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HANDBOOK OF  
RESEARCH ON  
LEARNING  
AND  
INSTRUCTION

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EDITED BY  
RICHARD E. MAYER  
AND  
PATRICIA A. ALEXANDER



# Handbook of Research on Learning and Instruction

During the past twenty years researchers have made exciting progress in the science of learning (i.e., how people learn) and the science of instruction (i.e., how to help people learn). This handbook examines learning and instruction in a variety of classroom and non-classroom environments and with a variety of learners, both K-16 students and adult learners. The chapters are written by leading researchers from around the world, all of whom are highly regarded experts on their particular topics.

The book is divided into two sections: learning and instruction. The learning section consists of chapters on how people learn in reading, writing, mathematics, science, history, second languages, and physical education, as well as learning to think critically, learning to self-monitor, and learning with motivation. The instruction section consists of chapters on effective instructional methods—feedback, examples, self-explanation, peer interaction, cooperative learning, inquiry, discussion, tutoring, visualizations, and computer simulations. Each chapter reviews empirical research in a specific domain and is structured as follows:

- **Introduction**—Defines key constructs and provides illustrative examples or cases.
- **Historical Overview**—Summarizes the historical context for the topic or domain.
- **Theoretical Framework**—Summarizes major models or theories related to the topic or domain.
- **Current Trends and Issues**—Synthesizes the research literature and highlights key findings or conclusions.
- **Practical Implications**—Suggests relevance of the research for educational practice.
- **Future Directions**—Considers next steps or stages needed for future research.

**Richard E. Mayer** is Professor of Psychology at the University of California, Santa Barbara.

**Dr. Patricia A. Alexander** is the Jean Mullan Professor of Literacy and Distinguished Scholar-Teacher in the Department of Human Development at the University of Maryland.

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# **Handbook of Research on Learning and Instruction**

**Edited by**

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## PREFACE

How do people learn in subject areas, such as reading, writing, mathematics, science, and history, and how can we help people learn, using instructional methods such as feedback, examples, self-explanation, tutoring, and visualizations? These questions about how learning works and how instruction works are central to both educational practice and learning theory. These are the questions that motivate this handbook. If you are interested in what research has to say about learning and instruction in academic subject areas, then this handbook is for you.

### GOAL AND RATIONALE

The goal of the *Handbook of Research on Learning and Instruction* is to provide a focused, organized, and evidence-based review of what research has to say about how people learn and how to help people learn. The *Handbook* seeks to examine learning and instruction in a variety of learning environments including in classrooms and out of classrooms, and with a variety of learners including K-16 students and adult learners. The *Handbook* is written at a level that is appropriate for graduate students, researchers, and practitioners interested in an evidence-based approach to learning and instruction.

Decisions about educational practice are often based on opinions, advice, or common practice. In contrast, the contributors to the *Handbook of Research on Learning and Instruction* were asked to demonstrate how educational practice can be guided by research evidence concerning what works in instruction (i.e., the science of instruction) and why it works (i.e., the science of learning).

During the past 20 years, researchers have made exciting progress in the science of learning (i.e., how people learn) and the science of instruction (i.e., how to help people learn). This *Handbook* is intended to provide an overview of these research advances. The chapters are written by leading researchers from around the world who are highly regarded experts on their particular topics and active contributors to the field.

## DESCRIPTION

The book is divided into two sections—learning and instruction. The learning section consists of chapters on how people learn in subject matter areas—reading, writing, mathematics, science, history, second language, and physical education—as well as how people acquire the knowledge and processes required for critical thinking, self-regulation, and motivation. The instruction section consists of chapters on effective instructional methods—feedback, examples, self-explanation, peer interaction, cooperative learning, inquiry, discussion, tutoring, visualizations, and simulations.

To maintain focus and organization, each chapter has a similar structure:

- *Introduction* in which key constructs are defined with illustrative examples,
- *Historical overview* that summarizes the historical context for the chapter topic or domain,
- *Theoretical framework* in which authors summarize predominant models or theories pertinent to the topic or domain,
- *Current trends and issues* where authors synthesize the relevant literature and summarize key findings or conclusions,
- *Practical implications*, in which authors suggest the relevance of the research for educational practice, and
- *Future directions* in which authors consider the next steps or stages required to inform research and practice in the years ahead.

The central feature of each chapter is a review of empirical research in a specific domain. Each chapter underwent an intensive review process.

## FOCUS

As editors, we seek to produce a handbook that showcases the best research work being done in our field, so readers can appreciate the advances being made in research on learning and instruction. We value empirical evidence so the heart of each chapter is a review of empirical research central to the domain. The chapter is not a narrow review of any author's research program but rather explores the most important advances in the domain. We value theoretical grounding so each chapter includes a description of a testable model or theory related to the learning or instructional topic under consideration. We value educational relevance, so the chapters address issues that have practical implications for education, are based on a research evidence base, and are grounded in a theory of how people learn. We value readability so each chapter is written with an eye for clarity, conciseness, and organization. Rather than provide an encyclopedia, each chapter focuses on a few major advances that represent progress in the field. We value timeliness, so each chapter provides up-to-date coverage, while putting the topic or domain into its historical context so you can see the roots of that topic or domain. We value comprehensiveness so the chapters of the book represent a broad array of academic domains, learning constructs, and instructional methods.

## ACKNOWLEDGMENTS

We wish to thank the chapter authors who have shared their expertise by contributing excellent chapters, revised them based on our feedback, and worked hard to craft chapters that meet the *Handbook's* standards. We gratefully acknowledge our colleagues who have produced the high quality research and theory that make up the content of this *Handbook*. We appreciate the work of the Taylor and Francis staff, and we are particularly grateful to Lane Akers for his continued support and encouragement of this project.

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# 11

## LEARNING WITH MOTIVATION

*Eric M. Anderman and Heather Dawson*

The study of academic motivation has blossomed during the past 30 years. Although motivation has been recognized as an important construct in both the fields of psychology and education for many years, it has recently become a major focus of research on academic learning. There is a vast array of empirical data and theory that readily inform both learning and instruction. In the present chapter, we examine some of the most prominent current research on academic motivation. In particular, we discuss the major theoretical perspectives, as well as the empirical research that supports these perspectives. We also demonstrate that motivation theory and research can be applied to instructional contexts at all levels (i.e., kindergarten through adult learning) in order to improve student learning.

In their classic text, Pintrich and Schunk defined motivation as “the process whereby goal-directed activity is instigated and sustained” (2002, p. 5). This definition reflects a social-cognitive perspective on motivation, wherein academic motivation is determined both by social (contextual) factors, as well as by the cognitions (thoughts) of learners. For example, a student who is reading a book can be “motivated” to read the book in many different ways. For some students, the goal may be to complete the book because the book is enjoyable; for others, the goal may be to complete the book in order to earn a good grade on a test about the book. From a motivation perspective, the *processes* by which reading is initiated and continued are the focus of interest; these processes are reviewed in the present chapter.

