memorization techniques for a biology course) or in college more generally (e.g., essay writing, study techniques). Finally, for students already investing considerable effort or those with overly inflated perceptions of academic (primary) control (Hall *et al.*, in press), an AR treatment encouraging students to also consider secondary-control strategies, such as adopting more realistic expectations or finding the “silver lining” (see Weisz, Thurber, Sweeney, Proffitt, and LeGagnoux, 1997), may also be an effective tool in facilitating the impact of attributional retraining in the college classroom.

SUMMARY OF RESEARCH ON ACADEMIC CONTROL IN HIGHER EDUCATION

Overall, our research on academic control has shown that a high level of control over educational experiences benefits students in several ways, over and above the predictive validity of traditional scholastic indicators, such as student aptitude. From enhancing their emotions, cognitions, and achievement motivation (Perry *et al.*, 2001; Schönwetter *et al.*, 1993), to improving their course grades and GPA (Hall, Perry, Ruthig, Hladkyj, and Chipperfield, 2005; Hall *et al.*, in press), to increasing their persistence as reflected in fewer courses dropped (Ruthig *et al.*, 2001, 2002), academic control provides students with the resources to overcome various educational obstacles. These findings also highlight the sustainability of the benefits of academic control over time, as evidenced by longitudinal research showing positive effects of academic control lasting up to three years (Perry *et al.*, in press). In addition to these main effects of academic control on student development, we have found that students' academic control also interacts with other individual difference variables involving academic emotions (Ruthig *et al.*, 2005), perceived success (Schönwetter *et al.*, 1993), and self-regulation (Perry *et al.*, 2001, in press) to predict performance outcomes. Previous laboratory analog studies of college classrooms demonstrate how classroom factors involving instructor effectiveness mediate the influence of academic control on scholastic development (Magnusson and Perry, 1989; Perry and Dickens, 1984, 1987; Perry and Magnusson, 1987; Perry *et al.*, 1986). Finally, our recent research suggests that by utilizing a dual-process model of perceived control, consisting of both primary and secondary academic control, we can gain a better understanding of how students adjust to failure experiences encountered during their first

academic year (Hall, Hladkyj, Ruthig, *et al.*, 2002; Hall, Perry, Ruthig, Hladkyj, and Chipperfield, 2005).

A major focus in our research has been to design attributional retraining (AR) procedures to assist low-control students (cf., Perry *et al.*, 1993; Menec *et al.*, 1994). We have found that AR techniques can be particularly effective for students who are failure prone due to both dispositional and situational factors such as an external locus of control (Menec *et al.*, 1994; Perry and Penner, 1990), maladaptive primary-/secondary-control beliefs (Hall *et al.*, in press), overly optimistic beliefs (Ruthig *et al.*, 2004), low perceptions of success (Perry and Struthers, 1994), infrequent use of elaborative learning strategies (Hall *et al.*, in press), reliance on performance goals as opposed to learning goals (Pelletier *et al.*, 1999), as well as poor academic performance (Hunter and Perry, 1996; Menec *et al.*, 1994). This research also shows how the overall effectiveness of AR techniques may be improved by the explicit manipulation of treatment methods in order to identify which AR procedures work best for different types of low-control students (e.g., Hall *et al.*, 2001, 2004; Hunter and Perry, 1996; Perry and Struthers, 1994; Ruthig *et al.*, 2004). These studies highlight the importance of providing not only AR information to students, but also of giving them the opportunity to elaborate on this information in a meaningful way through consolidation exercises which can be adapted to optimize the scholastic development of low-control students.

In having demonstrated the importance of academic control as an individual difference in college students and of attributional retraining as a viable instructional method for enhancing academic control, our next priority is to identify the underlying processes contributing to these findings. Notably, this requires a strong conceptual framework to guide the analysis of the underlying processes and a balance of methodological approaches involving both laboratory and field trials. In combination with our existing findings, these new studies should enable academic control differences between college students to be more clearly delineated, both for research and classroom purposes. In so doing, they would enable the efficacy of attributional retraining techniques to be subject to further development and improvement. As a consequence, failure-prone students would be more quickly identified by classroom instructors, before the students drop courses or withdraw from college altogether, and would be able to benefit from attributional retraining techniques applied in the classroom or offered more widely in university student-support programs.

