EMOTION, MOTIVATION, AND SELF-REGULATION

A HANDBOOK FOR TEACHERS

EDITED BY
NATHAN C. HALL
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Preface

You don't have to be an emotion researcher to know that prefaces are typically boring. So to motivate you to read further, we will try to highlight only the aspects of this handbook that are most relevant to you as a student, preservice teacher, or practicing educator.

We, the authors of the handbook chapters, are convinced that the subjects outlined in this handbook — emotions, motivation, and self-regulated learning — are important yet not frequently enough addressed in existing publications for those in, or preparing for, the teaching profession. The chapters were enjoyable to write as well as challenging in trying to clearly identify the practical relevance and potential applications of otherwise largely abstract theories and empirical research. As part of the writing process, the chapters were also prepared in a highly collaborative way to create a more coherent reading experience in which these three main themes, and the links between them, are addressed throughout.

Our primary motivation in preparing this handbook was to contribute a concise, accessible, practical, and theoretically sound summary of past, present, and future of research on the psychosocial aspects of learning and instruction in the classroom. As such, we hoped to contribute to the existing curricula of teacher education programs, while providing a useful resource for practicing teachers. In the process, we also learned about ourselves as researchers as well as instructors in balancing the need to explain technical research details with offering understandable explanations, meaningful reflection exercises, and useful examples for classroom practices. Some quick answers to basic questions about the handbook are provided below:

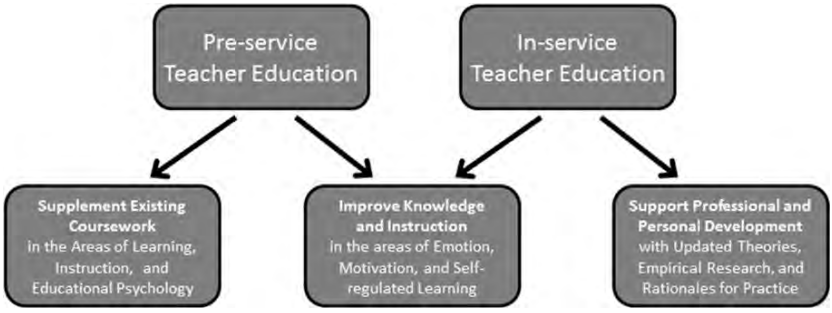
Who is the Handbook Written For?

- Students in teacher education programs (all school types)
- Individuals responsible for teacher education at schools (e.g., principals, teachers supervising practicum training) or higher education institutions (e.g., professors).

What are the Aims of this Handbook?

The first goal of this handbook is to equip preservice teachers with necessary background information on the psychological elements underlying student learning,

engagement, and achievement to prepare them for not only evaluations of competency (e.g., exams, practicum training) but also the real-world demands of classroom instruction. The second objective of this handbook is to provide an accessible and practical resource for in-service teachers and administrators that offers meaningful and immediately useable suggestions, following from research on psychosocial processes, for improving classroom activities and teaching methods.



How is the Handbook Organized?

The handbook consists of four chapters addressing the topics of (1) emotions, (2) motivation, and (3) self-regulation in students and teachers, and also provides (4) a concluding, integrative summary of how these three processes are interrelated. Each chapter is structured in a similar way. First, we start by providing quotes from students that highlight the chapter topic, followed by some theoretical sections in which concepts are explained and overviews of historical and current theories are provided. The sections to follow then discuss how emotions, motivation, and self-regulated learning can be measured (e.g., self-report measures, facial recognition), the role of contextual and developmental factors in influencing these processes (e.g., family background, biological development), and the effects of these three processes on students' learning and academic development (e.g., knowledge gains, achievement outcomes).

Finally, the last few sections of each chapter discuss how teachers can optimally promote emotions, motivation, and self-regulated learning in their students (e.g., teaching strategies, motivational intervention programs). In addition, these final sections explain how these psychological variables may be relevant to *teachers themselves* (e.g., emotions and teacher burnout) in terms of evaluating and improving these processes to optimize their impact on teaching effectiveness and personal well-being. In the last handbook chapter, the interrelationships between emotions, motivation, and self-regulation are addressed, important common principles are highlighted, and directions for future work in this field are presented. Although this

handbook talks a lot about theory and research, we made a concerted effort to depart from traditional handbooks by also clearly addressing how research in each area is directly relevant and useful for those in the teaching profession.

What is the Best Way to Read this Handbook?

- First, take a quick look through the chapters to get an overall impression of the content and see if anything in particular looks interesting. For example, previewing the content in the *definition boxes*, or the tables and figures, can give you a good idea of what a chapter is about and what you'd enjoy reading first.
- You can start with Chapters 1, 2, or 3. Although we do suggest reading Chapter 4 last, as it summarizes prior chapters and addresses future topics, feel free to start with any of the first three chapters depending on what seems most relevant or interesting.
- Try to consistently think of how the handbook contents could be incorporated into the way you teach. For example, by trying to guess what will (or should) be in the "*Implications for Practice*" sections, you are engaging in self-regulated learning which should help you to better understand how the information can be used to optimize classroom activities.
- Throughout the chapters, take a moment to review the "*Stop and Reflect*" sections (see the symbol to the right) that are intended to encourage a deeper understanding of the handbook content by asking you to consider how it relates to your personal experiences both as a teacher and student.

- Try to summarize single paragraphs or chapters in your own words. Even as an author, this can be a difficult task (see "*Conclusion*" sections), but it can really help to facilitate a more holistic and comprehensive understanding of the overall message and implications of the theory and research presented.
- Take a look through the list of terms in the *subject index* for this handbook. Periodically testing your knowledge of what the terms mean can be a good way of evaluating your understanding of the handbook content.
- Try to relate the different chapters of this handbook to each other. Although the links between the various theories and concepts are highlighted throughout the handbook, and particularly in the final chapter, trying to identify similarities or differences between these sections on your own should help you to better process and recall this information.
- Talk with others about the parts of the handbook you found most interesting, enjoyable, useful, difficult, confusing, or problematic. Getting feedback and sharing opinions is an excellent way to gauge your own understanding and to evaluate the handbook content.
- If you have any comments or critiques, or can offer any suggestions for improving the quality of this book, please let us know. We welcome any feedback and will incorporate them into future editions (or translations).

Finally, it is important that you determine for yourself how this handbook is most effectively read and which elements are most useful. Although we try to provide some guidance about how the contents may be relevant to you or your students, our aim is primarily to stimulate independent and critical thinking about how these concepts can be meaningfully addressed in a classroom setting (as opposed to "externally regulating" you as the reader — see Chapter 3!).

In closing, we hope you find this handbook to be informative as well as useful in providing a clear understanding of theories and research on psychological processes involving emotions, motivation, and self-regulation, as well as an opportunity to consider the practical implications of these processes for improving personal and academic development for not only students, but also those who teach them.

Nathan C. Hall, Thomas Goetz, Markus Dresel, Anne C. Frenzel, Ulrike E. Nett, Reinhard Pekrun, and *Elizabeth J. Stephens*
Montreal, Konstanz, Augsburg, Munich, and Ulm in May, 2013

Chapter 1

Emotions

Anne C. Frenzel and Elizabeth J. Stephens

1.1. Students in Focus

Esther G., 16 years old

This term in Biology class we dissected a fetal pig — who would have known *how interesting that could be*! My classmate and I had three hours to do it, and before we knew it, the teacher was telling us to start cleaning up our lab tables; the *time just flew by*! Next year, our Biology teacher is offering an elective anatomy course and the two of us *have already put our names on the sign-up list*!

- High value of the learning material
- Flow experience
- Approach behavior due to positive emotional experience

Edwin H., 24 years old

All throughout grade school *I was pretty good in math* and hardly had to study for any tests. In 10th grade, however, we had to take Algebra II and my grades were horrible (I had never received a D in school before). It was so *frustrating* to see so many red marks on my tests and homework. I was so upset and almost *gave up completely* on the class. I remember my buddies telling me how *stupid and pointless* math was anyways — I guess I started believing that, too. At the end of the term, getting a D on a test was *no big deal anymore*; math just wasn't my "thing."

- Positive self-concept of ability leads to high control
- Outcome-dependent negative emotions
- Motivational component of the emotional experience
- Reduced value of the learning material
- Dampened emotional reaction due to reduced control and value

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Theo W., 20 years old

I just declared math as my major and a few weeks ago we had our first exam in differential equations. As soon as I got the test, I looked at the first problem and thought to myself: Oh great. *Here's a question I didn't prepare for at all*! I started *panicking*. *I couldn't concentrate on the problems*, *my mouth got all dry, and I started to sweat*. I tried to keep reading through the rest of the test and to *tell myself that I had to know how to solve at least some of the questions*. But I completely *blacked out*. I was just staring at the test, and couldn't recognize a single thing. *I just wanted to quit*… to turn in the test unanswered. I tried to do some problems, but I knew it was all wrong. Since then, *I've become really scared about my future* and I've started to doubt whether I can actually be a math major. *Maybe I am just not cut out for it*…

- Appraisal of low control
- Affective component of emotional experience; cognitive component
- Physiological component
- Self-instruction as a strategy to deal with test anxiety
- Decreased cognitive resources as a result of test anxiety
- Motivational component
- Generalization of test anxiety to other areas
- Attribution of one's own failure to personal inadequacy (internal, stable)

Pablo G., 26 years old

I remember one of my classmates who did everything he could to be a good soccer player. Unfortunately, *he didn't really have a good feel for the game and on top of that he was slow*. Many of us made fun of him and laughed at him without ever thinking about his feelings. Now, when I look back, I think about how mean and unfair it was of us to treat him like that and to think we were better than him just because *we were lucky enough to be more talented*. Actually, it was much more impressive to see how hard he worked and struggled to improve. Honestly, that's something one can be *proud* of.

- Attribution of other's failure to internal, stable cause
- Internal, stable, uncontrollable attribution of success
- Pride due to success attributed to internal, instable causes

Alina R., 19 years old

I had a hard time getting into the honors program at my school, but finally I got in. I remember getting our first major test back at the end of the first term in Honors Spanish. Every student had their test back except for me, and it seemed to take forever for the teacher to start walking my way. Thoughts went racing

through my head, "Did I pass? Did I fail? *I could have studied more! But I felt like I was prepared!"* The teacher placed the test in front of me face down on my desk. I slowly turned it over and saw at the top of the page in green ink "70% — C." Ah, *the relief*! I had passed. I leaned back in my chair and felt perfectly *happy* with my passing grade.

- Moderate control beliefs leading to alternating feelings of fear and hope
- Relief due to not failing
- Positive outcome-dependent emotion

David H., 18 years old

I spend most of my time in class staring at the clock and waiting for the bell to ring. *I feel trapped* in those classrooms and I often ask myself what's the point of sitting there; *I just want to leave*! It's like the teachers just talk and talk without really ever saying anything interesting. Why does school have to be so *boring*?

- Affective component of the emotional experience
- Motivational component
- Boredom as a result of the low value of the learning context

Amy B., 19 years old

I can still remember the day my music teacher chose me out of the entire band to perform a xylophone solo in front of the whole school. *I loved the piece I was going to perform* and *practiced it every day for over a month* — I could have played it in my sleep. On the day of the performance, I stood in front of my instrument and looked out at the 500 people there to see me play, and was *thrilled*! My music teacher began to play the piano introduction but as I began my solo something sounded not right — I had played the wrong note. My teacher started again, *I restarted my solo*, but again I played the wrong note! What was going on, I asked myself. I knew this piece inside and out! At last, I *took a good look at my instrument* and realized that two of the bars I was striking had been incorrectly switched. I quickly put them back into the right places, nodded to my teacher with confidence, and played the piece perfectly to the very end. I was so *proud* of myself!

- High value of the learning material
- High effort as a result of high value
- Positive emotional experience as a result of high control and high value
- Persistence despite a setback due to high control
- Good concentration as an outcome of positive emotions
- Pride as the result of an internal attribution for success

These quotes from students in secondary school and college demonstrate not only the ubiquity of emotions in the learning context, but also the important role they play in numerous aspects of academic life. Emotions exert great power over us: They capture our attention, they influence our thoughts, and they dictate if and how we behave. Nevertheless, emotions have a "bad reputation" in both the scientific context and the daily life. Many individuals experience emotions as bothersome, inhibitive, or distracting, and therefore attempt to use their "minds" and not their "hearts" as their guide. This has been the case in science for a long time. Instead of confronting the fleeting, ephemeral, difficult-to-define phenomenon of emotion, psychologists and social-scientists found it much more promising to study observable human behavior. This approach, however, has changed over the last 30 years and emotions have become a popular scientific subject. At present, researchers from a wide range of disciplines agree that emotions are not irrelevant, bothersome background music of human thought and action — rather, they are the motivating force behind human thought and action. This is also the case for research in the realm of learning and performance. This chapter is devoted to emotions, and as such, presents what we know today about their causes and their effects particularly in learning and performance contexts. This scientific knowledge is of critical importance because it enables teachers to better understand their students and to create optimal learning environments. Studying emotions in teachers themselves is also important. Though the teaching profession is well known for being emotionally demanding, little research has explored how teachers feel or the consequences of these emotions for their own well-being and persistence.

1.2. Clarifying Terminology

Feeling calm and composed, stimulated, fearful, bored, proud, happy, or surprised: All of us understand what these terms refer to, can spontaneously give examples of these emotional states, and can talk about situations in which they were strongly experienced. Nevertheless, it is not easy to clearly define what an "emotion" is. Fehr and Russell (1984) ironically captured the state of this dilemma when they said, "Everyone knows what an emotion is, until asked to give a definition" (p. 464). In fact, to this day there is very little agreement among emotion researchers as to what exactly they are talking about when they refer to emotions (Reisenzein, 2007).

The other chapters in this book discuss thought-related (cognitive) terms such as motivation and metacognition. What is it that differentiates emotions from such cognitive constructs? Take a moment and think about what it feels like when you are scared, happy, proud, or angry.

If we ask ourselves what emotional experiences are like, it quickly becomes clear why the majority of definitions refer to emotions as "multidimensional." As outlined

in the next section, emotions are typically considered to be psychological constructs characterized by the interplay between their various components.

> **Definition**
>
> *Emotions* are multidimensional constructs comprising affective, psychological, cognitive, expressive, and motivational components.

1.2.1. The Components of Emotions

First and foremost, at the core of emotions is the *affective component*: We feel emotions, they are not mere thoughts or cognitive mental states. This component is also referred to as the "affective core" of an emotion. The affective experience is essential and sufficient to refer to a psychological experience as an emotion — there is no emotion without the affective experience, and without emotion there is no affective experience. Moreover, most emotion researchers agree that emotions are characterized by a *physiological component*. In other words, bodily processes are set in motion when we experience an emotion. For instance, when we feel fear our pulse increases, our muscles contract, our pupils dilate, our breath becomes shallow, and our digestive system slows down. Together, these processes may feel like generalized tension or agitation. Importantly, these physiological processes do not just take place in the body (peripheral nervous system), they also occur in the brain (central nervous system). Nowadays, it is well known that emotions have specific central nervous arousal patterns, particularly in areas such as the amygdala, but also in the cerebral cortex. In conjunction with cortical arousal is another typical component of emotions, specifically the arousal of distinct thoughts that is referred to as the *cognitive component* of emotions. For instance, when experiencing fear, thoughts about failure may race through your mind ("I'll never solve this one problem and almost everyone else has already finished the test!"). Similarly, while experiencing pride, thoughts about the positive consequences of the situation may enter your mind ("My parents are going to be so impressed when I tell them about my good grade!").

Furthermore, the *expressive component* of emotions refers to the specific, spontaneous facial expressions and body movements or postures that are displayed during an emotional experience. Such expressions of emotions make them recognizable to others. For example, imagine walking into a classroom in which some students are sitting upright in their seats and frowning at the blackboard, and others have their foreheads wrinkled and are slouched in their seats. It would be immediately clear to most that something was wrong in that classroom: Perhaps the students feel fearful or angry? Maybe they had just taken a difficult test in their previous class? Thanks to the expressive component of emotions, this situation can be immediately perceived and identified by others, thus enabling an appropriate response such as asking the students what is wrong. In response, one may even revise that day's class to include a more enjoyable exercise.

Finally, emotions typically contain a *motivational component*, which means that emotions can trigger behavior (see Chapter 2). From a psychological–evolutionary perspective, it is likely that this component of emotions serves to promote survival because emotional experiences typically motivate behaviors that help to preserve physical and psychological well-being. For instance, imagine feeling fearful of an individual with whom you must interact. You would likely behave in a reserved manner when interacting with this person, and otherwise try to avoid this person to the best of your ability (i.e., flight and avoidance behavior). However, imagine feeling positive emotions, for instance, the joy one feels when a class goes really well. In that case, you would probably feel exhilarated and want to repeat the technique you used in that class in order to recreate or sustain that positive emotional experience. Moreover, you are more likely to be open to new, creative teaching strategies in that class (i.e., exploratory and approach behavior). Figure 1.1 provides a visual depiction of the components of emotions described above.

1.2.2. Distinguishing between "State" and "Trait" Emotions

"Michael is fearful" — what would you think about Michael if you heard this? There are two ways this statement can be understood. On the one hand, it could be a current observation about Michael based on noticing during the lunch break that he looked agitated and seemed to flinch whenever someone spoke to him. On the other

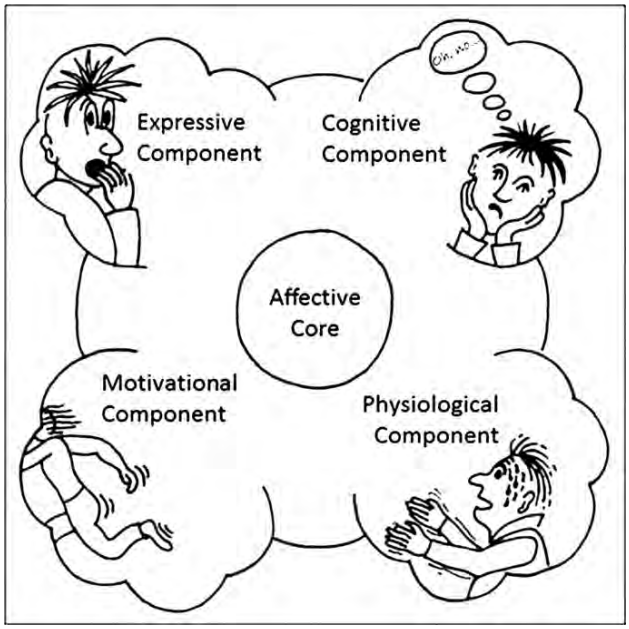

Figure 1.1: Components of emotions.

hand, it could also be a general statement about Michael after having observed him in several situations and noticing repeatedly that he tends to be a fearful person (e.g., he has a fearful demeanor during classes, before and after school, when spoken to by teachers as well as peers, etc.). In order to distinguish between momentary versus habitual forms of emotions, psychologists use the terms "state" and "trait." State emotions are emotions that are momentary conditions, whereas trait emotions refer to personal tendencies to react with certain emotions across different situations.

This scientific distinction between state versus trait emotions is also important for individuals in the teaching profession, because it enables them to better interpret comments such as "Michael is fearful" and ask specific question to get at the heart of Michael's emotional experience. While observing students, it is also important to discern whether an emotional experience is representative of a state emotion that was aroused in that specific situation, or if it is representative of a trait emotion that is a persistent characteristic of that student (see Box "Implications for Practice: Emotional Traits").

Implications for Practice: Emotional Traits

It is possible to design learning situations that decrease or increase students' tendencies to react with specific emotions. Individuals with high levels of specific negative trait emotions are particularly dependent on their teachers' efforts to design "emotionally sound" learning environments. A classic example here is, of course, test anxiety. If you notice that one of your students is high in trait test anxiety, making an effort to design the testing situation so that it minimizes this student's fear could be helpful (see Section 1.6 for more on possibilities for influencing emotions).

Also keep in mind that emotional traits are less global than we may think. Even if you observe the same emotion repeatedly in one student, for instance, a student who always seems nervous before tests in your class, it does not necessarily mean that this student has test anxiety in other classes. Instead, it is possible that the student is mainly anxious about tests in your class. In fact, a number of research studies show that emotional experiences are most often specific to the domain (subject area) in which it is observed — similar to how academic self-concept varies within students between different school domains (see Chapter 2). This suggests that a prudent approach would be to avoid quick and overly generalized characterizations of your students in terms of their emotions (and other traits). Instead, try to remind yourself that you are only seeing a small excerpt of your students' lives.

1.2.3. Distinguishing Emotions from Related Constructs

"How do you feel?" "How are you doing?" Do all answers to these questions refer to emotional phenomena? Actually, no. Often, these questions are referring to other

psychological constructs that are related, but not identical to, emotion. To better understand the phenomenon of emotions, let us quickly touch on these related constructs that include mood, well-being, stress, and flow.

Possible responses to the above-mentioned questions include, "I feel good," "I'm in a bad mood," "I am so proud of myself," or "I'm mad at Amanda." The first two statements describe *mood* states whereas the last two statements describe more specific emotional experiences. It might seem trivial to differentiate between these phenomena, and in many research papers the terms "emotions" and "mood" are used synonymously. Indeed, the concepts of emotions and mood do include similar components (e.g., affective experiences, specific physiological arousal patterns). But emotions and moods also differ with regard to duration and intensity. Specifically, moods typically last longer than emotions, but are lower in intensity, whereas emotions (i.e., emotional states) are generally short-lived but intense. For example, the student's anger toward Amanda might feel intense, but it should dissipate much more quickly than one's feeling of "being in a bad mood." In addition, moods are felt more globally, whereas emotions are generally directed toward a specific object: A negative mood permeates all of your experiences, whereas the feeling of anger as described above is mainly directed at Amanda. Finally, moods are generally classified as positive, negative, or neutral, while more specific differentiations are made between emotions. For instance, enjoyment and pride are two positive emotions that clearly differ from each other, just as fear and anger are clearly distinct negative emotions. Boredom and surprise are generally considered neutral emotions that clearly also differ from each other.

The subject of *well-being* has its own psychological research tradition. From this perspective, the questions "How do you feel?" and "How are you doing?" are understood in an even more generalized or global manner than would an interpretation focusing on one's mood. Research about well-being often applies to one's entire life or to important parts of it, such as one's job or family life. Emotions are considered integral components of subjective well-being. As such, well-being is understood to involve both the absence of negative emotions and the repeated experience of positive emotions. In addition, many definitions of well-being describe it as feeling that one's subjective and social values are fulfilled, and one's life is rated positively (Diener, Suh, Lucas, & Smith, 1999). In other words, a person who responds positively to the question, "In general, how do you feel about your job as a teacher?" is both likely to rarely experience emotions like fear, shame, or anger, but also to frequently experience positive emotions such as enjoyment during job-related activities. General well-being as a teacher also implies that one feels appreciated and confident about being able to reach important job-related goals.

"I am pretty stressed" is also a typical daily response to the questions above; a statement often intended to connote a mix of bad mood, negative emotions, and generally low well-being. The term *stress* — in contrast to the way it is commonly used in everyday speech — has a specific meaning in psychological research. The condition of "stress" refers to an organism's preparedness for alarm, particularly when a situation taxes or exceeds one's capabilities. Richard Lazarus, a pioneer of stress research and an important emotion researcher, distinguishes between three

main sources of stress: bodily harm, threat, and challenge. In his more recent work, Lazarus criticizes the fact that research on stress and emotions has been carried out separately from one another (Lazarus, 2006). For instance, it is well known that in addition to "general preparedness for alarm," the experience of stress also often includes feelings of fear as well as anger, envy, grief, or shame. As a result, there is quite a bit of overlap between theories that address stress and emotions. For example, similar findings have been reported concerning the development, effects, and ways of coping with stress as well as emotions.

Finally, the term *flow* was introduced by Mihaly Csikszentmihalyi (1975). It refers to the "holistic sensation that people feel when they act with total involvement" (p. 36). Csikszentmihalyi proposes that the feeling of flow can occur when the challenge level of a task and one's competence level at the task exist in a balanced relationship to each other. One is particularly likely to experience a sense of flow when working on a demanding activity for which one feels competent. The subjective experience of flow is pleasant. While experiencing flow, one is also especially likely to perform well and be creative. As such, this phenomenon is of great importance in the school context — teachers typically want to promote a sense of flow in their students while they are learning. They often also desire to experience flow themselves while they are teaching. According to Csikszentmihalyi, students should experience flow when the demands placed on them are in sync with their competencies. Naturally, this goal can be quite challenging for teachers to achieve because students differ widely in terms of their interests, prior knowledge, and abilities. New teaching methods related to individualized instruction, however, hold great promise in that respect. For teachers themselves, experiencing flow could result from a match between classroom demands (e.g., the difficulty involved in having students reach a specific learning goal) and the teacher's capacity to create an appropriate learning environment. This match is most likely to occur when the teacher has clear goals about how the class should proceed, has an excellent knowledge of the subject matter, and can react effectively and confidently to class disruptions.

1.2.4. Measuring Emotions

Measuring which emotions a person experiences, and with what intensity and frequency they are experienced, is a big challenge when working with emotions. For emotion researchers who are interested in the structure, antecedents, and effects of emotions, it is crucial that emotions be measured appropriately. Also in the school context, it may be important to be able to systematically assess emotions. Being able to label and quantify one's own emotional experiences can be helpful for becoming more aware of one's emotions and better coping with them. Several approaches and methods that have been developed to assess emotions are described below. Some of these techniques may also be employed in programs for enhancing students' emotional competencies, or adapted by teachers to facilitate their own self-reflection.

Because emotions (as per their definition) are characterized by subjective experience, it stands to reason that they can be assessed simply by asking individuals

about these experiences. This can take the form of assessments based on verbal descriptions, visual stimuli, or a combination of both. There are numerous methods for assessing verbal descriptions of emotions. For instance, the "Positive and Negative Affect Schedule" (PANAS) from Watson, Clark, and Tellegen (1988) assesses general positive and negative affects. The PANAS is a self-report instrument that consists of 20 emotion adjectives depicting affective experiences, 10 of which are positive (e.g., active, inspired) and 10 negative (e.g., hostile, nervous). Individuals filling out the PANAS can be asked to indicate how intensely they experienced the 20 experiences "in the last week," probing more the habitual experience of affect (trait), or "at this moment" as a means of assessing affective states.

Similar in structure to the PANAS, but focused solely on the emotion of fear, is the often used "State-Trait Anxiety Inventory" (STAI) from Spielberger (1983). This questionnaire consists of 20 statements (e.g., "I am nervous," "I am worried that things could go wrong") that can measure fear as either a state or a trait emotion.

With regard to school contexts, several self-report questionnaires exist that measure test anxiety, for example, the Test Anxiety Inventory from Spielberger (1983) and the Children's Test Anxiety Scale (CTAS) from Wren and Benson (2004). It should be noted that such tests should only be administered by school psychologists or individuals trained in diagnostics, because it is only through standardized testing procedures and professional interpretation of the results that reliable conclusions about students can be made.

Another method of assessing emotions involves a combination of verbal labels and graphic material. This technique was developed and is used currently by leading emotion researcher Mary Ainley. In this type of assessment, students are asked to identify which specific emotions they are experiencing at that exact moment by finding the appropriate word matched up with a pictorial depiction of the emotion (see Figure 1.2).

A well-used and language-free assessment of emotional states is Lang's "Self-Assessment Manikin" (SAM, Lang, 1980). To assess emotions using the SAM, individuals are asked to describe their emotional state according to three dimensions: valence (positive or negative), physical arousal, and dominance. These emotional states are represented using three sets of figures as depicted in Figure 1.3.

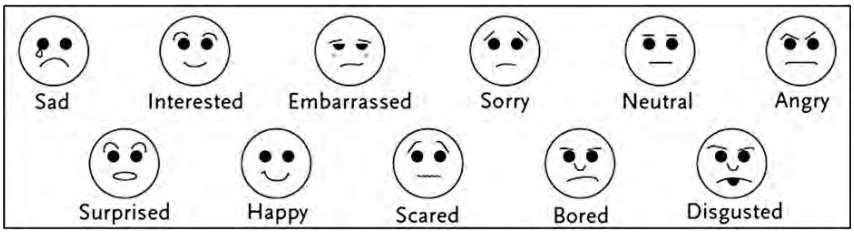

Figure 1.2: Combination of verbal and pictorial assessment of discrete emotions (Ainley, Hidi, & Berndorff, 2002).

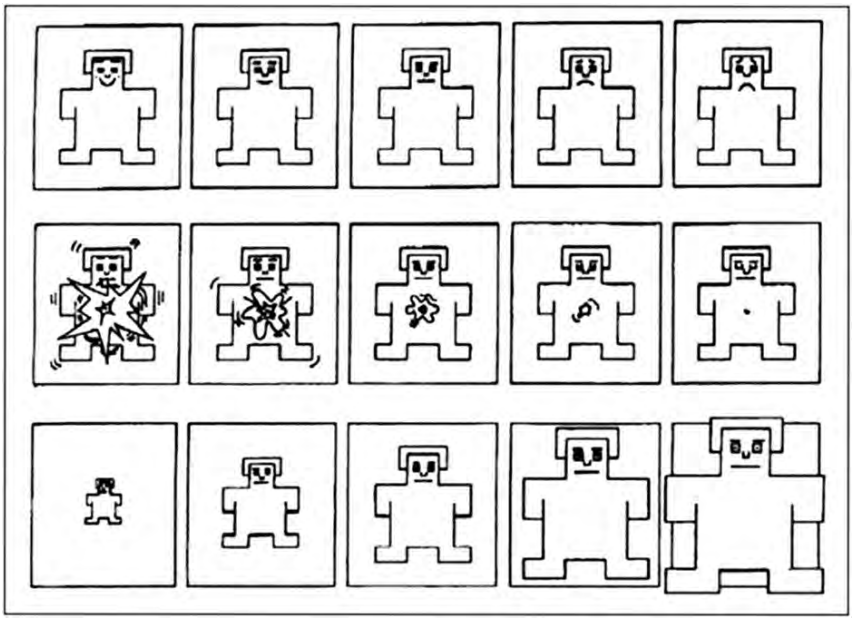

Figure 1.3: Self-Assessment Manikin (Lang, 1980). The affective dimensions are depicted in three rows: valence, arousal, and dominance.

Direct questioning methods to assess emotions may be problematic because they are prone to conscious or nonconscious biases (e.g., some participants may not want to admit that they are highly excited or agitated; some students might overexaggerate their test anxiety to provide themselves with an excuse for poor school performance). As a result of these potential biases, objective methods of assessing emotions have been developed that bypass participants' subjective responses. One example of this type of assessment makes use of the expressive component of emotions by coding and quantifying typical emotion-related facial expressions. This assessment method is called the "Facial Action Coding System" (FACS) and was developed by Paul Ekman and colleagues. The FACS records small facial muscle movements that are then examined in combination with each other and used to code different emotions (Ekman, Friesen, & Hager, 2002). Figure 1.4 shows an example from the FACS instruction manual depicting several central facial areas that are activated upon expressing emotions. The figure also provides examples of the described facial-expressive muscle movements (baseline and three "action units").

Finally, attempts have been made to assess bodily (physical) processes that occur during emotional experiences. Several peripheral–physiological measuring devices have been used to provide data related to participants' emotional experiences such as skin-conductance, pulse, and blood pressure. Additionally, cortisol (found in saliva) has been used in several studies as an indicator of increased emotional

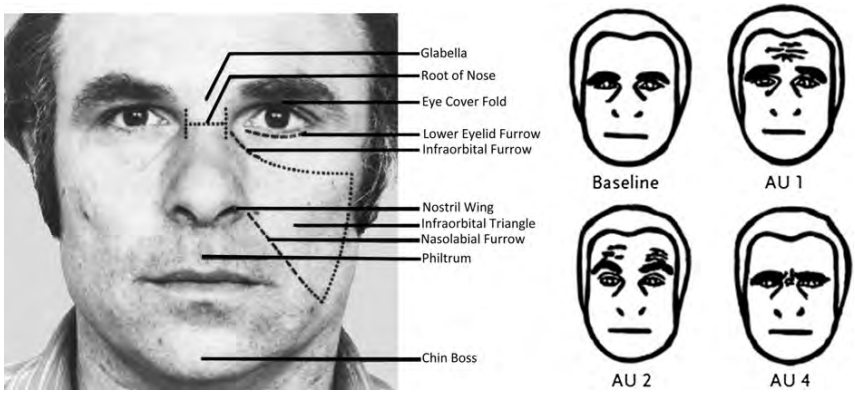

Figure 1.4: Sample from the FACS manual (Left: Ekman et al., 2002; Right: Hager & Ekman, 1983).

arousal (fear or stress). At present, researchers are also trying to quantify and visualize brain-based processes underlying individuals' emotional experiences using technologies such as functional magnetic resonance imaging (fMRI) and electro-encephalography (EEG).

1.2.5. Achievement Emotions

Classrooms are not simply rooms for learning; instead, they are places where people interact with each other and where success and failure are experienced on a daily basis. As such, classroom environments continually elicit various emotions in students and teachers alike.

Because emotions are ubiquitous in the learning context, one aim of this chapter is to pay particular attention to the emotions students (and teachers) experience on a daily basis. Pekrun (2006, p. 317) defines achievement emotions as the following:

> **Definition**
>
> *Achievement emotions* are defined as emotions tied directly to achievement activities or achievement outcomes.

An important characteristic of achievement situations is that they involve standards for individuals' behavior in terms of success versus failure. Such judgments can come from the individual themselves (e.g., the student) or from someone else (e.g., the teacher); they can be expressed verbally (e.g., "Very good, you did that exactly right") or based on a formal scoring system (e.g., grades). However,

standards can also be implied in certain situations, such as when a child while playing hide and seek recognizes that she runs faster or slower than her classmates. Moreover, reference norms can be oriented toward various criteria. For example, using a social reference norm means emphasizing one's performance relative to others (e.g., being able to spell more words correctly than your classmates), using an individual frame of reference means focusing on one's own prior achievement (e.g., being able to spell more words correctly than you did last week), and using an absolute frame of reference means judging one's achievement relative to objectively set criterion (e.g., being able to spell more than 50 words correctly). Regardless whether the frame of reference is explicit or implicit, and whether it emphasizes social, individual, or absolute standards, their application typically provides clear achievement feedback: success or failure. Achievement emotions are therefore the emotions that arise in relation to future, past, or current experiences of success and failure. Social emotions like sympathy, jealousy, or envy are therefore typically not considered achievement emotions.