Our major goal is to demonstrate that motivation is a complex topic with a rich research base; however, at the same time, we also demonstrate that motivation theory can be readily applied to educational practice. The results of many empirical studies examining both predictors of academic motivation and outcomes that are predicted *by* academic motivation are quite consistent, and many of these results can be applied to practice. We first provide a brief historical overview of the study of academic motivation. We then discuss some of the currently popular and empirically supported theoretical frameworks. Then, we examine current trends and issues in the study of motivation.

Next, we present practical implications of motivation research, and we end by discussing future directions for the field.

## HISTORICAL OVERVIEW

An historical overview of the study of motivation could encompass an entire book. Detailed reviews have been provided by others (Heckhausen, 2008; Schunk, Pintrich, & Meece, 2008; Weiner, 1990). Nevertheless, there are important trends that have occurred, particularly during the last century, that have shaped current theory and research in the field. These trends include the shift from behavioral to cognitive conceptions of motivation, as well as subtle and major developments within specific theories.

There are several different ways to examine developments in motivation research. One manner is simply to examine chronologically the various theories and perspectives that developed; another way is to examine these developments thematically. In the present chapter, we have chosen the latter approach, so that we can more readily point out the links between programmatic developments over the past century to current models of academic motivation.

### *From Behaviorism and Drives to Cognitivism*

Probably the most obvious and often discussed shift in motivational theorizing over time is the general movement from behavioral views of motivation to more cognitive and particularly social-cognitive views of academic motivation.

#### *Behavioral Theories*

Most research on academic motivation prior to the 1970s emanated from a behavioral perspective (E. Anderman, 2010). These theoretical perspectives generally did not acknowledge the cognitive components involved in motivated behaviors. The two most prominent theories that have framed this argument are operant conditioning and classical conditioning. Operant theorists argue that motivated behaviors are shaped by reinforcers and by punishments (Skinner, 1953, 1954). In operant conditioning terms, a child would become more “motivated” to read books if the child were rewarded with a new toy upon completion of each book; receipt of the new toy would increase reading behavior. In contrast, if a teacher wants a student to stop reading aloud during silent reading time, then the teacher might punish the child (e.g., give the student a “time out”). Thus various environmental reinforcers and punishers are seen as being the determinants of motivated behaviors from an operant perspective.

Classical conditioning represents a somewhat different but important behavioral framework for explaining motivated behaviors. In classical conditioning, motivation arises from individuals’ reactions to various stimuli; those stimuli can be both unconditioned (e.g., salivation at the sight of food), or conditioned (e.g., salivation upon hearing a bell that has been associated with food; Pavlov, 1927). Thus individuals may appear to be motivated to engage in certain behaviors (or to avoid engaging in certain behaviors) as a result of reactions to such stimuli. Classical conditioning is related to motivation in important ways. For example, a student who experiences difficulties learning math may ultimately become conditioned to experience unpleasant anxious reactions at the mere sight of mathematical problems in the future.

Drive theories also played an important role in early motivation research. Drive

theories are based on individuals' needs (e.g., the need for sleep or food). Individuals' "drives" become salient when a "need" must be satisfied. The individual is thus motivated to engage in certain behaviors in order to reduce the drive (and satisfy the need). Drive theory originated in early writings by Watson and Morgan (Remley, 1980), and was described in detail in theories developed by scholars such as Hull (1943) and Mowrer (1960).

Although behavioral theories have had an important impact on education, many motivation researchers grew dissatisfied with behavioral perspectives. Specifically, these theories do not account for the fact that learners' beliefs at times override previously learned reinforcement patterns in determining motivated behaviors (Dember, 1974). In addition, over time researchers became more cognizant of the fact that learning and motivation involved cognitive components (Bandura, 1986, 1997; Bruning, Schraw, & Ronning, 1999). Theoretical perspectives that focused on drives and conditioned behaviors did not acknowledge the important role that cognition plays in determining motivated behavior.

### *Early Cognitive Theories*

Although many of the cognitive theories of motivation that are prominent in contemporary research can be perceived as having developed as reactions to behavioral theories, it is important to note that many cognitive motivation theories developed at the same time that behavioral theories were in vogue. For example, volition, or "will" has been acknowledged as being related to beneficial educational outcomes (Corno, 1994). Nevertheless, volition originally was acknowledged as an important cognitive motivation construct in early studies by researchers such as Wundt (Blumenthal, 1998; Danziger, 2001) and James (1890; Rychlak, 1993).

Freud's theory of psychoanalysis also became prominent early in the 20th century (Freud, 1966). Freud's views on motivation stood in sharp contrast to behavioral views. Freud argued that motivation emanates from the satisfaction of needs. If an individual has a particular need, that individual tries to have that need met. In Freud's theory, the cognitive components of motivation are primarily unconscious in nature, but they are cognitive and not simply reactions to reinforcers or stimuli. As the individual channels psychological energy into meeting needs, the diminution of energy is experienced as satisfaction, ultimately increasing motivation. Freud's work was the impetus for other needs-based theories, such as Maslow's Hierarchy of Needs (Maslow, 1987).

### *Social Cognitive Theories*

Most contemporary theories of academic motivation have moved toward a social cognitive perspective. Social cognitive theories acknowledge that motivation is determined by beliefs about the self, cognitions, and social contexts (Alderman, 2008; Bandura, 1997). There are a number of contemporary motivation theories that have emerged in recent decades, and each of these theories feature both cognitive and social components.

Contemporary social cognitive theories, which are discussed in this chapter, include expectancy-value theory (Eccles & Wigfield, 1995), social learning theory (including self-efficacy; Bandura, 1986; Pajares, 1996; Schunk & Pajares, 2002), self-determination theory (Deci, 1980; Ryan, Connell, & Deci, 1985) and goal orientation theory (Ames, 1992b; Dweck & Leggett, 1988; Pintrich, 2000a; Thorikildsen & Nicholls, 1998). Although these theories differ, all of them acknowledge that self-beliefs (i.e., beliefs about one's own

competencies), individual cognitions (i.e., how we think and self-regulate in academic situations), and social contexts (i.e., the nature of schools, classrooms, and cultures) affect academic motivation in important ways.

### *Changes within Theories*

Another way to examine trends in the field of motivation is to consider developments within individual theories. Such changes are important, but also are often complex and slowly developed. Whereas some developments in theories have been large-scale revisions, other changes have been minute. Next we provide a few examples of major changes in theories, in order to demonstrate that shifts in thinking about motivation have at times had profound effects on how motivation is studied, and on the implications of motivation research for practice.

One major historical change occurred within the expectancy-value framework. Specifically, original conceptions of the theory suggested that expectancies for success at tasks and the value held for those tasks are inversely related (Atkinson, 1957). However, later research suggested that expectancy and value beliefs are positively related (i.e., individuals expect to be successful at tasks they value; Eccles et al., 1983; Eccles & Wigfield, 1995). For example, Wigfield et al. (1997) examined the relations between expectancies and values in elementary school children ranging from grades 1 through 6. Results indicated that the constructs were correlated positively in math, reading, music, and sports, and that these correlations were stronger for older compared to younger children.