REFERENCES

- Anastasi, A. (1988). *Psychological Testing*. New York, NY: Macmillan.
- Anderson, C.A. (1983). Motivational and performance deficits in interpersonal settings: The effect of attributional style. *Journal of Personality and Social Psychology* 45: 1136–1147.
- Andrews, G.R., and Debus, R.L. (1978). Persistence and the causal perception of failure: Modifying cognitive attributions. *Journal of Educational Psychology* 70: 154–166.
- Ashenfelter, O., and Krueger, A. (1994). Estimates of the economic returns to schooling from a new sample of twins. *American Economic Review* 84: 1157–1173.
- Aspinwall, L.G., and Taylor, S.E. (1992). Modelling cognitive adaptation: A longitudinal investigation of the impact of individual differences and coping on college adjustment and performance. *Journal of Personality and Social Psychology* 83: 989–1003.
- Atkinson J.W., and Feather, N.T. (1966) (eds.), *A Theory of Achievement Motivation*. New York, NY: Wiley.
- Aydin, G. (1988). The remediation of children's helpless explanatory style and related unpopularity. *Cognitive Therapy and Research* 12: 155–165.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review* 84: 191–215.
- Bandura, A. (1997). *Self-efficacy: The Exercise of Control*. Englewood Cliffs, NJ: Prentice Hall.
- Barling, J., and Snipelisky, B. (1983). Assessing the determinants of children's academic self-efficacy beliefs: A replication. *Cognitive Therapy and Research* 7: 371–376.
- Bess, J.L. (1973). Integrating faculty and student life cycles. *Review of Educational Research* 43: 377–403.
- Block, J., and Lanning, K. (1984). Attribution therapy questioned: A secondary analysis of the Wilson-Linville study. *Journal of Personality and Social Psychology* 46: 705–708.
- Borkowski, J.G., Weyhing, R.S., and Carr, M. (1988). Effects of attributional retraining on strategy-based reading comprehension in learning-disabled students. *Journal of Educational Psychology* 80: 46–53.
- Borkowski, J.G., Weyhing, R.S., and Turner, L.A. (1986). Attributional retraining and the teaching of strategies. *Exceptional Children* 53: 130–137.
- Britton, B.K., and Tesser, A. (1991). Effects of time-management practices on college grades. *Journal of Educational Psychology* 83: 405–410.
- Burger, J.M. (1989). Negative reactions to increases in perceived personal control. *Journal of Personality and Social Psychology* 56: 246–256.
- Burger, J.M. (1995). Need for control and self-esteem: Two routes to a high desire for control. In M.H. Kernis (ed.), *Efficacy, Agency, and Self-esteem* (pp. 217–233). New York, NY: Plenum Press.
- Burger, J.M., and Cooper, H.M. (1979). The desirability of control. *Motivation and Emotion* 3: 381–393.
- Canadian Association of University Teachers (2003). *CAUT Almanac of Post-secondary Education in Canada*. Ottawa, ON: Author.
- Carlyon, W.D. (1997). Attribution retraining: Implications for its integration into prescriptive social skills training. *School Psychology Review* 26: 61–73.

- Cassidy, S., and Eachus, P. (2000). Learning style, academic belief systems, self-report student proficiency, and academic achievement in higher education. *Educational Psychology: An International Journal of Experimental Educational Psychology* 20: 307–322.
- Chipperfield, J.G. (1993). Perceived barriers in coping with health problems: A twelve-year longitudinal study of survival among elderly individuals. *Journal of Aging and Health* 5: 123–139.
- Chipperfield, J.G., and Greenslade, L. (1999). Perceived control as a buffer in the use of health care services. *Journal of Gerontology: Psychological Sciences* 54B: P146–P154.
- Clifton, R.A. (2000, May). *Post-secondary education in Canada: 1960 to 2000: The best years we have ever had*. Paper presented at the annual meeting of the Canadian Society for the Study of Higher Education, Edmonton, AB.
- Clifton, R.A., and Roberts, L.W. (1992). *Authority in Classrooms*. Scarborough, ON: Prentice Hall.
- Cohen, J. (1988). *Statistical Power for the Behavioral Sciences* (2nd ed). Hillsdale, NJ: Erlbaum.
- Cohen, P.A. (1981). Student ratings of instruction and student achievement: A meta-analysis of multisession validity studies. *Review of Educational Research* 51: 281–309.
- Cohen, P.A. (1983). Comment on a selective review of the validity of student ratings of teaching. *Journal of Higher Education* 54: 448–458.
- Covington, M.V. (1992). *Making the Grade: A Self-worth Perspective on Motivation and School Reform*. New York, NY: Cambridge University Press.
- Covington, M.V. (1993). A motivational analysis of academic life in college. In J.C. Smart (ed.), *Higher Education: Handbook of Theory and Research* (Vol. 7, pp. 61–101). New York, NY: Agathon Press.
- Craske, M.L. (1985). Improving persistence through observational learning and attribution retraining. *British Journal of Educational Psychology* 55: 138–147.
- Craske, M.L. (1988). Learned helplessness, self-worth motivation and attribution retraining for primary school children. *British Journal of Educational Psychology* 58: 152–164.
- Creech, S.K., Carpenter, S., and Davis, E.J. (1994). The direct economic impact of Texas' appropriations to higher education. *The Review of Higher Education* 17, 125–141.
- Cronbach, L.J., and Snow, R.E. (1977). *Aptitudes and Instructional Methods: A Handbook for Research on Interactions*. Oxford, England: Irvington.
- Curtis, K.A. (1992). Altering beliefs about the importance of strategy: An attributional intervention. *Journal of Applied Social Psychology* 22: 953–972.
- DasGupta, B. (1992). Perceived control and examination stress. *Psychology: A Journal of Human Behavior* 29: 31–34.
- DeCharms, R. (1968). *Personal Causation: The Internal Affective Determinants of Behavior*. New York, NY: Plenum.
- Deci, E.L., and Ryan, R.M. (1985). *Intrinsic Motivation and Self-determination in Human Behavior*. New York, NY: Plenum.
- den Boer, D.J., Meertens, R., Kok, G., and Van Knippenberg, A. (1989). Measurements effects in reattribution research. *European Journal of Social Psychology* 19: 553–559.
- Desruisseaux, P. (1998). US trails 22 nations in high school completion. *The Chronicle of Higher Education*, December 4, A45.