In order to better clarify the current research on achievement emotions, it is helpful to begin by classifying these emotions based on specific criteria.

What emotions have you personally experienced in learning or performance contexts? Compare and contrast how it felt to experience these emotions. How could you classify these emotions?

Thinking about emotions in these ways is also a good exercise for students to improve their emotional competencies. This exercise can help to extend students' emotional vocabularies (e.g., being able to label different emotions) and improve their "meta-emotional competencies" by improving their ability to organize and differentiate between emotions.

In order to theoretically classify achievement emotions, Pekrun and colleagues propose three classification criteria: valence, object focus, and temporal perspective (Pekrun, Elliot, & Maier, 2006; Pekrun & Jerusalem, 1996). Frenzel, Goetz, and Pekrun (2009) also added a fourth criterion, namely self- versus other-reference.

- Valence refers to the distinction between positive or pleasant emotions, such as enjoyment, and negative or unpleasant emotions, such as anxiety.
- Object focus distinguishes between emotions directed primarily toward an activity or toward an outcome (i.e., success vs. failure).
- Temporal perspective describes whether the focus while experiencing an emotion is on the future (prospective), the present activity, or a past outcome (retrospective). When the object focus concerns an activity, then the temporal perspective is always the present (i.e., the activity on which one is currently working). When the object focus is an outcome, the temporal perspective can be either prospective or retrospective. Most emotions can be classified according to one temporal perspective (e.g., fear is generally a prospective emotion); however, some emotions

Table 1.1: Classification of achievement emotions.

Focus	**Valence**	
	Positive (pleasant)	**Negative (unpleasant)**
Activity		
Current	Enjoyment (of learning)	Boredom, Frustration, Anger
Outcome		
Prospective	Hope, Anticipatory Enjoyment	Fear, Hopelessness
Retrospective and self-referenced	Enjoyment (about an outcome), Relief, Pride	Sadness, Disappointment, Shame/Guilt, Anger
Retrospective and other-referenced	Gratitude, "Schadenfreude"	Anger

can have varied temporal perspectives (e.g., anger can be retrospective as the result of a past failure, but it can also be current, for instance, when one is required to work on a frustrating activity).

- Self- versus other-reference is particularly salient for retrospective emotions. This criterion of achievement emotions involves whether one interprets the source of responsibility of success or failure as within the self or another individual (this also relates to "attributions" which will be described later). A particularly intriguing emotion with regards to self- versus other-reference is anger. At first glance, one might classify anger as other-related because one is generally angry at someone else. However, anger can also be directed toward oneself, for example, when one interprets a failure as due to one's own behavior (e.g., not studying enough or studying the wrong material, despite knowing better).

Most achievement emotions can be classified according to these criteria. Table 1.1 highlights this taxonomy and provides sample emotions.

Conclusion

Emotions are multidimensional constructs that are composed of affective, physiological, cognitive, expressive, and motivational components. Emotions can be considered momentary conditions (states) and personality characteristics (traits). Emotions are independent psychological constructs, but they overlap with phenomena such as mood, psychological well-being, flow, and stress. The most common methods of assessing emotions are language-based, self-report questionnaires. In the school context, emotional experiences related to achievement activities and the outcomes of these activities are of primary importance.

1.3. Causes of Emotions

1.3.1. Appraisal Theory

A central question in any psychological research centers on the causes of mental phenomena. It is only when we understand how certain behaviors result from people's psychological experiences that we can attempt to influence these behaviors. Improving our own and others' experiences and behaviors is one of the most important goals also in educational settings.

What are the potential reasons or triggers for your own emotions? For example, think about a situation in which you felt anxiety. What caused your anxiety? Who was with you? How could the situation have been changed by you or others to minimize your anxiety? Alternatively, think of a situation in which you felt proud. What was the cause of this pride? What was it about the situation that allowed you to feel pride? What could have intensified your feeling of pride?

Emotion research has made the following basic observations in its search for the causes of emotions:

- An individual will not necessarily react with the same emotions, or with the same emotional intensity, in objectively similar situations (e.g., a student may feel anxiety during an English test, but not during a Spanish test).
- Two people can have completely different emotional reactions to the same situation (e.g., one student may be furious that her team lost a debate, while another student on the same team might not care).
- There are only a handful of situations or experiences that arouse the same emotions in everyone (e.g., most people experience at least some anxiety when they get a shot at the doctor or when they have to give a talk in front of a large crowd).

Appraisal theory provides a conceptual framework to help explain these observations. This theory proposes that emotions are not caused by situations themselves, but rather by how we interpret situations. This interpretation is referred to as an "appraisal."

Definition

Appraisals are cognitive judgments about situations, activities, or oneself. Different appraisal patterns produce different emotions.

The examples provided above can be explained using appraisals:

- *Two highly similar situations can be judged very differently by the same individual:* The student may have perceived the English test as threatening because he felt

ill-prepared, whereas during the Spanish test he felt in control due to having a good understanding of the test material.

- *The same situation can be interpreted differently by two individuals:* The student who felt angry after losing the debate may have thought that her teammates sabotaged the debate by staying out late the night before, whereas the student who was unaffected after losing did not get a chance to debate a topic and interpreted the situation as personally irrelevant.
- *Some experiences are primarily interpreted in a specific way and thus most people react to them similarly:* This includes situations in which one's physical well-being is threatened (e.g., getting a shot) or situations that involve being evaluated negatively by others (e.g., giving a public presentation).

Obviously there are various ways in which situations can be interpreted. Thus, an important focus for emotion researchers is to organize possible appraisals according to their underlying dimensions in order to be able to predict which emotions should arise as the result of specific appraisals. Important appraisal theorists include Richard Lazarus, Phoebe Ellsworth, Craig Smith, Nico Frijda, and Klaus Scherer (for a good overview of appraisal research, see Scherer, Schorr, & Johnstone, 2001). These researchers are in general agreement that the most important dimensions underlying the appraisals people make can be observed in the responses to the following questions:

- Do I find the situation comfortable (pleasant) or uncomfortable (unpleasant)?
- How personally important is this situation?
- Was I, another person, or some external circumstance responsible for the situation?
- Do I possess the capability to change the situation?
- How likely was/is the occurrence of a situation?

The central proposition stemming from appraisal theory is that specific emotions will be experienced depending upon one's responses to these questions. For instance, feelings of gratitude are aroused in situations that we perceive as personally relevant, positive, and caused by another individual. Anger arises when we perceive a situation to be personally important, negative, and avoidable. We feel anxiety when something personally relevant and negative is likely to occur and we see relatively few opportunities to change the situation (see the box below for more on achievement emotions and their typical appraisal patterns).

How, in turn, are appraisals determined? What accounts for one situation being perceived as pleasant or unpleasant, personally important or unimportant, or as likely or unlikely? To a large extent, such judgments reside in the individual and his or her personal beliefs (i.e., predispositions, biases, schemas, etc.). Such personal beliefs provide a lens through which we perceive our environment, and thus they strongly influence how a situation is interpreted. However, such generalized beliefs can also be overridden by situation-specific factors.

Implications for Practice: Appraisal Theory

Because emotions arise as a result of one's interpretation of a situation, you have the ability to influence your students' emotions by attempting to change the way they appraise classroom situations. How a student interprets their learning environment is predominantly influenced by how they perceive the situation through the lenses of preexisting beliefs about themselves and their world. For instance, a student who generally believes that she has a gift for math (i.e., her self-concept of ability in math is high) will likely perceive a math problem as solvable. Moreover, many students sooner or later will decide how personally important performance is in a specific school subject (e.g., with respect to their planned professional career). Also, the question of whether an outcome is considered a success or failure is dependent on the student, particularly on his or her expectations (e.g., if the student felt good about a test, getting a C might be disappointing, whereas if they were worried about failing, a C may result in feelings of relief).

However, the situation itself can also send strong "signals" that can determine one's perceptions of the situation. For example, even the student who strongly believes in her math skills may feel intimidated when the teacher warns the class about the difficulty of an upcoming test. Furthermore, an apparently unimportant test (i.e., low value) can easily become very important (i.e., high value) if students suddenly find out that the test will count toward a substantial portion of their final grade in that class. If possible, try to avoid undue emphasis on the difficulty of upcoming tests as well as such "unpleasant surprises," particularly as means of punishment, given that some otherwise successful students can experience strong negative emotions and failure as a result. Likewise, judgments about one's own performance in terms of success and failure can be strongly influenced by the situation — a C that at first induced disappointment can quickly be seen in a positive light when one finds out that most other students did poorly on the assignment.

A central task for you as a teacher is to create learning environments that result in emotionally "sound" appraisals of the learning environment. The way in which a learning environment or test situation is interpreted, for example, has a lot to do with how you have presented the situation to your students.

With a little bit of patience, in addition to effective and consistent feedback, you may even be able to positively affect your students' general beliefs about themselves and the classroom setting, and in turn, improve their emotional experiences. You are an important role model for your students and your own personal beliefs, as expressed in both verbal and nonverbal ways (e.g., facial expressions, tone of voice, and gestures), send messages to your students that make a stronger impression on them than you may think.

1.3.2. The Causes of Achievement Emotions: Weiner's Attribution Theory and Pekrun's Control-Value Theory

The psychologist Bernard Weiner is regarded as the founder of research on attributions. His theory and findings are of great importance in educational settings,

particularly with respect to students' motivation. Additionally, he has examined the emotional consequences of success and failure attributions (Weiner, 1985, 1986). In this context, attributions are almost identical to appraisals: They are the interpretations about the perceived causes of achievement outcomes. Weiner and his colleagues have examined numerous attributions individuals use to explain their achievement outcomes. As a result, they draw two key conclusions:

1. Success and failure themselves instigate immediate emotional reactions. Regardless of the perceived cause of performance, people tend to experience happiness after success and frustration or sadness after failure. As such, Weiner refers to these emotions as outcome-dependent emotions.
2. As soon as an individual begins to associate causes with achievement outcomes, he or she will experience more differentiated and specific emotions: Weiner refers to these emotions as attribution-dependent emotions.

Attribution researchers differentiate between three dimensions according to how individuals interpret the perceived causes of achievement outcomes: controllability (i.e., controllable vs. uncontrollable), locus (internal vs. external, i.e., the cause is within or outside of the individual), and stability (stabile vs. unstable, i.e., the cause is variable or persistent over time). According to Weiner, pride and shame arise, for instance, when one attributes success or failure, respectively, to subjectively internal, stable causes (e.g., to one's innate abilities or character). Furthermore, Weiner posits that external attributions for success or failure result in feelings of gratitude or anger, respectively. Stability, the third dimension in attribution research, is assumed to mostly influence expectations about future performance outcomes, and thus influences the experience of hope and hopelessness. In particular, if an individual attributes a past failure to an unstable cause (e.g., bad weather), he or she can still be hopeful that next time could be different. However, if the past failure is attributed to a stable cause (e.g., bad teacher), the student will likely feel hopeless and not expect that a different outcome will occur in the future.

Another important aspect of Weiner's theory is that we do not only search for the causes of our own successes and failures, but also for the causes of others' achievement. As such, attributions for others' performance can lead to one's own emotional experiences. For example, if a student of yours fails a test and you attribute this failure to a cause that is internal (to the student) and uncontrollable (by the student), you are likely to react to their failure with sympathy and pity — you feel bad for them because their failure is the result of an "inability." On the other hand, if a student fails a test and you attribute the failure to internal and controllable causes, then you will likely react with anger or contempt — the student could have done something to avoid failure and is responsible for his bad performance. With respect to someone else's success, on the other hand, an observer can either feel contentment (e.g., when the cause is seen as stable and internal to the observed actor) or surprise (e.g., when the success is seen as unexpected by the observed actor; for empirical evidence on this, see Graham & Weiner, 1986).

Implications for Practice: Attributions and Emotions

Because emotions arise as the result of attributions for achievement outcomes, you as a teacher have insight into your students' beliefs by observing their emotional reactions. Becoming more aware of your students' reactions to your performance feedback can help you to get to know your students and better inform your efforts to change their "maladaptive" attribution patterns into more "adaptive" ones.

Does a student thank you for a good grade? If so, it is possible that your student did not attribute this success to effort or talent, but rather to your assistance or generous grading. Be sure to let your student know that the grade was earned, as internal attributions for success generally lead to more positive motivational and emotional consequences than external attributions for success (e.g., higher levels of academic self-concept and pride).

Does a student appear to feel ashamed when he got a bad grade? If so, the student may attribute the bad grades to internal, uncontrollable causes (e.g., inadequacy) and believe that others think of him as stupid. Letting this student know that it's possible for him to do better next time (e.g., by trying a more effective learning strategy) is generally a helpful response, as controllable attributions for failure are better than uncontrollable attributions for improving subsequent motivation and emotional well-being.

As a teacher, you tend to search for the causes of your students' successes and failures, which can affect you emotionally. As a result, you also directly or indirectly let your students know about these attributions which can also influence students' beliefs.

Even if you feel sorry for your academically "weaker" students, try to avoid associating your feelings of sympathy with feedback about poor performance! Your sympathy signals to the student that you don't believe in him, and as a result, the student is likely to incorporate your internal, stable attributions for his performance into his own self-concept of ability.

In contrast, when students get a bad grade, mild displays of anger or related emotions may actually be more helpful! Although it is important to note that excessive anger is of course detrimental, displays of dissatisfaction or disappointment can in fact suggest to students that you believe in them and that you think they can do better; in other words, that you've attributed their failure to internal, controllable causes. Doing so can positively influence your students' self-concepts of ability and motivate them to try harder. In this case, the negative emotion of anger may have a positive influence on students when displayed in an appropriate manner.

While achievement emotions are not the primary focus of Weiner's theory, they are the key focus of Pekrun's control-value theory (Pekrun, 2000, 2006). Pekrun's theory is based on the appraisal theory. As such, in the control-value theory it is assumed that achievement emotions arise based on how achievement activities and outcomes are interpreted. Pekrun's theory extends beyond Weiner's theory by

considering appraisals more generally, and not solely the causes of past performance. Consequently, whereas Weiner's theory focuses mainly on retrospective emotions concerning past achievement outcomes (e.g., guilt, pride), Pekrun also takes into account currently experienced and prospective emotions (e.g., enjoyment, boredom, anxiety, hope).

The central assumptions of Pekrun's theory are reflected in its name in which two types of appraisals are considered to be most important for achievement emotions: one's subjective *control* over learning- and performance-related activities and outcomes, and the *value* attached to these activities and outcomes. What exactly is meant by these two types of appraisals within this theory is described in more detail below.

Subjective control refers to the extent to which one believes one is "in command" of a situation and its consequences; in other words, how much one can control these factors. Included in control appraisals are future-oriented expectations about the relationship between causes and their future effects (i.e., causal expectations) as implied by statements such as: "If I put in some real effort then I will do well on my upcoming physics exam" (high expectations of control); "I am just not good at physics; there's no way I will pass the exam" (low expectations of control). Control appraisals also include current perceptions of control such as when a student taking a test thinks, "Great! This is exactly what I studied!" (high control) or, in contrast, "I don't understand what the teacher means — I can't answer the question" (low control). Lastly, retrospective attributions for past performance, as outlined in Weiner's theory, can also be classified as control appraisals. Moreover, Pekrun's theory acknowledges that the locus of causation (the cause as originating from one's self or another individual) makes an important contribution to the overall perceived degree of perceived control. These appraisals are exemplified in statements such as "I failed the exam because I didn't study hard enough" (control: self) or "I got a bad grade because the teacher didn't ask questions about the material she said would be on the test" (control: other).

Value appraisals, on the one hand, refer to one's perception of whether an activity or outcome is judged as positive or negative. For instance, thinking "Thank goodness I didn't fail" is an example of a positive value appraisal. The same outcome, of course, could be judged in a negative manner by another student ("How horrible! I got a D!"). On the other hand, value appraisals also refer to how important and/or personally meaningful an individual perceives an activity or outcome to be. Failure is generally judged negatively; however, the severity of a failure can vary from situation to situation. For example, for most students, failing a final exam has more personal relevance than getting a bad grade in a noncore class. Value appraisals, therefore, always include a categorical evaluation (positive/negative) and a dimensional evaluation (more or less positive or negative).

Think for a moment about study or performance situations during college or in instructional situations as part of your daily responsibilities as a teacher — what kind of control and value appraisals can you think of in relation to specific aspects of being in college or being a teacher?

Control appraisals:

- As a college student: In which course do/did you feel in control? In which did you feel overwhelmed?
- As a teacher: What aspects of your teaching do you feel are under your control? Which aspects seem unpredictable?

Value appraisals:

- As a college student: What does your performance on your upcoming exams mean to you? Would a C be a sign of success? Would a B be a sign of failure?
- As a college student: How important is one of your upcoming exams? How personally meaningful would it be to do well or poorly on that exam?
- As a teacher: How would you rate your ''performance'' as a teacher if a student in your class shouted out the correct answer to a question? Would this be a success (because the student has learned from you) or failure experience (because the student didn't abide by the classroom rules in shouting out their answer without raising their hand)?

If you put yourself in these situations, you'll see that the emotions experienced by both students and teachers are very closely intertwined with the types of appraisals being made. Which appraisal combinations are associated with what emotions in an achievement context is the focus of the next section. Teachers' emotions will be more closely examined in Section 1.7 (''Teachers in Focus'').

Due to the sheer number of specific emotions experienced in the classroom setting, it is an enormous task to establish general rules that describe all the effects of control and value appraisals on emotions. Nevertheless, there seem to be three general mechanisms underlying the effects of control and value appraisals on emotional experiences: (1) The *categorical value appraisal* of an activity (pleasant or unpleasant) or an outcome (success or failure) determines the *valence of an emotion* (i.e., a positive or negative emotion is experienced). (2) The *control appraisal* determines the quality of an emotion, in other words, which discrete emotion is experienced (e.g., with regard to an upcoming test, having high perceptions of control results in feelings of anticipatory enjoyment, whereas lower perceptions of control result in feelings of anxiety). (3) The *dimensional value appraisal* of an activity or performance outcome, in combination with the control appraisal, determines the *intensity of an emotion*. With respect to value, the degree to which the situation is of personal relevance will affect how strongly both positive and negative emotions are experienced. With respect to control, the degree to which the situation is perceived as personally controllable will generally strengthen the experience of positive emotions and alleviate negative emotions. For example, the anger felt after failing a final exam should be more intense than the anger felt after failing a less heavily weighted test (because the final exam is more personally relevant). When two situations are equal in terms of personal relevance, feelings of enjoyment after success will be stronger in a

situation in which one feels more in control (e.g., after a test for which one studied hard) than in a situation in which one perceives lower control (e.g., passing a test based on sheer luck).

An exception to the points described above — that higher personal relevance translates into stronger emotional experiences and that high control alleviates negative emotional experiences — applies to the emotion of boredom. In fact, the more important an activity is to individuals, the less boredom they tend to experience (Goetz, Frenzel, & Haag, 2006). In addition, boredom can arise both in situations in

Table 1.2: Several achievement emotions and their typical appraisal combinations (adapted from Pekrun, 2006).

Emotion	**Situation**	**Control**	**Categorical value (valence)**
Anticipatory enjoyment	High expectation of success	High	Positive
Hope	Moderate expectation of success	Medium	Positive
Anxiety	Moderate expectation of failure	Medium	Negative
Hopelessness	High expectation of failure	Low	Negative
Activity-related enjoyment	Positive evaluation of current activity	High	Positive
Boredom	Negative evaluation of current activity (too easy or too difficult)	High or low	Negative
Anger	Negative evaluation of current activity	External	Negative
Outcome-related enjoyment	Success has occurred	N/A	Positive
Frustration/sadness	Failure has occurred	N/A	Negative
Pride	Success has occurred and is attributed to one's own ability	Internal	Positive
Gratitude	Success has occurred and is attributed to another individual's assistance	External	Positive
Relief	Unexpected success has occurred	Low	Positive
Disappointment	Unexpected failure has occurred	Low	Negative
Shame	Failure has occurred and is attributed to one's own (unchangeable) inadequacy	Internal	Negative
Anger	Failure has occurred and is attributed to another individual OR one's own (changeable) inadequacy; OR another individual's failure is attributed to their (changeable) inadequacy	External or internal	Negative
Sympathy	Another individual's failure is attributed to their (unchangeable) inadequacy	Internal	Negative

which perceived control is high (an individual feels underchallenged; having so much control that the situation becomes boring), but also it can arise in situations in which perceived control is low (the situation is absolutely out of one's hands and the individual just "tunes out"). The latter case is also referred to as boredom due to being overchallenged (Goetz & Frenzel, 2010).

Finally, every emotion can be characterized by the combinations of control and value appraisals that best predict them. In Table 1.2, we provide examples of several achievement emotions and their typical appraisal combinations involving controllability (high vs. low or internal vs. external) and value (positive vs. negative), as well as a short description of the achievement situation in which the emotion typically occurs.

Implications for Practice: Value Appraisals and Emotions

Due to the complex relationships between value appraisals and emotions, it is important to carefully consider whether and how one as a teacher can and should influence these appraisals.

Emphasizing the *importance of performance outcomes* (i.e., dimensional value; "This exam grade will count toward 25% of your final grade"; "Doing well on this exam is really important for your future educational career") can have ambivalent motivational and emotional effects for your students. On the one hand, such statements *increase the incentive to work hard on the task* (see also the expectation × value theory of motivation explained in Chapter 2). Additionally, they *induce stronger positive emotions when success is achieved* and *decreased feelings of boredom*. On the other hand, such statements also *increase the experience of negative emotions* before, during, and after the activity, such as anxiety, anger, and disappointment. In particular, when students' control appraisals are low, these well-intentioned statements can be emotionally problematic because they can increase anxiety or even hopelessness.

Emphasizing *competition* in an achievement context generally increases the value of performance outcomes, but is also associated with ambivalent emotional outcomes. For instance, competition *based on social comparison* ("Let's see who of you can do xyz the best/fastest etc.") is typically associated with *negative emotional consequences*. In such a case, success is in short supply because this type of competition implies that only one student can be the best. That is, one student's success is at the expense of everyone else's failure. Consequently, as most students will experience failure and therefore negative emotions, this is not balanced out by the few winners' feelings of joy. Instead, try to create competitive classroom activities that are *based on absolute criteria* ("Let's see who can do xyz in x number of seconds!"). Activities that allow success to be achieved by many students tend to be more emotionally beneficial on the whole. Another alternative is *competition between groups* in which individual success is (also) dependent upon team work. In this type of competition, winning is still related to feelings of enjoyment; however, failure is not associated with such strong feelings of frustration.

In general, it is advisable to emphasize the *value of an activity itself* (''That is really an interesting phenomenon''; ''Most students find this type of activity really fun'') or provide authentic tasks that have naturally high value due to their *everyday usefulness*. In doing so, one can expect positive emotions to increase and boredom to decrease.

1.3.3. Influence of the Social Environment on Achievement Emotions

As described earlier, appraisals and resulting emotions arise as a result of general beliefs and are also dependent upon the situation. Those interested in positively influencing students' emotions need to take into consideration how students' tendency to make certain types of appraisals develops and which situational factors lead to what appraisals. As described before, what individuals think about themselves, about school-related tasks, and also about the causes of their performance are critical factors that predict subsequent emotional experience in achievement settings. Thus, emotions are inevitably influenced by interventions aimed at self-concept, judgments about task difficulty, as well as attributions. Accordingly, the ''environmental influences on motivation'' described in Chapter 2 are of utmost importance also for students' emotional experiences. With respect to the social environment, various factors including parents, teachers, peers, and the media to which students are exposed are all important variables that influence their emotions.

Consistent with the possibilities to influence motivation described in Chapter 2, Pekrun (2000, 2006) makes several suggestions about how to positively influence achievement emotions based upon his control-value theory. He describes five aspects of the social environment that can influence control and value appraisals and thus achievement emotions. These environmental factors include (1) instruction, (2) value induction, (3) providing opportunities for autonomy, (4) others' expectations and goal structures, and (5) the feedback as well as consequences concerning students' performance.

Teachers (and also parents) can influence students' control appraisals by how they design their *instruction*. Presenting class material and activities (including homework, projects, etc.) in clear and understandable ways increases the chance that the content will be understood and learned. Consequently, students develop positive competence beliefs and feel better able to accomplish the demands of the class (high control), ultimately leading to a positive emotional experience. Furthermore, situational control appraisals can be influenced by the type and difficulty of learning activities, for example, familiarity with the test format. Familiar test formats are experienced as more predictable and allow for greater control over the outcome, whereas formats having unfamiliar content or structures can decrease perceived control and instigate negative emotions such as anxiety.

Value induction implies using socialization practices that influence students' beliefs and resulting appraisals concerning the importance of learning activities and performance outcomes (see also Brophy, 2008). For instance, one can influence

perceptions of value through verbal statements. When students are repeatedly told by their parents, teachers, or the media that certain domains (e.g., music, computer science) are important, then students' appraisals are likely to reflect these assumptions over time. Included here are also implicit and sometimes unintended or indirect messages about the significance of a given domain or behavior that can be conveyed both verbally and nonverbally. For example, students learn about others' value beliefs by hearing their reactions to success and failure (e.g., indifference signaling low value), and they also notice the types of topics chosen (and not chosen) for discussion. Finally, value induction involves designing learning material and problems that are more meaningful or useful to students (see Section 1.6 for more on designing emotionally "appropriate" learning environments).

As is also touched upon in Chapter 2, experiences of *autonomy* in the learning and performance context play a central role in determining what values and goals are adopted by students (self-determination theory; Deci & Ryan, 1985; Ryan & Deci, 2000). Self-selected activities are of greater personal relevance than activities dictated by others. Autonomy also implies designing tasks such that it is up to the individual how and when to complete them. As a result, students will believe they have the capability to control a situation, which in turn promotes the experience of positive emotions. One important criterion to foster such beliefs and emotions, however, is that students have the necessary competency to successfully accomplish the activity and that they are capable of self-regulating their behavior (see Chapter 3). Providing students with the optimal "amount" of autonomy in order to promote positive emotions is a challenge. For example, activities that provide a lot of freedom can be detrimental to positive emotions if they are too complex and poorly structured — in this case, students' control appraisals can actually decrease and lead to feelings of helplessness.

The experience of achievement emotions depends to a large extent upon the *expectations* an individual brings to an achievement activity. Parents, teachers, and peers can strongly influence the development of such expectations. Others' statements expressing high yet reachable expectations can increase one's own competence and control appraisals, and, consequently, positively influence one's emotions. Expectations from others that are too high, and particularly expectations associated with punishment if they are not reached, increase the importance of not failing and are thus emotionally disadvantageous. Furthermore, *classroom goal structures* can influence emotional experiences. Mastery goal structures (characterized by their focus on learning class material, personal improvement, and learning from mistakes) are more emotionally advantageous than performance goals, which are characterized by an explicit emphasis on performance assessments, use of social norms (i.e., comparing students to each other), public feedback about performance, preference for high-achieving students, and the use of competitive teaching methods (see also Linnenbrink, 2005). Empirical studies show students' anxiety to be higher in classrooms in which such competitive practices are more pronounced (Goetz, 2004; Helmke, 1983; Pekrun, 1983).

Finally, one of the most important sources of subjective control beliefs comes from *performance feedback and the consequences of performance*. Repeated success

feedback on a particular activity generally leads to the belief that one can master such activities. Consequently, individuals should feel in control of such activities and thus experience positive emotions when engaging in them. In contrast, repeated failure feedback on an activity generally leads to lower competence beliefs, decreased control appraisals, and thus negative emotions (anxiety, hopelessness). In addition, the consequences tied to success and failure can determine the personal relevance of these outcomes. As described above, outcomes with high personal relevance (e.g., having to repeat an exam following failure; public praise or monetary rewards following success) produce more intense positive as well as negative emotional reactions than outcomes with low personal relevance. As such, emphasizing negative consequences of failure can boost negative emotions and is generally not recommended. However, even positive consequences of success can have ambivalent effects, particularly when they are publically announced in class. Although such announcements may lead to positive emotions in those who do succeed, among those who are not successful, disappointment may increase. From a motivational-psychological perspective, announced rewards also tend to produce unfavorable results because they undermine students' beliefs that tasks were chosen autonomously (Deci & Ryan, 1985; Ryan & Deci, 2000).

Figure 1.5 displays an overview of the above described assumptions about the influence of the social environment on emotions in learning and performance contexts. As already stated, it is assumed that the main direction of effects begins

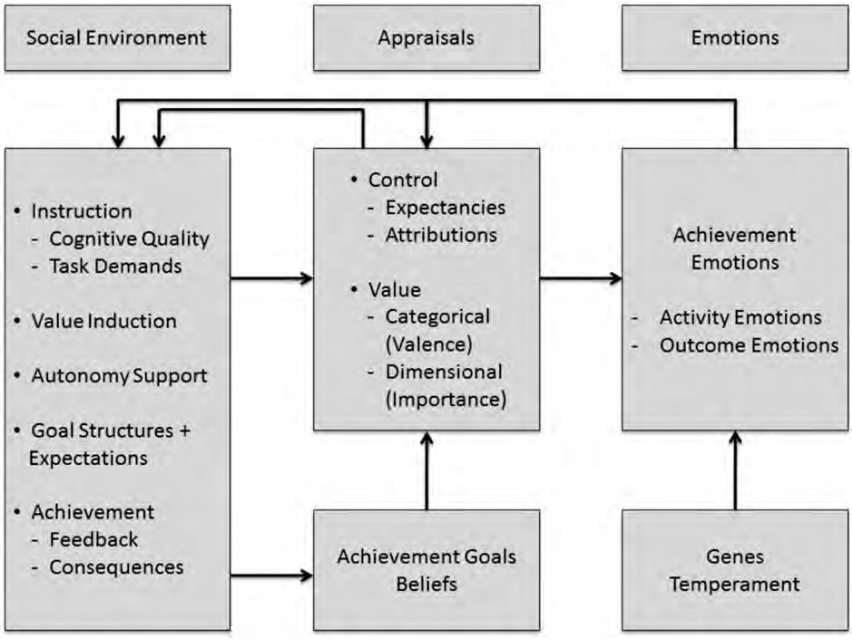

Figure 1.5: Overview of the causes of achievement emotions adapted from Pekrun (2006).

with generalized beliefs about oneself and the world that, in turn, influence cognitive appraisals which then influence emotions. The reverse direction, however, is also possible, as is depicted in the model with backward pointing arrows. Thus, it is also assumed that emotions can influence beliefs and appraisals. For example, a student who repeatedly experiences test anxiety, even if they prepared well for an exam, will over time believe less and less in their abilities, which in turn, will eventually have a negative effect on their control appraisals related to future exams. Emotions may also feed back to the social environment, as is exemplified in students who openly demonstrate helplessness and, as a result, are offered more support. In contrast, students who are excited and interested tend to engage in more teacher–student interaction and are given more leeway in terms of their classroom behavior. Finally, Figure 1.5 shows that in addition to appraisals, emotional traits (i.e., the tendency to strongly experience certain emotions) are also assumed to influence the actual experience of emotions in achievement settings.

Conclusion

The most well-known theoretical approach addressing the antecedents of emotions is appraisal theory. This theory proposes that emotions arise as the result of how we cognitively evaluate situations, activities, or ourselves. Two types of appraisals are most salient in regard to achievement emotions: control appraisals (e.g., judgments about one's own ability to master an activity; success and failure attributions) and value appraisals (e.g., judgments about the personal relevance of success and failure). The social environment also contributes to students' appraisals and subsequent emotions via processes such as instruction, value induction, autonomy support, expectations, and goal structure, and the consequences of achievement outcomes.

1.4. Effects of Emotions

Up to this point, the focus of this chapter has been on emotions themselves and what predicts them. However, emotions also exert powerful influences on numerous aspects of our lives. Take a moment and ask yourself: When and how in the recent past has an emotion colored your thoughts or influenced your behavior? Also, take a moment to think about which emotions you've observed in your students and how those emotions influenced their behavior or performance.

1.4.1. General Psychological Evidence about the Effects of Emotions

This section deals with the effects of emotions on thoughts and memory. As previously stated, emotions are central components of humans' well-being and are thus critical in daily life and for research. It is by evaluating the effects of emotions that

the importance of exploring them further becomes abundantly clear. For example, experiencing test anxiety is not only uncomfortable for a student, but also for their parents and can (in the worst case) lead to depression — an outcome with significant additional academic, personal, and clinical implications. In addition, if test anxiety prevents a student from accessing the knowledge they need to succeed on a test, thus causing them to perform poorly, this student may need to repeat an entire grade or risk not graduating. Thus, there are potentially devastating and far-reaching consequences of achievement-related emotions, such as anxiety.

To what extent does our performance depend on how we feel? This question has been examined both in research on mood and on memory. The most important findings from these two research areas are presented below.

In experimental *mood research*, individuals are generally primed to experience a positive, neutral, or negative mood in order to examine how such moods influence different cognitive processes. This type of "mood induction" is accomplished, for example, by showing individuals pictures or videos or by asking them to remember a time when they felt positive, negative, or neutral. There are different, often contradictory theoretical approaches on the effects of emotions; thus, the results from this research tradition tend to be mixed. On the one hand, it has been argued that one's mood — positive and/or negative — demands cognitive resources and therefore negatively influences performance. Several studies have shown both positive and negative moods (vs. neutral mood) to negatively affect attention and planning behavior. Similarly, studies have found that performance on tasks requiring significant cognitive reasoning were highest when individuals were in a neutral mood (vs. positive/negative mood; Meinhardt & Pekrun, 2003; Oaksford, Morris, Grainger, & Williams, 1996; Spies, Hesse, & Hummitzsch, 1996). Furthermore, it has been argued that positive and negative moods are associated with different cognitive processing styles that, depending upon the type of activity, can enhance or impede subsequent performance. According to this line of reasoning, negative mood should be associated with convergent, analytical, and detail-oriented thinking — a "deeper" yet more narrowly focused approach. In contrast, positive mood tends to be associated with divergent, heuristic ways of thinking that enable more flexible and creative approaches. Empirical studies have repeatedly shown that performance on verbal fluency tasks, or the ability to quickly switch between activities, is improved when people are in a positive (vs. negative or neutral) mood. However, evidence is still largely lacking regarding whether negative mood actually improves convergent thinking (Mitchell & Phillips, 2007).