Another more recent historical change occurred in the literature on goal theory. Prior to the mid-1990s, most researchers discussed mastery goals and performance goals (Ames, 1992a; Dweck & Leggett, 1988). However, in the mid-1990s, researchers argued that performance goals reflect both approach and avoidance goals; thus performance goals were reconceptualized as performance-approach goals (i.e., the goal of demonstrating one's ability relative to others), and performance-avoid goals (i.e., the goal of avoiding appearing incompetent; Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997). More recently, researchers have argued that mastery goals can be characterized both by approach and avoid qualities (Conroy, Elliot, & Hofer, 2003; Elliot & McGregor, 2001). These changes in the theory occurred because empirical research in both laboratory settings and using survey instruments confirmed that these constructs could be conceptualized in terms of both approach and avoid tendencies (Elliot, 2005). For example, Elliot and Harackiewicz (1996) compared the effects of performance-approach and performance-avoid goals on completion of word puzzles; results indicated that performance-avoid goals in particular undermined intrinsic motivation (compared to performance-approach), thus demonstrating that the approach-avoid distinction led to different types of outcomes.

In summary, motivation research has a rich history. The methodologies, constructs, and levels of specificity used to study motivation have changed greatly over the past century. Conceptualizations of motivation have evolved from theoretical perspectives solely concerned with unconscious motives, drives, and rote behaviors to current theories that acknowledge cognitive, social, and developmental aspects of motivation.

## **THEORETICAL FRAMEWORK**

It is important to note that motivation is not a "one size fits all" term; rather, motivation is complex and consists of an array of components, and these various components

are more readily explained with distinct theories. We prefer not to look at theories of motivation as competitive; rather, each theory addresses distinct aspects of academic motivation. In addition, each theory has both strengths and weaknesses that must be considered.

In this section, we review four of the most prominent current theoretical perspectives on achievement motivation. These include: goal orientation theory, social cognitive theory, self-determination theory, and expectancy-value theory. We describe the general tenets of each theory, and review empirical studies that support each framework.

### *Achievement Goal Theory*

*Achievement Goal Theory* (also known as Goal Orientation Theory) focuses on the reasons that students choose to engage in some tasks, and not others. We review below the basic tenets of this framework, and their relations to educational outcomes. Two primary goal orientations are considered in this theory: mastery goals and performance goals. Depending on a variety of other factors, the orientation that students adopt is central to many motivational and academic outcomes (Ames, 1992b; Kaplan, Middleton, Urdan, & Midgley, 2002; Pintrich, 2000a).

Goal orientations have been measured across several levels: the types of goals that individuals adopt are known as *personal goal orientations*; the goals that are perceived as being emphasized in classroom settings are known as *classroom goal structures* (Ames, 1992b; Midgley, 2002). The addition, the goals that are perceived as being emphasized at the school-level are referred to as *school goal structures* (E. Anderman & Maehr, 1994; Maehr & Midgley, 1996). Most research on goal orientations has used survey methodologies, wherein students report self-perceptions; however, some researchers have used experimental methodologies in which goal orientations have been induced by manipulations (e.g., Elliot & Harackiewicz, 1996).

Students who endorse mastery goals (also referred to as task goals and learning goals) are invested in tasks for the sake of learning. Mastery-oriented students refer to their own past performance as a point of comparison, instead of comparing their performance to that of other students. Students who endorse performance goals (also referred to as ability goals, relative ability goals, competitive goals, and ego-involved goals) are concerned with demonstrating their ability relative to others. Students who adopt performance goals are concerned about appearing competent, and compare their performance with that of other students. Demonstrating ability, rather than learning the material, is the central focus of the performance-oriented student (see E. Anderman & Wolters, 2006, for a review).

It is also important to distinguish between the *performance-approach* and *performance-avoid* goals (Elliot & Church, 1997; Middleton & Midgley, 1997). Students who adopt performance-approach goals seek to appear more competent than others; in contrast, students who adopt *performance-avoid goals* seek to avoid appearing incompetent, often by attempting to achieve only what is minimally required. Recent work also distinguishes between *mastery-approach* goals (i.e., the goal is to master the task) and *mastery-avoid* goals (i.e., the goal is to avoid misunderstanding the task; Conroy, et al., 2003; Elliot & McGregor, 2001).

*Classroom goal structures* were introduced later by such theorists as Ames (1984) and Midgley (2002). These are defined as “goal-related messages that are made salient in the achievement setting (i.e., the laboratory, classrooms, schools) that are related to,

and most likely influence, the personal goals that individuals pursue in those settings” (Kaplan et al., 2002, p. 24). Classroom goal structures reflect the purposes for learning that students perceive in classrooms. If a student perceives a mastery goal structure, the student believes that instruction emphasizes learning, improvement, and effort; if a student perceives a performance goal structure, the student believes that instruction focuses on relative ability, outperforming others, and grades. Goal structures are communicated to students through assessments, daily tasks, and discourse and instruction (Kaplan et al., 2002; Midgley, 2002).

Research generally indicates that mastery goals and perceptions of mastery goal structures are related to adaptive educational outcomes. For example, Archer (1994) used three independent large samples of university students to examine the relations between mastery goals and a variety of outcomes. Results indicated that mastery goals were related positively to the use of effective learning strategies, enjoyment of learning, and likelihood of choosing challenging academic tasks.

Performance-avoid goals are generally related to maladaptive outcomes, whereas results for performance-approach goals are mixed. Middleton and Midgley (1997), using a large sample of early adolescents, found that performance-avoid goals were related to maladaptive outcomes such as test anxiety, the avoidance of help-seeking, and lower levels of achievement; in contrast, the relations of performance-approach goals to various outcomes are somewhat inconsistent. Elliot, McGregor, and Gable (1999) found that performance-approach goals are related positively to examination scores and to the use of deep processing strategies using a sample of college-aged students; in contrast, using a sample of middle school students, Middleton and Midgley (1997) found that a performance-approach goal orientation was unrelated to self-regulation and self-efficacy, and was related positively to test anxiety.

In summary, goal orientation theorists conceptualize motivation in terms of the goals that students have when they are engaged with academic tasks. These goals are related to a variety of educational outcomes. Goals are determined both by students’ individual cognitive beliefs, as well as by contextual influences.

### *Social Cognitive Theory*

*Social cognitive theory* is a term that is used to describe several related constructs. Among these are *self-efficacy*, *reciprocal determinism*, and *social learning*. Aspects of these various concepts and constructs all emphasize the social nature of learning, and are focused on how social interactions influence learning. Social cognitive theorists examine the interactions between the learner, the environment, and others. In this section, we focus specifically on self-efficacy, since much research indicates that it is related in important ways to educational outcomes (Bandura, 1997; Pajares, 1996).