- Dev, P.C. (1998). Intrinsic motivation and the student with learning disabilities. *Journal of Research and Development in Education* 31: 98–108.
- Dicintio, M.J., and Gee, S. (1999). Control is the key: Unlocking the motivation of at-risk students. *Psychology in the Schools* 36: 231–237.
- Dieser, R.B., and Ruddell, E. (2002). Effects of attribution retraining during therapeutic recreation on attributions and explanatory styles of adolescents with depression. *Therapeutic Recreation Journal* 36: 35–47.
- Dweck, C.S. (1975). The role of expectations and attributions in the alleviation of learned helplessness. *Journal of Personality and Social Psychology* 31: 674–685.
- Eaton, S.B., and Bean, J.P. (1995). An approach/avoidance behavior model of college student attrition. *Research in Higher Education* 36: 617–645.
- Edmonds, H.K. (2003). Grade retention and children's academic self-efficacy and use of self-protective strategies. *Dissertation Abstracts International Section A: Humanities and Social Sciences* 63: 11-A.
- El-Hindi, A.E., and Childers, K.D. (1996, January). *Exploring metacognitive awareness and perceived attributions for academic success and failure: A study of at-risk college students*. Paper presented at the Southwest Educational Research Association annual meeting, New Orleans, LA.
- Entwistle, N. (2000). Approaches to studying and levels of understanding: The influences of teaching and assessment. In J.C. Smart (ed.), *Higher Education: Handbook of Theory and Research* (Vol. 15, pp. 156–218). New York, NY: Agathon Press.
- Eysenck, H.J. (1997). Personality and experimental psychology: The unification of psychology and the possibility of a paradigm. *Journal of Personality and Social Psychology* 73: 1224–1237.
- Feldman, K. (1989). The association between student ratings of specific instructional dimensions and student achievement: Refining and extending the synthesis of data from multisection validity studies. *Research in Higher Education* 30: 583–645.
- Feldman, K.A. (1998). Reflections on the study of effective college teaching and student ratings: One continuing question and two unresolved issues. In J.C. Smart (ed.), *Higher Education: Handbook of Theory and Research* (Vol. 13, pp. 35–74). New York, NY: Agathon.
- Folkman, S. (1984). Personal control and stress and coping processes: A theoretical analysis. *Journal of Personality and Social Psychology* 46: 839–852.
- Försterling, F. (1985). Attributional retraining: A review. *Psychological Bulletin* 98: 495–512.
- Försterling, F. (1986). Attributional conceptions in clinical psychology. *American Psychologist* 41: 275–285.
- Furio, B.J. (1987). The relationship between instructor behaviors and student perceptions of control in the classroom. *Dissertation Abstracts International* 47(8-A): 2798.
- Garber, J., and Seligman, M.E.P. (1980) (eds.), *Human Helplessness: Theory and Applications*. New York, NY: Academic Press.
- Garcia-Campayo, J., Sanz Carrillo, C., Larrubia, J., and Monton, C. (1997). Reattribution revisited: A critical appraisal. *European Journal of Psychiatry* 11: 5–10.
- Geraghty, M. (1996, July 19). More students quitting college before sophomore year, data show. *The Chronicle of Higher Education* A35–A36.
- Glass, D.C., and Singer, J. (1971). *Urban Stress*. New York, NY: Academic Press.

- Green-Emrich, A., and Altmaier, E.M. (1991). Attributional retraining as a structured group counselling intervention. *Journal of Counselling and Development* 69: 351–355.
- Hall, N.C., Chipperfield, J.G., Clifton, R.A., Ruthig, J.C., and Perry, R.P. (2002, April). *Primary control, secondary control, and gender: Empirical links to health and college students' academic development*. Paper presented at the American Educational Research Association annual meeting, New Orleans, LA.
- Hall, N.C., Chipperfield, J.G., Perry, R.P., Pekrun, R.H., and Schönwetter, D. (2001, April). *Attributional retraining, perceived control, and failure: Assisting at-risk students through writing*. Paper presented at the American Educational Research Association annual meeting, Seattle, WA.
- Hall, N.C., Chipperfield, J.G., Perry, R.P., Ruthig, J.C., and Götz, T. (2005). *Primary and secondary control in academic development: Gender-specific implications for stress and self-rated health in college students*. Manuscript under review.
- Hall, N.C., Hladkyj, S., Chipperfield, J.G., and Perry, R.P. (2002, June). *Primary, secondary, and action control strategies: Health implications of college students' "switching capacity"*. Paper presented at the Canadian Psychological Association annual convention, Vancouver, BC.
- Hall, N.C., Hladkyj, S., Chipperfield, J.G., and Stupnisky, R.H. (2003, May). *Perceived control and self-regulation: A structural equation modelling approach*. Paper presented at the Western Psychological Association annual convention, Vancouver, BC.
- Hall, N.C., Hladkyj, S., Perry, R.P., and Ruthig, J.C. (2004). The role of attributional retraining and elaborative learning in college students' academic development. *Journal of Social Psychology* 144, 591–612.
- Hall, N.C., Hladkyj, S., Ruthig, J.C., Pekrun, R., and Perry, R.P. (2002, April). *The role of action control in moderating primary versus secondary control strategy use in college students*. Paper presented at the American Educational Research Association annual meeting, New Orleans, LA.
- Hall, N.C., Perry, R.P., Chipperfield, J.G., Clifton, R.A., and Haynes, T.L. (in press). Enhancing primary and secondary control in at-risk college students through writing-based attributional retraining. *Journal of Social and Clinical Psychology*.
- Hall, N.C., Perry, R.P., Ruthig, J.C., Haynes, T.L., and Stupnisky, R.H. (2005, April). *Internet-based attributional retraining: Longitudinal effects on academic achievement in college students*. Paper presented at the American Educational Research Association annual meeting, Montreal, PQ.
- Hall, N.C., Perry, R.P., Ruthig, J.C., Hladkyj, S., and Chipperfield, J.G. (2005). *Primary and secondary control in achievement settings: A Longitudinal Field study of academic motivation, emotions, and performance*. Manuscript under review.
- Harackiewicz, J.M., Barron, K.E., Tauer, J.M., and Elliot, A.J. (2002). Predicting success in college: A longitudinal study of achievement goals and ability measures as predictors of interest and performance from freshman year through graduation. *Journal of Educational Psychology* 94: 562–575.
- Haynes, T., Ruthig, J.C., Newall, N.E., and Perry, R.P. (2003, May). *Attributional retraining, dispositional optimism, and success: Effects on academic achievement*. Paper presented at the Western Psychological Association annual convention, Vancouver, BC.
- Heckhausen, J., and Schulz, R. (1998). Developmental regulation in adulthood: Selection and compensation via primary and secondary control. In J. Heckhausen, and C.S.