In *memory research*, participants are generally given material to learn that is either neutral, positive, or negative in emotional valence (e.g., lists of words including "book, tree, house" vs. "happy, love, sunshine" vs. "hate, violence, guns"). The goal of this research is to examine how well such material is learned and remembered. Numerous studies have shown that positively and negatively colored material is learned and remembered better than neutral words (e.g., Burke, Heuer, & Reisberg, 1992). This is similar for autobiographical experiences — emotionally charged memories, both positive and negative, are remembered better. One reason for this phenomenon is that emotional stimuli involves the arousal of the amygdala, consequently affecting the cortex (the brain region responsible for focusing one's

attention) and the hippocampus (the brain region responsible for consolidating memory; see also Richardson, Strange, & Dolan, 2004).

Another well-known phenomenon is that of *mood-dependent learning* (Bower, 1981; Parrott & Spackman, 2000). In this research, a positive or negative mood is induced and then participants are asked to learn positively or negatively valenced material. These studies find that memory is enhanced when positive material is learned while one is in a good mood, and when negative material is learned while one is in a bad mood. Finally, studies have also found evidence for *mood-state-dependent recall* (Blaney, 1986). In these studies, different moods are induced and participants are asked to learn and recall mood-congruent or mood-incongruent material. Participants in the congruent conditions generally do better than those in incongruent conditions. Such information can be a helpful learning tip for students: For instance, memorizing a sad poem should be easier if one puts oneself in a "bad" mood (e.g., by thinking about a sad movie). Recalling the poem later (e.g., in front of the class) could also be facilitated by first thinking about the sad movie.

A drawback to all of these studies is that it remains unclear to what extent the *learning activity itself* influences one's emotional state (e.g., if the learning is experienced as enjoyable or frustrating). As such, learning and achievement emotions were not addressed in these studies. Furthermore, as the learning situations in these predominantly lab-based studies are artificial, generalizations to the school context are rather limited. In educational psychological research, however, the relevance of emotions for these outcomes has been given some attention as is outlined in the following section.

1.4.2. Applying Mood and Emotion Research to Learning and Performance Contexts

In Pekrun's (2000, 2006) theoretical model, consideration is also given to how emotions may impact achievement outcomes. He proposes three mechanisms: cognitive resources, learning strategies, and motivation.

First of all, it is assumed that negative emotions related to learning and achievement expend cognitive resources: Experiencing intense emotions while working on an activity means that attention will be drawn away from the activity, thus hindering performance. This is particularly the case for difficult tasks that require much attention. This assumption is empirically well established for the emotion of test anxiety (for a review, see Zeidner, 1998). In addition, it could be shown that feelings of anger while working on a task also require necessary resources, and thus negatively influence performance (see Goetz, 2004). As detailed earlier, mood research has shown that a positive mood can also use cognitive resources. In those studies, however, mood was manipulated externally to the task individuals were required to complete.

For positive task-related emotions (like enjoyment of learning), however, it's assumed that they actually help to *focus on the learning activity*. As such, experiencing a learning task as emotionally positive tends to result in better performance. When experiencing positive task-related emotions, one should be able to move quickly from task-irrelevant, emotionally colored thoughts ("Wow, this is really fun!") to task-relevant thoughts ("How should I tackle the next problem?")

while completing the task. When experiencing negative task-related emotions, however, one is likely to get distracted by task-irrelevant thoughts (''Hm, I don't really understand this, what a stupid task…'') and even drift off to completely irrelevant topics (''What am I going to do tonight?'') while completing the task.

Based on the evidence from mood research on the different processing styles resulting from positive versus negative moods, it is also assumed that achievement emotions influence students' use of *learning strategies*. Positive emotions, like enjoyment and pride, should be related to the use of effective, flexible strategies such as elaboration. In contrast, negative emotions, like anxiety and anger, tend to be more associated with rigid and less effective learning strategies such as rehearsal and rote memorization. Consequently, the more an assigned task demands flexible, transfer-oriented strategies, the more negative emotions will negatively influence performance. Moreover, it's assumed that emotions influence the degree to which individuals *self-regulate* their learning. Accordingly, positive emotions promote better autonomous learning and self-regulation, while negative emotions lead individuals to prefer externally given rules (e.g., Goetz, 2004). In the long run, self-regulated approaches to learning are generally associated with more academic success than other-dependent approaches (see Chapter 3). As such, the effects of emotions on self-regulation help explain the performance-enhancing effects of positive emotions, and performance-diminishing effects of negative emotions, with self-regulated learning acting as a mediational process.

Emotions in achievement settings are also closely related to one's motivational approach to learning, particularly intrinsic and extrinsic motivation. Whereas intrinsic motivation implies ''learning for its own sake,'' extrinsic motivation implies learning to achieve desired consequences or avoid undesired consequences (see Chapter 2). Positive, task-oriented emotions such as enjoyment of learning make a learning activity feel rewarding, thus promoting intrinsic motivation and persistence in the face of academic challenges and setbacks. In addition, when we experience positive, outcome-related emotions in achievement situations (e.g., anticipatory enjoyment or hope at the thought of success), we feel inspired to invest effort toward our achievement goal (e.g., getting a good grade) — which is related to extrinsic motivation. In sum, as a result of increased intrinsic and extrinsic motivation, one can expect performance-enhancing effects of positive emotions. In contrast, in learning and achievement situations where negative emotions, such as boredom or hopelessness, are more evident, both intrinsic and extrinsic motivation are expected to be lower. From this perspective, negative emotions should result in significant declines in performance via their effects on motivation. One exception, however, are the so-called ''negative-activating'' emotions (Pekrun, 2000), such as test anxiety. On the one hand, test anxiety does decrease intrinsic motivation, since feelings of uneasiness and worry during learning are simply incompatible with the experience of ''learning for its own sake.'' On the other hand, anxiety also implies a strong desire to avoid the feared consequences of failure (extrinsic motivation) and thus sometimes increases effort. All in all, one can expect comparably mild negative performance effects from negative-activating emotions such as anxiety. However, it is important to bear in mind that in the long run, academic success is unlikely when one is mainly motivated by such externally driven, failure-oriented cognitions and emotions (see Chapter 2).

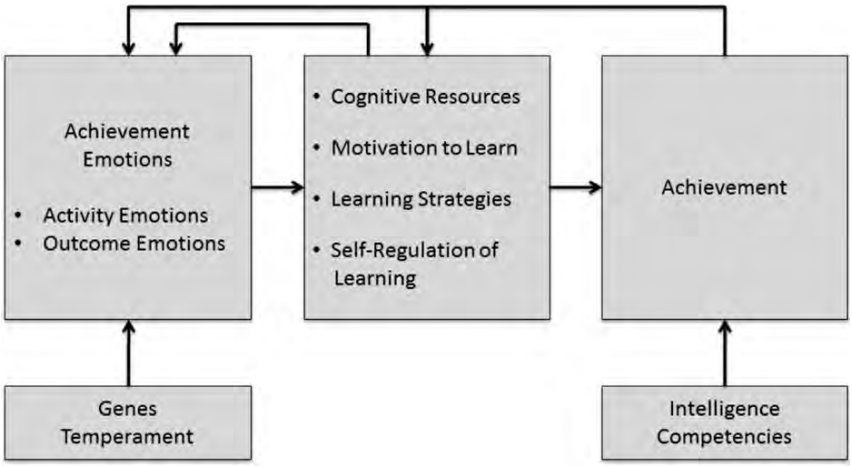

Figure 1.6: Overview of the effects of achievement emotions according to Pekrun (2006).

Figure 1.6 presents a summary of the described effects of emotions on performance. The primary assumption underlying this model is that emotions influence academic performance via their effects on cognitive resources, learning behaviors, and motivation. However, it is also assumed that the reverse holds true, as is again indicated by backward-pointing arrows. For instance, it can be assumed that a learning-related task is more enjoyable when more cognitive resources are available, such as after a good night's sleep (cognitive resources affecting emotions). Furthermore, it is particularly difficult to establish a clear directional relationship between motivation and emotions since there is a large amount of conceptual overlap between the two phenomena. As described earlier, many definitions of emotions entail a motivational component. Conversely, affective experiences are at the core of several motivation theories, for example, the feeling of enjoyment when being intrinsically motivated or the feeling of anxiety when in a state of avoidance motivation. Overall, one of the main messages of this handbook is that teachers should consider *why* students show certain types of achievement-related behavior (motivation), and *how* students organize their learning (self-regulation), while keeping in mind that an important key to answering these questions is also thinking about *how students feel* while they are engaging in achievement-related activities (emotions).

Conclusion

Emotions influence how we perceive the world, our thoughts, and our behavior. Evidence from brain, mood, and memory research demonstrates that relationships between emotions, learning, and achievement exist. With respect to the school context, it can be assumed that emotions influence performance via their effects on cognitive resources, learning strategies, self-regulation, and motivation.

1.5. Development of Emotions over the School Years

How does the frequency and intensity of emotions develop across the lifespan? What do children of different ages know about emotions, their causes, and their consequences? How can they deal with their own emotions and the emotions of those around them? These and related questions fall within the domain of emotional development and emotion regulation, an extensive and growing research domain (for an overview, see Sroufe, 1997; Gross, 2006). In this chapter, we highlight only the central aspects of this literature dealing with the development of achievement emotions.

Emotion research dealing with early childhood and pre-school-aged children focuses mainly on the experiences of pride and shame (Lagattuta & Thompson, 2007; Lewis, 2000). Findings from this research show that children's emotional development progresses from the pleasure taken from the mere experience of producing effects (e.g., turning a knob opens a door) at age 1 to being able to experience, articulate, and differentiate enjoyment from pride, and shame from frustration, by age 3. The mental processes responsible for this development during these years stem from awareness of the self, recognition and adherence to external standards of performance, and internalization of these standards as part of evaluating one's self. These abilities continue to improve between the ages of 3–5 primarily due to speech development, as children become better able to identify standards, as well as recognize and label specific emotions in themselves and others (e.g., pride vs. shame). Nevertheless, children in this age range still find it difficult to differentiate between pride and enjoyment, and tend to express positive emotional reactions following any type of success regardless of how it was achieved (e.g., effort vs. low task difficulty). Such differential reactions based on the perceived causes of success or failure are typically found at around eight years of age.

Little is known about the intensity and frequency of the experience of other achievement emotions at the start of school. The few longitudinal studies that exist demonstrate unequivocally that negative emotions increase over the course of schooling, whereas the intensity and frequency of positive emotions tend to decrease. In particular, test anxiety appears to increase sharply across the elementary school years and then remains relatively constant in the middle to high school years. In contrast, enjoyment of learning tends to decrease as soon as children begin school and then levels off around eighth grade (Helmke, 1983; Pekrun, Frenzel, Goetz, & Perry, 2007). This finding is similar to that found for (academic) interest, which drops drastically in the first years of school and declines only moderately during secondary school (Frenzel, Goetz, Pekrun, & Watt, 2010; Watt, 2004).

Different theoretical attempts have been made to explain these generally unfavorable trajectories of emotional development. Self-concept research proposes that during elementary school, students go through a (painful) developmental process: They come to school full of curiosity, interested in everything, and with unrealistically high expectations of what they can achieve. Many of them then subsequently encounter repeated failure experiences and during this painful process gain insight into their own limitations (Helmke, 1983; see also Butler, 2005, for

details on self-concept development). These failure experiences are themselves emotionally negative and the resulting lower (more realistic) self-concepts correspond with lower control appraisals and negative emotions.

In addition, the demands placed on students increase upon entry into secondary school (particularly in honors and gifted courses), thus requiring students to invest more effort to fulfill their own expectations, and those of important others (e.g., parents, teachers). This increased effort investment naturally implies emotional costs. Moreover, adolescents' interests outside of school are often in competition with school responsibilities. As a result, students' enjoyment of, and interest in, school work typically decreases and feelings of boredom in school increase.

It has also been shown that changes in teaching style and classroom climate contribute to the increase in negative emotions over the school years. Quite a few studies have shown that higher grade levels also correspond with greater competition that, in turn, promotes more "traditional" teacher-centered instruction and decreases personal contact between teachers and students. However, there exists very little research showing that such relationships actually contribute to students' detrimental emotional development over time.

Longitudinal studies that examine such questions are very complex (and costly) and the results from these studies are often confounded by methodological problems: Students typically complete the same questionnaire numerous times, sometimes over years, to find out whether and how their responses to these (identical) questions change. Although this method provides much needed consistency, students' perceptions of what these questions mean can actually change from year to year. In one of our studies, for instance, we found that students' conception of "interest" changed from fifth to ninth grade. For younger students, the affective component of interest was most salient ("Interest means that I have fun doing something"), whereas for older students, the cognitive component of interest was most critical ("Interest means that you do something voluntarily and that you do it well"; Frenzel, Pekrun, Dicke, & Goetz, 2012). If the underlying meanings of the concepts that researchers want to investigate in students change from one grade to the next, it becomes difficult to draw firm conclusions about the quantitative development of these constructs over time.

One last empirically and theoretically established factor that is possibly responsible for the change in achievement emotions over the school years are reference groups. Students are typically motivated to judge their own performance based on how it compares to their classmates' performance (for an overview, see Harter, 1990; Marsh, Craven, & Debus, 1998). These self-evaluations, in turn, influence control appraisals and achievement motivation. As a result, when children change from one reference group to another, this brings about changes in students' emotional experiences in school. This is the case, for instance, when high-achieving students move from heterogeneous classes in which they outperformed most others, into honors or gifted courses in which students' overall achievement is higher. As a consequence, these students now judge their ability in relation to others of equal or higher ability, resulting in more negative emotional consequences (anger, anxiety). Studies by Preckel and colleagues have shown such effects for students

entering gifted classes. However, they also showed that such a change in reference group corresponded with lower boredom due to being underchallenged for these students — at least in the beginning (Preckel, Goetz, & Frenzel, 2010). From this perspective, one should cautiously consider whether it is in a student's best interest to transfer into a high-achieving school or class. Although honors and gifted classes promise demanding and cognitively optimal learning environments for a student, this change is also likely to come with significant emotional and motivational costs to the student. In contrast, transferring students into academically "weaker" classes can, in some instances, have positive emotional and motivational outcomes due to more favorable performance comparisons with one's classmates. The main idea is that students' motivation, emotions, and resulting performance depend, to a considerable extent, on the capabilities and performance of those around them.

Conclusion

Very young children are able to experience and express enjoyment after success, and sadness or frustration following failure. Toddlers and preschool-aged children overestimate their own abilities and are thrilled to learn. After starting school, however, the development of achievement emotions becomes more negative: Enjoyment of learning strongly decreases, and negative emotions such as anxiety, anger, and boredom increase. These trends are particularly influenced by students' reference groups.

1.6. Opportunities for Influence: How to Design an Emotionally "Healthy" Classroom

When was the last time you loved to learn? Think about when you were a student in school or your experiences as a teacher: How did it feel when everything just "clicked" and learning was truly fun? In this situation, you may be sitting on the edge of your seat, especially engaged in learning activities, feeling as if time is passing quickly, and feeling excited about the next class. Think for a moment about a class you attended that made you feel like this. What did that teacher do to make that class or material so enjoyable?

In order to influence students' emotional experiences, one first needs sound assumptions about the causes of emotions, and then one needs effective techniques for influencing emotions themselves, or the causes of emotions. In the next section, techniques are presented that are meant to help teachers promote optimal emotional experiences in students. First and foremost, we focus on attempts to increase students' positive emotions in the classroom. Based upon the control-value theory of achievement emotions by Pekrun, emotions arise as the result of subjective appraisals

about the controllability and value of learning activities and their consequences; thus, optimizing these factors should improve students' emotional experiences. In addition, supporting students' emotion regulation capabilities, and experiencing positive emotions oneself as a teacher, is also assumed to positively influence students' emotions.

1.6.1. Promoting Enjoyment of Learning in the Classroom

Without resorting to "songs and dances," it's important for teachers to periodically ask themselves how and if classroom material can be made more interesting for students and how learning can be made more enjoyable. One key to achieving this goal is by introducing humor into the classroom. As a rule of thumb, it is recommended to have students laugh at least once an hour (but not at the expense of a classmate!). Before jumping into class material, try and come up with a funny or entertaining association you have with the material and then build these jokes or stories into your lesson plan. Try to incorporate funny or well-known (comic) figures into classroom material. Don't take yourself too seriously (e.g., see humor in your own faults). Role-play occasionally for your students; for instance, come to class dressed up as Napoleon, or even as a movie character. Don't worry that doing so will somehow undermine your authority or disturb your lesson plan. In one of our studies, we found that students in classes in which the mathematics teacher agreed with the statement, "Humor and fun play an important role in my class" found their teachers' explanations to be more clear and coherent and also reported feeling closer to their teachers than students whose teachers indicated that humor played a less important role in class (Frenzel, Goetz, & Pekrun, 2008).

1.6.2. Ways to Influence Control and Value Appraisals

How can we help students develop more positive subjective control beliefs? Under what conditions do students experience learning and performance outcomes as controllable? To optimize students' perceptions of control, it is important that they perceive classroom events as predictable, and that they are certain that specific behaviors will reliably produce desired effects (i.e., that they have control over outcomes through their behavior). It is expected that as control appraisals increase, students' positive emotions will also increase and their negative emotions will decrease. In the following section, several examples of how teachers can facilitate perceived control in students are highlighted.

Suggestions for how to positively influence students' control appraisals

- *Clearly structure lessons.* To maintain optimal perceptions of control, it is important that the goals of your lesson are understandable and clear, organized coherently, and that the learning activities used to achieve them are well adapted to the material. Consequently, it is imperative that teachers clearly communicate

these goals as well as the tasks and roles students are expected to carry out. For instance, at the beginning of the year, you can inform your students about the topics to be covered in the upcoming semester and approximately how long each topic will take. At the start of each new topic, or even better, each new class, explicitly remind students of the goal for that lesson. Identifying the subgoals already achieved, and summarizing how far the students have come with the material at the end of that class or topic, can also help to improve students' control perceptions. Task clarity can also be optimized, for instance, by having your colleagues take a look at your lesson plans and assignments, by critically analyzing the questions you want to ask in class, and by preparing different ways in which questions can be phrased. When posing questions to your class, waiting at least three seconds until calling on someone and making sure that all students have an opportunity to participate in class discussions are particularly important for promoting weaker students' control beliefs.

- *Clearly formulate performance demands*. As you know from your own experience, tests and exams always contain an element of unpredictability and uncontrollability. This is of course inherent in the roles of "examiner" (the one who gives the questions and has control) in contrast to the "examinee" (the one who answers and is at the mercy of the examiner). However, you are in a position to attenuate these conditions and thereby promote students' perceptions of control. Try to avoid presenting tests and exams as threats or punishment. Make it clear what material will be covered in your exams, how many points each question is worth, and how many points are needed to achieve certain grades — particularly for passing the exam. Optimally, you can provide pre-exam topic summaries in class or sample tests to review outside of class and provide students beforehand with a rubric telling them how points are distributed throughout exams, and how many points are needed to pass or achieve certain grades. Such a criterion-oriented grading policy promotes perceptions of control among the students. By contrast, if grades are determined by how performance is distributed in the class, students' feelings of control will tend to decrease because the performance of others is largely uncontrollable by the student.

- *Clearly distinguish between learning and testing*. Many students believe that they are constantly being tested when they are in the school setting. In this situation, students can feel that posing questions about class material, or giving wrong answers to teachers' questions, indicates incompetence and may result in lower grades, leading the student instead to avoid asking questions if something is unclear. However, asking (comprehension) questions in class is of course strongly related to academic success and teachers should want to promote this behavior in the classroom. In order for students to not associate answering or asking questions with potential failure, it's helpful for the teacher to make it clear when it is time to "learn" — that is, a time in which errors are seen as a means of learning and do not count toward students' grades — and when it's time to be "tested," that is, when learning is evaluated.

- *Design "open" learning opportunities*. Provided that tasks are clearly defined, students' control beliefs can be positively influenced when they feel able to set their own learning goals and can use their own strategies to achieve their goals. Students feel less efficacious when they can only achieve goals via a strict, predetermined path, as compared to when they achieve a goal using their own means. It is generally beneficial for student outcomes when they are allowed to find their own solution to problems (even if you disagree with some of their methods). Projects that are completed over a longer period can be an effective way to promote students' goal setting and striving and resulting positive learning emotions, as long as they are helped with setting subgoals and applying various learning strategies to reach their goals.

- *Communicate controllable causes of success and failure*. For students, ascribing success or failure to controllable or uncontrollable causes (attributions) depends to a large extent on how these causes are communicated by teachers. In the short term, attributing failure to uncontrollable, external causes ("bad luck") can be psychologically advantageous, as is attributing success to uncontrollable, internal causes ("I'm just good at these types of problems"). However, for long-term academic success and emotional stability, particularly in novel circumstances, it is most advantageous when both success and failure are attributed to controllable, internal causes such as effort and strategy use. Teachers can promote these adaptive attributions through the type of feedback they give to students (oral and written comments directly in the context of performance feedback). Adaptive success feedback could be, "Great job! You were really well prepared and you concentrated well on the task," whereas optimal failure feedback could be, "Too bad! Next time you should memorize the vocabulary words better; do you use notecards at home to test yourself on the words?" (see also Chapter 2).

Suggestions for how to positively influence students' value appraisals

As already discussed earlier in the chapter, one should proceed with caution when attempting to influence students' value appraisals because as the value of academic outcomes increases, so does the intensity of both positive and negative emotions. However, emphasizing the value of learning activities — not learning outcomes — tends to have clear positive emotional effects. Below are a few possibilities for how teachers can make learning activities more attractive for students.

- *Direct communication*. The meaning, importance, and attractiveness of a learning task can be directly communicated to students, for instance, with statements such as, "This is a really interesting topic." As long as you are expressing your genuine feelings about the topic (i.e., you really *do* think the topic is interesting), there's no reason to worry about sounding like a cliché. It is also effective to emphasize the novelty and possible ambiguity of a new topic or material to make it more enticing, for instance, by saying, "This topic is very different from how it appears at first glance," or, "Even researchers aren't really sure about this phenomenon."

Sometimes you may also have to remind yourself as a teacher why a certain topic is interesting, particularly if you've taught it numerous times before, or if the material seems simplistic. You are doing yourself and your students a favor by consciously evoking the meaning and value of a specific topic and planning in advance how you are going to highlight these values in your lesson plan.

- *Authentic tasks*. Simply adding columns of numbers together is not an attractive task. Finding out how much money one has earned after selling old CDs or clothes in a garage sale is much more relevant — even if students only imagine the situation and work on it as a word problem. Using strategies that incorporate students' real-world experiences is a well-used technique in the math domain. However, such strategies can also be effective in other domains to increase the value of school tasks and to increase positive emotions such as enjoyment of learning, and decrease negative emotions like boredom. One difficulty that teachers often encounter with this strategy is knowing which "real-life situations" actually apply to their students (e.g., do students still know what garage sales are, or instead use eBay to sell used items?), and then using these situations as effective settings for teaching material. Ask your students which topics are currently important to them and give them the opportunity to participate in the process of finding out in what ways school topics and skills can be relevant for daily life. Empirical evidence attesting to the effectiveness of this intuitively plausible method comes from a study by Hulleman and Harackiewicz (2009) published in the highly reputable journal *Science*. They randomly selected ninth graders who filled out a short diary every three to four weeks for an entire school year about how their science class content was useful for their own lives (experimental group). Another group filled out a short diary in the same time frame, but focused only on what they learned in science class (control group). The results showed that — particularly for weaker students — interest and performance increased in the experimental group, whereas no changes in interest were observed in the control group.

- *Offering students choices*. Many consider it a helpful parenting tip to allow a child to choose what jacket to wear rather than simply demanding that the child put on a jacket. Being able to choose makes the situation more personally relevant and avoids undue focus on accomplishing an assigned, and potentially undesirable, activity. Offering your students choices whenever possible can be an effective means of fostering perceptions of value and emotional engagement. However, as opposed to posing open questions such as, "What do you want to do?" offering alternatives should sound more like, "Would you like to do A or B?" Try to allow each student to make her or his own choice and, whenever possible, avoid letting the majority dictate what the whole class will do which can lead to negative consequences for those students who did not prefer the task. As opposed to dictating learning activities, allowing each student to choose between a few options can enhance the personal relevance, and sense of ownership, concerning the learning experience.

- *Avoiding socially referenced (competitive) performance feedback*. Socially referenced feedback such as, "You are better/worse than most of the other students"

emphasizes the value of performance outcomes, but adds a caveat to personal success and dampens its resulting positive emotional consequences (as discussed earlier in this chapter). As an alternative to this approach, providing students fact- and task-based competency feedback, for example, ''Your definitions were very clear'' or ''You need some more practice solving these types of problems'' tends to be perceived as more personal and meaningful by students. These types of statements focus on the personal meaning of the task, while minimizing the focus on positive and/or negative achievement outcomes as well as social comparisons.

1.6.3. Supporting Emotion Regulation

Even when everything appears to be just perfect — interesting topic, enthusiastic teacher, challenging tasks — negative emotions in the learning and achievement context are unavoidable. Thus, despite the importance of teachers investing effort to promote positive emotions and to minimize negative emotions in their students, it is also important to support students' attempts to regulate their own emotions. Emotion regulation includes promoting and maintaining positive emotions *and* conquering negative emotions (the latter is referred to as ''coping'' in psychological research; see Zeidner & Endler, 1996). In general, knowledge about emotions and how to cope with them develops early in the child–parent relationship. Nevertheless, teachers can support students in dealing with their emotions in relation to academic challenges, with some strategies for doing so highlighted below (Goetz, Frenzel, Pekrun, & Hall, 2005).

- *Emphasizing the importance of emotions and emotion regulation*. In contrast to ''hard measures'' such as performance and competence, factors such as emotion and motivation are often overlooked during classroom instruction. Discussion of emotions in the classroom can help to make students aware of their emotions, and also seek assistance in dealing with them. For instance, through class discussion of emotion topics, students should be able to better identify feelings of test anxiety before they become too severe, and enact effective coping strategies sooner which can prevent negative achievement consequences. Make some time in class to discuss emotions and emotion regulation in regards to learning and achievement issues, for instance, by having students interview each other about these topics or by having them create a story or skit in which emotions are effectively addressed (e.g., a comic strip about test anxiety).

- *Communicating the controllability of emotional experiences*. Just as many students come to the (often incorrect) fatalistic conclusion that they are simply ''not good'' at a certain subject, many students also feel destined to experience certain emotions, particularly anxiety. In contrast, numerous studies have found test anxiety to be one of the most treatable problems and suggest a number of effective ways to combat it. Teachers can assist students by demonstrating that one can have control over one's emotions in achievement settings, for example, by telling students about their own experiences with test anxiety. When doing so, it is important to let students know that dealing with emotions is an active process

whereby an individual exerts control over their emotion by modifying their own thoughts and behaviors.

- *Practicing emotion regulation strategies*. As a "learning coach," teachers are responsible for not only teaching their students new material, but also teaching them specific methods for managing their emotions during challenging learning and evaluation activities. One way of fostering such self-regulation is through explicit instruction and practicing of emotion regulation strategies in the classroom. For instance, you could do a short relaxation exercise with students prior to an exam, or play calming music during difficult independent learning activities to minimize anxiety and improve concentration. You can also help your students to engage in self-instruction in order to motivate themselves and avoid intrusive emotion-inducing thoughts during tests and while studying. For instance, reading small self-written notes during exams, such as "I am well prepared" or "Don't rush! Read the entire question before responding" can be helpful. These types of techniques have specific beneficial effects on emotions which is why they are called "emotion-oriented" strategies. In addition, it can be helpful to change the learning situation in which negative emotions are triggered in order to minimize destructive negative emotions or promote positive emotions (so-called "problem-oriented" strategies). Included in these types of strategies are asking for help, and actively designing the situation to make it more emotionally comfortable. Enable students to use these techniques as often as possible in the classroom: Make sure students feel free to ask questions; discuss with your students if and why they think a certain topic is boring and what could possibly be interesting about that topic.

1.6.4. Expressing Performance-Enhancing Emotions

Several studies have shown that emotions are contagious and can be transmitted through social interactions. As such, it is logical to think that teachers' and students' emotions reciprocally influence each other. For example, if a teacher gets angry in class and displays anger, then students will also likely be irritated which, in turn, can further aggravate the already upset teacher. In contrast, if a teacher feels and expresses genuine enjoyment, enthusiasm, and curiosity about a subject, this "spark" can "fly" to students and awaken their own enjoyment and curiosity about the subject (for empirical support for this phenomenon, see Frenzel, Goetz, Lüdtke, Pekrun, & Sutton, 2009; see also Section 1.7).

From their teachers, students can learn what it means to be excited about learning, how to deal with anger and frustration, and how to effectively deal with the emotional consequences of failure. If you as a teacher get angry with a student, expressing this emotion clearly, regaining your focus, and then returning to your lesson can be a good way of demonstrating that control over one's emotions is indeed possible. Another thing you can do is tell your students how nervous you get when you are observed (e.g., by the principal) and explicitly describing specific methods you use to cope with this nervousness in those types of situations.

Think for a moment about the strategies mentioned in the previous sections; are there ones that you have used before in your own class? How effective was the technique for positively influencing the emotional climate of your class? Ask a colleague to come to one of your classes to observe students' emotions during your lessons. Doing so can provide you with valuable feedback about the effectiveness of the techniques you are using.

Conclusion

Teachers have the opportunity to positively influence their students' achievement emotions. Humor, enthusiasm, and enjoyment should play an integral role in instruction. Moreover, students' emotions can be indirectly positively influenced by optimizing control and value beliefs. In addition, teachers can support students' emotion regulation, and performance-enhancing emotions may be augmented by teachers' own authentic emotional experiences.

1.7. Teachers in Focus

Teachers themselves serve as the focus of the last section of this chapter — after all, teaching and learning is not only infused with emotions for students, but also for teachers. Teachers, just like students, experience successes and failures as part of daily school life, and thus repeatedly feel happiness, sympathy, and anger, etc. Therefore, any discussion of emotions in the classroom should also focus on those experienced by teachers.

There is an obvious lack of research addressing teachers' emotions. It is interesting to note that whereas research has extensively evaluated teachers as "experts" concerning their subject and pedagogical knowledge, research exploring the teacher as "human" in having positive and/or negative emotions and related experiences is, to date, very limited. One exception to this lack of empirical research is research on stress and "burnout" that has been relatively well researched among individuals in social professions, including teaching (for an overview, see Vandenberghe & Huberman, 1999). For practicing as well as prospective teachers, job-related stress is no doubt an important topic, and as such, is addressed in the following section.

Employment-related stress has long been considered problematic due to its devastating consequences for physical health, psychological well-being, job performance, as well as persistence and attrition. In addition, we believe it is important to consider how teachers' emotions influence behavior in the classroom most generally and outline below a model by Frenzel and colleagues (Frenzel, Goetz, Stephens, & Jacob, 2009) that describes reciprocal relationships between teachers' emotions, instructional behavior, and students' classroom behavior. This conceptual model is

particularly useful in providing several implications for how teachers can establish an emotionally "healthy" classroom for themselves (and their students).

1.7.1. Burnout and Job-Related Stress

General definitions. In classical definitions, burnout is defined as the endpoint of a developmental trajectory that starts with enthusiasm and ends in experiences of frustration, disillusionment, and apathy. Burnout refers to a condition of emotional exhaustion that corresponds to reduced ability to work, increased frequency of psychosomatic illness, depression or aggression, and a greater likelihood of addiction. The term "burnout" was coined in 1974 by Herbert Freudenberger who noticed that individuals in professions whose work requires continuous contact with other people (doctors, nurses, emergency medical technicians, teachers, social-workers, etc.) seemed most prone to miss work or took early retirement because of health-related issues. Freudenberger identified high job-related stress, coupled with strong personal engagement, as the cause of these problems. It was his hypothesis that this specific combination of personal- and job-related factors leads to burnout in these individuals.

A well-known theory of burnout was also proposed by Christina Maslach (Maslach, 1982; Maslach & Jackson, 1981). Based on her research, the burnout syndrome comprises three separate components: emotional and physical exhaustion, depersonalization, and reduced personal accomplishment. Consequently, individuals suffering from burnout experience high levels of negative emotions toward their colleagues, students, clients, etc., and feel highly physically drained. This, in turn, leads to cynicism and withdrawal from social life. Moreover, efforts at work are often reduced to a bare minimum and challenges or problems tend to be avoided, both of which lead to declines in work productivity.

Although the phenomenon of burnout has been rather thoroughly studied, the topic remains controversial in psychological research today. For instance, some psychologists argue that the symptoms accompanying burnout overlap extensively with those related to depression. In clinical terms, it is almost impossible to distinguish between burnout and depression. Furthermore, the term burnout so far is not used as a clinical diagnosis in renowned diagnosis handbooks like the World Health Organization's (WHO) International Classification of Diseases (ICD) or the Diagnostic and Statistical Manual of Mental Disorders (DSM). Critics thus often refer to burnout as a "fashionable disease"; a more socially desirable term than depression. As such, one could assume that many individuals who suffer from burnout actually suffer from depression. In addition, it is important to note that the central characteristic of burnout — that individuals' emotional experiences start with enthusiasm and turn into frustration, disillusionment, and apathy — does not apply to many who suffer from this syndrome. For instance, many student teachers experience exhaustion throughout their university studies. In this respect, it is perhaps more precise for some individuals to say that they generally have low capabilities for coping with stress, rather than to say that they once "burned" with

enthusiasm and then flame out, which is more indicative of a trait-like, and less trajectory-oriented, description of burnout. In line with this is the theorizing of Uwe Schaarschmidt, a well-known researcher who studies job-related stress in teachers. He distinguishes between two risk patterns of job stress (e.g., Kieschke & Schaarschmidt, 2008; Schaarschmidt & Fischer, 2003) that differ in terms of high versus low early-onset idealism and (risk pattern A versus B, see below for more details).

Measuring burnout and occupational stress. The subjective experiences of job pressure are generally assessed by self-report measures (see above for the general assessment of emotional experiences). Below we present two well-known measures that assess burnout and job-related stress, the Maslach Burnout Inventory (MBI) from Maslach and Jackson (1986) and Schaarschmitdt and Fischer's "AVEM: Pattern of Work-related Coping Behavior" (Kieschke & Schaarschmidt, 2008; Schaarschmidt & Fischer, 2003). It is important to note that only school psychologists or other trained individuals should administer these tests, because they need to be administered and interpreted in a standardized fashion in order to make an accurate diagnosis. Although it can be helpful to reflect about oneself based upon these tests and theories, we would like to advise against any type of self-diagnosis.