*Self-efficacy* was put forth by Bandura in the 1970s, and became popular among researchers in education. *Self-efficacy* is defined as a person’s beliefs about his or her ability to complete a task (Bandura, 1997). Self-report is the primary method used to assess efficacy beliefs (Pajares, 1996). Self-efficacy beliefs are dependent upon the task they are associated with, and as a result, a microanalytic assessment is needed (Pajares, 1996). Thus general efficacy beliefs are occasionally measured, but such measures may be less accurate than more specific measures (Pajares, 1996).

Self-efficacy is critical to educators because of the empirical connection to outcomes for students. For example, research indicates that self-efficacy beliefs are related to the

types of choices that students make. Betz and Hackett (1983) examined the relations between mathematics self-efficacy college major choices; results indicated that students with higher math self-efficacy were more likely to report choosing a science major. Self-efficacy also has been shown to relate positively to effort, persistence, and achievement (Bandura, 1997; Pajares, 1996).

Individuals acquire efficacy for a task from four potential sources (Bandura, 1997). The mastery experience, or actually completing the task, is the most potent source. A successful mastery experience increases self-efficacy whereas an unsuccessful mastery experience causes efficacy to drop. The second source is vicarious experience, or being present while another individual engages with the task. The importance of the task and closeness of the relationship to the person completing the task are related the development of self-efficacy from a vicarious experience. The third is social persuasion, which includes being convinced by another individual that one is capable of completing a task. The significance of the relationship with the other individual is also critical to the potency of this source. The final source of efficacy is physiological, which refers to the human body's reaction to the task. For example, sweating while giving a speech may cause self-efficacy for public speaking to diminish.

### *Self-Determination Theory (SDT)*

Deci, Connell, and Ryan (1989) defined *self-determination* as “experiencing a sense of choice in initiating and regulating one’s own actions” (p. 580). Self-determination focuses on three basic human needs: *the need for competence* (i.e., the need to experience success and mastery), *the need for autonomy* (i.e., the need to experience control over outcomes in one’s life), and *the need for relatedness* (i.e., the need for feeling a sense of social belonging; Deci & Ryan, 2000). According to SDT, it is particularly important to satisfy the needs for competence and autonomy to become intrinsically motivated (Deci & Moller, 2005).

The basic tenets of SDT, as described in Deci and Ryan’s (1985) more specific Cognitive Evaluation Theory, are *intrinsic* and *extrinsic* motivation. Although controversial among some scholars, these two constructs represent parts of a continuum that consists of (a) amotivation (i.e., a complete lack of motivation), (b) four levels of extrinsic motivation (external, introjected, identified, and integrated), and (c) intrinsic motivation (Ryan & Deci, 2000a). Intrinsic motivation is defined as engagement with a task fully and freely, without the necessity of material rewards or constraints (Deci & Ryan, 1985); extrinsic motivation refers to varying degrees of engagement with a task in order to receive an external reward. The four types of extrinsic motivation describe the extent to which an individual internalizes motivation for the task; through this process, learners begin to transform their reasons for engaging with tasks from extrinsic to intrinsic (Deci & Ryan, 1991).

*External regulation* describes how motivation originates outside a person. For example, a student who engages in academic tasks for the sole purpose of receiving a reward, or for the sole purpose of avoiding an unpleasant consequence such loss of recess is *externally regulated* (Deci et al., 1991). *Introjected regulation* is a type of extrinsic motivation in which behavior is largely determined by one’s feelings; an individual who is regulated by introjection may behave in ways that the individual feels are appropriate (i.e., socially acceptable); however, such individuals are not motivated by their own volition (Deci et al., 1991). *Identified regulation* describes a person who values to some extent the

task, and has accepted the process of regulation. Students who spend extra time studying because they genuinely feel their skill level may improve, even if they do not enjoy the task, fall into the category of *identified regulation* (Deci et al., 1991). Finally, *integrated regulation* is very similar to intrinsic motivation: *integrated regulation* toward an activity suggests that a learner has internalized information and integrated involvement with specific tasks into one's self-schema, whereas purely *intrinsic motivation* refers to a situation in which a person is interested in the activity itself.

Research supports the relation of SDT to adaptive motivational outcomes. Specifically, when social contexts support meeting individuals' needs for autonomy, those individuals experience a variety of positive outcomes. For example, in one study, Deci and colleagues (1993) examined the relations between mothers' vocalizations and intrinsic motivation of 6–7-year-old children. Results indicated that when mothers' vocalizations were perceived as *controlling*, their children reported lower levels of intrinsic motivation. In another study in an organizational setting, Deci et al. (1989) examined the relations of managerial styles to workers self-determined motivation. Using a sample of over 1000 employees from a large cooperation, Deci and colleagues found that when extrinsic stressors were addressed in an organization (e.g., when salary issues were addressed), there was a strong relation between provision of an autonomy-supportive work context with workers' satisfaction with their jobs.

Although research on SDT supports individual facets of the theory, much additional research is warranted. In particular, future research that examines multiple aspects of the theory simultaneously should be extremely beneficial.

### *Expectancy-Value Theory*

Expectancy-value theory originally was described mathematically as the product of one's expectancy of attaining a given outcome and the value one placed on that outcome (hence Expectancy \* Value, often shortened to EV; Atkinson, 1957). These expectancies and values were originally thought to be inversely related; that is, the more challenging the task, the lower the value, and vice versa. This idea has since been invalidated empirically (Eccles et al., 1983; Wigfield & Eccles, 1992). For example, Wigfield et al. (1997) examined the relations between expectancies and values in math, reading, music, and sports, using a longitudinal sample of over 600 children. Results indicated that expectancies and values were correlated positively in all domains, across grades 1 through 6.

More recent developments have included the identification a number of sub-components of achievement values (Eccles et al., 1983; Wigfield & Eccles, 1992). Eccles and Wigfield (1995) examined the structure of achievement values using confirmatory factor analysis. Data from a longitudinal sample of adolescents indicated that values separated into three distinct factors (interest, perceived importance, and perceived utility). In a subsequent study, Battle and Wigfield (2003) examined the factor structure of achievement values using a sample of female undergraduates, and developed a measure of cost, which is the fourth component; cost refers to the sacrifices the student must accept in order to engage in the task.

### *Summary*

To summarize, motivation is complex, in that there are numerous theoretical perspectives that are used by researchers to explain the reasons why students engage with academic tasks. Motivation researchers are concerned with students' goals, the intrinsic and



extrinsic nature of motivation, students' beliefs about their competence, and students' perceived valuing of tasks.

For most motivation researchers, the specific motivational issue that is being examined determines the theoretical perspective that is most useful in a given situation. For example, if a motivation researcher is interested in examining students' long-term likes and dislikes in a particular subject (e.g., mathematics), then the researcher might examine the question using an expectancy-value perspective. Thus specific motivational questions are the best determinants of the theory that should be employed.