- Dweck (eds.), *Motivation and Self-regulation Across the Life Span* (pp. 50–77). New York, NY: Cambridge University Press.
- Heller, K.A. (1999). Individual (learning and motivational) needs versus instructional conditions of gifted education. *High Ability Studies* 10: 9–21.
- Heller, K.A. (2003). Attributional retraining as an attempt to reduce gender-specific problems in mathematics and the sciences. *Gifted and Talented* 7: 15–21.
- Heller, K.A., and Ziegler, A. (1996). Gender differences in mathematics and the natural sciences: Can attributional retraining improve the performance of gifted females? *Gifted Child Quarterly* 40: 200–210.
- Hladkyj, S., Hunter, A.J., Maw, J., and Perry, R.P. (1998, April). *Attributional retraining and elaborative learning in the college classroom*. Paper presented at the American Educational Research Association annual meeting, San Diego, CA.
- Hladkyj, S., Pelletier, S.T., Drewniak, E.P., and Perry, R.P. (1998, April). *Evidence for the role of secondary control in students' adaptation to college*. Paper presented at the American Educational Research Association annual meeting, San Diego, CA.
- Hladkyj, S., Perry, R.P., Hall, N.C., Ruthig, J.C., and Pekrun, R. (2003, April). *The employment of unpredictable experience: A multi-sample study of secondary control in college student motivation*. Paper presented at the American Educational Research Association annual meeting, Chicago, IL.
- Hladkyj, S., Perry, R.P., and Pelletier, S.T. (2000, April). *Narrative employment and the creation of meaning: Links to student emotion, cognition, and motivation*. Paper presented at the American Education Research Association annual meeting, New Orleans, LA.
- Hladkyj, S., Taylor, J.R., Pelletier, S.T., and Perry, R.P. (1999, April). *Narrative employment: Meaning and value in unpredictable experience and its role in student motivation*. Paper presented at the American Educational Research Association annual meeting, Montreal, PQ.
- Ho, R., and McMurtrie, J. (1991). Attributional feedback and underachieving children: Differential effects on causal attributions, success expectancies, and learning processes. *Australian Journal of Psychology* 43: 93–100.
- House, J.D. (1995). Noncognitive predictors of achievement in introductory college mathematics. *Journal of College Student Development* 36: 171–181.
- Hudley, C., Britsch, B., Wakefield, W.D., Smith, T., Demorat, M., and Cho, S.-J. (1998). An attribution retraining program to reduce aggression in elementary school students. *Psychology in the Schools* 35: 271–282.
- Hunter, A.J., and Perry, R.P. (1996, August). *Attributional retraining: Identifying at-risk students before admission to university*. Paper presented at the XXVI International Congress of Psychology, Montreal, PQ.
- Jesse, D.M., and Gregory, W.L. (1986–87). A comparison of three attributional approaches to maintaining first year college GPA. *Educational Research Quarterly* 11: 12–25.
- Kaaya, S., Goldberg, D., and Gask, L. (1992). Management of somatic presentations of psychiatric illness in general medical settings: Evaluation of a new training course for general practitioners. *Medical Education* 26: 138–144.
- Kuhl, J. (1985). Volitional mediators of cognition-behavior consistency: Self-regulatory processes and action versus state orientation. In J. Kuhl and J. Beckmann (eds.), *Action Control: From Cognition to Behavior* (pp. 101–128). Berlin: Springer Verlag.