Maslach and Jackson developed the "Maslach Burnout Inventory" based on their three-component theory of burnout. This measure assesses the components of emotional exhaustion, depersonalization, and personal accomplishment using nine, five, and eight items, respectively (see Table 1.3 for sample items). Respondents rate the 21 items regarding how often they experience the situations described on a scale from one ("never") to seven ("every day"). Each component is calculated as a separate score — no total scale for burnout is calculated. Based on the authors' criteria, individuals with a high degree of burnout are those who have high scores for exhaustion and depersonalization, and low scores for personal accomplishment. These scales have been tested on over 10,000 professionals in a variety of occupations and are thus interpreted based on norms for individuals who work in schools, higher education, social work, medicine, and psychiatry, among others. Using these norms, it is possible to identify to what extent one's scores are above, at, or below the mean relative to individuals in the same profession.

The AVEM from Schaarschmidt and colleagues is a broad measure that assesses perceptions of stress in relation to work. The questionnaire is made up of 11 scales, with a long-form consisting of six items per scale, and a short-form including four items per scale (see Table 1.3 for sample items). For each statement, participants indicate how true it is of them on a scale of 1–5. Most individuals, according to the authors of this scale, fall into one of four configurations in terms of their responses (a so-called typological approach). The first is the "healthy type" (pattern G) in which individuals score high but not the highest on professional commitment (defined as the subjective significance of work, professional ambitions, tendency to persist, striving for perfection), and indicate a high ability to distance themselves from work-related demands (emotional distancing). Individuals in this category are

Table 1.3: Sample items from the MBI (Maslach Burnout inventory and the AVEM (Pattern of Work-related Coping Behavior).

Measure	Subscale	Sample item
MBI	Emotional exhaustion	I feel emotionally drained from my work.
	Depersonalization	I don't really care what happens to some students.
	Personal accomplishment	I deal very effectively with the problems of my students.
AVEM	Subjective significance of work	Work is the most important part of my life.
	Professional ambition	I want to achieve more in my career than most people I know.
	Tendency to persist	If necessary, I will work until I am exhausted.
	Striving for perfection	My work should never contain errors or deficiencies.
	Emotional distancing	After work is over I can forget about it quickly.
	Resignation tendencies	I give up quickly when success is not likely.
	Proactive coping with problems	For me, difficulties are there to overcome.
	Balance and mental stability	I don't get upset easily.
	Satisfaction with work	Until now, I have been successful in my work.
	Satisfaction with life	So far, I have been satisfied with my life.
	Experience of social support	My partner shows understanding for my work.

also good at relaxing, able to prevent intrusion of professional problems into their leisure time, have a "healthy" attitude toward work (low scores on resignation tendencies, high scores in proactive coping with problems, balance and mental stability), and have a generally positive attitude toward life (higher levels of satisfaction with work, satisfaction with life, experience of social support).

The second type suggested by the authors is what they call the "work-investment sparing type" (pattern S), that is, a work avoidance type. Characteristics of this type include below average scores on subjective significance of work, professional ambition, tendency to persist, and striving for perfection. In addition, individuals who display this behavioral pattern score the highest of all the four types on emotional distancing. The tendency toward resignation is rather low which further

indicates that low commitment in the work environment does not reflect despair and resignation. Instead, the low tendency toward resignation is expressed in conjunction with high scores on the scale for balance and mental stability. This combination suggests a rather effective coping capacity when professional challenges are faced. The authors further argue that the pattern S individual's positive attitude toward life (expressed by relatively high life satisfaction scores) is probably not primarily derived from success at work, as indicated by low scores on perceptions of professional success.

Finally, the authors have identified two "risk" combinations, an "ambitious type" (risk pattern A) and the classical "burnout type" (risk pattern B). Risk pattern A is characterized by excessive commitment at the workplace and a low ability to distance oneself from work. Further, for these individuals, high commitment is not coupled with sufficient resilience to withstand excessive stress- and work-related demands (low scores on coping capacity) which put the individual at a high risk for health problems. In addition, quite negative emotions dominate their work experience and their high commitment to work does not seem to be emotionally rewarding. In contrast, people characterized by pattern B have low levels of professional commitment, especially concerning the subjective significance of work and professional ambitions. Differing from pattern S individuals, reduced commitment is not connected to more emotional distancing for pattern B individuals, but rather to a limited ability to distance themselves from work demands. For the coping capacity dimensions, all scores are problematic (i.e., resignation tendencies, proactive coping with problems, balance and mental stability). Moreover, low scores on virtually all scales related to satisfaction with work and well-being indicate a negative emotional tone. This type is characterized by exhaustion, the experience of excessive challenge, and resignation. As such, these individuals show closest similarities to the "classic" burnout syndrome described by Freudenberger (1974) and Maslach (1982).

Causes of burnout and occupational stress. Numerous factors that lead to job-related stress have been identified. Among these are both personal variables and factors related to the environment. Problems are most likely when the individual is in a particularly vulnerable state and at the same time must cope with difficult environmental conditions (for an overview of research findings, see Cordes & Dougherty, 1993; Montgomery & Rupp, 2005).

Personal factors that appear to go hand-in-hand with job-related stress include:

- Neuroticism (characterized by high anxiety, low self-awareness, irritation, and obsessiveness)
- Perfectionism (characterized by unrealistically high goals, thus risking difficulties and undesirable compromises)
- Helper syndrome (characterized by attempts to stabilize one's self-esteem by sacrificing oneself for others in exchange for their gratitude)
- Other personal deficits (e.g., a particularly poor education that promotes failure).

Environmental factors include:

- Objectively stressful working conditions (e.g., night-shifts, physically demanding jobs, noisy environments)
- Role-related factors (e.g., close personal contact with clients, instructional or assistive position, high responsibility for others)
- Structural problems within the organization (e.g., ambivalent or conflicting roles, inability to choose one's clients, inability to work with clients within a desired time-frame, low cognitive demands, poorly structured goal or performance [success] criteria, poor or no teamwork, poor emotional and/or strategic support from superiors, too little feedback/praise/recognition, low personal control and autonomy in designing work activities)
- Inaccurate or overly optimistic ideas about one's profession, possibly learned during training ("professional mystiques"; e.g., that clients are generally cooperative and thankful)
- Private family or relationship problems, loneliness, limited social support.

Burnout and occupational stress in teachers. In today's society, the teaching profession is regarded with ambivalence. On the one hand, teachers are often considered experts in their domain (e.g., spelling, math, languages) and are thus authority figures deserving of respect. Teachers do indeed exert considerable influence over the future qualifications and professional opportunities of the students under their supervision. It is also generally agreed that those in the teaching profession need to possess a combination of both domain-specific knowledge and social skills including assertiveness and empathy. On the other hand, teachers are often the object of criticism (e.g., from entitled parents, biased media coverage) and the demands of the job are often underestimated or ridiculed (cf. George Bernard Shaw's quote, "Those who can do, do; those who can't, teach"). It is also common for people to think they have great insight into the teaching profession having themselves spent many years in school. In contrast, it is not clear to most what a chemical engineer or stock market analyst actually does in their profession, which can lead to greater restraint when criticizing people in these professions. In sum, the teaching profession is characterized simultaneously by high societal demands and low appreciation that together can promote feelings of frustration and resignation.

Furthermore, upon reviewing the above-mentioned environmental factors that lead to job-related stress, it becomes obvious that several of them can be problematic for the teaching profession. One particularly relevant point for classrooms and schools in general is the "noise" factor, with the sheer volume of sound generated by students throughout a given day producing environmental strain. Concerning the positive aspects of the teaching profession, it can be cognitively stimulating and has an organizational structure that offers opportunities to be autonomous and independent. However, performance feedback that is accurate and contingent upon one's efforts, and effective teamwork among teachers, administrators, and staff remain uncommon in most schools. As a result, many

teachers feel stranded or abandoned in their classrooms. Additionally, student teachers appear prone to making erroneous assumptions about the teaching profession (i.e., professional mystiques), thus making the transition into real-world classrooms a rude awakening for many (this is also referred to as the "transition shock" or "practice shock"; e.g., Corcoran, 1981; Stokking, Leenders, De Jong, & Van Tartwijk, 2003).

As opposed to environmental reasons for why teachers experience significant stress, an alternative, person-focused hypothesis suggests that stress-prone individuals may be drawn to the teaching profession. However, there is no empirical support for the assumption that those who choose to be teachers have deficits with respect to cognitive and psychosocial characteristics and therefore they are prone to feeling overloaded on the job (Klusmann, Trautwein, Lüdtke, Kunter, & Baumert, 2009). In their study, Klusmann and colleagues compared university students majoring in education with students in other majors regarding their cognitive capacity, professional interests, and personality traits and found no difference between these groups. To sum up, given the significant challenges and biases faced by teachers on a daily basis, it is perhaps not surprising that environmental factors are commonly explored as critical predictors of job-related stress in teachers.

1.7.2. Teachers' Achievement Emotions: Causes and Effects

As described in Section 1.3.2, cognitive appraisals (i.e., individuals' judgments about situations) are viewed as the primary cause of students' emotions in the classroom — a premise that should also hold true for emotions as experienced by teachers. In order to understand what leads to the emotions teachers experience, we first need to look at the main types of appraisals made by teachers in typical classroom settings. We thus focus our attention explicitly on emotions that arise specifically in the classroom, bearing in mind that many emotions experienced by both teachers and students are triggered by situations that take place outside of school. According to Frenzel and colleagues (Frenzel et al., 2008; Frenzel, Goetz, Stephens, et al., 2009), it is possible to identify three general themes that guide teachers' formation of classroom goals and their perceptions of their students' behaviors. With respect to the alignment between their classroom goals and the students' behaviors, teachers make cognitive appraisals, which, in turn, should influence their emotional experiences.

The three overarching themes that Frenzel and colleagues have identified involve students' (1) achievement behavior, (2) motivational engagement, and (3) social–emotional behavior. For instance, a teacher's goal may be for his students to be able to correctly answer questions about a topic (good achievement behavior), to develop or maintain interest in a specific topic and actively participate in class (high motivational engagement), and to abide by the classroom rules (appropriate social–emotional behavior). Based on their perceptions of the students' behaviors, teachers

make appraisals with respect to their classroom goals. These appraisals involve answers to the following questions:

- *Goal attainment appraisal*: Are student behaviors consistent with my classroom goal? Are student behaviors conducive to my classroom goal?
- *Relevance appraisal*: How important is my classroom goal?
- *Responsibility appraisal*: Who is responsible for attaining or impeding my classroom goal?
- *Coping appraisal*: Do I have the potential to cope with classroom challenges and achieve my classroom goal?

Teachers' emotional reactions will vary depending upon their responses to these questions. The mechanisms that apply here are the ones described above with respect to students' achievement emotions (see Table 1.2 outlining achievement emotions and their typical appraisal combinations). If students' behavior indicates that a goal was attained (e.g., they answer questions correctly), then the teacher's emotional experiences are likely to be positive. In contrast, when a teacher perceives a student's behavior as indicating that a goal has not been attained, then negative emotions are expected to be more prominent. In addition, the intensity of any emotions experienced should depend on the personal relevance of the goal (in line with the above-described assumption that value appraisals generally intensify emotional experiences, see Section 1.3.2).

Furthermore, responsibility and coping appraisals are expected to have more specific effects on teachers' emotional experiences. For example, anxiety is likely to occur when a teacher perceives students' behavior as inconsistent with their goals, feels it is his own responsibility to change the behavior, but does not see any possibility for improving the situation through his behavior. In contrast, if the teacher assigns responsibly for goal nonattainment to someone else, anger is likely to occur.

Think for a moment about yourself and your tasks as a teacher:

- What ideals and goals do I have for my teaching?
- How do I know if I have achieved a goal?
- How would I feel if I achieved, or did not achieve, a particular teaching-related goal?
- Do I need help to achieve my goals? Where could I get help?

As described in Section 1.3.3, our emotions influence our thoughts and our behavior. Likewise, teachers' emotions should influence their behavior in class. The relationships described above between emotions and learning strategies can also be applied to teachers — it can be assumed that teachers' positive emotions enable them to better utilize a broad range of teaching strategies (just as students would use a wider array of learning strategies). The experience of positive emotions should also allow them to be more creative in class, more open to "riskier" (e.g., less traditional) teaching strategies, and better able to flexibly deal with unexpected obstacles that arise during class. Teachers who typically experience emotions such

as anxiety or anger should instead find it more difficult to deviate from the predetermined lesson plan and would be expected to rely on more rigid learning strategies such as rehearsal or rote memorization for their students.

Thanks to the expressive component of emotions, teachers' experienced emotions often do not go unnoticed by students, which means that students are inevitably influenced by teachers' emotions. "Emotional contagion" results in students not only recognizing that their teachers feel a certain way, but also having emotional reactions similar to their teachers' emotions. In one of our empirical studies, we found that high school teachers who said they experienced much enjoyment while teaching math classes were rated as being more enthusiastic by their students. Enjoyment in math class for these students was much higher at the end of the year than for students whose teachers reported feeling less enjoyment and were less enthusiastic (Frenzel, Goetz, Lüdtke, et al., 2009). Moreover, a teaching style that is influenced by enjoyment and enthusiasm — characterized by lively gestures, frequent eye contact with students, humor, and many examples — has positive effects on student learning, and in particular, on students' motivation (for an overview about the effects of teachers' nonverbal behavior including enthusiasm, see Babad, 2007). In contrast, teachers' negative emotions can have unfortunate consequences for students. For instance, if teachers repeatedly express negative emotions, students' motivation may decrease and they may display undesirable behaviors (e.g., being rude to the teacher). Moreover, teachers' negative emotions can influence students in a less obvious manner. In a recent study from Beilock and colleagues, math-related anxiety experienced by elementary school teachers was shown to negatively influence girls' math performance (Beilock, Gunderson, Ramirez, & Levine, 2010). In addition, girls in this study were more likely to think that "Boys are good at math, girls are good at reading" even after not having been with the math-anxious teacher for over a year; boys were generally less influenced by their teachers' math-related anxiety.

In this way, positive and negative feedback loops exist such that teachers' emotions can affect their own behavior, which in turn influences their students' emotions and behavior. Figure 1.7 outlines the model proposed by Frenzel and colleagues that depicts these reciprocal relationships.

The following example illustrates the relationships proposed in this model. A specific lesson of a math teacher may involve teaching the Pythagorean Theorem. The teacher will have certain goals pertaining to the lesson — she aims for her students to demonstrate their understanding of the Pythagorean Theorem (e.g., by giving correct answers to her questions), to show interest in the topic (e.g., by actively participating in the class discussion), and to "behave well" in class (e.g., by being attentive). While teaching, the teacher constantly observes the students' behavior: How many students can correctly identify where the right angle in a triangle is? Do students ask questions and take notes, indicating interest in the subject? How well do they abide by the classroom rules? The key proposition of the model by Frenzel and colleagues is that it is the comparison between the teacher's explicit goals and the observed student behavior (appraisals) that influences the teacher's emotional experiences during teaching.

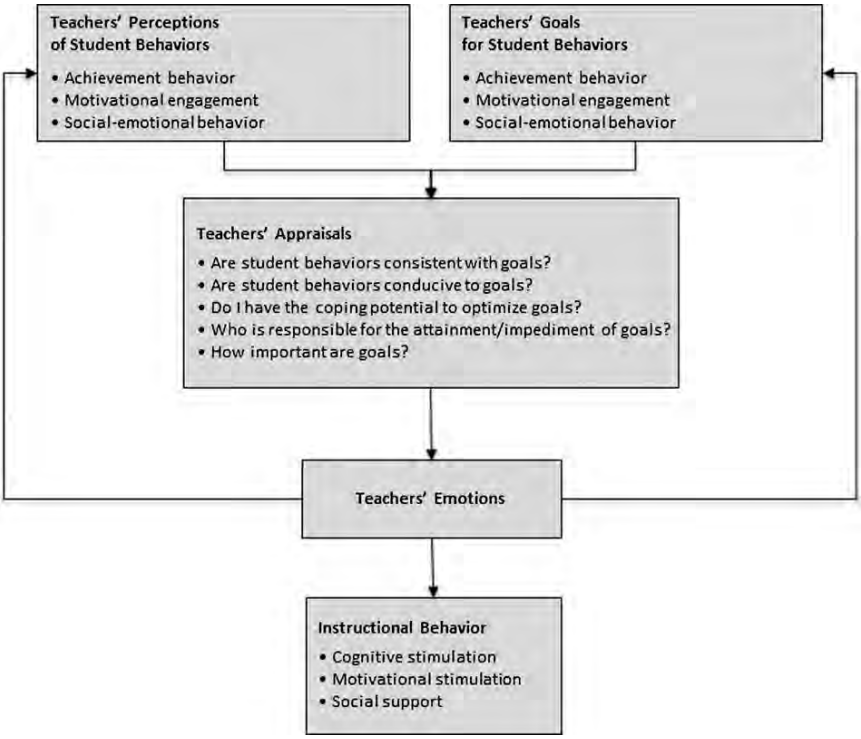

Figure 1.7: Model depicting the causes and consequences of teachers' emotions (adapted from Frenzel, Goetz, Stephens, et al., 2009).

If the teacher senses that her goals have been achieved (goal congruency and consistency), she will most likely display positive emotions during class activities. Consequently, she will likely react calmly to small disturbances in the classroom, come up with alternative ways to explain complicated material if students have difficulties (flexible teaching approach), and be happy to invest time and effort in finding complex and interesting (transfer) tasks for her students. In addition, she will likely present the material in her next class in an enthusiastic manner. Such behaviors are then likely to further positively influence students' motivation, discipline, and attentiveness during upcoming classes, as well as improve learning outcomes.

In contrast, if this teacher is introducing the topic and senses that her students do not have the necessary prior knowledge to understand the new material, or feels as if their students are not paying attention and are unmotivated, then she is also more likely to feel angry and frustrated during instruction. Classroom disturbances and wrong answers will likely be more aggravating for this teacher who will tend to attribute these outcomes to the "inability" of the students, or intentional

misbehavior aimed at avoiding learning and class participation. Consequently the teacher is likely to resort to using rigid strategies to explain the material and require students to complete simpler, less cognitively stimulating learning tasks. These activities will then most likely result in students further losing interest in the subject and acting up in class.

All in all, in order to create a positive classroom climate, these types of negative feedback loops should be minimized and positive feedback loops should be facilitated. The model presented above provides numerous areas where teachers can begin to create emotionally healthy classrooms. Below are a few tips for how teachers can achieve a more emotionally "sound" classroom setting by focusing on their own emotional experiences.

1.7.3. Tips for Teachers: How to Promote Your Own Emotional Well-Being

The assumed causes and effects of teachers' emotions, as described in the preceding model, are outlined below alongside corresponding tips suggesting things that teachers can do to promote and sustain their own emotional well-being.

Regarding your classroom goals:

- Make it clear to yourself how important your various ideals are to you and make a list of priorities — nobody can completely fulfill all of their ideals.
- Set realistic goals for yourself; try not to be too dependent or rigid regarding your lesson plans. Not achieving your goals can be emotionally draining for both you and your students!

Regarding your perceptions of student behaviors:

- Focus on the positive and try to see small improvements as little successes (e.g., Sally, who is generally very disruptive in class, was quiet today).
- Give your students the benefit of the doubt — believe in them! Try to not base your views about students on others telling you a class was "difficult" or "weak," as this can negatively influence your (and your students') motivation and emotions regardless of if the assumption is true.

Regarding your cognitive appraisals:

- Think about apparent classroom failures in terms of how they might in fact be conducive to your goals: Are lots of "dumb" questions really a sign that students didn't pay attention in class? Or is this a sign that your students are engaged and a better way of explaining the material is needed?
- Give yourself a pat on the back. If you prepared a lesson well, felt your teaching was great, or your enthusiasm fostered class participation, don't simply attribute

these outcomes to an "easy" class or an interesting topic; appreciate your role in your successes.
- In the same way, own up to your teaching failures and recognize that it is possible to improve and do a better job of reaching your goals, for example, by asking for assistance from your colleagues or attending professional development workshops. Don't simply give up and assume there's nothing that you can do — doing so can have a significant negative impact on your motivation and emotions, and will only perpetuate ineffective instruction.
- Be prepared to revise your goals and to decrease their importance if needed. Not achieving a less-important goal is less emotionally troublesome than not achieving a goal one has deemed to be very important.

Regarding your emotional experiences:

- Put yourself in a good mood before class by thinking about something pleasant, or by focusing on past classes that have gone well.
- Show your positive emotions! Find a place for humor in your class (even on a daily basis); laugh when something unexpected happens. Before a lesson, think ahead about times in the lesson plan where you or your students could share a laugh. By simply expressing your positive emotions, you will be positively influencing the emotional climate of your class.
- Allow yourself to experience negative emotions. Communicate to your students what is bothering you but, if possible, avoid being cynical or aggressive. Sometimes negative emotions can have positive effects (e.g., showing a mild form of anger or disappointment at a student's failure; see the box entitled "Implications for Practice: Attributions and Emotions"). If at any point you feel you've gone too far, acknowledging your mistake and apologizing to students shows them that one's negative emotions can be identified and regulated.
- Talk to peers or colleagues as a means of dealing with frustration. Talk to good friends or close family members about the sources of negative emotions in your job. After venting, be sure to also look at the positive aspects of your profession — "A really amazing thing about teaching is…," "What I really got excited about was…."

Conclusion

The teaching profession is characterized by a number of objectively stressful factors that, in the long run, can lead to emotional exhaustion and decreased professional effectiveness. Appraisals regarding classroom goal achievement are critical predictors of teachers' emotions. Teachers' emotional lives, in turn, influence their behavior in the classroom. A healthy emotional classroom climate is a worthy goal for teachers and students alike.

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Chapter 2

Motivation

Markus Dresel and Nathan C. Hall

2.1. Students in Focus

It's Friday morning during a break between classes, and Grade 9 students Jane, Andy, and Kathryn are having a conversation.

Andy:	Have you done the math homework?
Kathryn:	Nope.
Jane:	Yes I did!
Andy to Jane:	Of course you did.
Jane to Andy:	Well, I really want to understand math [mastery goal orientation]. It just interests me, and I actually enjoy doing my math homework [interest, intrinsic motivation].
Kathryn to Jane:	Can I copy your work? I'm just not good at math [ability self-concept].
Andy:	The only time I study is right before a test, just so I don't fail [extrinsic motivation, performance avoidance goal orientation]
Jane to Andy:	Doesn't that backfire sometimes?
Andy (grinning) to Jane:	It has worked so far for me. I always manage to get a D or a better [expectancy for success].
Kathryn to Andy:	If I was as good at math as you are, I would try harder.
Andy to Kathryn:	Just because the teacher says math is important [controlled extrinsic motivation], it doesn't mean it's true. You can make a lot of money without being good at math.

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Jane to Kathryn:	But if doing well in math is important to you, why don't you try to understand it better by spending more time practicing [mastery goal orientation]?
Kathryn to Jane:	Because I already know what will happen. Even if I try my best to read the questions and understand something, I just don't manage to learn it [expectancy for success]. No matter what I do, I can't improve in math [helplessness]. I only do as much as necessary, so that nobody notices that I don't know anything [performance avoidance goal orientation].
Jane to Kathryn:	I feel the same way about doing my French homework. But for that class, the teacher is really bad which makes it hard to learn anything [external causal attribution].
Andy to Jane:	I don't know about the teacher; all I know is I really want to go on the exchange trip to France next year, so I need a good grade [autonomous extrinsic motivation]. That's why I'm working hard in the class; I got a B on the last test only because I studied like crazy for weeks before [internal causal attribution to effort].
Kathryn to Andy:	You don't do anything unless it involves getting out of class [extrinsic motivation]!
Andy (smiling) to Kathryn:	Exactly!

2.2. Structure and Effects of Motivation in Students

The conversation above offers an opportunity to address several aspects of student motivation ranging from intrinsic versus extrinsic motivation, to causal attributions for success and failure experiences. In this section, we will address core motivational concepts in terms of their mechanisms and effects as outlined in psychological theories and research, with a particular focus on those of specific relevance to learning and achievement in educational settings.

2.2.1. What is Motivation?

Many undergraduates are familiar with the situation of partying with friends when they should be studying for an exam. So how do we get from socializing to studying? First, we need to "get into gear" — to *move* ourselves from the bar to the books (Latin: *movere*). The term *motivation* is derived from this verb and represents the internal forces that move us in a certain direction. It is not possible to "see"

motivation; we can only assume it based on certain indicators in our behavior, cognition, and emotional experiences. Therefore, motivation is a hypothetical construct. For example, one could infer that a student was motivated to prepare for an exam after observing them leaving a party early in order to finish studying at the library.

The definition of motivation provided below reflects our current understanding of the concept as informed by recent theories and research in this domain (e.g., Schunk, Pintrich, & Meece, 2008).

> **Definition**
>
> *Motivation* refers to the processes underlying the initiation, control, maintenance, and evaluation of goal-oriented behaviors.

This current understanding of motivation is characterized by the following principles:

- Motivation refers to psychological mechanisms that occur throughout the entire process of pursuing one's goals. At first, this process involves the identification and selection of viable courses of action for achieving one's objectives. The focus of early research was limited to this aspect of motivation, but this focus has widened in recent decades to provide a more comprehensive analysis of how people plan, execute, and evaluate their selected action plans, thus addressing the entire process of goal pursuit.
- The current state of one's motivation to pursue a particular course of action is dependent on the characteristics of the individual as well as of the specific situation. This understanding of motivation has developed from earlier conceptualizations of motivation as simply a personality trait that is invariant across situations. More specifically, this principle acknowledges that although there are a number of relatively stable motivational tendencies and beliefs that can differentiate one individual from the next (e.g., interest in a certain subject), motivation can vary significantly depending on the type of situation or the specific goal in question. Theoretically, these stable motivational tendencies and beliefs are separate from one's current motivation to engage in a specific action and understood as personal factors that influence one's current motivation by interacting with specific characteristics of the situation.
- Cognitive processes are central to motivation. Among other things, these include goals as thinking ahead to desired end states, evaluations of one's options for action, as well as expectations about whether a desired end state can be achieved through direct action which, not surprisingly, are related to the estimation of one's abilities.
- Also important are social processes that contribute to the development of motivational tendencies and beliefs. A notable example of this is social comparison, particularly when one's own achievement is compared to the achievement of others (e.g., competition). Another example involves what is referred to as

impression management – goals aimed at ensuring one leaves a positive impression on others (e.g., with regard to ability; Schlenker, 1980).

One influential model in which the contemporary interpretation of motivation is reflected is the *Rubicon model of action phases* (e.g., Heckhausen & Gollwitzer, 1987; for an overview see Achtziger & Gollwitzer, 2008) depicted in Figure 2.1.

The Rubicon model addresses human actions from a chronological perspective and specifies four phases in the action process: (1) in the *predecisional phase*, people formulate subjective evaluations about how significant they consider the attainment of a desired end state to be, or conversely, the avoidance of an undesirable end state (*value component*, referring to the *desirability* of end states). They also form expectations about whether that end state can be realized or the undesirable state can be avoided (*expectancy component*, referring to the *feasibility* of attaining that state). Once it has been determined that the combination of these values and expectations is sufficiently positive, an action goal is formulated. This decisive point in the action process is, according to the authors, comparable with crossing of the Rubicon River by Julius Caesar and his troops, which precipitated the irrevocable entry into the Roman Civil War. (2) In the *preactional phase*, preparing oneself to engage in the behaviors required to achieve the selected goal is of primary importance with respect to planning the implementation of the action, waiting for (or inducing) a timely opportunity to initiate the action, as well as protecting one's attention and motivation in the face of competing goals. (3) In the *action phase*, the specific action process leading to the intended goal is initiated. In this phase, the regulation of effort and persistence, as well the efforts to guard against disruptive influences, are the most significant processes (self-control). According to this model, successful completion of this phase requires that the selected action process is not terminated prematurely, and that alternative courses of action are not undertaken before evaluating the success of the chosen action plan. (4) In the *postactional phase*, the process of striving for the goal, and outcome of that process, are evaluated and conclusions for future goal striving endeavors are made. Of particular interest in this

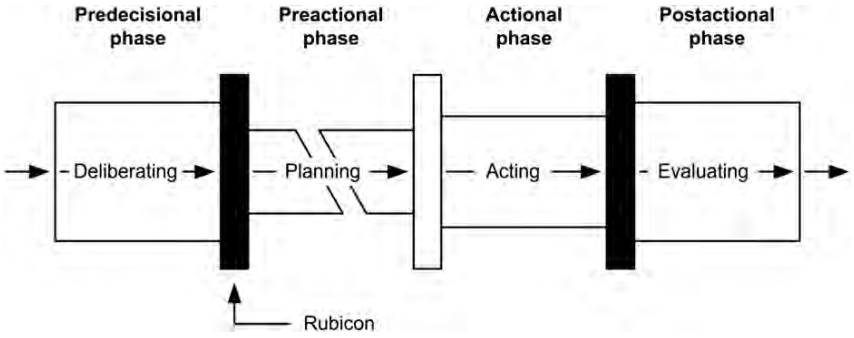


Figure 2.1: Rubicon model of action phases (e.g., Heckhausen & Gollwitzer, 1987).

phase is what the individual perceives the causes for success or failure to achieve one's goal to be.

Consider for a moment the effects that motivation and its two components (expectancy and value components) can have on action processes and their results. Try to take all four phases of the action process into consideration.

2.2.2. Effects of Motivation on the Learning Process

The level and type of motivation people have to undertake specific courses of action can have a variety of effects on the scope, quality, and results of these actions. In an educational context, the following consequences of higher levels of motivation for learning and achievement are most evident:

- Initiation of actions for accomplishing learning or achievement goals
- Planning appropriate learning activities and setting suitable subgoals
- Creating favorable conditions and acquiring appropriate resources in support of learning activities (e.g., help-seeking)
- Selecting challenging levels of difficulty that ensure optimal learning progress (not too demanding nor too easy)
- Lower tendency to procrastinate
- Sufficient quantity of effort (e.g., time invested)
- Endurance, particularly in the face of difficulties (persistence)
- High quality of efforts in terms of applying effective types of learning strategies (e.g., deep-level strategies) and appropriate forms of self-regulation (monitoring, adjusting strategies in the event of difficulties)
- Limited thoughts that are irrelevant to one's course of action (e.g., worry)
- Experiencing emotions that are conducive to one's course of action (e.g., enjoyment of learning)
- Learning progress and high-quality performance

Given the various positive consequences of greater learning and achievement motivation, the various components thereof are considered to be important predictors of scholastic achievement, alongside and in interaction with cognitive factors (e.g., intelligence, prior knowledge) that are ascribed a great deal of significance with regard to the quality and outcomes of learning in educational settings (Helmke & Schrader, 2001). Furthermore, improving learning and achievement motivation also represents an essential educational goal given the far-reaching benefits of optimal motivation levels beyond improved academic performance. Such efforts are particularly important for meeting the educational demands of modern knowledge-based societies that increasingly require individuals to continuously acquire new knowledge and adapt existing knowledge long after the completion of formal education (*lifelong learning*). To this end, ensuring robust levels of learning

motivation is considered a critical precondition for effective learning progress and educational success (Lüftenegger et al., 2012).

2.2.3. Theoretical Model of Motivation for Learning and Achievement

The model outlined in Figure 2.2 depicts the interplay among the various components, conditions, and consequences of motivation in individuals throughout the learning and achievement-striving process. A brief overview of the macro-level structure of the model is provided below, with important aspects of specific theoretical components, and their interactions, discussed in more detail in the sections that follow.

One's current motivation to engage in certain actions related to learning or performance in a specific learning or instructional situation (Block A) lies at the center of the theoretical framework. As noted above, this motivation is assumed to result from personal evaluations of the desirability (value component) and expectations regarding the feasibility (expectancy component) of the options for action. These two situational evaluations, and the resulting current motivation, depend on enduring characteristics of the person, as well as characteristics of the specific learning environment in which one is situated. Characteristics of the person include a number of relatively stable motivational tendencies and beliefs (Block B) such as interests, goal orientations (more value related), and assumptions about one's personal capabilities (more expectancy related). Characteristics of the learning environment (Block C) include relatively stable social–environmental factors, such as the expectations and values of significant others (teachers, parents, peers) and contextual elements such as how learning is evaluated (e.g., social competition, individual gains). Likewise, characteristics of the specific learning or instructional situation need to be considered, such as actual opportunities and demands to engage in specific courses of action, the interestingness and difficulty of the learning topic and actions, as well as the type of learner support and feedback provided.

The middle column in the model refers more specifically to actions taken by the individual in a specific learning situation as adapted from the Rubicon model of action phases: Based on one's current motivation (predecisional phase — Block A), certain actions will be planned, initiated, and executed toward realizing a chosen goal (preactional and actional phases — Block D). In this section is where most of positive consequences of greater motivation as outlined above would be observed. Following these action phases is the subsequent evaluation of these learning-related behaviors, the result of which can be deemed a success or failure depending on quality benchmarks. An explicit and/or implicit causal analysis in which the individual determines likely contributors to the learning or achievement outcome is also located in this section (postactional phase — Block E). This evaluation is dependent, on the one hand, on the person's motivational tendencies and beliefs, such as viewing a success experience as due to luck based on a low estimation of personal ability (B → E). On the other hand, environmental characteristics may also influence the way in which one evaluates learning outcomes (C → E), such as ability-related feedback provided by teachers or external standards.

Finally, this model is recursive in suggesting that evaluations of learning or achievement outcomes (e.g., causal attributions) can feed directly back into personal evaluations of the feasibility and desirability of one's potential end states, as well as current motivation to engage in similar courses of actions (E→A). Recurring evaluations are further assumed to possibly result in changes to one's more general motivational beliefs (E→B), for instance, when interest in a subject is reduced because high achievement cannot be readily attributed to one's personal ability, and therefore cannot bolster one's perceived competence. Similarly, the way in which a course of action is evaluated could result in modifications to one's learning environment (E→C), such as parents who upwardly adjust their beliefs about a child's ability after a success, or teachers who downwardly adjust lesson complexity due to difficulties experienced by their students. Overall, these feedback loops suggest that people's motivational tendencies, as well as their social environment, can change (and stabilize) over time as part of a recurring, cyclical interaction. At the same time, aspects of the learning environment can also adapt to the learner as a consequence of this reciprocity.