## CURRENT TRENDS AND ISSUES

As indicated, motivation theory and research has developed and changed over time, with many substantive changes occurring during the past 30 years. Today, there are trends and issues in the study of academic motivation that remain particularly salient, and that are vigorously debated among researchers. Here, we discuss a few of those salient and contested issues. Specifically, we examine some of the issues related (a) intrinsic versus extrinsic motivation; and (b) the debate about the costs and benefits of performance-approach goals.

### *The Intrinsic/Extrinsic Motivation Debate*

One of the most vocal debates among motivation researchers in recent years concerns the benefits versus potential problems associated with the use of extrinsic rewards. This has become particularly salient in the United States, given the *No Child Left Behind* legislation, which affords states the opportunity to implement high-stakes rewards (e.g., money) and high-stakes punishments (e.g., changing the leadership of a school) based on students' test scores (Mathis, 2003; U.S. Department of Education, 2003).

The debate among researchers has focused mostly on the potential benefits versus harmful effects of extrinsic rewards on intrinsic motivation. The effects of rewards on motivation can be examined in terms of effects on students (e.g., in terms of student motivation), as well as in terms of the effects on teachers (e.g., in terms of teachers' motivation toward their jobs, and the selection of instructional practices to be used with students).

Some researchers argue that the extensive use of extrinsic rewards ultimately undermines intrinsic motivation (Deci, Koestner, & Ryan, 1999a, 1999b, 2001; Kohn, 1993; Ryan & Deci, 2000b), whereas others argue that the use of extrinsic rewards does not undermine intrinsic motivation (Cameron & Pierce, 1994; Eisenberger, Pierce, & Cameron, 1999). Specifically, those who argue that extrinsic rewards are problematic contend that if individuals are offered rewards for activities that they would do regardless of whether or not a reward is available, intrinsic motivation declines. In a classic study, Lepper, Greene, and Nisbett (1973) provided preschool children with the opportunity to draw freely with magic markers. Children were assigned to either receive an expected reward, an unexpected reward, or no reward. Results indicated that children's intrinsic motivation to draw was lower for students in the expected reward condition than for the other two conditions.

The phenomenon of intrinsic motivation declining in the presence of rewards has been explained by the overjustification hypothesis (Lepper et al., 1973; Lepper & Henderlong, 2000). When students perceive that a reward is available for their participation in a given

activity, the students' participation in the activity is in essence overjustified (since they would have participated in the activity anyway). Once the reward is no longer available, the "justification" for engaging with the task is gone, and consequently intrinsic motivation to subsequently engage with the task decreases. More specifically, students reason that their participation is no longer justified, given the loss of the possibility of receiving the reward.

A debate has ensued over the past decade regarding the undermining effects of extrinsic rewards on intrinsic motivation. Cameron and Pierce (1994) presented results of a meta-analysis and concluded that although researchers often argue that extrinsic rewards undermine intrinsic motivation, this finding actually is not empirically supported. In response, a variety of researchers argued that Cameron and Pierce's meta-analysis was methodologically problematic, and that their conclusions were not warranted (Kohn, 1996; Lepper, Keavney, & Drake, 1996; Ryan & Deci, 1996). Deci and his colleagues conducted their own independent meta-analysis, and came to the opposite conclusion (Deci et al., 1999a). Lepper, Henderlong, and Gingras (1999) argue that these different results are due to differing approaches to meta analysis; specifically, they argue that meta analyses may not be accurate when the studies incorporated use highly diverse samples and procedures, and contain extensive moderator variables. Although the debate has continued (Deci et al., 1999b; Eisenberger et al., 1999; Lepper et al., 1996), researchers generally do acknowledge that extrinsic rewards can be harmful if used inappropriately. However, extrinsic incentives do not have to be harmful, if they are used in ways that provide students with information about their learning, and if the rewards are perceived as non-controlling (Deci, 1975). Pittman, Davey, Alafat, Wetherill, and Kramer (1980) compared the effects of informational and controlling rewards on intrinsic motivation. Undergraduate college students were asked to complete puzzles. Participants who received informational verbal rewards displayed greater intrinsic motivation than did participants who received controlling rewards or no rewards; specifically, during a free-time period, participants who had received informational feedback were more likely to continue to voluntarily work on the puzzles than were the others.

### *The Performance-Approach Goal Debate*

Another contemporary debate among motivation researchers is the debate over the benefits and problems associated with performance-approach goals. Recall that in goal orientation theory, there are two primary goals: *mastery goals* (where the goal is to truly master the task at hand), and *performance goals* (where the goal involves demonstration of one's ability).

In the mid-1990s, researchers argued and demonstrated that performance goals can be broken down into performance-approach and performance-avoid goals (Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997). A student who endorses performance-approach goals engages with a task in order to demonstrate that the student is more competent than others; in contrast, a student who endorses performance-avoid goals engages with a task in order to avoid appearing "dumb" or incompetent. Thus when presented with a challenging math problem, a student with performance-approach goals would be focused on demonstrating that she is better than others at solving the problem, whereas a student with performance-avoid goals would be focused on avoiding being seen as unable to solve the problem.

Prior to the mid-1990s, measures of performance-approach and avoid goals often were confounded, in that measures often contained items reflecting both the approach

and avoid aspects of these constructs (E. Anderman & Wolters, 2006). Now that more appropriate measures exist, researchers have been able to more carefully address the relations between performance-approach and performance-avoid goals with other important educational outcomes.

Research indicates that performance-avoid goals are maladaptive. When students approach their academic work with the goal of avoiding appearing unable or incompetent, few benefits arise (Pintrich, 2000a). For example, research indicates that performance avoid goals are inversely related to grades and performance (Elliot & Church, 1997; Elliot & McGregor, 2001; Roney & O'Connor, 2008; Skaalvik, 1997), and positively related to the use of self-handicapping strategies (Midgley & Urdan, 2001). Although most of this research has been conducted using self-report survey measures, some experimental studies also support the negative effects of performance-avoid goals. For example, Elliot and Harackiewicz (1996) conducted an experiment in which undergraduate students were randomly assigned to one of four conditions: performance-approach, performance-avoid, performance-neutral, and mastery. In the performance-avoid condition, students were instructed to solve a puzzle in order to demonstrate that they were not poor puzzle solvers; results indicated that intrinsic motivation to solve puzzles was undermined for participants in the performance-avoid condition.

In contrast, there are mixed results regarding the benefits of performance-approach goals. Some research indicates that the adoption of performance-approach goals is related to maladaptive educational outcomes, such as the avoidance of help-seeking (Ryan, Hicks, & Midgley, 1997) and the avoidance of challenge (Middleton & Midgley, 1997). However, other studies indicate that performance-approach goals may be beneficial. For example, among college students, the adoption of performance-approach goals is related positively to achievement (Church, Elliot, & Gable, 2001; Elliot & McGregor, 1999; Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997).