- Langer, E.J. (1989). Minding matters: The consequences of mindlessness-mindfulness. *Advances in Experimental Social Psychology* 22: 137–173.
- Leondari, A., and Gialamas, V. (2000). Relations between self-esteem, perceived control, possible selves, and academic achievement in adolescents. *Psychology: The Journal of the Hellenic Psychological Society* 7: 267–277.
- Leslie, L.L., and Slaughter, S.A. (1992). Higher education and regional economic development. In W.E. Becker and R. Lewis (eds.), *The Economics of American Higher Education*. Boston, MA: Kluwer Academic Publishers.
- Luzzo, D.A., Funk, D.P., and Strang, J. (1996). Attributional retraining increases career decision-making self-efficacy. *Career Development Quarterly* 44: 378–386.
- Luzzo, D.A., James, T., and Luna, M. (1996). Effects of attributional retraining on the career beliefs and career exploration behavior of college students. *Journal of Counselling Psychology* 43: 415–422.
- Magnusson, J.-L., and Perry, R.P. (1989). Stable and transient determinants of students' perceived control: Consequences for instruction in the college classroom. *Journal of Educational Psychology* 81: 362–370.
- Marsh, H.W., and Dunkin, M. (1992). Students' evaluations of university teaching: A multidimensional perspective. In J.C. Smart (ed.), *Higher Education: Handbook of Theory and Research* (Vol. 8, pp. 143–233). New York, NY: Agathon.
- McKeachie, W.J. (1997). Student ratings: The validity of use. *American Psychologist* 52: 1218–1225.
- Menec, V.H., and Perry, R.P. (1995). Disciplinary differences in perceptions of success: Modifying misperceptions with attributional retraining. In N. Hativa and M. Marinovich (eds.), *Disciplinary Differences in Teaching and Learning in Higher Education*. San Francisco, CA: Jossey-Bass.
- Menec, V.H., Perry, R.P., Struthers, C.W., Schönwetter, D.J., Hechter, E.J., and Eichholz, B.L. (1994). Assisting at-risk college students with attributional retraining and effective teaching. *Journal of Applied Social Psychology* 24: 675–701.
- Menges, R.J., and Associates (eds.) (1999). *Faculty in New Jobs*. San Francisco, CA: Jossey-Bass.
- Meyer, G.J., Finn, S.E., Eyde, L.D., Kay, G.G., Moreland, K.L., Dies, R.R., Eisman, E.J., Kubiszyn, T.W., and Reed, G.M. (2001). Psychological testing and psychological assessment: A review of evidence and issues. In A.E. Kazdin (ed.), *Methodological Issues and Strategies in Clinical Research* (Vol. 3, pp. 265–345). Washington, DC: American Psychological Association.
- Miller, C., Mulvey, P., and Martin, N. (1995). What do twins studies reveal about the economic returns to education? A comparison of Australian and U.S. findings. *American Economic Review* 3: 586–599.
- Miller, R.L., Brickman P., and Bolen, D. (1975). Attribution versus persuasion as a means for modifying behavior. *Journal of Personality and Social Psychology* 31: 430–441.
- Miranda, A., Villaescusa, M.I., and Vidal-Abarca, E. (1997). Is attribution retraining necessary? Use of self-regulation procedures for enhancing the reading comprehension strategies of children with learning disabilities. *Journal of Learning Disabilities* 30: 503–512.
- Miserandino, M. (1998). Attributional retraining as a method of improving athletic performance. *Journal of Sport Behavior* 21: 286–297.

- Morriss, R.K., and Gask, L. (2002). Treatment of patients with somatized mental disorder: Effects of reattribution training on outcomes under the direct control of the family doctor. *Psychosomatics: Journal of Consultation Liaison Psychiatry* 43: 394–399.
- Murphy, K.M., and Welch, F. (1992). Wages of college graduates. In W.E. Becker and D.R. Lewis (eds.), *The Economics of American Higher Education* (pp. 121–140). Boston, MA: Kluwer Academic Publishers.
- Murray, H.G. (1991). Effective teaching behaviors in the college classroom. In J.C. Smart (ed.), *Higher Education: Handbook of Theory and Research* (Vol. 7, pp. 135–172). New York, NY: Agathon.
- Murray, H.G. (2001). Low-inference teaching behaviors and college teaching effectiveness: Recent developments and controversies. In J.C. Smart (ed.), *Higher Education: Handbook of Theory and Research* (Vol. 16, pp. 239–272). New York, NY: Agathon.
- Musher-Eizenman, D.R., Nesselroade, J.R., and Schmitz, B. (2002). Perceived control and academic performance: A comparison of high- and low-performing children on within-person change patterns. *International Journal of Behavioral Development* 26: 540–547.
- National Center for Educational Statistics (2004, August 22). *Enrollment in Degree-granting Institutions* [On-line]. Available: http://nces.ed.gov/pubs2002/proj2012/ch_2.asp
- Newall, N.E., Haynes, T., Hladkyj, S., and Chipperfield, J.G. (2003, May). *Academic achievement: Effects of attributional retraining, perceived control and desire for control*. Paper presented at the Western Psychological Association annual convention, Vancouver, BC.
- Noel, J.G., Forsyth, D.R., and Kelley, K.N. (1987). Improving performance of failing students by overcoming their self-serving attributional biases. *Basic and Applied Psychology* 8: 151–162.
- Okolo, C. (1992). The effects of computer-based attribution retraining on the attributions, persistence, and mathematics computation of students with learning disabilities. *Journal of Learning Disabilities* 25: 327–334.
- Pascarella, E.T., and Terenzini, P.T. (1991). *College Affects Students: Findings and Insights from Twenty Years of Research*. San Francisco, CA: Jossey-Bass.
- Paulsen M. B. (1998). Recent research on the economics of attending college: Returns on investments and responsiveness to price. *Research in Higher Education* 39: 471–489.
- Pearl, R. (1985). Cognitive-behavioral interventions for increasing motivation. *Journal of Abnormal Child Psychology* 13: 443–454.
- Pelletier, S.T., Hladkyj, S., Moszynski, S.L., and Perry, R.P. (1999, August). *Goal orientation and perceived control: Delineating prerequisites for sustained motivation with an attributional retraining context*. Paper presented at the American Psychological Association annual meeting, Boston, MA.
- Pennebaker, J.W. (1997). Writing about emotional experiences as a therapeutic process. *Psychological Science* 8: 162–166.
- Perry, R.P. (1991). Perceived control in college students: Implications for instruction in higher education. In J.C. Smart (ed.), *Higher Education: Handbook of Theory and Research* (Vol. 7, pp. 1–56). New York, NY: Agathon Press.
- Perry, R.P. (1997). Teaching effectively: Which students? What methods? In R.P. Perry