2.2.4. Situation-Specific Expectancies and Values

As previously mentioned, one's current motivation in a given educational setting is hypothesized to be primarily determined by subjective expectations of the feasibility as well as desirability of one's potential end states (Block A in Figure 2.2). The undisputed significance of these two situation-specific motivational components is reflected in a large number of long-established and contemporary *expectancy-value theories of motivation*. A basic theoretical element of these models is that motivation is a result of an interaction between expectancy and value. Thus, one's level of the motivation is assumed to increase as a consequence of higher levels of one or both of these components, with certain minimum thresholds for each needing to be met before describing an individual as "motivated." Conversely, should an individual not find a course of action to be attractive, or decide that a specific required action cannot be successfully executed even with great effort, they will tend to not be motivated to pursue this course of action. A well-established model of motivation in the context of scholastic learning and achievement behavior is the expectancy-value model developed by Eccles (1983). It not only considers the antecedents of one's current motivation with respect to situation-specific expectations and values, it also addresses the manner in which these variables depend on more stable motivational tendencies and beliefs, previous learning and achievement experiences, as well as the social environment. Given the consistency of these assumptions with the theoretical framework presented above, this model is further explained in the subsequent sections.

Value components. Concerning the ways in which students subjectively assign value to specific tasks and corresponding outcomes (also commonly referred to as assigning "valence"), research in motivational psychology has developed a few useful distinctions in this regard. Probably the most significant differentiation is that

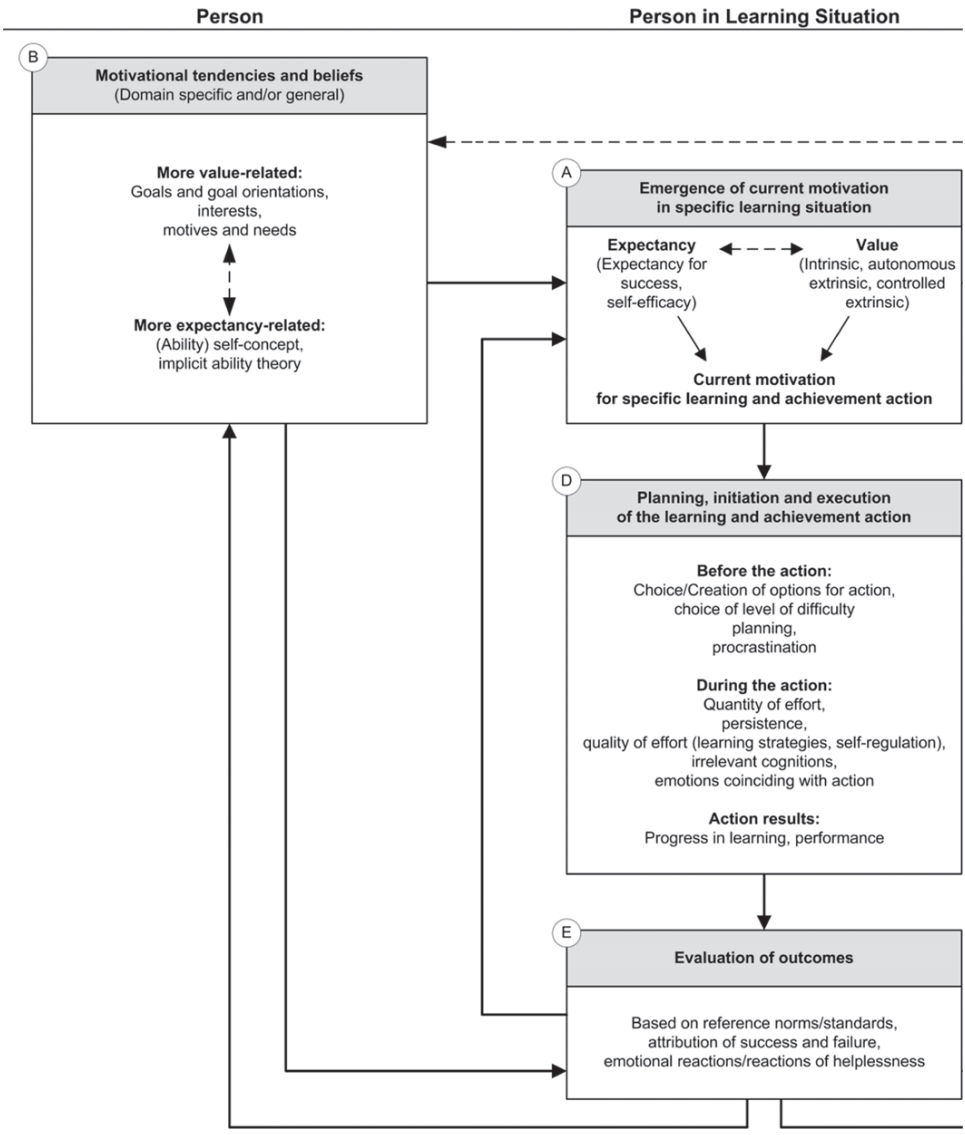
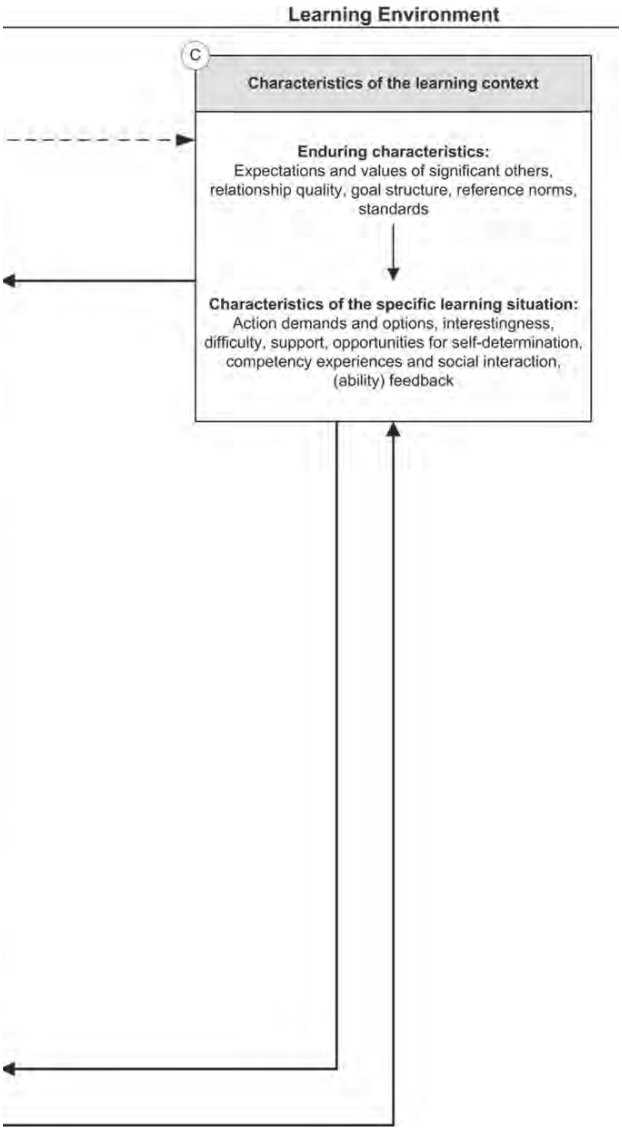


Figure 2.2: Conceptual model of learning and achievement motivation.


Learning Environment
C
Characteristics of the learning context
Enduring characteristics:
Expectations and values of significant others, relationship quality, goal structure, reference norms, standards
Characteristics of the specific learning situation:
Action demands and options, interestingness, difficulty, support, opportunities for self-determination, competency experiences and social interaction, (ability) feedback

made between intrinsic motivation and various forms of extrinsic motivation as outlined by Deci and Ryan (1985) in their work on *self-determination theory* (see also Ryan & Deci, 2000) as well as in the model developed by Eccles (1983).

Definition

Intrinsic motivation denotes the willingness of an individual to execute an action because they find it satisfying or rewarding; the activity is experienced as positive in itself (activity incentives) or the topic is engaging (interest). *Extrinsic motivation* is characterized by value not being found in the activity itself, but rather in the consequences of the activity. Distinctions are made here between *autonomous (self-determined) extrinsic motivation*, in which value originates from external factors and, to a greater extent, from within the person executing the action, and *controlled (nonself-determined) extrinsic motivation*, whereby value is determined primarily by a reward structure that is outside the individual.

For intrinsic motivation (*intrinsic value* according to Eccles, 1983), the value is located within the action itself. This is a self-determined form of motivation in which individuals complete activities autonomously and independent of external reinforcements (e.g., enjoyment experienced while performing physics experiments due to interest in electromagnetism). Generally, we find uniformly positive effects of intrinsic motivation on various aspects of self-regulated learning and performance quality. Extrinsic motivation, however, is much more diverse, more complex with regard to its effects, and is far more common in the academic context than intrinsic motivation. To further clarify the different forms of extrinsic motivation, Deci and Ryan (1985) attempt to classify them according to the degree to which they are associated with one's personal values and goals. Deci and Ryan refer to autonomous (self-determined) extrinsic motivation when the results of the learning process (extrinsic value of the outcome) are personally important to the individual. This type of motivation is also represented when the outcome is valued because of how useful it is for achieving other personal goals (*utility value* in Eccles, 1983), for example, if a student studies intensively for her math exams because of her personal goal of one day becoming an economist. Similarly, autonomous extrinsic motivation is assumed if success is important for an individual's self-concept and identity (*attainment value* or *importance* in Eccles, 1983), for example, if a student performs exceptionally well at an athletics competition because he defines himself as an athlete. In contrast, less autonomous motivation is involved when the value of one's actions or outcomes is due primarily to external rewards, regulations, or norms (e.g., when a student studies for English class to avoid punishment or a guilty conscience). Figure 2.3 illustrates these types of motivation and also incorporates more specific differentiations as described by Ryan and Deci (2000).

Empirical studies have shown that autonomous forms of extrinsic motivation can have positive effects, similar to those seen with intrinsic motivation, and that long-term negative effects for the learning process result primarily from controlled forms of extrinsic motivation (e.g., due to negative effects on learning strategy use;

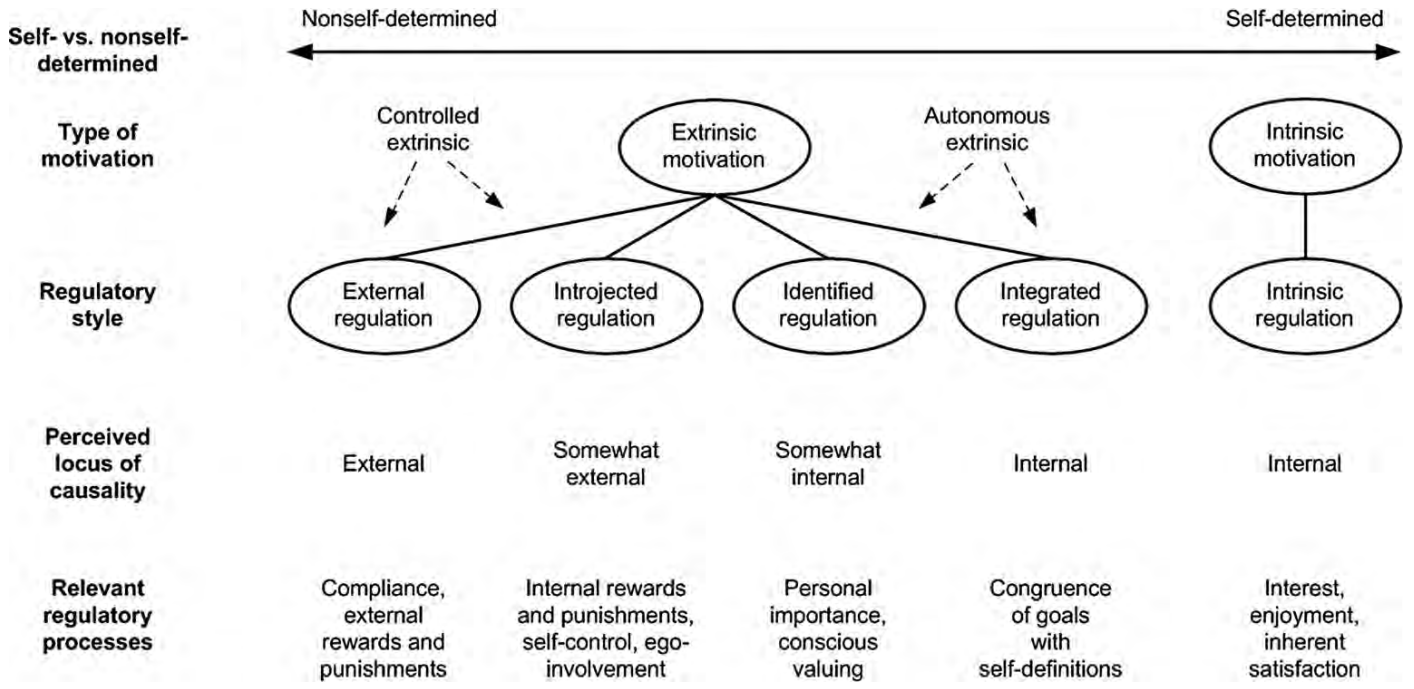


Figure 2.3: Continuum of self-determined motivation (adapted from Ryan & Deci, 2000).

Ryan & Deci, 2000). However, externally controlled motivation can, in the short run, also have positive effects on learning and achievement behavior — namely when the learning activity or outcome is of little personal value to the learner otherwise. It is also important to acknowledge that intrinsic and extrinsic motivations are not mutually exclusive. For instance, adolescents can both be interested in the object of their learning activities as well as recognize that competence gains associated with the learning material may useful for later occupational opportunities. It should be noted here that the understanding of intrinsic and extrinsic motivation as a simple dichotomy is not sufficient to adequately capture students' motivation, and that a more differentiated consideration of extrinsic motivation, based on the specific degree of self-determination involved, is required to properly explain the effects of the values associated with various activities. Although studies have recently opted to not assess one type of extrinsic motivation proposed by Ryan and Deci (2000), namely "integrated" motivation (Vansteenkiste et al., 2009), the remaining three categories do highlight critical distinctions between people who are motivated to (a) avoid punishment or obtain rewards ("external"), (b) to avoid guilt or feel pride ("introjected"), or (c) to pursue their goal because they value both the learning process and the eventual outcome ("identified").

Think about an educational activity that requires a considerable investment of your time and energy to achieve it (e.g., studying to complete a university degree). Why do you do it? What are your main reasons for engaging in this activity? Take a moment to consider the roles that the various forms of intrinsic and extrinsic motivation described above play in keeping you motivated while pursuing this activity.

Expectancy components. If a student assumes they will do well on their next test in math class, this would be a typical example of high success expectancy in a learning and achievement context. Further, it can reasonably be assumed that the most important aspect of this student's expectations is their perceived probability that they can achieve this success through their own actions. On the other hand, these expectations will also depend on the student's beliefs about what would happen if they did not invest significant effort in the learning process — the probability that a successful result would be determined by external factors beyond the student's control. In order to distinguish between the overlapping effects of one's own actions and those of external forces on one's learning-related expectations, Heckhausen and Rheinberg (1980) differentiated among a variety of expectations individuals can hold while assessing a situation (Table 2.1; see also Rheinberg, Vollmeyer, & Rollett, 2000; Skinner, 1996). The first type of expectations is referred to as the *action–outcome expectancy* (the anticipated effect of personal actions), the second as *situation–outcome expectancy* (the impact of external factors), and a third type of expectancies as *outcome–consequence expectancy*, which refers to the learner's expectation that the outcome of the learning process will produce the desired consequences (e.g., in the social environment).

Definition

Expectancy for success refers to the subjective assessment, by an individual, of the probability of successfully completing a task.

The action–outcome expectation component is considered to be particularly significant for the motivation process. As a large number of empirical studies have already demonstrated, the expectation that one's own behavior will lead to positive outcomes has significant beneficial effects on the quality of learning processes and academic success (for a review, see Schunk et al., 2008).

Table 2.1: Three types of expectancies in the model developed by Heckhausen and Rheinberg (1980; see also Rheinberg et al., 2000).

Expectation type	Definition	Examples
Action–outcome expectancy	Assumed probability that the desired outcome can be obtained through one's own actions	1. "If I prepare intensively, the presentation I have to make next class will go well." 2. "I am capable of understanding the literature assigned for English class, and I know how to best complete the final writing assignment. For these reasons, I should get a good final grade in this class."
Situation–outcome expectancy	Assumed probability that the desired outcome is determined by the situation, regardless of actions taken by the individual	3. "If I do not invest much effort in this group project, other group members will take up the slack and we will succeed regardless of my contribution." 4. "Even if I don't study for the next English test, I will get a good mark because the teacher likes me."
Outcome–consequence expectancy	Assumed probability that the desired outcome will lead to desired consequences	5. "If we do a good presentation, the teacher will give us positive feedback and our classmates will be impressed." 6. "If I get a good mark on my English test, my parents will take me out to the movies."

The fundamental significance of action–outcome expectations is further supported by the number of similar constructs with differing labels. To start, this concept is quite similar to personal *control beliefs* as proposed by Rotter (1966, 1990), as well as *self-efficacy* from Bandura's social-cognitive theory (1977, 1997). However, Bandura further suggests that self-efficacy can be differentiated into beliefs about whether one can successfully execute a specific course of action (*efficacy expectation*) and about whether these actions will lead to the desired result (*outcome expectation*). This differentiation is depicted in the second example of action–outcome expectations provided in Table 2.1 in which the learner's belief in their ability to perform required actions is clearly linked to their expectation that this action will be effective (a similar distinction is made in the control beliefs model of Skinner, 1996). The assumption made by the student in this example – that they are capable of understanding course content effectively – corresponds to their efficacy expectation, whereas the assumption that a good understanding of the material will lead to a good grade on the upcoming test reflects their outcome expectation. Although this differentiation may appear at first glance to be somewhat contrived, it does have practical relevance. For example, it is commonly the case that a student can be acutely aware of which learning activities will lead to academic success, but not be confident in their ability to execute them effectively to improve their performance. Conversely, a student could also lack a firm understanding of what specific learning strategies would be effective for attaining a specific learning objective, despite being fully convinced that they are capable of successfully implementing them (see Chapter 3).

2.2.5. *Motives and Needs*

In addition to exploring situation-specific variables, a large proportion of the foundational research in the motivation domain, as well as related applications, has addressed comparatively *stable individual differences*. The following sections highlight this research as it relates to motivational tendencies and beliefs (Block B in Figure 2.2), starting with the more value-related tendencies in order to structure the discussion of stable motivational constructs in a way that replicates the historical development of motivation research (motives and needs followed by goal orientations and interest). In the sections that follow, two types of expectancy-related belief systems pertaining to the way in which learners view their personal competencies are presented (ability self-concept, implicit theories). It should be noted here that these motivational tendencies and beliefs cannot be associated explicitly with only one "side" of motivation — value versus expectancy — in that they also have reciprocal relationships with one another, and act in conjunction with each of these two components.

As highlighted at the outset of this chapter, it is clear that motivation is best understood as a process, one that is directed toward the learning-related course of action currently being pursued. What then is to be understood by the term *motive*, a word that is also frequently utilized in everyday language?

Definition

Motives (synonym: *needs*) are temporally stable preferences, that differ between individuals, for specific types of behavior and the subjective incentives associated with these behaviors, particularly the experience of emotional satisfaction (see McClelland, 1987).

Thus, motives can be understood as components of an individual's personality. That is, although motives are variable between persons (interindividual), they are seen to be relatively stable traits within a person (intraindividual). In this way, a motive can be differentiated from one's (current) motivation. The motivation associated with a specific course of action does depend on individual motives — albeit only to a certain extent, in that current motivation also integrates situational conditions. In recent decades, motivation research has been able to convincingly demonstrate that the effects of motives — conceptualized as noncognitive and domain-general in nature — are in fact mediated through a number of domain-specific cognitions.

Earlier work in motivational psychology was particularly focused on investigating different types of motives (cf. Murray, 1938) with need for achievement, need for affiliation, and need for power emerging as central motives or needs (Table 2.2). The following sections provide greater detail specifically concerning the achievement motive as it is traditionally afforded the greatest significance with respect to scholastic achievement behavior.

Table 2.2: Three central motives/needs.

Motive	Stable preference for	Subcomponents	Further reading
Need for achievement	Mastering difficult tasks, measuring against performance standards, overcoming difficulties, competition and surpassing others	Hope for success Fear of failure	Brunstein and Heckhausen (2008)
Need for affiliation	Belonging, making friends and starting relationships, cooperation, reciprocating kindness, maintaining friendships, loyalty, love	Hope for affiliation Fear of rejection	Sokolowski and Heckhausen (2008)
Need for power	Control over the social and physical environments, exercising influence over others or leading others	Hope for control Fear of being controlled	Schmalt and Heckhausen (2008)

Achievement motive (need for achievement). The achievement motive refers to one's ambition to accomplish a challenging task — a consistent psychological need that nonetheless varies between individuals (thus, an "individual difference" variable). This motive involves working as quickly as possible, overcoming obstacles, as well as other efforts required to attain a set performance standard or measure of quality. These quality standards can further evoke *hope for success* as well as *fear of failure*. These two concepts can be traced back to Atkinson (e.g., 1957) who conceptualized them as subcomponents of the achievement motive that are stable over time yet variable between individuals. First, hope for success is represented by an individual's expectation of being successful, and reflects a dispositional focus on wanting to feel pride in one's achievements. People who are hoping for success are characterized as being truly committed to completing the requisite performance tasks. This motivational process is therefore focused on approaching desired achievement outcomes. Second, fear of failure refers to the dispositional tendency in some individuals to instead focus on avoiding feelings of shame or blame should one's actions result in failure. In this case, the motivational process instead focuses on avoiding undesirable outcomes. Therefore the motivational "system" can, at a fundamental level, be described as consisting of two different foci that involve behaviors aimed at *approaching* desirable states and/or *avoiding* undesirable states. Approach and avoidance subcomponents have also been postulated for the other types of motives mentioned above (see Table 2.2).

A series of consequences in terms of behaviors and outcomes are associated with these different foci, and not only in the academic context, but in basically all spheres of life where some form of achievement can be demonstrated. One behavioral consequence that was often explored in early research in motivational psychology was choice of task difficulty. Frequently, persons with high hopes for success tended to choose moderately difficult tasks with a subjective probability rate of success that is close to 50% — the very same type of task that individuals with a strong fear of failure tended to avoid. Instead, learners who had high levels of fear were much more likely to choose tasks that were either too simple or too difficult for them. Why would hope for success and fear of failure predict such different choices in terms of the difficulty of learning tasks?

Behaviors involving the selection of tasks with respect to their difficulty can be explained with the *risk-taking model* developed by Atkinson (1957). According to this model, individuals select their tasks in accordance with the emotional incentive value of achieving success as well as the (subjective) probability of success. According to Atkinson, emotional incentives and perceived probabilities of success are inversely related: A simple task with a high probability of success should have a low level of incentive value in regards to how emotionally rewarding it is in that one would not be particularly proud if success occurs. On the other hand, a difficult task only achievable by a few would be considered to have high emotional incentive value given the personal and unique significance of a successful outcome. In order to formalize the assumption that one's current motivation is dependent on the subjective probability and the incentive value of success, and that both of these components must be sufficiently present to prompt subsequent actions, Atkinson suggested that

current motivation is a multiplicative combination of these components. Related to this assumption, Atkinson further proposed that motivation follows an inverted U-shaped function, which is at its maximum for tasks of moderate subjective difficulty and lowest for tasks that are extremely simple or exceptionally difficult. These assumptions are illustrated in Figure 2.4.

What does the difficulty level of a task have to do with hope for success and fear of failure? It became quickly evident that the proposed function of motivation applied mainly to individuals who were hoping to achieve academic success. For these learners, their current motivation level was highest for tasks with a probability of success of about 50%, which ensured that the learning process would be challenging and engaging yet afforded a good chance of eventual success. Accordingly, these types of learners tended to select moderately difficult learning tasks to complete. However, not everyone was motivated by these odds of success, particularly those who were focused on avoiding failure. More specifically, whereas hopeful individuals saw a 50% chance of success as an opportunity for their personal abilities and effort to pay off, fearful individuals instead focused on how failing on a task with such odds would make it embarrassingly clear to others that they lacked the ability to succeed. This is precisely what individuals who fear failure try to avoid, with their primary concern being that failure will undoubtedly be attributed to their lack of ability (see Section 2.2.9). For this reason, these types of learners tend to select simpler tasks with a higher probability of success and less risk of failure. However, these individuals were also likely to select excessively difficult tasks at which the

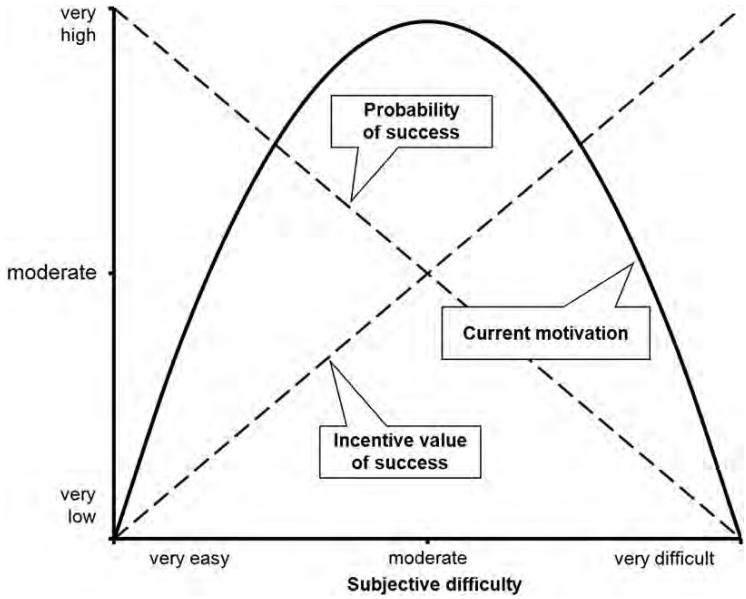


Figure 2.4: Choice of task difficulty in Atkinson's risk-taking model (1957).

majority of learners would also fail, thus avoiding attributions to a lack of personal ability if success did not occur.

Given substantial empirical evidence to confirm this kind of selection bias among those who suffer from fear of failure, it is clear that this pattern of results does not conform to the U-shaped function for motivation as originally postulated by Atkinson (1957). Instead, this pattern is opposite of his assertion in suggesting that some learners demonstrate minimal motivation with moderately difficult tasks, and maximal motivation when faced with extremely low or high task difficulty. Another limitation of the assumptions made by Atkinson concerns the restrictive definition of emotional incentive value of success in his model that specifically involves feelings of pride. Whereas it may be assumed that this specific facet of subjective value has an inverse relationship with the probability of success (e.g., less pride following the completion of easy tasks), subsequent empirical work shows this not to be the case for other components of value. For example, as other variables such as intrinsic value or utility value have been found to positively correspond with expectations for success (e.g., readily attainable goals tend to be more enjoyable to pursue), subjective value came to be understood as multifaceted in nature (see Section 2.2.4) and, for the most part, positively related to expectancy variables (e.g., Eccles & Wigfield, 1995). Furthermore, these findings resulted in less research emphasis in general on the strictly formalized function for optimal motivation as well as the assumed multiplicative relationship between expectancy and value proposed by Atkinson (1957).

Universal needs (Maslow; Deci & Ryan). In the context of universal human needs, the hierarchical model proposed by Maslow (1954) has gained widespread appeal (see Figure 2.5). Maslow worked under the assumption that not all basic needs are of equal importance and proposed a theoretical perspective involving a hierarchically ordered system of needs. A central assumption was that higher-order psychological needs, focused mainly on self-reflection and personal development, would not be given sufficient consideration as long as lower-order physical and social needs were not being met.

Figure 2.5: Maslow's (1954) hierarchy of needs (adapted from Schunk et al., 2008).

Upon close inspection of the model in Figure 2.5, it becomes obvious, however, that the strict hierarchy it assumes is not always plausible. For example, it could well be the case that while engaged in the learning process one may become hungry (level 1) yet nevertheless complete the learning task to satisfy higher-order needs for understanding and competence (levels 4 and 5). Csikszentmihalyi and Csikszentmihalyi (1988) have even described a state of full cognitive absorption in a task — referred to as *flow* — in which unsatisfied basic needs (e.g., hunger) are not even perceived by the individual. In addition, there are differences between individuals in the strengths of needs, as well as changes in the strengths of needs over time within an individual. Therefore, it is clear that the model can be criticized in terms of not only its strict hierarchical structure, but also interindividual and intraindividual differences that are unaccounted for. However, this model is important due to its emphasis on self-actualization and personal development which clearly encourages teachers and administers to design learning environments that address not only basic learning processes but also higher-order psychological needs of students. To be more precise, Maslow's model suggests that in addition to addressing basic physical needs, social belonging (affinity, acceptance), and personal safety (freedom from fear), the satisfaction of students' needs for self-esteem (recognition, competence) and to understand their social environment and optimize their potential (self-actualization) should be considered when designing lesson plans and school programs.

Deci and Ryan (1985) arrived at similar conclusions within the framework of their self-determination theory (see Section 2.2.4), and postulated that three fundamental needs must be fulfilled in order to facilitate intrinsic motivation and interest:

- the need for autonomy,
- the need for competence, and
- the need for relatedness.

Over the past 20 years, a number of studies have confirmed the assumption that classroom instruction is most effective in promoting motivation in students when these three basic needs are being met (for an overview, see Krapp, 2005). These findings also form the basis for motivational programs and instructional methods to encourage the development of interest and intrinsic motivation in students (see Section 2.2.2).

2.2.6. Goals and Goal Orientations

In research on learning in social contexts, the concept of goal orientations is afforded a great deal of significance in the explanation of the motivational predictors of learning and achievement behavior (see Meece, Anderman, & Anderman, 2006a). *Goal orientations* are regarded as habitualized or dispositional preferences for specific goals that can be pursued in learning or achievement situations. Before addressing goal orientations more specifically, it is important to first clarify what precisely is meant by *goals*.

According to author Zig Ziglar, "A goal properly set is halfway reached." Do you agree with him? Take a moment to think about what a goal is, and what kind of goals you set for yourself.

To answer these questions, we must first consider the psychological definition of the term "goal" which comprises several facets.

Definition

Goals are conscious anticipations of the consequences of one's actions. They refer to future, desirable outcomes of actions, and also encompass a cognitive representation of these consequences of actions (Austin & Vancouver, 1996; Kleinbeck, 2006).

Goals are directly related to a number of functions in our psychological systems (Austin & Vancouver, 1996; Kleinbeck, 2006):

- Goals encourage actions geared toward achieving the associated outcomes; they prompt individuals to act with purpose.
- Goals provide an overarching structure that focuses individuals' use of knowledge, abilities, and skills when pursuing the associated outcomes.
- Goals provide a standard — a desired end state — against which one's current state can be compared to determine progress over time. This standard can also be used following the completion of required actions to determine whether or not they were successful.

In a number of models of self-regulated learning, goals are highlighted as guiding forces that motivate learning behavior (see Chapter 3). More specifically, they are considered to drive and direct activities involving the planning, initiation, monitoring, and evaluation of the learning process.

In principle, goals can focus on any of the conceivable consequences of courses of action (desirable states) pursued during the learning process. In an innovative step, Ford (1992) attempted to develop a taxonomy of superordinate goals and found that individuals pursue various different types of goals such as, for example, social goals (e.g., establishing and maintaining social contacts), achievement goals (e.g., meeting demands), or emotion-related goals (e.g., avoiding boredom). Historically, these overarching classes of goals are cognitive manifestations of motives, and as such, avoid some of the theoretical limitations of the concept of motives (e.g., the motive concept neglects mental processes, differences across subject domains, temporal fluctuations, and complex processes involving action regulation).

Goals can involve either the attainment of desirable states (*approach goals*) or the avoidance of undesirable states (*avoidance goals*). Therefore, a student can pursue the approach goal of being accepted by a certain circle of friends, or the avoidance goal of not being ostracized by those friends. This distinction mirrors

the differentiation made in motive psychology with respect to the proposed subcomponents of individuals' motives (see Table 2.2). Research has been able to demonstrate that approach and avoidance motivation imply qualitatively different psychological processes related to cognition, emotions, and behavior, and has provided evidence that they also differ from neurobiological perspectives (see Elliot, 2008).

In addition to the higher-order, abstract goals described by Ford, individuals' cognitions also include *concrete goals,* usually a large number of them (e.g., "Finish reading two chapters tonight," "Get at least a D in math class," "Make sure I express my opinion at the next parent–teacher meeting," "Don't embarrass myself in front of the class"). These types of goals correspond to intended actions that are formulated at the end of the decisional phase in the Rubicon model (see Section 2.2.1). Concrete goals are often comprised of *subgoals* in the planning and action phases, as per the assumption that goals are hierarchically organized and are frequently subgoals of higher-order goals. A number of empirical studies have explored how factors such as task difficulty, specificity, and the temporal perspective of one's goals (e.g., short- vs. long-term) are related to current motivation and performance (Locke & Latham, 2002). The results of these studies have implications for students in term of set appropriate learning goals in the classroom and for how to optimally scaffold students' goal-setting processes. The following section summarizes these implications for classroom contexts, but they can be generally applied to any goal-setting process.

Implications for Practice: Achievement Goals

- Goals should be *specific*, in other words, they must reflect a *measurable* standard to determine when the goal has been attained. The goal of "Working through four math problems in the next study period" is a more suitable goal than "To work through as many math problems as possible."
- Goals should be based on a *limited temporal perspective* and deadlines need to be *scheduled* — a point in time should be specified by which the goal should be attained. Whereas the higher-order goal that "All students should understand the fundamentals of thermodynamics" can provide a baseline level of motivation, students are probably much more motivated and successful when such abstract goals are broken down into subgoals such as "By the end of the week, all students should understand Gay-Lussac's law."
- Goals should be *personally challenging*, as well as *realistic*. In other words, they should not be too easy to attain, but also not too difficult to prevent premature disengagement. Moderately difficult yet achievable goals afford students the best chances for optimal gains in performance and competence. This issue often poses a challenge for instructors given that individualized scaffolding with respect to goal-setting can be difficult in large classes consisting of students with varying levels of preexisting knowledge and competence.

In contrast to specific higher-order or concrete goals, *goal orientations* refer instead to enduring tendencies within individuals to pursue the types of abstract goals as described by Ford (1992).

Definition

Goal orientations represent stable motivational tendencies that lead to the selection and pursuit of corresponding concrete goals in applicable situations.