An interesting debate has emerged in recent years regarding the potential benefits of performance-approach goals. Midgley, Kaplan, and Middleton (2001) argued that results of studies examining relations of performance-approach goals to various adaptive educational outcomes are at best inconsistent. Midgley et al. (2001) argued that goal theory should not be “revised” to indicate that both mastery and performance goals are universally beneficial, given the mixed evidence surrounding performance-approach goals. They cautioned that future research is needed explain inconsistent findings about the relations of performance-approach goals to various outcomes. In addition, they argued that a revision of goal orientation theory with a greater emphasis on the benefits of performance-approach goals might lessen the emphasis placed in classrooms on mastery goals, which are known to be beneficial.

In contrast, Harackiewicz and colleagues (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002) have argued that achievement goal theory should be reconceptualized. Specifically, they have argued that given the empirical evidence for the existence of both performance-approach and avoid goal orientations, it is sensible to revise goal orientation theory to reflect this distinction. In addition, they argue that the evidence regarding the beneficial effects of performance goals is quite robust.

The debate about the costs and benefits of performance-approach goals is important, because the types of goals that students adopt are related to the types of instructional practices that teachers use in classrooms (E. Anderman & L. Anderman, 2010; E. Anderman & Maehr, 1994). For example, E. Anderman, Maehr, and Midgley (1999) examined

student motivation in two middle schools: one that was characterized as emphasizing performance goals, and one that emphasized mastery goals. Results indicated that although there were no significant differences in motivation prior to transitioning into those schools, after the transition the students in the “performance” school reported higher performance and extrinsic goals. Thus the contrasting instructional practices in the two schools may have produced these different outcomes.

The debate about the costs versus benefits of performance-approach goals continues to be a salient issue for motivation researchers. Nevertheless, there are other issues that need to also be considered in this argument; this is not a simple question of “good” versus “bad” goals. For example, Bouffard and her colleagues (Bouffard, Bouchard, Goulet, Denocourt, & Couture, 2005) have suggested that the nature of a goal may not matter as much as the personal significance of the goal to the individual students. Roeser (2004) argued that the debate about performance-approach goals actually represents a larger debate regarding science (i.e., theory-building) and application (i.e., applying theory to practice). The Harackiewicz et al. argument represents the perspective of motivation theorists who are mostly concerned with theory-building, whereas the Midgley et al. argument represents the perspective those who are primarily concerned with educational applications. For example, Elliot and his colleagues have spent much time in recent years conducting empirical research to validate a theoretical model of achievement goals that includes mastery-approach and avoid goals, as well as performance-approach and avoid goals (e.g., Elliot & McGregor, 2001), whereas Maehr, Midgley, and their colleagues have focused on the roles of goal orientations in school settings (e.g., E. Anderman et al., 1999; Maehr & Midgley, 1996). Clearly both perspectives are important, and when viewed in this way, both sides of the issue can be better appreciated (Roeser, 2004).

### *Practical Implications*

The practical implications of motivation research are plentiful. Of particular importance are the daily decisions that teachers make in classrooms and their powerful effects on students’ motivation. Whereas expensive, large-scale interventions can certainly be delivered to enhance achievement motivation, simple changes in daily instructional practices can also have profound effects on students, both positively and negatively. For example, E. Anderman et al. (2001) found that in classrooms where teachers used performance-oriented instructional practices (e.g., displaying the work of the best students), children’s valuing of math and reading declined over the course of a year.

Reviews of the implications of motivation research for practice have been presented elsewhere (Ames, 1992b; E. Anderman & L. Anderman, 2010; Brophy, 2004; Maehr & Midgley, 1996). In the following sections, we briefly examine some of the daily decisions that teachers make, and how these decisions affect student motivation. In particular, we examine decisions regarding (a) selection of academic tasks; (b) evaluation of achievement; and (c) grouping students for instruction.

### *Selection of Academic Tasks*

Every day in classrooms, teachers choose the types of tasks and activities that they present to students. Although standards and curricula often are set by districts and states, the ways in which curricula are presented varies. Teachers make choices about how curricula are presented, and those decisions can affect student motivation both in the short and long term.

### Classification of Tasks

Academic tasks can be classified in a number of different ways. The way that a task is classified and ultimately presented to students can affect motivation. For example, tasks are classified by teachers in terms of whether the task represents (a) seatwork; (b) homework; (c) group work; or (d) assessments. These terms have different connotations and applied meanings for students; when a student hears that a task is going to be “seatwork,” the student may express different types of motivation, compared to when the task is presented as an assessment.

Researchers tend to classify academic tasks somewhat differently, but these classifications nevertheless may affect student motivation. Doyle (1983) described four types of tasks that are presented in classrooms. These include (a) *memory tasks* (i.e., recalling information that has been learned previously); (b) *procedural/routine tasks* (i.e., applying an algorithm to solve a problem); (c) *comprehension/understanding tasks* (i.e., recognizing that an article about outer space is referring to possible voyage to Mars); and (d) *opinion tasks* (i.e., giving opinions about the performance of nationally elected government officials; Doyle, 1983).

Another common classification system is Bloom’s Taxonomy. The original taxonomy for the classification of cognitive learning objectives included six categories: (a) knowledge; (b) comprehension; (c) application; (d) analysis; (e) synthesis; and (f) evaluation (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956). The taxonomy was revised several years ago; this revision was undertaken in order to better reflect the actual cognitive processes that students use when engaging with academic tasks. The revised taxonomy includes the following cognitive functions: (a) remember; (b) understand; (c) apply; (d) analyze; (e) evaluate; and (f) create (Anderson et al., 2001). Bümen (2007) conducted an experimental study in which preservice teachers were taught either the original taxonomy, or both the original and revised taxonomies. Results indicated that teachers who also learned the revised version produced lesson plans that were rated as being of higher quality than those of the group that was only exposed to the original taxonomy.

### Motivation and Tasks

As mentioned, the choice of task is related to student motivation. Thus if a teacher chooses a task that focuses on *analysis*, this task may be motivational for some students, but not for others. Indeed, the task may be exciting to students who enjoy analyzing complex phenomena, whereas the same task may induce anxiety in a student who either does not enjoy analytic tasks or has had unpleasant experiences in the past with such tasks.

Depending on the type of task that is selected, the context of the classroom environment, and the students’ prior experiences and beliefs about the nature of the task, the specific task that students are asked to complete affects their motivation (E. Anderman & L. Anderman, 2010). Most theories of achievement motivation can be used to explain how task choice affects student motivation; however, research from goal orientation and from expectancy-value theories in particular have focused on how tasks affect motivation.

### Goal Orientation Theory and Task Choice

Goal orientation theorists argue that students’ goals are determined by several factors, including the classroom context, as well as the specific task. In most cases (although certainly not all), the teacher determines the types of tasks that students encounter. From

a goal theory perspective, the student can adopt mastery goals, performance-approach goals, or performance-avoid goals for the task; in addition, the student can adopt several of these goals simultaneously (Linnenbrink & Pintrich, 2001; Pintrich, 2000b).