- and J.C. Smart (eds.), *Effective Teaching in Higher Education: Research and Practice* (pp. 154–168). New York, NY: Agathon.
- Perry, R.P. (2003). Perceived (academic) control and causal thinking in achievement settings. *Canadian Psychologist* 44: 312–331.
- Perry, R.P., Abrami, P.C., and Leventhal, L. (1979). Educational seduction: The effect of instructor expressiveness and lecture content on student ratings and achievement. *Journal of Educational Psychology* 71: 109–116.
- Perry, R.P., Clifton, R.A., Menec, V.H., Struthers, C.W., and Menges, R.J. (2000). Faculty in transition: A longitudinal analysis of perceived control and type of institution in the research productivity of newly hired faculty. *Research in Higher Education* 41: 165–194.
- Perry, R.P., and Dickens, W.J. (1984). Perceived control in the college classroom: The effect of response outcome contingency training and instructor expressiveness on students' attributions and achievement. *Journal of Educational Psychology* 76: 966–981.
- Perry, R.P., and Dickens, W.J. (1987). Perceived control and instruction in the college classroom: Some implications for student achievement. *Research in Higher Education* 27: 291–310.
- Perry, R.P., Hechter, F.J., Menec, V.H., and Weinberg, L. (1993). Enhancing achievement motivation and performance in college students: An attributional retraining perspective. *Research in Higher Education* 34: 687–720.
- Perry, R.P., Hall, N.C., Newall, N.E., Haynes, T.L., and Stupnisky, R.H. (2003, May). *Attributional retraining and elaboration: Differential treatment effects in college students*. Paper presented at the Western Psychological Association annual convention, Vancouver, BC.
- Perry, R.P., Hladkyj, S., and Pekrun, R.H. (1998, April). *Action-control and perceived control in the academic achievement of college students: A longitudinal analysis*. Paper presented at the American Educational Research Association annual meeting, San Diego, CA.
- Perry, R.P., Hladkyj, S., Pekrun, R., and Pelletier, S. (2001). Academic control and action control in the achievement of college students: A longitudinal field study. *Journal of Educational Psychology* 93: 776–789.
- Perry, R.P., Leventhal, L., and Abrami, P.C. (1979). An observational learning procedure for improving university instruction. *Improving University Teaching* 5: 240–248.
- Perry, R.P., and Magnusson, J.-L. (1987). Effective instruction and students perceptions of control in the college classroom: Multiple-lectures effects. *Journal of Educational Psychology* 79: 453–460.
- Perry, R.P., and Magnusson, J.-L. (1989). Causal attributions and perceived performance: Consequences for college students' achievement and perceived control in different instructional conditions. *Journal of Educational Psychology* 81: 164–172.
- Perry, R.P., Magnusson, J.-L., Parsonson, K., and Dickens, W.J. (1986). Perceived control in the college classroom: Limitations in instructor expressiveness due to noncontingent outcomes and lecture content. *Journal of Educational Psychology* 78: 96–107.
- Perry, R.P., Menec, V.H., Struthers, C.W., Hechter, F.J., Schönwetter, D.J., and Menges, R.J. (1997). Faculty in transition: A longitudinal analysis of the role of perceived control and type of institutions in adjustment to postsecondary institutions. *Research in Higher Education* 38: 519–556.

- Perry, R.P., and Penner, K.S. (1990). Enhancing academic achievement in college students through attributional retraining and instruction. *Journal of Educational Psychology* 82: 262–271.
- Perry, R.P., and Smart, J.C. (eds.) (1997). *Effective Teaching in Higher Education: Research and Practice*. New York, NY: Agathon.
- Perry, R.P., and Struthers, C.W. (1994, April). *Attributional retraining in the college classroom: Some cause for optimism*. Paper presented at the American Educational Research Association, New Orleans, LA.
- Perry, R.P., and Williams, R.G. (1979). Videotape instruction. The impact of teacher characteristics on student ratings and achievement. In A.M. Sullivan (ed.), *Experimental Research in Videotaped Instruction*. St. Johns, NF: Memorial University Press.
- Perry, R.P., Hladkyj, S., Pekrun, R.H., Clifton, R.C., and Chipperfield, J.G. (in press). Perceived academic control and failure in college students: A three-year study of scholastic attainment. *Research in Higher Education*.
- Pintrich, P.R., Smith, D.A., and McKeachie, W.J. (1989). *A Manual for the Use of the Motivated Strategies for Learning Questionnaire*. Ann Arbor, MI: National Center for Research to Improve Postsecondary Teaching and Learning, School of Education, University of Michigan.
- Reed, J.G. (1981). Dropping a college course: Factors influencing students' withdrawal decisions. *Journal of Educational Psychology* 73: 376–385.
- Robbins, S.B., Lauver, K., Davis, H.L., Davis, D., Langley, R., and Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychological Bulletin* 130: 261–288.
- Rodin, J. (1986). Health, control, and aging. In M.M. Baltes and P.B. Baltes (eds.), *Aging and the Psychology of Control* (pp. 139–165). Hillsdale, NJ: Erlbaum.
- Ross, C.E., and Broh, B.A. (2000). The roles of self-esteem and the sense of perceived control in the academic achievement process. *Sociology of Education* 73: 270–284.
- Rothbaum, F., Weisz, J., and Snyder, S. (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology* 42: 5–37.
- Rotter, J.B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs* 80: 1–28.
- Rotter, J.B. (1975). Some problems and misconceptions related to the construct of internal versus external control of reinforcement. *Journal of Consulting and Clinical Psychology* 43: 56–67.
- Ruthig, J.C., Hladkyj, S., Hall, N.C., and Haynes, T.L. (2003, May). *Attributional retraining: Longitudinal effects on optimistic students' perceived control and stress*. Paper presented at the Western Psychological Association annual convention, Vancouver, BC.
- Ruthig, J.C., Hladkyj, S., Hall, N.C., Pekrun, R., and Perry, R.P. (2002, April). *Profiling voluntary course withdrawal among college students: A longitudinal study with motivational implications*. Paper presented at the American Educational Research Association annual meeting, New Orleans, LA.
- Ruthig, J.C., Hladkyj, S., Perry, R.P., Clifton, R.A., and Pekrun, R. (2001, April). *Academic emotions and perceived control: Effects on achievement and voluntary course withdrawal*.