In research on learning in social contexts, the main focus has been on three types of goal orientations. Significant work on this topic has been conducted by Dweck (1986), Nicholls (1984), Maehr and Midgley (1991), as well as Ames (1992), and is outlined in Figure 2.6.

Learners are understood as having a *mastery goal orientation* when they preferentially pursue the goal of increasing their competencies, expanding their knowledge, and striving for a comprehensive understanding of the learning material. With these types of goals, the learning process is given primary importance and learning and achievement situations are understood as opportunities to expand one's existing skills. A mastery goal orientation is, from a prescriptive perspective, the most desirable goal orientation — since the primary objective of schools and other instructional settings is, of course, for learning to occur. Instructional and other learning situations are, however, also social situations consisting of other students, teachers, and parents, who together constitute an ever-present audience throughout the achieving striving process. Accordingly, learners also pursue the goals of providing good performances and demonstrating their capabilities to others. Other students pursue the goal of avoiding poor performance outcomes and make a concerted effort to conceal gaps in their knowledge or a lack of ability. For many students, this preoccupation with avoiding low achievement, and the ability implications thereof, is their primary motivation in the classroom. Should this type of motivation persist over time, such learners are said to have a strong *performance goal orientation*. In this case, the learning process is not the focus, but rather the outcome of the learning process is of primary importance — more specifically, the assessment of one's abilities relative to others. For these individuals, learning and performance situations are interpreted as settings in which an individual can or must demonstrate their abilities and engage in social comparison. In addition to these two basic goal orientations, Nicholls (1984) suggested a third approach referred to as *work avoidance goal orientation* in which an individual aims to exert the least amount of effort possible when completing a task, and generally avoids learning endeavors altogether.

With respect to performance goal orientations, researchers soon made a differentiation between *performance approach* and *avoidance goals* in order to better explain the inconsistencies being found in empirical studies based on a one-dimensional conceptualization of performance goal orientation (e.g., Middleton & Midgley, 1997). Should learners be pursuing performance approach goals, they are said to be motivated mainly to demonstrate that their knowledge and capabilities are better than those of others. On the other hand, should they be pursuing performance

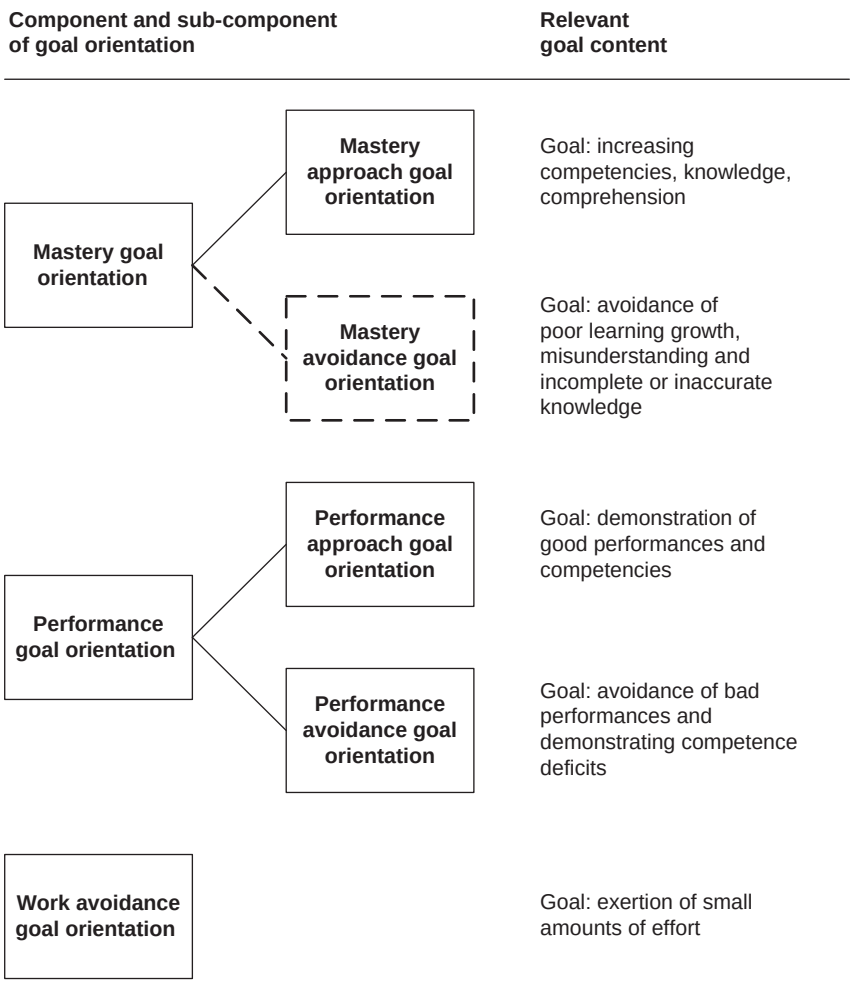


Figure 2.6: Achievement goal orientations in educational contexts.

avoidance goals, they will instead attempt to avoid poor performance and prevent others from thinking they may be deficient in their knowledge and abilities. Taking things a step further, Ziegler, Dresel, and Stöger (2008) were able to show that students' performance goals are often addressee specific, that is, focused on establishing positive impressions with specific individuals (e.g., teachers, classmates, parents, themselves). The suggestion has also been made to similarly differentiate between *mastery approach goals* and *mastery avoidance goals*, in other words, between goals that focus primarily on acquiring knowledge and competencies, and goals that instead focus on avoiding poor learning progress and incomplete or inaccurate knowledge (Elliot & McGregor, 2001). The importance of this differentiation is, however, still disputed in the research literature as there is very little evidence

concerning the prevalence and effects of mastery avoidance goal orientation (for an overview, see Moller & Elliot, 2006).

A number of empirical studies have shown that the types of goal orientations described above are associated with different cognitive and affective processes, as well as differences in learning behavior (for an overview, see Meece et al., 2006a). More specifically, a mastery (approach) goal orientation tends to be associated with the selection of challenging tasks, extensive effort, the application of deep-level learning strategies (cognitive elaboration), and optimal self-regulation of one's learning activities including adaptive responses to failure. In contrast, a performance avoidance goal orientation is typically associated with lack of effort, the use of surface-level learning strategies (memorization), experiences of test anxiety, as well as helpless reactions to failure and poor achievement levels. The performance approach goal orientation is commonly found to correspond with positive self-assessments and short-term performance gains, but does not ensure intensive, long-term engagement with a specific topic (ambivalent effects). Research on the mastery avoidance goal orientation has so far been sparse. Early indicators do however suggest that the effects of this orientation are not as negative as those associated with the performance avoidance goal orientation, but not as positive as those resulting from the mastery approach goal orientation. Finally, students with a strong work avoidance goal orientation often show little interest in their learning objectives, engage in ineffective study strategies, and demonstrate poor achievement levels. In summary, an extensive and increasing body of evidence suggests that an orientation toward mastery goals is most beneficial for learning, and serves to optimally protect one's motivation when confronted with failure experiences. These effects are opposite of the effects of performance and work avoidance goal orientations on the learning process, particularly with regard to the previously mentioned increased risk for maladaptive reactions to failure.

Empirical studies on goal orientations also indicate that they are not independent from one another, but are related to each another (see Pintrich, 2000). For instance, mastery goals tend to be positively correlated with performance approach goals, and negatively correlated with performance avoidance goals and work avoidance goals. These relationships suggest that learners often pursue several goals in specific learning situations (*multiple goal setting*). Moreover, preliminary empirical findings indicate that goal orientations are not motivational tendencies that are consistent from one subject domain to the next, but are rather "domain-specific" in nature — students' goals can substantially differ depending on the specific type of learning task (e.g., homework vs. classroom learning) and subject domain under consideration (e.g., language vs. science classes; Bong, 2001).

2.2.7. Interest

From the previous section it is clear that in current research motivation and motivational tendencies are increasingly being conceptualized in domain-specific and

object-specific ways. One motivational tendency, which by definition is specifically related to an object, is *interest* (see Krapp, 2002).

Definition

Interest is a particular relationship maintained by an individual with regard to an object. Objects can be specific objects (e.g., robots), abstract object fields (e.g., electrical engineering), or classes of activities (e.g., building electronic devices with kits). The distinctive features of interest within individuals include the experience of positive emotional states (e.g., joy) when interacting with the object of interest (emotional value), high subjective value of this object (personal importance on a cognitive level), as well as the aim of expanding one's knowledge of this object (epistemic orientation, mastery goals).

In this particular form of person–object relationship, one's actions undertaken in relation to the object of an individual's interest are often characterized by high levels of intrinsic motivation and intensity. This is particularly evident when one's interest is persistent over time; when interests are not restricted to specific situations. When it comes to consistent interests within an individual, it is also important to acknowledge that different people can differ greatly from each another in terms of what interests them (e.g., Anna is interested in biology, Katharina is interested in volleyball). In the research literature on interest, this differentiating motivational tendency is more specifically referred to as *personal interest* or *individual interest*. Hobbies that are maintained over a long period of time are often examples of personal interests. In the academic domain, personal interests are often significant predictors of the types of classes, degree programs, and career paths students choose to pursue. Furthermore, they are positively correlated with the use of deep-level learning strategies (e.g., cognitive elaboration) and academic achievement in the domains that correspond to the area of interest (for an overview, see Schiefele, 2001). One can also assume reciprocal relationships between students' interest and their grades (see Figure 2.2): A high level of interest results in persistence toward the learning objective that then leads to greater achievement in school (due to interest being positively associated with intrinsic value). Better grades, in turn, tend to encourage the development and persistence of interest in students (due to higher achievement being positively related to students' beliefs in their academic abilities).

As a separate concept from individual interest, *situational interest* refers to the temporary spike in curiosity in students that is generated mainly by certain elements of the learning or teaching situation (as opposed to originating from the individual themself). For instance, situational interest may be prompted by an interesting reading, novel classroom technology, or the use of an anecdote, debate or game to stimulate students' initial engagement in the subject matter. Conceptually, this type of situationally generated interest is quite similar to the intrinsic value of a learning activity as previously described (see Section 2.2.4).

2.2.8. Self-Concepts

When engaging in self-reflection, students have access to more detailed information about themselves than do others. This privileged information allows them to formulate specific estimates of their academic capabilities or personal characteristics such as physical attractiveness or intelligence. This self-related knowledge, regardless of its accuracy, is collectively captured under the umbrella term *self-concept*. More specifically, the types of self-concepts that are typically evaluated by researchers are "declarative" in nature, meaning that these self-evaluations are made consciously and can be explicitly stated by students (e.g., "I am intelligent"). In addition to this cognitive component, self-concepts also have emotional undertones (e.g., "I feel as though I am a valuable person") that although are critical elements of how one evaluates oneself, can be conceptually distinguished from the more cognitive part of one's self-concept and instead referred to as self-esteem (Harter, 2006). Of course, the most important types of self-concepts for students are those that are most relevant to learning and achievement, namely those regarding their abilities in academic domains (e.g., perceived ability to solve math problems, to learn quickly) as opposed to nonacademic domains (e.g., athletic ability, physical attractiveness, social skills).

> **Definition**
>
> The *academic self-concept* refers to the declarative self-evaluation of one's cognitive abilities.

Generally speaking, students' evaluations of their cognitive abilities in the academic domain involve the *magnitude* of these abilities and are commonly referred to not only by the term *academic self-concept*, but also *self-concept of ability*, *confidence in one's abilities*, as well as *perceived academic competencies*. It should also be noted that these estimations of one's abilities may be realistic or may either overestimate or underestimate one's actual capabilities. However, without access to systematic diagnostic procedures, it is often difficult for teachers to determine whether a given student has a high or low academic self-concept (see Praetorius, Berner, Zeinz, Scheunpflug, & Dresel, 2013). It is even more challenging for teachers to ascertain whether or not their students have a realistic understanding of their abilities. For the most part, teachers' assessments in this regard typically involve comparisons with other students — determining a student's relative standing with regard to the magnitude of their self-concept (e.g., lower than most of their classmates) and comparing this with their relative standing with regard to their actual achievements (e.g., obtains higher grades than 60% of their classmates).

In addition to students' estimations about their ability levels, their evaluations with respect to the *variability* of their abilities over time are also important. These beliefs, however, are not very explicit and are often referred to as *implicit theories* (Dweck & Leggett, 1988). Some students' theories about their abilities reflect a belief

that they can improve their abilities (e.g., intelligence) by investing effort and learning, in other words, that they can modify their abilities (incremental theory). Alternatively, other students are convinced that these abilities are stable over time, and are therefore unchangeable (entity theory). As opposed to the latter approach, the first perspective which assumes that one's abilities can be modified can serve to protect against disruptions or breakdowns in motivation and performance after failure experiences, mainly because it is believed that ability deficits can be remedied through appropriate learning efforts (see Dweck, 2000). An overview of the consequences associated with implicit ability theories is provided by Dweck and Molden (2005).

Returning to the more commonly assessed self-concepts regarding the magnitudes of one's abilities, a student's overall academic self-concept is generally hypothesized to be based on a multilayered evaluation of one's abilities across various academic domains and activities. Thus, at a certain stage of development, more specific self-concepts can be empirically differentiated based on the domain to which they refer, such as a self-concept pertaining to mathematics as compared to a students' self-concept regarding language skills. A similar example involving sports activities would be a distinction between self-estimations of one's basketball skills versus one's skills in gymnastics. According to a popular theoretical model by Marsh and Shavelson (1985), academic self-concepts (and self-concepts in general) are assumed to adhere to a hierarchical structure. According to this assumption, self-concepts that are specific to the domains of mathematics, the natural sciences, and the language arts are all hypothesized to be subcomponents of an overall academic self-concept. Further, each domain-specific self-concept is assumed to be broken down into specific self-concepts for every school subject (e.g., physics vs. chemistry; see Figure 2.7), with each of these in turn, being subdivided into self-concepts for specific learning tasks (e.g., physics homework vs. test completion). It is assumed that the more generalized self-concepts that are higher up in the self-concept hierarchy are more stable over time than the domain- and task-specific self-concepts that are more likely to vary over time.

A broad range of empirical studies have confirmed that students' estimations of their abilities are indeed organized in a domain-specific and task-specific way (Marsh & Craven, 1997). One surprising finding in this research involves the relationships between these various specific facets of self-concept: Although moderately positive correlations between achievement in different domains are found, and self-concept shows strong correlations with achievement in a specific domain, one's self-concept in one domain is usually not correlated with one's self-concept in another domain. For example, a meta-analysis by Möller, Pohlmann, Köller, and Marsh (2009) conducted on a total of 69 existing studies found the relationship between students' self-concepts in math and language domains to be almost negligible, despite high correlations between students' performance in the math and language domains (high achievement in math is often associated with high achievement in language courses). This finding is significant as it challenges the conception that self-concepts of ability are hierarchically organized in that "neighboring" self-concepts were not significantly interrelated and thus cannot be assumed to form a coherent

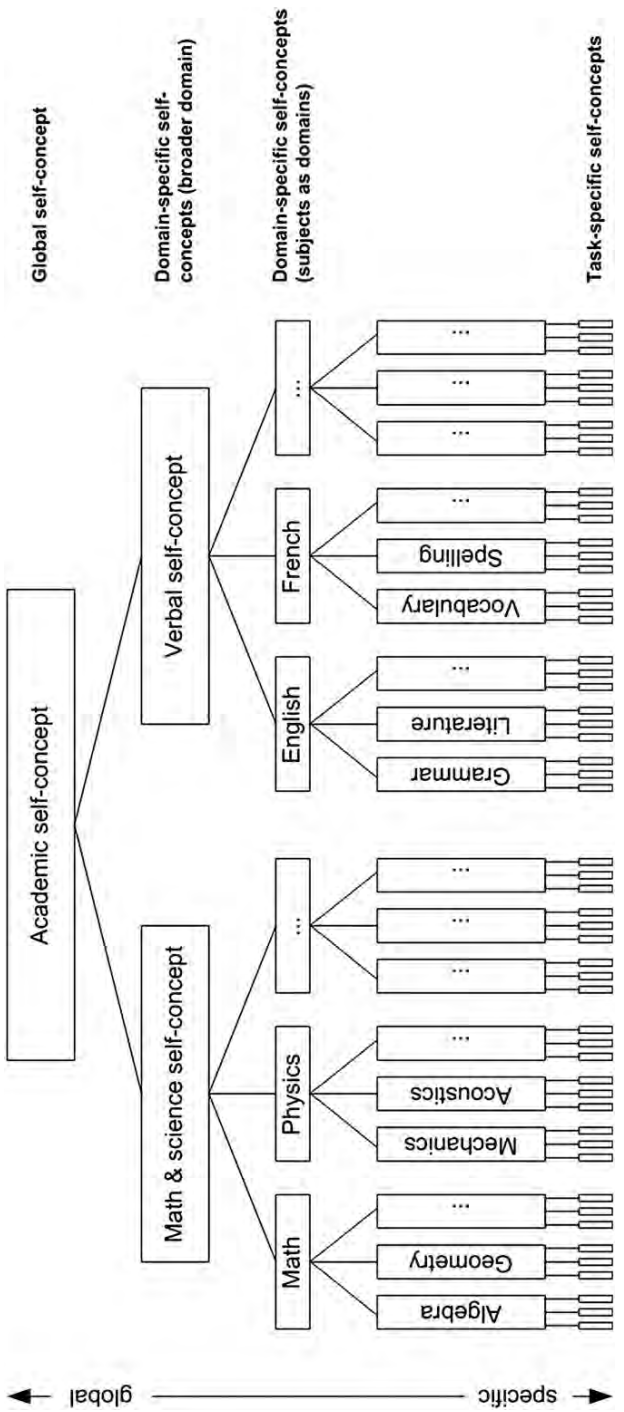


Figure 2.7: Domain-specific organization of academic self-concepts (adapted from Stiensmeier-Pelster & Schöne, 2008).

basis for a superordinate self-concept. Rather, these results suggest that domain-specific self-concepts should instead be understood and evaluated as independent constructs and prompted the development of an updated conceptualization of self-concepts referred to as the *internal/external frame of reference model* (*I/E Model*; Marsh, 1986). With regard to the relevance of self-concepts for self-esteem, findings have also been able to show that different students do assign different degrees of importance to specific ability areas in accordance with their personal attainment values (see Harter, 2006).

Students' self-concept of ability has a multitude of effects on their current motivation, the quality of the learning strategies they use, as well as their academic achievement as demonstrated in numerous research studies (for an overview see Marsh & Craven, 1997). With regard to the effects of students' academic self-concept on their current motivation, self-estimations of one's ability are an important predictor how successful one expects to be at a learning task. How a student develops an expectation about whether or not an action process or a task can be successfully completed is understood to be a cognitive process in which the perceived difficulty of the task is assessed in relation to the availability of the skills required to complete it. It is commonly assumed that students' expectations for success are ultimately dependent on domain-specific and task-specific self-concepts as well as the difficulty of the task at hand (see Eccles, 1983), at least when these cognitive comparisons are elaborated on and processed consciously (Reinhard & Dickhäuser, 2009).

Furthermore, a series of studies have determined that students with high academic self-concepts are less likely to experience intrusive cognitions that are irrelevant to the learning task (e.g., worry, self-doubt), use deep-level learning strategies focused on understanding, use meta-cognitive strategies to better regulate their learning progress, and show greater persistence than students with lower self-concepts. These effects are assumed to be due to students with high academic self-concepts having higher expectations for success that, in turn, lead to optimal learning and engagement (a "mediation" effect).

A large number of studies have shown that, similar to their effects on the learning process, both general academic as well as domain-specific self-concepts are positively correlated with scholastic achievement. Empirical findings further suggest that reciprocal relationships may be involved (e.g., Helmke & van Aken, 1995): On the one hand, self-concept are influenced by a student's previous achievements (mediated through their subjective interpretations), yet on the other hand, higher self-concepts have a positive influence on learning processes that, in turn, lead to better grades. This beneficial effect of self-concepts on achievement is still evident even when the effects of prior achievement is statistically controlled for (meaning that self-concept still had significant effects on later achievement gains over and above what one would expect based on students' previous performance).

Given the extensive effects associated with academic self-concepts, it becomes clear that a positive view of one's own abilities has a far-reaching significance for motivated and effective learning processes. Therefore, moderately optimistic

self-concepts are considered optimal for motivation as they reflect self-confidence as well as the need to still master the academic content.

2.2.9. Causal Attributions

In order to adequately understand and explain how students respond to outcomes and events in the academic domain (most importantly, success and failure experiences) in terms of their subsequent motivation and learning behaviors, considerable research has been conducted on how students perceive these experiences with respect to their *causal attributions* for why these events occurred.

> **Definition**
>
> *Attributions* are the causes that individuals believe are responsible for their experiences, actions, and achievement outcomes.

Attributions are therefore causes that are subjectively perceived by the learner to account for outcomes, and as such, are not necessarily realistic. Instead, one's causal attributions for why something happened can be affected by various types of attributional biases that can be present to different degrees in different learners (for an overview, see Fiske & Taylor, 2007). For example, the attributions students make, on average, tend to protect or enhance their own self-esteem: They tend to explain successes with personal characteristics and failures with unfavorable circumstances. Furthermore, students' self-concepts can influence the kinds of attributions they make with students having a high academic self-concept being more likely to demonstrate this type of highly self-protective attributional pattern, and students with a low self-concept tending to attribute success to external factors and failure to insufficient ability. Although the latter case is indeed consistent with a negative self-image, in attribution research it is referred to as a pessimistic attributional style characterized by the frequent underestimation of the potential courses of action that are available to that individual.

According to attribution theory (and appraisal theories more generally; see Chapter 1), it is the subjective interpretation of one's experiences, and not objective reality, that is most relevant for one's subsequent motivation and behavior. The causes to which we attribute events and their outcomes have a significant influence on how we perceive our environment, and further, how we perceive ourselves (our subjective reconstructions of reality). Should this perceptions turn out to be unrealistic, these beliefs can result in inappropriate behavior and — particularly in learning contexts — in an inadequate utilization of learning opportunities (e.g., a student who inaccurately believes their failure is due to teacher bias is less likely to make use of available study time or tutoring services). Therefore, realistic attributions, or alternatively, attributions that reflect a slightly optimistic perspective on the potential courses of action, are considered to be "functional" or "adaptive." In contrast, unrealistic attributions, particularly when they reflect an underestimation of

one's opportunities to learn and succeed, are considered to be "dysfunctional" or "maladaptive" in nature (see Försterling, 2006).

Individuals frequently think about the causes of the events they or others experience. We do this deliberately, especially when the outcomes or events we encounter are important, unexpected, and most importantly, viewed as unpleasant or negative (e.g., Möller & Köller, 1999; Stupnisky, Stewart, Daniels, & Perry, 2011). In educational settings, students' attributions for their achievement outcomes (success vs. failure) are most commonly assessed.

For high-school and university students, exams are commonplace and considered to be especially important academic events given their academic and personal implications. Try to remember a time when you received a good grade on a major exam in an important class. Why did this happen? Take a few minutes to consider what you believe to be the most important reasons behind this success.

Was it because you studied hard and prepared well for the exam? Was it because the exam was easier than expected? Was it due to superior skill or your abilities? Did you do well because you tend to do well on the specific types of questions included on the exam? Was it because you were able to effectively calm your nerves during the exam? Was your success due to help from other students before (or during) the test? Was it perhaps just luck?

One can thus attribute achievement outcomes to various types of causes: In principle, for every academic event there exist a number of potential differing explanations. However, when responding to specific success or failure outcomes in educational settings, there are certain causal explanations that are quite frequently used. For positive performance outcomes (success), these causal attributions can be deduced from, or are similar to, those listed in the "stop and reflect" example above (see Dresel, Schober, & Ziegler, 2005). When coming up for an explanation of failure, one often refers to lack of ability, low or ineffective effort, task difficulty, lack of assistance from others, ineffective coping strategies for stress and nervousness, as well as bad luck.

In order to describe the effects that these different types of explanations can have, it is important to keep in mind that these causal attributions do not themselves directly impact achievement outcomes. Instead, they tend to lead to other types of cognitions and emotions within the individual that, in turn, predict learning behaviors and academic performance. The most influential as well as practical theory concerning the effects of causal explanations on performance and achievement is the attributional theory of achievement motivation developed by Weiner (1986). In his theoretical model, Weiner suggests that any attribution chosen to explain an academic outcome can be classified according to three different factors, referred to as *attributional dimensions*:

- *Locus of causality* (also often referred to as "Internality"): Is the cause located within the individual, and therefore an internal factor? Or is the cause located outside the individual, referring instead to the influence of external factors?

- *Stability*: Does the cause remain the same for similar future events; is it stable over time? Conversely, does the cause fluctuate over time and is thus unstable?
- *Controllability*: Can the individual or others change the cause or control it through their own actions?

In his initial formulation, Weiner focused mainly on the first two dimensions and outlined the most frequently used attributions for success and failure in a popular 2×2 schematic (combination of locus of causality and stability). He later incorporated the third attributional dimension into a $2 \times 2 \times 2$ schematic that addressed the important differentiation between attributions that were personally controllable, or controllable by others, and those that were not. The revised conceptualization is depicted in Table 2.3.

It is important to note here that students often differ significantly in their understanding of how these attributions are viewed with respect to the three attributional dimensions. Again, aside from normative assumptions of what these attributions commonly denote, what is most critical is what the student believes the attribution to imply — the students' own opinion about what the perceived cause of an academic outcome or event actually means with respect to how internal, stable, and controllable it is to them. For example, whereas two students may believe lack of intelligence is the cause for a failure experience, these students may differ in their beliefs about how much one's intelligence can be improved through effort (see "implicit theories" in Section 2.2.8).

In addition to the idea that the same attribution can be viewed differently by different students, the subjective nature of causal attributions further implies that different explanations for academic events can actually have the same effects on motivation and achievement if they share similar underlying causal dimensions. In other words, one's beliefs about what various attributions represent in terms of their internal versus external origins, stability over time, and controllability can result in various attributions being effectively classified as equivalent in terms of their consequences (e.g., when poor study strategy and lack of persistence are both seen by a student as internal, unstable, and personally controllable). This is a central assumption in Weiner's theory (1986) — that different attributions

Table 2.3: Revised scheme adapted from Weiner (1979) to classify important causes of success and failure along three attributional dimensions: "locus of causality," "stability," and "controllability."

	Internal		**External**	
	Controllable	**Uncontrollable**	**Controllable**	**Uncontrollable**
Stable	Continued effort	Ability	Teacher bias	Difficulty level
Unstable	Immediate effort	Mood	Help from others	Luck

with similar attributional dimensions lead to identical results with respect to motivation, emotions, learning behavior, and achievement outcomes (see also Dresel et al., 2005).

The most relevant causal dimension with respect to expectations for success is the stability dimension. In this regard, Weiner postulates that the more stable a causal explanation for achievement is perceived to be, the more it is expected that the outcome can be repeated in the future. Put simply, if you believe you succeeded due to something that won't change, your expectations for success will increase or stay high. Whereas success attributed to stable factors should raise a low expectation and stabilize a high expectation, success attributed to factors that vary over time should have no effect on expectancy for success, regardless of how high or low it may be. In the case of failure experiences, the converse is true: Whereas failure attributed to stable causes should lower or maintain low expectations, failure attributions to variable factors should not affect expectancies. The relationship between the stability of the perceived causes and expectancy for success has been empirically confirmed by a large number of empirical studies (see Graham, 1991). Moreover, several studies conducted outside of a laboratory in natural learning contexts have demonstrated that the controllability dimension is significantly related to expectations for success. In this case, expectancy for success tends to be higher when success and failure experiences are attributed to factors that are within the personal control of the student (see Dresel et al., 2005).

Therefore, the stability and the controllability aspects of causal attributions have been found to correlate with the expectancy components of motivation. Accordingly, it stands to reason that the assumptions learners make regarding the strength of their academic abilities (ability self-concept), as well as other expectancy-based constructs, should be correlated with attributional processes. In support of this assertion, studies such as one by Skaalvik (1994) indicate that attributions of failure to lack of effort (internal, unstable, controllable) can help to protect against drops in academic self-concept and self-esteem. As such, it is clear that one's causal attributional style and one's academic self-concept can be described as having a reciprocal, mutually stabilizing dependent relationship, with students having high self-concepts tending to make ability attributions for success, and attributions to effort serving to bolster one's self-concept after failure feedback. This symbiotic relationship between attributions and academic self-concept helps to explain why these two motivational components are not immediately impaired after unexpected events, but rather only after several rounds of learning-related courses of action.

According to another empirically supported assumption in Weiner's (1986) theory, the locus of causality dimension should directly lead to specific emotional experiences following success or failure. For instance, a success experience coupled with an internal attribution should be followed by a sense of pride, whereas success that is attributed to external or environmental factors should not result in self-reflective emotions and have little impact on one's self-esteem. After failure events, attributions to internal factors should conversely correspond to lower feelings of pride and self-esteem, which is why blaming external factors tends to be a popular,

albeit short-sighted, strategy used by students to protect their self-esteem (especially defensive students with high self-esteem; Hall, Jackson, Goetz, & Musu-Gillette, 2011). Similarly, the causality dimension should result in specific emotional consequences. For example, success experiences believed to be primarily due to the assistance from the teacher (external, controllable) should lead to feelings of gratitude. In the case of failure, attributions to lack of effort (internal, controllable) are expected to result in feelings of guilt, whereas attributions to teacher bias (external, controllable) should lead to anger. Finally, the stability dimension is also assumed to lead to specific emotions, through its effects on expectations for success: Success should lead to feelings of hope, whereas repeated failure should result in feelings of hopelessness (see Chapter 1).

With regard to the effects of these various causal explanations, it becomes clear that in cases of success, internal causal attributions are associated with the most beneficial effects for learning and achievement motivation. In cases of failure, it is instead unstable and personally controllable causal attributions that are the most advantageous. Thus, from a broader educational perspective in which both success and failure events are considered, personally controllable types of attributions are found to correspond with optimal learning processes and overall academic success. For example, whereas attributions to intelligence are motivating after success and can lead to shame after failure, attributions to insufficient effort help to maintain motivation levels after both success and failure events because it is an internal as well as personally controllable attribution. Particularly detrimental are failure attributions to factors that are perceived as internal, stable, and personally uncontrollable, particularly attributions to lack of ability, and especially when such attributions are not realistic (e.g., when opportunities to improve one's performance are indeed available).

Consistently attributing failure events to deficiencies in one's abilities is often considered to be characteristic of a phenomenon referred to as *learned helplessness* (see Dweck, 2000). This phenomenon describes a systematic tendency to overlook opportunities to learn and make maladaptive explanations for negative experiences that are internal, stable, and "global" in nature (that last dimension refers to attributions that apply to several areas of one's life). Learned helplessness is associated with motivational deficits (resignation, passivity, and apathy), cognitive deficits (difficulty recognizing opportunities, inability to escape rumination over setbacks), and emotional deficits (feelings of hopelessness and depression). In an educational setting, learned helplessness is primarily understood as the inability to see opportunities to learn and improve one's knowledge and abilities as evidenced by statements such as "It doesn't matter how much I study, I won't ever understand anything" or "I will always perform poorly, regardless of how hard I try." Learned helplessness has been observed among students in various grade levels and subject domains, and affects a significant proportion of students. The prevalence of this demotivating predisposition implies that teachers should be capable of recognizing the symptoms of learned helplessness, and further, be equipped with effective strategies for helping students overcome this motivational deficit (see Section 2.4.3).

Conclusion

One's motivation to complete a specific learning task is the result of situation-specific assessments of the desirability (value) and expectations pertaining to the feasibility (expectancy) of possible courses of action, which themselves are a product of interactions among relatively stable motivational tendencies and beliefs (goal orientations, interests, self-concepts) and characteristics of the learning environment. Motivational tendencies and beliefs, as well as one's motivation in a given situation, influence the entire learning processes and are important predictors of learning quality and achievement outcomes. Depending on one's performance, and the causal factors (attributions) that are believed to be responsible for it, adjustments may be made to expectations and values related to similar tasks or subject areas, to one's motivational tendencies and beliefs, as well as to the learning environment.

2.3. Developmental and Environmental Effects on Motivation

In the previous sections, we established that social factors and characteristics of the learning environment have a significant influence on various components of one's motivation to learn and through repeated courses of action, and can further impact the development of enduring motivational tendencies and beliefs (see Figure 2.2). Accordingly, the view that one's current motivation in a given learning situation, as well as one's motivational tendencies and beliefs, are characteristics that vary only between individuals is inadequate. Instead, a comprehensive perspective on the antecedents and effects on motivation in students must consider both individual differences as well as situational influences on students' motivation. More specifically, teachers have the potential, and thus the responsibility, to substantially impact the motivation of their students through the use of teaching techniques that maintain and bolster motivation in their students, as well as utilize classroom structures and interaction techniques that promote motivation in their students (see Urdan & Schoenfelder, 2006).

The following sections are devoted to understanding the development of learning and achievement motivation, and in particular, the influence of environmental characteristics (e.g., teachers, classroom instruction) on motivation in students. Before describing these influences, however, we must first consider general patterns in the development of the various components of motivation as outlined above. For more detailed elaborations of the developmental trajectories of motivational constructs, please refer to Heckhausen and Heckhausen (2008).

Think about the various ways teachers and parents can influence the development of motivation in students. In doing so, feel free to refer back to the descriptions of the different motivational components in Section 2.2, as well as the conceptual framework of learning and achievement motivation outlined in Figure 2.2.

2.3.1. Development of Achievement Motives, Attributions, Self-Concepts, and Interest

Development of the achievement motive. The development of an achievement motive can be broken down into several developmental phases (cf. Heckhausen & Heckhausen, 2008). The first phase begins in infancy and is characterized by displays of joy resulting from having caused an effect: Starting at about the age of three months, children find pleasure in engaging in actions that produce observable consequences. For example, this could be demonstrated by the repetitive knocking of one object against another to obtain a sound, or pushing a round object to see it roll. The pleasure derived from causing this effect does not require any sort of external social reinforcement. This "effectance motivation" can be understood as an early form of achievement motivation.

In their second year, children begin to develop an understanding of their responsibility for causing effects and show a desire to produce effects and perform tasks on their own without assistance. Children express this desire through verbal statements such as "myself" or "alone" and — should these wishes not be permitted — they may have strong emotional reactions.