The instructions that teachers provide to students upon receipt of the task can determine the types of goals that students adopt. Both experimental research (Elliot & Harackiewicz, 1996) and descriptive research (E. Anderman et al., 1999) indicate that students' adoption of goals for particular tasks can be induced by the context. More specifically, when teachers focus students on issues related to relative ability or social comparison, performance goals may be induced, whereas when teachers focus students on effort, improvement, and using oneself as a point of reference, mastery goals may be induced. For example, Patrick et al. (2001) examined teachers' specific behaviors in fifth-grade classrooms that were perceived by students as emphasizing a variety of goal structures. Classroom observations indicated that teachers utilized distinct behaviors across these classrooms. Although teachers in both high and low performance-focused classrooms publicly provided feedback about task performance and rewards during instruction, the emphasis on the *importance* of feedback and rewards was much greater in the high-performance classrooms. Results also indicated that teachers in high mastery classrooms emphasized creativity and deep understanding. Those teachers also were noted as being particularly enthusiastic and encouraging verbal participation from their students.

#### *Expectancy-Value Theory and Task Choice*

Recall that Eccles and Wigfield's expectancy-value theory of motivation focuses on four core achievement values (attainment value, utility value, intrinsic value, and cost). Research indicates that values develop over time, and that students are able to think about achievement values in a more complex manner as they move from childhood into adolescence (Eccles, 1993; Eccles, Wigfield, Harold, & Blumenfeld, 1993; Wigfield & Eccles, 1992). The development of positive achievement values in students is important, because valuing an academic subject is predictive of subsequent involvement with that subject (e.g., enrollment in future courses in that subject; Wigfield & Eccles, 1992) and of later life-choices, including career-related decisions (Durik, Vida, & Eccles, 2006).

Teachers communicate achievement values to students by the ways in which they present academic tasks. Many times, students engage in academic tasks without understanding why the task is important. However, educators can easily affect student motivation by helping students to value certain tasks. Specifically, it is incumbent upon educators to choose tasks that perceive as being important, interesting, useful, and worthy of one's time.

#### *Evaluation of Student Achievement*

Most education involves the assessment of achievement. From pre-school through graduate-level education, there is an implicit expectation that students' work will be evaluated. The motivational consequences of evaluation are important. Indeed, receipt of a "good grade" or a "bad grade" can have profound effects on subsequent motivation. In addition, a forthcoming assessment may produce debilitating anxiety in some students, which can adversely affect performance. On a larger scale, policy in the United States such as the *No Child Left Behind* legislation mandates that high-stakes assessments are given in all states (Linn, Baker, & Betebenner, 2002).

### *Intrinsic/Extrinsic Motivation and Evaluation*

Students' intrinsic motivation and extrinsic motivation are related to assessment practices. When a student is intrinsically motivated, the receipt of a grade may ultimately lower the students' intrinsic motivation to learn (Deci et al., 1999b, 2001; Freedman, Cunningham, & Krismer, 1992; Ryan et al., 1985). This may be particularly true in schools or classrooms that stress the importance of testing. When the teacher persistently talks about the importance of extrinsic outcomes such as grades, students may become highly focused on obtaining those outcomes. In such contexts, students ultimately may come to believe that the grade is more important than the actual material that is being learned; this in turn can lead to decrements in intrinsic motivation. For example, a student who truly loves reading mystery novels may experience decrements in intrinsic motivation to read such novels, if the student is enrolled in an English class in which the students are persistently tested on the novels. This may be particularly true if the assessments focus on factual recall of somewhat trivial details in the novel.

Testing and assessment are not going to be eliminated in schools. However, the emphasis on testing can be diminished. First, teachers can be better educated to use discourse that does not focus on evaluation; rather, teachers can be better trained to communicate about the intrinsic value of the material, rather than simply focusing on the importance of a forthcoming test. Second, teachers also can be better educated regarding to the proper way to present grades to students. The negative effects of grades on intrinsic motivation can be lessened if grades are presented as informational and non-controlling in nature (Deci, Spiegel, Ryan, Koestner, & Kauffman, 1982; Pittman et al., 1980). Thus rather than simply writing "A" on a student's paper, optimal motivation may be achieved if an additional personal comment is written to the student; such comments should indicate that the student earned the "A" grade because she truly mastered the material. In addition, the comment should indicate that the student earned the grade, rather than indicating that the teacher "gave" the student the grade (which could be perceived as controlling).

### *Grouping Students for Instruction*

The ways that teachers organize groups for instruction can affect student motivation (Linnenbrink, 2005). Children recognize that they often receive differentiated instruction based on ability (Weinstein, Marshall, Brattesani, & Middlestadt, 1992). Thus students who are placed in lower ability groups are aware of such placements. Such grouping practices often are inevitable, but they do impact academic motivation.

A student who is put in the "low" ability reading group during the first grade may develop a poor self-concept of ability at reading; that low self-concept of ability may perpetuate if the student consistently is placed in low-ability reading groups throughout the elementary school years. In contrast, a student who moves from a low ability group into a higher ability or heterogeneous group at a later time may not experience the same decrements in motivation (E. Anderman & L. Anderman, 2010). Low achieving students in particular may benefit from participation in mixed-ability groups. For example, Saleh, Lazonder, and De Jong (2005) randomly assigned fourth graders to either homogeneous or heterogeneous groups. Students all received identical instruction on plant biology. Results indicated that low ability students displayed greater learning when they were assigned to the heterogeneous groups.

Grouping of students by ability is very popular among educators, particularly because

it is easier for a teacher to prepare instruction for a more homogeneous group of students. Nevertheless, the evidence about the effectiveness of ability grouping on achievement is limited. Indeed, research indicates that between-class ability grouping is largely unrelated to achievement, except for the highest ability students (Fuligni, Eccles, & Barber, 1995; Gamoran, 1992; Slavin, 1990). Other research indicates that teachers of low ability groups focus less on students' individual interests and use less cognitively demanding tasks than do teachers of higher ability groups (Borko & Eisenhart, 1986; Oakes & Lipton, 1990).

Cooperative learning has been demonstrated to be a viable alternative to grouping students by ability (Johnson, Johnson, & Smith, 2007; Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Slavin, 1996, 1983, Chapter 17 in this volume). Most cooperative grouping techniques have several common characteristics: (a) success of the group is dependent on mutual success among group members; (b) groups are heterogeneous in composition; and (c) students must still demonstrate individual learning.

Research on cooperative learning indicates that it is effective both at producing achievement gains and at maintaining students' motivation to learn (Qin, Johnson, & Johnson, 1995; Slavin, 1990, 1992). A number of explanations have been posited to explain the benefits of cooperative learning. For example, Webb and her colleagues have argued that in classrooms where cooperative groups are used effectively, students communicate better with each other, and offer each other help that students ordinarily might not receive (Webb, 1982, Webb, Nemer, & Ing, 2006). From a Vygotskian perspective, when students learn in cooperative groups, the social interaction among the students facilitates cognitive growth, since higher achieving students can scaffold learning and lure lower achieving students into their zones of proximal development (Palincsar, 1986; Vygotsky, 1978).