- Paper presented at the American Educational Research Association annual meeting, Seattle, WA.
- Ruthig, J.C., Perry, R.P., Hall, N.C., and Hladkyj, S. (2004). Optimism and attributional retraining: Longitudinal effects on academic achievement, test anxiety, and voluntary course withdrawal. *Journal of Applied Social Psychology* 34: 709–730.
- Ruthig, J.C., Perry, R.P., Hladkyj, S., Hall, N.C., Pekrun, R., and Chipperfield, J.G. (2005). *A Longitudinal Analysis of Perceived Control and Emotions in an Academic Setting*. Manuscript under review.
- Schönwetter, D.J., Perry, R.P., and Struthers, C.W. (1993). Students' perceptions of control and success in the college classroom: Affects and achievement in different instruction conditions. *Journal of Experimental Education* 61: 227–246.
- Schönwetter, D., Walker, L.J., Hladkyj, S., Perry, R.P., Ruthig (Kobylak), J.C., and Hall, N.C. (2001, April). *Facilitating the academic development of high-risk freshmen students through a deliberate teaching strategy*. Paper presented at the American Educational Research Association annual meeting, Seattle, WA.
- Schulz, R., and Heckhausen, J. (1996). A life span model of successful aging. *American Psychologist* 51: 702–714.
- Schunk, D.H. (1983). Ability versus effort attributional feedback: Differential effects on self-efficacy and achievement. *Journal of Educational Psychology* 75: 848–856.
- Seligman, M.E.P. (1975). *Helplessness: On Depression, Development, and Death*. San Francisco, CA: Freeman.
- Shapiro, D.H., Schwartz, C.E., and Astin, J.A. (1996). Controlling ourselves, controlling our world. *American Psychologist* 51: 1213–1230.
- Sinnott, K., and Biddle, S. (1998). Changes in attributions, perceptions of success and intrinsic motivation after attributional retraining in children's sport. *International Journal of Adolescence and Youth* 7: 137–144.
- Skinner, E.A. (1996). A guide to constructs of control. *Journal of Personality and Social Psychology* 71: 549–570.
- Skinner, E.A., Connell, J.P., and Zimmer-Gembeck, M.J. (1998). Individual differences and the development of perceived control. *Monographs of the Society for Research in Child Development* 63: 1–220.
- Skinner, E.A., Wellborn, J.G., and Connell, J.P. (1990). What it takes to do well in school and whether I've got it: A process model of perceived control and children's engagement and achievement in school. *Journal of Educational Psychology* 82: 22–32.
- Slavin, R.E. (1996). Research on cooperative learning and achievement: What we know, what we need to know. *Contemporary Educational Psychology* 21: 43–69.
- Smart, J.C. (1986). College effects on occupational status attainment. *Research in Higher Education* 24: 73–95.
- Smart, J.C. (1988). College influences on graduates' income levels. *Research in Higher Education*, 29 (1) 4–59.
- Smart, J.C. (1990). A causal model of faculty turnover intentions. *Research in Higher Education*, 31 (5) 405–424.
- Sokoloff, H. (2004, March 6). Why aren't men going to university? *National Post*, pp. RB1, RB2.
- Stark, R., Mandl, H., Gruber, H., and Renkl, A. (2002). Conditions and effects of example elaboration. *Learning and Instruction* 12: 39–60.