The third phase occurs at about age three and involves the outcomes of one's actions leading a perception of one's capabilities or efficiency. Further, children's emotions during this phase also become more differentiated in that in addition to emotions that are experienced immediately following the effect (e.g., joy, frustration), more specific achievement-related emotions are also experienced (e.g., pride after success, shame after failure), at least in the presence of significant others. This intriguing development indicates that, from this point forward, the child is no longer just concerned with the mere generation of effects, but is willing to compare their behaviors and performance against a standard of efficiency, which is typically inferred through the reactions that are elicited by their actions in their social environment. From this stage on, actions are not just understood as being motivated by effect, but also by achievement in a narrower sense. Toward the end of this phase, one can already observe the differentiation among children in the predominance of one of two components of the achievement motive (need for achievement), hope for success and fear of failure. This orientation can — depending on environmental conditions — further stabilize and, in many cases, develop into a personality trait that influences scholastic achievement motivation (see Section 2.2.5).

The fourth phase in the development of achievement motivation kicks in at about four-and-a-half years of age, and is characterized by the desire to set *aspiration levels* and consider *reference norms* (evaluative standards). When dealing with specific tasks, children at this stage of development are capable of setting goals on the basis of their previous successes and failures (e.g., how high they want to jump). In other words, children at this stage are able to set an aspiration level — a specific standard for one's behaviors and achievement against which success and failure can be clearly determined. As outlined below, there are three types of standards against which students typically compare their progress and performance to determine how well they are doing.

Definition

- An *individual reference norm* (synonyms: intraindividual or self-based standard) involves comparisons between one's current and previous performance.
- A *social reference norm* (synonyms: normative, interpersonal, or other-based standard) entails the performances of the other members of a social reference group being used as a benchmark.
- A *criteria reference norm* (synonyms: absolute or task-based standard) refers to comparisons with standards specific to the task itself (e.g., a set list of task requirements, preset educational standards).

Individual reference norms are found to be used by students early on in their development (ages: 4–6 years). These norms are then accompanied by social reference norms that develop during the early elementary school years (ages: 6–8 years). The development of a social reference norm does not necessarily imply a loss of significance for the individual reference norm. In fact, they coexist nicely and either of the two can be applied depending on the specific characteristics and demands of a given learning situation.

With respect to parental conditions, warm and supportive behaviors on the part of the parents, as well as high yet realistic performance expectations, have been found to promote favorable development of achievement motivation. As research on classroom environments and teacher expectations has pointed out, this principle also applies to teacher behavior (for an overview, see Schunk et al., 2008; see also Walker, 2009; Wentzel, 2009). Furthermore, reference norm orientations in teachers themselves have actually been found to correlate with achievement motivation in their students, with individual reference norms leading to an intensification of the "hope for success" motive component in students, and social reference norms instead being associated with greater "fear of failure," particularly in low-achieving students.

Development of causal attributions. By the time they start elementary school, children are already starting to attribute specific causes to their successes and failures. Early work by Nicholls (1978) suggests a prototypical course of development in which children do not initially differentiate between "effort" and "ability" as causal attributions for a learning outcome. Instead, attributions to effort are initially the most common attributions made by children which is likely due to it being easily observed (e.g., "I tried and it worked!"). Ability, in contrast, is not directly observable and must be deduced from both the performance outcome and the amount of effort expended. Thus, a prerequisite for making such attributions is the capacity to cognitively distinguish effort from ability, which is usually acquired between the ages of 9 and 12. Finally, children tend to start making more complex attributions to factors beyond themselves, such as luck or situational circumstances, by about age 12. Prior to this stage of development, performance outcomes which may most accurately be attributed to fortunate, or unfortunate, circumstances are likely to be incorrectly attributed to effort.

Development of the (domain-specific) self-concept. Generally speaking, domain-specific self-concepts are the result of experiences of competence in that domain, and in particular, the perceived experience of success or failure following the completion of a task. As soon as more elaborated attributional processes start to develop, however, success and failure do not automatically trigger changes in one's academic self-concept. It is instead after occurring repeatedly that these outcomes lead to adjustments in self-concept beliefs, due to being constantly filtered through attributional processes (see Section 2.2.9). Likewise, hints from significant others (e.g., teachers, parents, classmates) that suggest ability may play a part in one's performance can also influence students' self-concept of ability (e.g., Meyer, Reisenzein, & Dickhäuser, 2004). Although these social influences can be direct in nature (i.e., explicit statements pertaining to ability), indirect communications about perceived ability are more common and can be implied by emotional reactions, the type of assistance provided, the task difficulty of assigned tasks, as well as praise or blame. For example, teachers may communicate low ability attributions by showing surprise in response to good performance, or pity (and consolation) following poor performance, both of which can lead to a lower self-concept. Likewise, students can interpret being assigned simple tasks and receiving unsolicited assistance as indicative of the teacher believing their skills are limited. In a similar manner, extensive praise following the successful completion of rather simple tasks can decrease a student's self-concept, whereas assigning blame to the student and expressing disappointment following failure on more difficult tasks can improve a student's self-concept (see Chapter 1 for more on expressing mild negative emotions that motivate students). In each of these cases, students are receiving indirect communications about their academic abilities from others that, in turn, affect — via attributional processes — their academic self-concept.

With regard to the overall development of students' academic self-concepts over time, there are a number of rather significant general developmental transitions (for an overview, see Butler, 2005). Children in the early elementary school years tend to overestimate their competence levels, with more realistic self-concepts being established only once they become more familiar with specific subject areas, or when they have access to more informative and individualized feedback. Moreover, the self-assessments made by children in early elementary school are not particularly differentiated with regard to particular subject areas (e.g., mathematics), and are initially only weakly associated with global self-esteem or scholastic achievement.

With greater exposure to academic achievement experiences, direct and indirect ability-related feedback from teachers and significant others, as well as social comparisons in the classroom come significant changes in students' academic self-concepts soon after starting elementary school: On average, academic self-concepts decrease significantly and become increasingly more realistic. Furthermore, with increasing age and experience, children begin to acquire more specific assessments of their abilities in specific subject domains (e.g., mathematics self-concept vs. languages self-concept). By the second half of elementary school, students' academic self-concepts also start to be significantly correlated with their overall self-esteem and academic performance, with the achievement level of their reference group

(classmates) now playing a significant role in shaping their self-concept beliefs (see Section 2.2.8). At this point in development, the social reference norm is especially important, with students' self-concepts being highly dependent on their status relative to their classmates with respect to their achievement level. That is, students who perform better in comparison to their classmates are more likely to have higher self-concepts.

In addition to comparisons with others through social reference norms, internal comparisons made by a student across different subject domains also influence their self-concepts (e.g., when a student determines they typically perform better in English than in mathematics). These comparisons are referred to as cross-domain or dimensional comparisons, and were alluded to earlier in this chapter in context of the *internal/external frame of reference model* (I/E Model; Marsh, 1986; an overview of several empirical studies is provided by Möller et al., 2009). In essence, the prediction made by the I/E model pertaining to the effects of comparisons within a given student across subject domains on their academic self-concept is that such cross-domain comparisons tend to lead students who perform well in one subject to underestimate their abilities in another subject, and vice versa. Accordingly, the student in the preceding example above would be expected to downgrade her perceived mathematical abilities and instead emphasize her linguistic capabilities. In fact, empirical studies have revealed weak to moderate negative correlations between achievement in language domains and students' self-concepts related to mathematics, as well as between math achievement and verbal self-concepts (see Möller et al., 2009). These dimensional comparisons explain the phenomenon first presented in Section 2.2.8 that students' self-concepts in different academic domains are frequently independent of one another, despite moderate positive correlations being found between students' achievement levels in the respective domains.

Development of interest. The development of interest in students can be understood as a process of *interest differentiation*. As a consequence of this increasing differentiation in students' interests, starting at about mid-adolescence, students have specific profile of interests that becomes increasingly stable over time. In spite of this increase in the clarity and specificity of students' academic interests, it is important to acknowledge that interest continues to develop even at this age, and that the classroom environment still plays a significant role in the development of interest in adolescents. Consequently, recent research has devoted itself to the question of how students' interests are formed and change over time (see Section 2.2.7). According to Krapp (2002), both cognitive as well as emotional factors are responsible for the specific type of interests that students develop. He postulates that a student will only develop a permanent ("personal") interest in a learning activity or subject when they consider it to be of value to them, and if the overall emotional experience when dealing with activity or object is positive. Similar to the principles outlined in self-determination theory (Deci & Ryan, 1985), theories related to interest in students are based on the assumption that this emotional response to learning should be especially positive when the students' needs for autonomy, competence, and relatedness are met (see Section 2.2.5). Several studies conducted

in both the educational and occupational settings provide empirical support for this assumptions (for an overview, see Krapp, 2005).

In their *four-phase model of interest development*, Hidi and Renninger (2006) describe the formation of students' personal interests and directly address the differentiation of these interests over time. As outlined below, the four phases differ from each another in terms of the types of emotions experienced when completing tasks in students' domain of interest, students' subjective assessments of these domains, as well as the role played by domain-related knowledge in a given subject domain:

1. *Triggered situational interest* is elicited by features of the learning environment (e.g., interestingness, group work, digital media), and typically must be maintained by external factors (e.g., the teacher, content format) to prevent declines.
2. *Maintained situational interest* is characterized by student attention and engagement over a longer period of time, and is primarily produced through the meaningful and personal involvement of students in classroom activities. Sustaining this type of interest over time is also dependent on external support.
3. *Emerging personal (individual) interest* is characterized by positive emotions, advanced knowledge, as well as a positive assessment of the domain of interest and the types of activities that are associated with it. A consequence of this type of interest is that students typically wish to advance their knowledge in that domain, and utilize self-directed learning methods to this end, yet are to some degree still reliant on external support to guide their efforts.
4. *Well-developed personal (individual) interest* is also characterized by positive emotions, extensive knowledge in that domain, an even more positive assessment of the value of this domain, and the demonstration of highly autonomous learning activities. Although not required at this level of interest, even students with fully developed personal interest can benefit from external support, for instance, through apprenticeship or advice from experts.

According to this model, a student must first progress through one phase of interest before proceeding to the subsequent phase. As such, it is possible that some students may not progress to more advanced phases of personal interest, resulting in interest declines, due to insufficient external support.

Over the course of childhood and adolescence, interest differentiation is considered necessary for the optimal development of identity and one's self (see Krapp, 2002). One consequence of this increasing differentiation in students' interest — that initially starts with high interest in almost all domains — is that by developing interests in increasingly specific areas, one's interest in other domains tends to decrease. As a result, studies typically find an overall decline in students' *average* interest levels, for example in specific school subjects, from the beginning of elementary school until the latter stages of secondary school. Thus, one of the causes behind this often lamented "loss of motivation" in students can be traced to students developing more refined interests in specific topics, some of which may be academic in nature (e.g., sciences or mathematics) and others not (e.g., extra-curricular sports).

Again, whereas a decline in interest for all academic subjects is commonly reported in longitudinal empirical research (e.g., Frenzel, Götz, Pekrun, & Watt, 2010; Gottfried, Fleming, & Gottfried, 2001), this trend is likely best understood as students becoming more selective in their academic pursuits, as opposed to being unmotivated. Similar to other interindividual differences in other motivational variables (e.g., achievement motives, self-concepts, interests, goal orientations), this pattern of development is assumed to become more stable and increasingly irreversible with age (Heckhausen & Heckhausen, 2008).

2.3.2. Environmental Influences on Motivation

Evidence for the significance of environmental influences has been consistently provided by studies in which specific aspects of students' social environment (i.e., parents, peers, teachers; instructional methods) are systematically evaluated. For instance, studies that have analyzed parental assumptions pertaining to the abilities of their children demonstrate that they are closely correlated with the self-concepts of their children. These studies also show the effect of students' prior achievements on their academic self-concept is actually considerably due to what parents think about their children's competencies (e.g., Frome & Eccles, 1998). This suggests that parents play a significant role in how students interpret their scholastic achievements, and that they can substantially influence the motivation of their children by the beliefs they express concerning the child's academic abilities. As can be expected, attributional processes are typically involved in such parent–child interactions, on the part of both the parent (for the child's performance) and the child (as influenced by attributions implied or stated by parents).

Evidence for this type of conformity has also been observed for other types of motivational variables. For instance, Friedel, Cortina, Turner, and Midgley (2007) showed that the goal orientations of students corresponded with the perceived goal orientations of their parents (and their teachers). More specifically, their research indicated that students who perceived their parents as having a strong mastery goal orientation also demonstrated a mastery orientation themself that, in turn, was associated with higher levels of self-efficacy. In addition to parental beliefs and values, a students' family structure is also important for their motivation, as evidenced by lower average levels of academic performance and motivation among students from families having a lower socioeconomic status (see Grolnick, Friendly, & Bellas, 2009). However, it should be noted that socioeconomic status typically does not have a direct impact on children's motivational patterns, but rather it is the resulting impaired quality of the learning environment within the family unit (e.g., educational materials, assistance with homework, parental expectations, reinforcement for study behaviors) that leads to motivational problems.

In addition to parental influences, another major influence on the motivation of students is, of course, their teachers in terms of their feedback and instructional behavior, as discussed in greater detail in the following sections. Findings from several studies indicate that various aspects of learning and achievement motivation

in students are found to differ substantially from one classroom to the next, with such differences in student motivation often being traced back to differences in how the teachers interact with the students and the types of teaching methods employed (e.g., Meece et al., 2006a).

Peer groups and friends also play an important role in the development of learning and achievement motivation in students. In this regard, studies have consistently demonstrated that students belonging to the same network of peers tend to display quite similar motivation and performance levels, and further, that these similarities often intensify the longer one associates with a peer group (for an overview, see Schunk et al., 2008). Whereas the effects of some peer groups may be positive in terms of having advantageous motivational characteristics (e.g., high academic standards), the effects of peer groups on students' motivation can also be negative (e.g., pressure to engage in unrelated activities or underperform in order to fit in). Thus, contrary to the common assumption that the effect of peers on students' motivation are uniformly negative, studies also highlight the potential benefits of a motivating peer group on persistence and study habits. Whereas the motivational similarities among members of peer groups can be, on the one hand, explained by socialization within the groups (e.g., social learning, forming and maintaining group norms and values), selection effects are, on the other hand, also responsible as students with similar motivational profiles tend to seek each other out.

Finally, the gender differences that exist in various components of learning and achievement motivation can be interpreted as indicators of the influence of socialization. These differences are generally domain-specific and correspond to culturally conveyed gender role stereotypes (see overviews in Meece, Glienke, & Burg, 2006b; Ziegler, Heller, Schober, & Dresel, 2006). More specifically, concerning the subject areas of mathematics and the natural sciences, girls are less interested, have lower expectations of success, and lower self-concepts than boys. In verbal areas, evidence suggests contradictory, although weaker, differences in these constructs favoring girls over boys.

Given that gender differences in cognitive abilities are either slight or nonexistent, it stands to reason that socialization regarding gender stereotypes may be partially responsible for observed gender differences in academic motivation and achievement (see Ziegler et al., 2006). Generally speaking, the sources of these influences need to be sought out for all instances of socialization, particularly those located in the school and in the classroom. This is made clear, for instance, by findings showing vastly different degrees of gender differences in achievement motivation and scholastic achievement in different classrooms (Dresel, Stöger, & Ziegler, 2006).

The following sections more specifically address the effects of teachers, the classroom structure, and reference groups as have been previously discussed in this chapter.

Teacher expectations. Beyond the academic expectations of students and their parents, teachers also develop specific *interpersonal expectations* with regard to the ability levels as well as the ideal learning and achievement behaviors for individual students in their classes.

Definition

Interpersonal expectations refer to future-oriented assumptions pertaining to behaviors, competencies, and other characteristics of others.

First, it is important to distinguish *interpersonal* expectations (expectations of others) from *intrapersonal* expectations (expectations for oneself) as was previously introduced in Section 2.2.4. Extensive research indicates that the perceptions and assessments teachers make pertaining to their students, as well as the resulting patterns of communication and the instructional behaviors, are influenced by the expectations they have toward these students. This, in turn, has an influence on the motivation, learning behavior, and achievement of the students. In fact, the effects of teachers' expectations, as demonstrated by their teaching behaviors and interactions with students, on students' behavior can result in so-called "self-fulfilling prophecies," or in other words, lead students to perform either better or worse so as to more closely align with the teacher's expectations.

An early study by Rosenthal and Jacobson (1968) introduced the term *Pygmalion Effect* (named after a figure from Greek mythology; see also the play by G. B. Shaw) to describe the self-fulfilling effect of (positive) expectations and sparked a long-standing research interest in self-fulfilling expectations among teachers. In this study, elementary school teachers were incorrectly led to believe that 20% of their pupils should be expected to demonstrate above average achievement based on the fabricated results of intelligence tests. In fact, these preselected students were selected purely at random with no consideration of their intelligence test scores. One year later, however, these randomly nominated children tended to perform better on tests of reading and intelligence than their classmates who had not been identified as potential high achievers. These findings were attributed to the effects of differential teacher expectations and self-fulfilling prophecies among teachers who believed certain students were more capable of success, behaved differently toward these students, and generally perceived unique improvements in these students relative to their peers. Despite the popular and intriguing nature of these findings, they were nonetheless subject to widespread criticism and could not always be replicated. At any rate, subsequent research has been able to show that teacher expectations are indeed relevant and capable of influencing students' motivation, learning behaviors, and achievement outcomes (for an overview, see Jussim & Harber, 2005).

Building on these findings, psychological research has worked intensely to determine both how teacher expectations are generated and the effects they have on how teachers interact with students (see Jussim & Harber, 2005). Overall, a very important finding of research in this area is that the expectations a teacher has for their students can have a significant impact on their students' academic motivation. On the negative side, teachers' expectations can be particularly detrimental if they entail unreasonably low assumptions of a student's abilities or chances of success, or if they are rigid in nature. Positive teacher expectations, on the other hand, can have beneficial effects on students, for instance on goal orientations and interest levels, and especially for students who are performing poorly or are from families with a low socioeconomic status who may otherwise doubt their ability to learn and succeed (see Jussim, Robustelli, & Cain, 2009).

Classroom goal structures. Another comprehensive approach to describe the motivational effects of classroom instruction is derived from goal orientation theory (see Section 2.2.6) and is referred to as *classroom goal structures*. According to this perspective, it is assumed that various instructional aspects combine to influence the degree to which students believe mastery and/or performance goals are being encouraged in class, in other words, the degree to which they perceive a *classroom mastery goal structure* and/or a *classroom performance goal structure*. It is assumed here that a mastery goal structure is characterized by a strong focus on understanding the learning objectives, highlighting individual opportunities for improvement, the application of individual reference norms, viewing errors as learning opportunities, as well as the encouragement of cooperation and autonomy in the learning process. Performance goal structures are represented by an explicit focus on assessment and achievement, the application of social reference norms, public feedback on individual evaluations, preferential treatment of high-achieving students, as well as the use of instructional methods that encourage competition (see Meece et al., 2006a). As a result of encouraging specific types of learning activities and classroom interactions, classroom goal structures have been found to exert a significant influence on the personal achievement goals of students as well as the quality of the learning behavior they exhibit (see Ames, 1992; Dresel, Berner, & Fasching, 2011; Meece et al., 2006a; Murayama & Elliot, 2009). Moreover, it is also assumed that the goals promoted in specific learning situations can, in some cases, supplant or replace the initial personal goal orientations held by students (see Ames, 1992; Meece et al., 2006a). For instance, it would be highly unlikely for a student with a strong mastery goal orientation to maintain their focus on learning and personal enrichment when bombarded by performance-oriented classroom activities and interactions that instead encourage superficial information processing and elicit detrimental performance emotions such as anxiety or boredom (e.g., through frequent evaluations and assignments requiring rote memorization).

Over the past 20 years, a considerable number of studies have explored the effects of perceived classroom goal structures on motivation and performance in students (see Meece et al., 2006a). These studies have consistently shown that a strong classroom mastery goal structure is associated with favorable effects on motivation and learning, whereas a classroom focus on performance goals produces detrimental effects in these same areas. As to the question of which specific characteristics of classroom instruction are most representative of a mastery or performance goal structure, and further, which classroom elements are most predictive of student development, relatively few studies beyond those evaluating the effects on students' perceptions have been conducted (e.g., studies assessing observational data and teachers' perspectives are lacking). Nonetheless, the research literature to date indicates that it is the interplay among several instructional dimensions that characterizes a classroom as having either a mastery or performance goal structure (see Section 2.4.2 for more on promoting adaptive goal structures in class).

Reference groups. As previously discussed in Section 2.2.8, social comparisons with a particular reference group have significant implications for a student's self-concept in a given subject area, as well as related motivational variables, due

to the use of a social reference norm. Changes in one's reference group, particularly when transitioning from elementary to secondary school (which in many countries involves streaming or "tracking" students into specific classes based on achievement level), can impact students' motivation. In fact, these changes can lead to counterintuitive reference group effects with regard to students' self-concept of ability (see Marsh, 1987, 2003). More specifically, for high-achieving students, the transition from elementary school into a high-achieving track in secondary school is typically not associated with improvements in one's self-concept, but instead with a deterioration in academic and subject-specific self-concepts. This reaction is commonly attributed to these students now finding themselves surrounded by only high-achieving students, resulting in their relative performance in the class being lower, on average, than in a more inclusive classroom setting. Conversely, the self-concepts of the lower-achieving students often rise when they enter lower-achieving tracks in secondary school, as their performance relative to their classmates tends to be higher, on average, than was the case in elementary school. In the research literature, this reference group effect is commonly referred to as the "*big-fish-little-pond effect*": A big fish in a little pond (relatively high-achieving individual in a rather poorly achieving group) becomes a small fish when it is displaced into a lake (high-achieving classroom). These types of reference group effects are not only relevant for transitions within the school system, but also for crossovers into other types of educational institutions (e.g., the transition to higher education or employment).

In addition to possible negative effects of a high-achieving reference group on the self-concepts of students, as captured by the big-fish-little-pond effect, positive although significantly weaker effects can also be generated by joining a more prestigious group. The so-called "*basking in reflected glory effect*" (also referred to as the assimilation, labeling, or identification effect) suggests that new membership in a higher status, positively selective group (e.g., being selected to participate in college preparatory courses, classes for the gifted) can have positive effects on a students' academic self-concept and self-esteem, whereas membership in low-prestige, negatively selective groups (e.g., remedial classes) can have negative effects on these self-evaluations (e.g., Liu, Wang, & Parkins, 2005).

Conclusion

The development of fundamental aspects of learning and achievement motivation can be traced back to early childhood. Particularly large changes in motivation accompany the onset of formal education, the elementary school years, and the transition into secondary school. Environmental influences and socialization play a significant role in the development of students' motivation. For example, the expectations of teachers regarding students' abilities and the characteristics of a student's reference group are of particular relevance here. Finally, the concept of classroom goal structures has proven useful for describing, explaining, and optimizing the influences of classroom instruction on motivation in school-age children.

2.4. Fostering Learning and Achievement Motivation in Students

In order to ensure learning, sufficient motivation must be present on the part of the learner — effective learning is only possible when students are adequately motivated to engage in learning activities. At the same time, it is not reasonable to assume that all students will be adequately motivated by the same learning objectives and activities. Often, a student may show absolutely no interest in the learning objective outlined by the teacher, may not care about improving their competencies, or cannot be convinced that they will be able to master class content. Following from the process of interest differentiation that occurs during childhood and adolescence (Section 2.3.1), it is in fact developmentally appropriate and expected for students to not be equally motivated to learn and succeed in every subject domains.

Nonetheless, it remains the responsibility of the teacher to attempt to instill a sufficiently positive subjective valuing of the learning objectives and activities as well as a sense of confidence in their students that they can succeed, in order to enable students to explore all their options as well as maximize their potential. Given the instructional and developmental importance of providing students adequate opportunities to become and stay motivated in class, promoting student motivation has for decades been considered one of the most important, and most difficult, tasks in the teaching profession (see Klauer, 1985). Moreover, considering that many students also face serious motivational problems, it also falls on the instructor to occasionally utilize more specific and directed motivational scaffolding techniques to help specific at-risk students overcome these challenges and achieve their academic potential.

In the following sections, various teaching methods and intervention programs for promoting and sustaining motivation in students are described, beginning with the situation-related specific ways in which the subjective importance of a specific learning objective or learning activity can be highlighted (value components). More general instructional principles found to encourage and maintain student motivation are then discussed, followed by information on motivational training programs that can be proactively used by teachers to protect against motivation declines, or to address serious motivational problems in specific at-risk students.

2.4.1. Promoting Subjective Valuing of the Learning Objectives and Activities

When considering how to best motivate students, a primary goal is to address students' situational motivation to learning class content and the learning task at hand. To this end, it is important for teachers, especially when introducing a new topic, to establish a relationship between the material being taught and the everyday life experiences of their students in order to emphasize the relevance of the material. The point here is not only to establish situational interest and other situation-related aspects of the value components, but also to avoid detrimental emotions, such as boredom (see Chapter 1). This form of motivation is primarily directed toward

the present learning objectives and, in most cases, the effects are short term in nature. Furthermore, teaching techniques that promote situational value and interest are primarily relevant to direct instructional methods (teacher-centered, top-down approaches) that tend to be less motivating than other more collaborative forms of instruction involving discovery, problem-based, or cooperative learning activities (student-centered, bottom-up approaches). In addition to the previously mentioned associations with everyday life experiences, there are a number of other ways to encourage positive assessments of learning objectives and learning activities, as outlined below (adapted from Schiefele, 2009).

Implications for Practice: Promoting Value

- Clearly describing the rationale behind the learning objective
- Explaining the underlying purpose and context of the learning activities
- Expressing the teacher's own interests related to the learning objective
- Highlighting the practical applications and real-world relevance of the learning content
- Emphasizing the emotional aspects of the learning material
- Connecting the learning material to the specific interests of the students
- Using diverse types of instructional methods and classroom activities
- Creating cognitive conflicts (in which new information contradicts prior knowledge)

Without a doubt, such measures are both reasonable and necessary in order to motivate a student to pursue assigned learning objectives. However, these approaches do not typically leave a lasting positive influence on learning and achievement motivation. Concerning this issue, two types of misconceptions are important to address.

Misconception 1: It is sufficient to try to motivate students mainly during the first few minutes of teaching. The introduction phase of a course of instruction is indeed important for fostering student motivation in establishing an initial foundation of situation-specific motivation (in research on interest, this is referred to as the *catch component*). However, in order to retain student motivation and promote learning quality throughout the lesson (especially as subject matter difficulty increases), it is necessary to motivate learners not only at the start of the class or exercise, but throughout the entire course of instruction. For instance, this may involve repeatedly incorporating the initial attention-grabbing exercise throughout the class, or continually emphasizing the real-world or personal relevance of the subject matter (*hold components*). In high-quality instructional settings, motivating students happens continuously throughout the learning process and is not limited to the "opening act" (for more on "catch and hold" techniques, see Durik & Harackiewicz, 2007).

Misconception 2: Trying to encourage students to value learning objectives and activities is sufficient. In the previous sections, it is made clear that students' motivation to learn encompasses much more than simply valuing of a learning task or having situational interest in a learning activity. In addition to these value-related elements, it has consistently been found that the assumptions students have concerning their academic and intellectual abilities, as well as related beliefs regarding the probability of successfully completing learning tasks, have a great deal of influence over their learning behaviors. In fact, one counterintuitive finding related to students' values is that downgrading the perceived importance of a subject area or learning activity can actually have short-term *protective* effects on their self-esteem. For example, a student may believe they have limited mathematical skills and subsequently refer to math as "stupid," "boring," or "unimportant" and thereby prevent their low mathematics self-concept from having further negative effects on their self-esteem (Harter, 2006). Indeed, devaluing and having low interest in learning activities are, in many cases, caused by poor ability self-concepts and low success expectations (see Eccles, 1983). These underlying factors can be easily overlooked by teachers, however, particularly when students' statements concerning the limited value of academic tasks are more common. This also drives home the point that the motivation of students must always involve a sufficient expectation of success.

Considering these two common misconceptions, it should be apparent that encouraging students to value learning is frequently not sufficient to address all aspects of student motivation or have it persist over time. In light of the previous sections of this chapter, what else can teachers do to have a longer-term impact on motivation and engagement in their students? How can students' values as well as their expectancies for success be addressed in order to more effectively elicit and maintain students' motivation over time?

The following section introduces more extensive principles for how to motivate students both comprehensively and continually during the learning process.

2.4.2. Principles for Encouraging Student Motivation

Fostering interest and self-determined motivation. A fundamental set of instructional principles concerning how to encourage student motivation can be derived from both self-determination theory and interest theory (Krapp, 2005; Ryan & Deci, 2000). As outlined in Section 2.2.5, self-determination theory suggests that the necessary preconditions for the development of intrinsic motivation and interest are the fulfillment of the needs for autonomy, competence, and relatedness. Accordingly, it follows that instructional techniques that best facilitate motivation in students are those that consistently satisfy these three needs. Thus, it is commonly found that teachers who consistently utilize instructional methods that encourage not only appreciation of the subject matter, but also provide opportunities for students to experience themselves as self-determined and

competent, and promote positive teacher–student and peer relationships, tend to have more motivated and successful students. The box below suggests various types of teaching strategies that address each of these important psychological needs (adapted from Schiefele, 2009).

Implications for Practice: Promoting Self-Determination

Facilitating the need for autonomy:
- Student participation in selecting learning goals and activities
- Implementing classroom activities that afford students opportunities to use various skills and engage in self-regulated learning
- Providing students opportunities for self-assessment
- Joint negotiation of behavioral regulations with students

Facilitating the need for competence:
- Frequent positive feedback
- Clear, structured, and intelligible instructions
- Adjusting task difficulty in accordance with students' ability levels
- Supporting specific students when difficulties are encountered
- Implementing learning activities that require a variety of skills (not simply skills that are directly relevant to the subject area or learning task)

Facilitating the need for relatedness:
- Implementing activities that promote cooperative learning between students
- Building a partnership between teachers and students in which the learning progress of students is conveyed as personally important to their teachers

Evidence from empirical studies has demonstrated that these techniques can be effectively used to increase students' interest levels (for an overview, see Schiefele, 2009). Furthermore, these strategies afford teachers meaningful opportunities to foster the development of their students by allowing them to move away from controlled motivation in their students (external regulation; see Chapter 3) and instead promote autonomous (self-regulated) forms of motivation (e.g., fully intrinsic or autonomous extrinsic motivation; see Section 2.2.5). Noteworthy here is the fact that these measures serve to not only encourage motivation and interest in students, but are also consistent with the core principles underlying high-quality instructional practices that are cognitively stimulating and optimize learning (e.g., Hattie, 2009). Finally, it is important to note that these teaching techniques, as well as those described in the following section, do not involve "pushing" or pressuring students to learn and succeed — which could represent a third common misconception about how to best motivate students.

Establishing a beneficial classroom goal structure. A second, and even more varied cluster of instructional principles for how to motivate students can be derived from achievement goal theory. As explained in Section 2.3.2, the learning and

achievement motivation of students can be positively influenced through the promotion of certain types of classroom goal structures. In order to organize the various relevant classroom characteristics and instructional techniques that constitute an effective classroom goal structure, a classification framework outlined by Epstein (1989) has proven particularly useful (see also Ames, 1992). In this model, the relevant aspects or dimensions of classroom instruction include the selection of tasks and learning activities, the distribution of responsibility, authority, and autonomy, the recognition and evaluation of students and their achievements, the formation of learning groups, as well as the allocation of learning time. The acronym used for these dimensions is TARGET (task, authority, recognition, grouping, evaluation, time), with specific teaching methods corresponding to each of the six dimensions described in Table 2.4 (notice that most of the interest-enhancing methods also appear in this list). The TARGET model provides a structure for efforts to promote advantageous mastery goal structures in the classroom, as well as reduce performance goal structures.

Although empirical research regarding the relationships between teacher behavior, classroom goal structures, and students' motivation to learn is ongoing, it is important to note that research based on goal orientation theory has contributed to clear set of differentiated and sensible instructional principles for promoting motivation in the classroom. Overall, the overarching goal should be to prepare and deliver classes, as well as interact informally with students, in such a way that mastery goals take center stage, and performance goals function mainly in the background. Table 2.4 can thus be viewed as a useful checklist for teachers to assist in acknowledging as well as encouraging effective goal structures as part of classroom instruction.

2.4.3. Motivational Intervention Programs

As mentioned in the introduction to Section 2.4, we need to differentiate between general instructional approaches that encourage overall student motivation and specific programs targeting students with serious motivational problems. Although the measures described above that tend to focus on the value component of motivation can — if utilized consistently and correctly — help teachers to encourage motivation and academic development in their students, they may not be focused or explicit enough to optimally assist students with significant motivational difficulties (e.g., unrealistically low estimations of their academic ability). A motivational training program is required when serious motivational problems are evident, particularly those that manifest themselves in the following: detrimental choices (choosing either very simple or very difficult tasks), low levels of persistence, poor quality learning, performance that is well below expectations, a systematic underestimation of one's abilities, very low expectancies for success, devaluating of learning, detrimental attributions, and/or symptoms of learned helplessness. In these cases, motivational training programs have been found to facilitate engagement,

Table 2.4: Dimensions and associated teaching techniques of the TARGET model (Epstein, 1989).

Dimension	**Teaching techniques for promoting optimal classroom goal structures**
Task	• Using diverse, varied, personally relevant, meaningful, emotionally rich, and therefore interesting tasks • Assigning individually challenging tasks that can be accomplished with effort • Structuring learning activities into subgoals that allow students to monitor their progress
Authority	• Emphasizing student responsibility for personal learning and classroom cooperation in a developmentally appropriate manner • Providing opportunities to choose learning goals, activities, and materials in a manner consistent with the self-regulatory abilities of individual students (see Chapter 3) • Providing opportunities to make decisions and for leadership
Recognition	• Acknowledging effort through praise, positive emotional reactions, rewards, and other forms of reinforcement • Conveying the belief that effort leads to the improvement of competencies • Acknowledging individual improvement • No preferential treatment for high-performing students • Recognizing the understanding (rather than memorization) of content • Recognizing the validity of individual pathways to solutions • Creating a classroom climate in which errors are understood as opportunities for learning and not as a sign of limited competence
Grouping	• Use of cooperative teaching methods • Creating heterogeneous groups with regard to achievement levels to promote the collaborative attainment of learning goals • Fostering a cooperative as opposed to competitive classroom climate • Teaching the competencies for effective group work
Evaluation	• Using individual and criterion reference norms in evaluating task performance • Avoiding social reference norms

Table 2.4: (*Continued*)

Dimension	Teaching techniques for promoting optimal classroom goal structures
	• Avoiding social comparisons • Avoiding competitive learning and achievement activities wherever possible • Refraining from public performance feedback (e.g., when returning tests) wherever possible • Providing private feedback to students (oral and written)
Time	• Provide sufficient time to complete a task (on tests and class activities) • Adjust the learning time available to low-achieving students (and plan extra tasks for the high-achievers if necessary) • Provide opportunities for students to plan the time allotted for their learning activities and to schedule self-tests

learning, and achievement outcomes, thereby helping these struggling students to reach their academic potential.