Educators can effectively use groups for instruction without harming students' intrinsic motivation. In particular, groups can be organized around students' interests instead of around abilities. Motivation is enhanced when students are allowed to examine areas of personal interest (Hidi, 1990; Renninger, 2000; Schiefele, Krapp, & Winteler, 1992; Schraw, Flowerday, & Lehman, 2001). Thus an alternative to assigning students to reading groups that are organized in terms of students' abilities is to organize the groups around various topics. For example, teachers could arrange groups so that one group is reading a mystery, another is reading science fiction, another is reading an adventure, and another is reading a tragedy. Such arrangements afford all students the opportunity to engage in reading with peers around mutually interesting topics.

## FUTURE DIRECTIONS

In this chapter, we have reviewed developments in research on academic motivation. Although motivation research has exhibited important and significant theoretical and applied developments in recent years, there is still much that needs to be pursued. In the next section, we suggest some areas in which motivation research has shown some initial promise, and in which further research is needed.

### *Motivation-Based Interventions*

Motivational issues have not been the focus of many intervention studies. Maehr (1976) noted over 30 years ago that motivation often is neglected as a valued outcome



variable. Although motivation often has been included as a predictor variable in educational interventions, it for the most part has not been identified as a valued outcome worthy of study.

A recent issue of *Educational Psychologist* focused on educational interventions that are designed to enhance student motivation (Wentzel & Wigfield, 2007). Whereas that issue featured several important and promising interventions, it also served as an important reminder about the limited amount of intervention-based work that has occurred in the study of motivation. Indeed, the majority of studies over the past 30 years have been descriptive. Such studies are important and have helped us to identify how motivation constructs are related to other important outcomes (e.g., achievement). However, few studies have experimentally evaluated programmatic efforts (i.e., programs that are well grounded in motivation theory) aimed directly at enhancing academic motivation. This is a fruitful area for future research.

### *Developmental Studies*

Another important area for future research is in the area of longitudinal/developmental studies of motivation. Some longitudinal studies examining changes in motivation constructs over time have been conducted. For example, some studies have examined changes in expectancies and values (Eccles et al., 1993; Wigfield & Eccles, 1992, 2002; Wigfield, et al., 1991); other studies have examined changes in achievement goal orientations (E. Anderman & Midgley, 1997; L. Anderman & E. Anderman, 1999); and some studies have investigated changes in intrinsic motivation over time (Gottfried, Fleming, & Gottfried, 2001). However, developmental studies are still relatively rare in the motivation field.

Longitudinal studies are particularly difficult to conduct because of problems with participant attrition. First, it is very time-consuming to collect large-scale longitudinal data. Families often move to new neighborhoods, and it becomes quite difficult and expensive to track students over time. Second, it often is difficult to get participants to agree to remain in studies over extended periods of time. Even though a study participant may remain in the viable sample pool, it may be difficult to convince all participants to remain in the study.

Nevertheless, there is a need for additional studies examining how motivational beliefs develop over time. In particular, the field is lacking in studies that examine motivation in both very young children (i.e., preschool and the lower grades), and in studies examining older adolescents (i.e., after the transition into high school; Wigfield & Eccles, 2002). In addition, there is a need for studies that examine the development of motivational beliefs across diverse populations and from varied socioeconomic backgrounds. Finally, there is a need for developmental studies that are framed in other theoretical frameworks. For example, the field would benefit from additional studies examining developmental changes using self-determination theory.

### *Qualitative Studies*

Most motivation research has been conducted using survey-based designs and quantitative methods. Whereas researchers have learned much about the relations of motivation constructs to a host of variables, quantitative studies have not provided researchers or practitioners with more nuanced studies of how students think about motivation, and how social contexts and social interactions affect motivation. In particular, many of the

quantitative studies that have been conducted in the field of motivation have relied on self-report data, provided by students via survey instruments. Turner and Meyer (2009) recently re-examined one of their survey-based studies of motivation in math classrooms, and concluded that the results of self-report measures about math are quite generic in nature. Specifically, they noted that whereas students responded to items about math, the researchers really did not know about the specific aspects of math that students were thinking about when responding to the survey items.

Qualitative studies allow motivation researchers to delve more deeply into the ways in which students truly think about motivation. Some qualitative studies have been conducted in recent years. These studies have provided the motivation community with important insights into the relations of motivation to learning in classrooms. For example, the previously mentioned study by Patrick and colleagues (L. Anderman, Patrick, Hruda, & Linnenbrink, 2002; Patrick et al., 2001) examined the ways that elementary school teachers communicate mastery and performance goal structures to their students. Classroom observations indicated that teachers who communicated a mastery goal structure to their students engaged in specific instructional behaviors, such as communicating the importance of effort, encouraging student interaction, and demonstrating a concern for student learning. In comparison, teachers who communicated the presence of a performance goal structure emphasized grades, tests, and ability differences among students.

In another study, L. Anderman and her colleagues (L. Anderman, Andrzejewski, & Allen, in press) conducted an observational study in high school classrooms. Surveys were used to identify a small set of teachers who were perceived by students as communicating a strong mastery goal structure, high academic press, high social support, and a low performance-avoid goal structure. Observations were then conducted in order to identify and describe the instructional practices of those teachers. The authors proposed a grounded model that included three intersecting themes: supporting understanding, building and maintaining rapport, and managing the classroom.

## CONCLUSION

Motivation affects learning in important ways. As we have reviewed in this chapter, motivation is related to how students learn in classrooms; to ways in which students approach academic tasks; to the development of interest in certain domains; to students' beliefs about their abilities and their weaknesses; to the activities in which students choose to participate during their free time; and to numerous other outcomes, including career choices.

Although student motivation is affected by numerous entities (e.g., parents or communities), motivation is communicated to students daily and consistently by their teachers. The interactions that students have with their teachers have powerful effects on motivation; thus the practical implications of motivation research are profound. Educators make both small and large instructional decisions that affect students' motivation. The selection of tasks, the manner in which assessments are delivered, the ways that instructional groups are formed, and the discourse that teachers use in class all are related to students' motivational beliefs.

Finally, we must reiterate that motivation is a complex topic. Many educators have a simplistic view of motivation, and many assume that motivation solely resides within the student, and that the teacher does not have any responsibility in determining

student motivation. In the present chapter, we have tried to communicate that motivation is complex; it involves students' goals, values, ability beliefs, and numerous other variables. Although at some level motivation does emanate from the student, motivation also is largely determined by the instructional practices and social contexts of schools and classrooms. The instructional decisions made by teachers everyday strongly influence students' beliefs about their abilities, their goals, their values, and ultimately their educational and vocational choices.

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