- Stipek, D.J., and Weisz, J.R. (1981). Perceived control and academic achievement. *Review of Educational Research* 51: 101–138.
- Struthers, C.W., and Perry, R.P. (1996). Attributional style, attributional retraining, and inoculation against motivational deficits. *Social Psychology of Education* 1: 171–187.
- Stupnisky, R.H., Perry, R.P., Hall, N.C., and Haynes, T.L. (2004, April). *Individual differences in attributional retraining: A longitudinal study*. Paper presented at the Western Psychological Association annual meeting, Phoenix, AZ.
- Sullivan, A.M., and Skanes, G.R. (1974). Validity of student evaluation of teaching and the characteristics of successful instructors. *Journal of Educational Psychology* 66: 584–590.
- Tesser, A., and Campbell, J. (1983). Self-definition and self-evaluation maintenance. In J. Suls and A.G. Greenwald (eds.), *Psychological Perspectives on the Self* (Vol. 2). Hillsdale, NJ: Erlbaum.
- Tompkins-Bjorkman, A.B. (2002). Internet-based attributional retraining and career decision making. *Dissertation Abstracts International Section B: Sciences and Engineering* 63(11-B): 5540.
- Thompson, S.C., Sobolew-Shubin, A., Galbraith, M.E., Schwankovsky, L., and Cruzen, D. (1993). Maintaining perceptions of control: Findings perceived control in low control circumstances. *Journal of Personality and Social Psychology* 64: 293–304.
- Van Overwalle, F. (1989). Structure of freshmen's causal attributions for exam performance. *Journal of Educational Psychology* 81: 400–407.
- Van Overwalle, F. (1997). Dispositional attributions require the joint application of the methods of difference and agreement. *Personality and Social Psychology Bulletin* 23: 974–980.
- Van Overwalle, F., and De Metsenaere, M. (1990). The effects of attribution-based intervention and study strategy training on academic achievement in college freshmen. *British Journal of Educational Psychology* 60: 299–311.
- Van Overwalle, F., Segebarth, K., and Goldchstein, M. (1989). Improving performance of freshman through attributional testimonies from fellow students. *British Journal of Educational Psychology* 59: 75–85.
- Weary, G., Gleicher, F., and Marsh, K.L. (eds.) (1993). *Control Motivation and Social Cognition*. New York, NY: Springer-Verlag.
- Weinberg, L.E. (2001). The effects of attributional retraining, age, and perceived control on health-related cognitions: A longitudinal field study of older adults attending geriatric day hospitals. *Dissertation Abstracts International Section A: Humanities and Social Sciences* 61(7-A): 2865.
- Weiner, B. (1980). A cognitive (attribution)–emotion–action model of motivated behavior: An analysis of judgments of help-giving. *Journal of Personality and Social Psychology* 39: 186–200.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review* 92: 548–573.
- Weiner, B. (1986). *An attributional theory of motivation and emotions*. New York, NY: Springer-Verlag.
- Weiner, B. (1988). Attribution theory and attributional therapy: Some theoretical observations and suggestions. *British Journal of Clinical Psychology* 27: 93–104.

- Weiner, B. (1995). *Judgments of Responsibility: A Foundation for a Theory of Social Conduct*. New York, NY: Guilford Press.
- Weiner, B., Graham, S., Taylor, S.E., and Meyer, W.U. (1984). Social cognition in the classroom. *Educational Psychologist* 18: 109–124.
- Weisz, J.R., Thurber, C.A., Sweeney, L., Proffitt, V.D., and LeGagnoux, G.L. (1997). Brief treatment of mild-to-moderate child depression using primary and secondary control enhancement training. *Journal of Consulting and Clinical Psychology* 65: 703–707.
- White, R.W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review* 66: 297–333.
- Wiggins, J.S. (1996). *The Five-factor Model of Personality*. New York, NY: Guilford Press.
- Wilson, T.D., Damiani, M., and Shelton, N. (2002). Improving the academic performance of college students with brief attributional interventions. In J. Aronson (ed.), *Improving Academic Achievement: Impact of Psychological Factors on Education* (pp. 88–108). San Diego, CA: Academic Press.
- Wilson, T.D., and Linville, P.W. (1982). Improving the academic performance of college freshmen: Attributional therapy revisited. *Journal of Personality and Social Psychology* 42: 367–376.
- Wilson, T.D., and Linville, P.W. (1985). Improving the performance of college freshmen with attributional techniques. *Journal of Personality and Social Psychology* 49: 287–293.
- Wise, S.L. (1994). Understanding self-adapted testing: The perceived control hypothesis. *Applied Measurement in Education* 7: 15–24.
- Wise, S.L., Roos, L.R., Leland, V., Oats, R.G., and McCrann, T.O. (1996). The development and validation of a scale measuring desire for control on examinations. *Educational and Psychological Measurement* 56: 710–718.
- Wise, S.L., Roos, L.L., Plake, B.S., and Nebelsick-Gullett, L.J. (1994). The relationship between examinee anxiety and preference for self-adapted testing. *Applied Measurement in Education* 7: 81–91.
- Wortman, C.B., and Brehm, J.W. (1975). Responses to uncontrollable outcomes: An integration of reactance theory and the learned helplessness model. In L. Berkowitz (ed.), *Advances in Experimental Social Psychology* (Vol. 8, pp. 277–336). New York, NY: Academic Press.
- Yajima, H., Sato, J., and Arai, K., (1996). The relationship between motives for science, perceived control, achievement anxiety, and self-regulation in junior high school students. *Psychologia: An International Journal of Psychology in the Orient* 39: 248–254.
- Yamauchi, H., Kumagai, Y., and Kawasaki, Y. (1999). Perceived control, autonomy, and self-regulated learning strategies among Japanese high school students. *Psychological Reports* 85: 779–798.
- Yan, W., and Gaier, E.L. (1991, April). *Causal attributions for college success and failure: An American-Asian comparison*. Paper presented at the American Educational Research Association annual meeting, Chicago, IL.
- Ziegler, A., and Heller, K.A. (2000). Effects of an attribution retraining with female students gifted in physics. *Journal for the Education of the Gifted* 23: 217–243.