Principles of motivational programs. The field of educational psychology has for years developed and evaluated the effectiveness of motivational intervention programs for mitigating the aforementioned motivational deficits in at-risk students (for an overview, see Schunk et al., 2008). In addition to interventions for already struggling students, these types of programs have also been used in a preventative manner to avert potential motivation declines in students with relevant risk characteristics. For example, such programs have been used to assist students following the transition from elementary into secondary school (to mitigate the big-fish-little-pond effect; see Section 2.3.2) or by teachers when introducing a new and particularly difficult subject to their class.

Most motivational training programs that target students facing specific motivational problems place their emphasis on expectancy components of motivation and related beliefs in students. More specifically, their primary aim is typically to improve students' academic self-concepts and expectancies for success, and to alleviate the symptoms of learned helplessness. To this end, these programs tend to utilize one or more of the following training elements:

- Encouraging adaptive causal attributions for academic success and failure
- Promoting an individual reference norm for evaluating achievement outcomes
- Fostering the selection of challenging yet realistic task difficulty levels
- Promoting an implicit, incremental theory of intelligence (abilities are modifiable, not static)

For example, Rheinberg and Krug (2005) proposed and evaluated a number of effective motivational programs that promote individual reference norms in performance assessments, foster the selection of appropriate task difficulty levels for themselves, and encourage realistic causal explanations (a brief description can be found in Rheinberg et al., 2000). Results showed that especially for low-achieving students, the adoption of individual reference norms led mainly to a reduction in their expressed fear of failure and test anxiety, as well as improvements in their academic self-concept. These findings illustrate that encouraging the utilization of individual reference norms can be an effective way of helping at-risk students to maintain their motivation in the classroom.

In addition to reference norm approaches, other motivational intervention programs based directly on attribution theory have been found to effectively promote academic motivation and achievement in at-risk students. In these attribution-based approaches, students are encouraged to reflect on the causal attributions for their success and failure experiences, as well as consider the implications of adopting more motivating causal attributions (and conversely, avoiding maladaptive attributions) in terms of their subsequent learning and achievement (see Graham & Weiner, 2011, for an overview). As outlined in greater detail below, one particular long-standing intervention technique referred to as *attributional retraining* represents a prototypical example of this type of program.

Motivational intervention programs are often used in combination with the knowledge or skill development activities pertaining to a specific topic (e.g., mathematics), or with training exercises aimed at improving students' use of learning strategies (e.g., Dresel & Haugwitz, 2008). The advantage here is that it is not only the desire, or "want" component that is improved, but also the ability, or "can" component. By combining these two elements, interventions can exert a more powerful positive influence on student development (see Fries, 2002).

Attributional retraining. Attributional retraining programs are designed to improve student development by attempting to modify the causal explanations (attributions) they choose to explain to why they perform the way they do. In this process, the first goal is to replace attributions that are motivationally detrimental with attributions that are more conducive to motivation (to "reattribute" their performance). This means that realistic causal explanations should take the place of unrealistic attributions, which are frequently reflected in pessimistic perceptions of one's own competence levels and perceived courses of action. In addition to its use in the prevention of motivational problems, attributional retraining is also effective in helping students who already demonstrate a consistent underestimation of their abilities, overlook potential opportunities to improve their learning and achievement, or demonstrate symptoms of learned helplessness (e.g., "No matter how much I study, I will never understand this material"). Typically, attributional retaining methods tend to encourage internal causes (primarily ability and effort). However, the types of attributions recommended after failure are those that are personally controllable and/or can change over time (mainly, lack of effort). In Section 2.2.9, a

case was made for how students' causal attributions for their success and failure at school are directly related to other motivational constructs such as students' self-concepts in specific academic domains, as well as their emotions surrounding learning activities. Based on this premise, the long-term goal of attributional retraining is to produce improvements in motivational and emotion variables (e.g., perceived competence, expectations; attribution-based emotions such as hope) and, in turn, learning behavior and achievement levels.

Given the straightforward nature of attributional retraining, its use is not at all limited to researchers, counselors, or school psychologists, but can be readily incorporated by teachers into the feedback provided to students following performance evaluations, or into regular classroom content and activities to proactively inoculate students against maladaptive explanations for success and failure (e.g., Heller & Ziegler, 2001).

The most important technique based on attributional retraining principles that can be used by teachers to improve the motivation of their students is to provide feedback on students' successes or failures that conveys desirable causal attributions (*attributional feedback*). These comments can be made in writing (when returning written submissions such as pop quizzes, class exams, essays, practice exercises, or homework), or verbally either during class (e.g., through praise or reprimands) or after class (e.g., candid expressions of disappointment or explicit statements indicating improvements are possible). In light of the negative side effects of providing public performance feedback in the classroom (e.g., social comparisons, jealousy), verbal forms of attributional feedback should be used carefully and judiciously, particularly when provided spontaneously by teachers during classroom instruction, given that prior consideration of its social appropriateness and plausibility is required in order to minimize adverse consequences. Table 2.5 outlines a range of sample comments by teachers in which optimal attributions for responding to success and failure are encouraged.

The effectiveness of attributional retraining has been empirically demonstrated in a substantial research literature on this intervention technique (for overviews, see Graham & Weiner, 2011; Perry, Hall, & Ruthig, 2007; Schunk et al., 2008). This research suggests, however, that individual and small group programs that are conducted external to classroom instruction tend to be more effective than intervention programs that are integrated into the classroom and administered by students' regular teachers. Thus, in contrast to formalized efforts to train teachers to use attributional techniques with their students, it may be more productive to focus instead on how teachers convey attributional information to their students in more subtle and informal ways (e.g., indicating insufficient effort in written feedback, not providing unsolicited assistance). Nevertheless, it is important to recognize that teachers are indeed capable of improving attributions and motivation in their students through attributional feedback.

Concerning externally administered intervention programs, longitudinal field studies with college students have repeatedly found attributional retraining methods encouraging unstable and personally controllable attributions for failure to help students do better academically, and also be more successful in job

Table 2.5: Examples of attributional feedback from teachers (adapted from Dresel, 2004; see also Dresel & Haugwitz, 2006).

Attribution category	**Examples**
Success	
Ability	"You obviously write very well." "It's easy to see that you know what you're doing."
Effort	"It's apparent that you've spent a great deal of time studying." "You succeeded because that you focused on your work."
Strategy	"Summarizing each paragraph in a single sentence really paid off." "You really took the right approach for this task."
Failure	
Effort	"You didn't quite put in enough effort." "I know you can try harder."
Strategy	"Solving the more difficult problems in a step-by-step way on scrap paper will help you solve them more easily." "If you have problems remembering the vocabulary words, try to learn just a few words at a time, and only move on when you really know them."
Task difficulty	"These exercises were difficult for everyone." "Perhaps the problems I chose for the test were too tough."
Bad luck	"This can happen to anyone." "Sometimes it's just bad luck."

interviews, particularly those at-risk of demotivation and poor performance due to the use of maladaptive learning strategies (e.g., Hall, Hladkyj, Perry, & Ruthig, 2004; Hall et al., 2007), unrealistic competence beliefs (e.g., Hall, Perry, Chipperfield, Clifton, & Haynes, 2006), or low self-esteem (e.g., Hall et al., 2011). Findings suggest that addressing attributions for both success and failure experiences is important, and further, that attributions for success should include both effort and ability, with effort-only or ability-only feedback tending to produce ambivalent effects (see Dresel & Haugwitz, 2006). In fact, a study conducted by Dresel and Ziegler (2006), in which the effects of computer-based attributional feedback as incorporated into mathematics instructional software were evaluated, found the most effective type of attributional feedback after success was to first provide statements acknowledging the student's *effort*, then replacing effort feedback with statements implying *ability* attributions once the student had demonstrated sufficient progress (see also Dresel, 2005). The findings of this study clearly indicate that only this particular sequence of attributional feedback was optimal, likely because it enabled students to interpret their academic abilities as resulting from the efforts they invested in learning, which is consistent with related research showing students who hold implicit personal theories that their competencies are modifiable to be more highly motivated (see Section 2.2.8).

Conclusion

A critical and ongoing responsibility for teachers is to ensure their students stay motivated throughout the learning process. This task is not limited to the first few minutes of class and involves more than encouraging students to see the value in class content, although these two aspects are indeed important in their own right. In designing classroom activities that help to keep students motivated, principles derived from self-determination theory (meeting students' needs for autonomy, competence, and relatedness) and achievement goal theory (promoting mastery goal structures, minimizing performance goal structures) have proven particularly useful. Motivational programs for assisting students with more serious motivational problems typically adopt expectancy-related approaches. These include intervention programs that promote individual reference norms, being realistic with regard to task difficulty, as well as the explicit encouragement of adaptive attributions for success and failure experiences.

2.5. Teachers in Focus

In recent years, the motivation of *teachers* has received increasing attention in motivation research alongside the predominant research focus on the motivation of students. In addition to commonly heard sentiments such as "Motivated teachers are effective teachers" or "Students are only as motivated as their teachers," as well as increasing mention of the term *teacher enthusiasm*, the importance of teacher motivation has also been supported by empirical studies (for an overview, see Schunk et al., 2008). On closer inspection, research in fact suggests that the phenomenon of teacher motivation is more complicated than is implied by one-dimensional concepts like general enthusiasm, with studies indicating that motivation in teachers, not unlike in their students, can be differentiated according to both quantitative ("How motivated are you?") and qualitative elements ("What are you motivated to do and why?"). Thus, it is clear that a differentiated consideration of several components of teacher motivation is required.

2.5.1. Expectancy and Value Components of Teacher Motivation

In theoretical models of teacher motivation, the effects of motivation-related beliefs and behaviors in teachers are primarily evaluated in terms of achievement motivation and, for the most part, focus mainly on instructional activities in the classroom that are most successful (e.g. de Jesus & Lens, 2005). Similarly, following from the research tradition in which student motivation is understood to be based primarily on expectancy and value components, these two motivational elements are also typically incorporated into theoretical perspectives on motivation in teachers.

With regard to expectancy components, most of the studies conducted on teacher motivation have explored the *self-efficacy expectations of teachers*, namely the degree to which teachers see themselves as capable of mastering pedagogically challenging situations through their own actions. A variety of empirical studies have demonstrated that higher self-efficacy expectations among teachers correspond to a more favorable classroom climate, more comprehensive support behavior, and better achievement in their students (see Woolfolk Hoy, Hoy, & Davis, 2009). Concerning the personal psychological and physiological benefits of teacher self-efficacy, other studies also show higher self-efficacy in teachers to predict lower levels of burnout, better physical health, as well as higher job satisfaction in teachers (e.g., Caprara, Barbaranelli, Steca, & Malone, 2006; Schwerdtfeger, Konermann, & Schoenhofen, 2008; Skaalvik & Skaalvik, 2010).

Turning to the value components of teacher motivation, studies have examined teachers' intrinsic versus extrinsic (autonomous vs. controlled extrinsic) motivation in the employment context, teachers' interest in classroom instruction and the subject of instruction, as well as goal orientations and the previously mentioned concept of teacher enthusiasm (e.g., Hanfstingl, Andreitz, Müller, & Thomas, 2010; Long & Woolfolk Hoy, 2006; Nitsche, Dickhäuser, Fasching, & Dresel, 2011; Pelletier, Séguin-Lévesque, & Legault, 2002). Overall, findings from research in this field suggest that teachers who demonstrate more self-determined and intrinsic motivation tend to provide better support and opportunities for autonomy in their students, and are also more effective in promoting students' motivation for learning and achievement. Furthermore, recent research has begun to explore the types and effects of goals that teachers pursue in their profession as informed by achievement goal theory (see Section 2.2.6). However, this research also shows the conceptual evolution of our understanding of motivation in teachers such that, in addition to achievement motivation in the strictest sense, learning and work-avoidance goals are also considered, thus reflecting a broader conceptualization of the value components of motivation in teachers. Given the predominance of research on achievement goal orientations in students, research in which this theoretical model is applied to how teachers approach classroom instruction and student development is highlighted in the final section of this chapter.

2.5.2. Goal Orientations of Teachers

In applying the concept of goal orientations to better describe and explain the experiences and behavior of teachers in the classroom, it is acknowledged that, similar to their students, teachers are faced with various types of performance demands, and that their teaching activities are indeed carried out in social contexts in which their performance is consistently evaluated (e.g., by colleagues, students, parents). More specifically, it has been argued that schools and classrooms represent an "achievement arena" for students as well as teachers (Butler, 2007, p. 242). Consequently, one can assume that teachers, to varying degrees, also pursue the goal of expanding their professional competencies, and to differing degrees may also aim

to conduct their daily occupational activities with the lowest amount of effort possible (often an important consideration given limited resources and time). In accordance with these assumptions, research by Butler (2007) found four qualitatively different types of goal orientations of teachers (see Table 2.6).

Butler (2007) was also able to show these four goal orientations to correspond in specific ways with the experiences and behaviors of teachers. On the one hand, teachers who reported a strong mastery goal orientation tended to interpret help from colleagues as an opportunity to expand their teaching abilities and to make their career more interesting. On the other hand, teachers who adopted an avoidance-performance goal orientation seldom sought help from others and were inclined to perceive it as an indicator of personal teaching deficiencies. As teachers are continually faced with the challenge of maintaining and improving their professional competencies to most effectively help their students learn and succeed, and that the help-seeking could be an effective strategy in this regard, a strong mastery goal orientation should benefit both new and experienced teachers by encouraging them to use available support services to improve both knowledge and performance in both themselves and their students. Conversely, a strong performance-avoidance goal orientation can put teachers at significant risk of suffering from low levels of perceived competence over the course of their teaching career (see also Fasching, Dresel, Dickhäuser, & Nitsche, 2011; Nitsche et al., 2011).

Research evidence also suggests that the goal orientations adopted by teachers are directly associated with their occupational stress levels (see Chapter 1). As an example, one study by Tönjes, Dickhäuser, and Kröner (2008) showed both a strong performance-avoidance goal orientation and a weak performance-approach goal orientation to correspond with a greater perceived lack of accomplishment among teachers — a critical underlying component of occupational stress — even when the effects of personality characteristics (such as neuroticism) were statistically controlled for.

Finally, findings from recent empirical studies suggest that the occupational goal orientations held by teachers are also significantly correlated with the instructional practices they use in the classroom. For instance, results obtained by Retelsdorf, Butler, Streblow, and Schiefele (2010) indicate that teachers with a high mastery goal orientation tend to more frequently utilize cognitively stimulating teaching methods and instructional techniques that enable all students to master the

Table 2.6: Goal orientations of teachers.

Goal orientation	Goal content
Mastery	Increase one's competence as a teacher
Performance approach	Demonstrate one's competence as a teacher
Performance avoidance	Do not show deficits in one's competence as a teacher
Work avoidance	Invest as little effort as possible in one's professional capacity as a teacher

material being covered. Furthermore, this study also found the endorsement of work avoidance goals, as well as performance avoidance goals, to instead be associated with teaching practices in which performance displays and competition are emphasized (see Section 2.4.2). Thus, preliminary findings from studies with teachers parallel those from research with older students in showing a strong orientation toward mastery goals to be most beneficial, and conversely, a preference for performance-avoidance goals to be particularly detrimental for instructional quality and student development in classroom settings.

Conclusion

Motivation in teachers represents an important prerequisite for high-quality classroom instruction and the optimal development of motivation, learning, and achievement in students. Moreover, it also serves an important function in promoting psychological and physical health, as well as the development of instructional competencies in teachers. Emerging research on teacher motivation further suggests that the structure, conditions, and effects associated with both expectancy and value-related motivational components closely parallel those observed over the past several decades with student populations.

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Chapter 3

Self-Regulated Learning

Thomas Goetz, Ulrike E. Nett, and Nathan C. Hall

3.1. Students in Focus

"I want to be a concert pianist and I practice the piano a lot. School things for me are less important. I am not learning very much – what is important for me is that I just get through high school." (Karen M., 17 years old)

Self-Regulation / Resource Management

"If I'm doing my homework, I usually think about what is important and I'll do that first. In the end, I usually learn or repeat French vocabulary." (Markus P., 13 years old)

Planning

"In the gym, I regularly look at the clock so I can stick to my training schedule." (Kyle D., 19 years old)

Monitoring

"I do what my mom wants me to do." (John K., 5 years old)

External Regulation

Emotion, Motivation, and Self-regulation: A Handbook for Teachers

ISBN: 978-1-78190-710-8

"While I am studying for a physics exam, I turn off my phone and my e-mail program so I'm not constantly distracted and can concentrate better." (Brigitte F., 21 years old)

Volition

"The day before an exam, I go to bed very early to be at my best the next day." (Joanna W., 16 years old)

Resource Management

"When preparing for an important exam, I sometimes think about how best to study and prepare." (Lukas H., 14 years old)

Metacognition

"When I study for my psychology class, I think about examples from real life." (Olivia S., 23 years old)

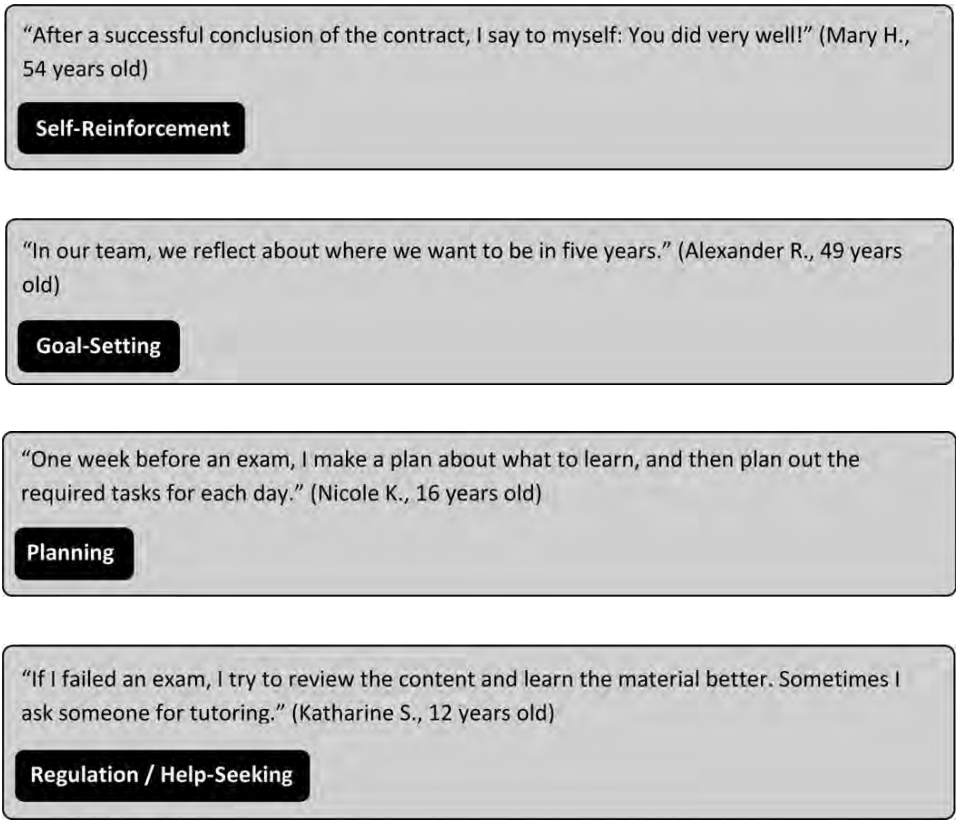
Elaboration

"After studying, I sometimes briefly reflect about how well I studied and if I achieved my learning goals." (Sylvia M., 18 years old)

Evaluation

"Before an exam, I have a thorough look at my notes and summarize the most important issues. Afterwards, I focus on solving specific tasks and examples." (Michael S., 12 years old)

Organisation



3.2. What is Self-Regulated Learning?

3.2.1. Definition

There exist a variety of definitions of self-regulated learning in both textbooks and scientific publications (Boekaerts & Corno, 2005). Among other reasons, this is due to the specific perspectives and priorities of the different psychological research traditions in which this topic has been explored (e.g., social, personality, educational psychology). The definition of "self-regulated learning" presented in this chapter follows directly from the three parts of this phrase, and is thus relatively comprehensive as well as consistent with many other definitions of the construct.

The term "self-regulated learning" involves the three critical elements: "learning," "regulation," and the "self." The element of "learning" pertains to the range of activities involved in acquiring knowledge and skills. "Regulation" describes a process in which one's current state is compared with a target state (e.g., a learning goal) and the perceived discrepancy motivates subsequent actions aimed at reducing it (Wiener, 1948). Although various conceptualizations of the self have been

proposed (James, 1892/1999), the definitions of the self in research on learning and achievement typically refer to the individual's initiative in terms of setting and achieving one's personal goals. On the basis of these three elements, self-regulated learning can be defined as follows:

> **Definition**
>
> *Self-regulated learning* is a form of acquiring knowledge and skills in which the learners are independent and self-motivated. Learners independently choose their own goals and learning strategies that will lead to achieving those goals. It is through evaluating the effectiveness of one's learning strategies — comparing one's current state with the target state — that learning can be modified and optimized.

According to this definition, a repertoire of skills for initiating and sustaining self-regulated learning is necessary. In particular, the following competencies are necessary in order for self-regulated learning to be successful:

- Ability to independently establish appropriate learning goals (e.g., goal quality and quantity, accounting for learning time, or considering the required depth of processing when learning new information — for instance, new information may be processed in either a superficial or more elaborated way).
- Diagnostic skills in order to accurately determine the discrepancy between one's current state of learning and one's target learning goals while in the process of achievement striving (e.g., realistic assessments of one's knowledge and skills, rate of progress in learning goals, how much farther one must progress prior to an achievement test — for instance, knowing what grade is required on the next math test in order to achieve at least a B in math class).
- Knowledge and skills aimed at reducing the difference between one's current learning state and the target state (e.g., ability to plan, having a repertoire of learning strategies, knowing when to use and not use specific strategies — for instance, it may be more effective to rehearse information for multiple-choice tests, but elaborate more deeply on content to be tested using open-ended questions).
- Motivation to initiate and to maintain optimal learning (e.g., having learning-related values, goals, and emotions that help one start and continue the learning process, being persistent with effective learning strategies, and disengaging from unproductive strategies — for instance, more motivated students should be better able to leave an unproductive study group and instead seek out an experienced tutor, or more likely to encourage other members of the study group to improve their learning behavior).

The definition presented above highlights the *process* of regulation: reducing the difference between the current and the target learning state. This element is of primary importance in most definitions of self-regulated learning and may be regarded as its most basic principle. From this perspective, self-regulated learning

can be understood as a dynamic and cyclical process, which can only be effective if the above competencies are already developed and being used. For example, having the ability to set appropriate goals for oneself is of little use if the student is not motivated to achieve these goals and lacks competencies that are required during the learning process (e.g., without knowing how to use specific learning strategies, or being able to monitor one's progress, these goals are unrealistic). Similarly, students who are competent with respect to motivational and learning strategies can also be unsuccessful if they are unable to set appropriate learning and achievement goals (wasted effort).

Given the multifaceted and complex nature of self-regulated learning, it is common in empirical research to refer to specific elements of the self-regulated learning process, rather than self-regulated learning as a whole. For example, although studies often describe their focus as evaluating the effect of self-regulated learning on performance, it is typically the case that only the effects of students' use of specific learning strategies on achievement are explored. In light of this research practice, it is perhaps most appropriate to refer to the implications of specific aspects of self-regulated learning, for example, specific learning strategies such as goal setting or elaboration, on learning and performance outcomes.

Definition

The term *learning strategies* refers to thoughts and actions that are used to control the learning process either directly or indirectly, and may be knowingly used by individuals to optimize their learning experience. Learning strategies can be classified into various categories such as cognitive, metacognitive, and resource-based learning strategies, or general, subject-specific, and self-control strategies.

Apart from incidental or nonintentional learning experiences, the acquisition of knowledge and expertise is always self-regulated to some degree as basic learning processes, by definition, must happen within the individual and do not require external facilitation to occur (e.g., perceptual encoding of information, cognitive processing of new knowledge). Similarly, the extent to which the learning process is regulated by external instruction or support can also be viewed as a continuum ranging from exclusively self-regulated (e.g., learning something of individual interest) to primarily externally regulated (e.g., classroom drills). External regulation can take various forms as outlined below:

- Goals that are defined by others (e.g., a teacher explicitly outlining the content to be evaluated on an upcoming test).
- Evaluations of one's current state of knowledge and skills by others (e.g., formal grades from teachers).
- Learning strategies that are determined by others (e.g., explicit instruction on appropriate methods of learning such as flash cards, note-taking, etc.).

- Being motivated by others (e.g., competition resulting from zero-sum grading practices, verbal praise, monetary rewards, etc.).

One aspect of self-regulation involves the extent to which external regulation by others is required or permitted. For example, some students may indicate a desire for greater personal responsibility, and less involvement from overeager parents, while completing their homework. As such, a request for greater or less external regulation can be considered a strategy for engaging in self-regulation (for more on motivation and help-seeking, see Newman, 2008).

As our behaviors are always limited in some respect by our physical or social environment, one's behavior is always externally regulated to some degree. In what situations are your actions determined mainly by factors beyond your control? When and where do you find yourself having more freedom to choose your activities? Are there situations in which you prefer to self-regulate, and other situations where you prefer external regulation? What are the benefits of being able to independently complete an activity? Alternatively, what are the possible advantages of having one's behavior limited by external factors? In what circumstances do you have the possibility to influence the self-regulation of others, or impose limits on others' behavior?

3.2.2. Historical Development

The amount of research conducted on a given topic tends to be a good indicator of its prevalence and perceived societal relevance. In an effort to illustrate the development of research interest related to "self-regulated learning," we conducted a literature review and presented the results in Figure 3.1.

Our search looked at papers published from 1950 to the present in which "self-regulated learning" appeared in either the title or abstract (non-English publications with English titles/abstracts were included), and was conducted using two international databases: PsycINFO (created by the American Psychological Association) and ERIC (maintained by the Education Resources Information Center, Washington, DC). The number of publications found is displayed in Figure 3.1 in 10-year periods starting from 1980 (we found only one article published prior to 1980). To indicate the increase in publications on self-regulated learning relative to overall increase in scientific publications, the number of publications in this domain relative to the total number over a given 10-year period is displayed. Accordingly, Figure 3.1 presents the number of publications on "self-regulated learning" per 100,000 publications in each database.

Overall, this chart illustrates that self-regulated learning as a research topic has gained increasing scientific interest over the past 30 years, even after accounting the general increase in research publications. For example, whereas only 16 of 450,359 publications found in PsycINFO from 1980 to 1989 addressed self-regulated

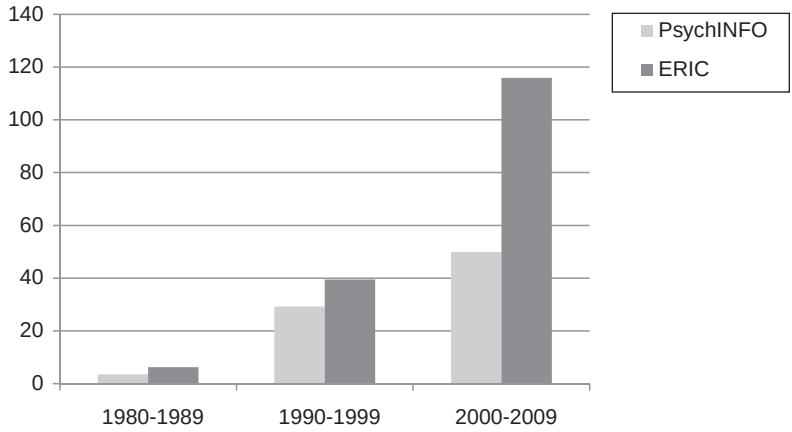


Figure 3.1: Number of publications on "self-regulated learning" per 100,000 publications in each database.

learning, 540 of the 1,081,106 papers in this database that were published between 2000 and 2009 have explored this topic (compare also with Winne, 2005). In the ERIC database, the relative increase is even clearer — the total number of all publications in this database in the periods shown in Figure 3.1 does not increase, yet a noted increase in the number of publications on self-regulation can be seen. In the first 10-year period, only 20 of 317,551 publications dealt with self-regulated learning, as compared to 344 of 296,964 publications in the most recent decade.

Research on self-regulation in the 1980s happened primarily in the fields of social and personality psychology (e.g., analysis of the influence of groups and personality on individual regulatory behavior; Boekaerts, Pintrich, & Zeidner, 2005). Over time, self-regulation became an increasingly prevalent research topic in the fields of cognitive and developmental psychology, especially in the context of metamemory and metacognitions. In the 1990s, self-regulation was increasingly studied in specific contexts, including learning and achievement settings, and continues to be researched extensively in the domains of educational and organizational psychology.

The practical importance of self-regulated learning, specifically in the education domain, is clearly evident in the large number of recent books on the subject (e.g., *Handbook of Self-regulation* by Boekaerts et al., 2005; *Self-regulated Learning and Academic Achievement* by Zimmerman & Schunk, 2001). The topical nature of self-regulated learning in educational psychology is further reflected in entire chapters in popular textbooks and handbooks in this discipline being dedicated to the discussion of self-regulation issues (e.g., *Educational Psychology* by Ormrod, 2006; *Educational Psychology* by Woolfolk, Winne, & Perry, 2009; *Handbook of Educational Psychology* by Alexander & Winne, 2006).

Of course, it would not be correct to assume that the importance of self-regulation in the learning process was only recognized over the last 30 years. Although it is obvious that research in this area has become considerably more rigorous and

comprehensive in recent years, with the term "self-regulation" itself now commonly used in educational contexts, the core idea that the promotion of skills for independent learning is an important part of acquiring knowledge has been around for a long time.

The concept of self-directed learning is closely linked to the principle of maturity of the Enlightenment in the 17th and 18th centuries (Levin & Arnold, 2008). For example, Jean-Jacques Rousseau (1712–1778) describes in his famous novel *Emile* how self-determination can be encouraged in students through explicit instruction. This assertion thus reflects the main premise of educational anthropology that humans are fundamentally self-regulated and can in an educational setting only be encouraged and guided in their efforts. Thus, the idea of self-directed learning was strongly represented in multiple educational reform approaches, including those led by Maria Montessori (1870–1952) and John Dewey (1859–1952). Given the long-standing interest in self-regulation as an underlying assumption of the learning process, it is perhaps surprising that more in-depth, systematic research by educational psychologists on this topic, involving the development of specific conceptual frameworks, began to emerge in only the past three decades. Nonetheless, self-regulated learning continues to receive considerable theoretical attention as evidenced by this concept being the primary focus of self-determination theory in work by Edward Deci and Richard Ryan (2002; see Chapter 2).

3.2.3. Relevance in a Knowledge-Based Society

The ability to engage in self-regulated learning is commonly regarded as a prerequisite for becoming autonomous and responsible individuals. As such, enabling people to become independent learners is of particular importance in modern and fast-changing, knowledge-based societies. It is through self-regulatory competencies that people are better able to handle new challenges and achieve greater success and life satisfaction in both the short and long term (Schober et al., 2007). Consequently, the teaching of self-regulated learning skills has become a critical directive of schools, universities, and training institutions (Ertl, 2006). However, before these self-regulatory skills can be adequately taught in a classroom setting, it is necessary that theory and research in this area be incorporated into the education and training of future teachers.

To optimally teach self-regulation skills in an educational setting, it is important to also provide actual opportunities for self-regulation to occur. In this regard, teachers are ultimately responsible for the learning and success of their students, for example, when affording possibilities for independent study.

What are the best ways to give students freedom to engage in self-regulated learning in the classroom? What are the limits that should be imposed on students' self-regulatory opportunities in a school setting?

3.2.4. Current Theoretical Models

In research and teaching, theoretical models and heuristics are used to make complex issues easier to understand and present them in a clear and structured manner. They often provide the conceptual basis for the assessment of different variables as well as analyses of how they interact with each other. In the numerous models of self-regulated learning in the current research literature, nearly all of them describe this phenomenon as reflecting a dynamic combination of motivational, cognitive, and metacognitive aspects of the learning process.

> **Definition**
>
> The term *metacognition* in its broadest sense refers to "knowledge about knowledge." Metacognitive aspects of learning thus include knowledge of one's capabilities, such as one's aptitudes or skills, but also knowledge of how to effectively use and modify cognitive learning strategies such as planning, monitoring, and evaluation.

Below is a list of the conceptual models that appear in the research literature on self-regulated learning. The list is not exhaustive, but does provide an overview of key theoretical frameworks that have guided ongoing research in this domain.

Upon comparison, these models have various similarities as well as differences in the way in which self-regulation is addressed. To contrast the relative contributions of the self-regulation models, reviews of the relevant literatures often focus on how each differ on key elements of the self-regulation process. For instance, Puustinen and Pulkkinen (2001) suggest the following criteria for comparison: (1) underlying theoretical basis (e.g., metacognitive theories, social-cognitive theories), (2) definition of self-regulated learning (e.g., focus on goal attainment), (3) critical components that are integrated (e.g., motivational, emotional, social factors), and (4) empirical support for the model (e.g., research findings on the proposed mechanisms).

Another frequently mentioned and more fundamental distinction refers to whether the model is primarily hierarchical or process-oriented in nature. In hierarchical models, constructs are located on different levels in a given hierarchy. For example, "meta-constructs" (e.g., metacognition, overarching personal motives) are located at higher levels as compared to more basic psychological constructs (e.g., specific learning strategies, situation-specific motivational states such as an approach orientation) which are located at a lower level. Generally, constructs at a higher level have an impact on constructs at lower levels. For example, metacognitions can impact one's choice of a specific learning strategy. In contrast, process-oriented or phase models have constructs arranged in a temporal sequence in which specific processes occur during specific phases of the learning process and unfold sequentially over time (e.g., planning occurs before learning; monitoring of one's learning occurs before evaluation of the effectiveness of one's learning strategy). As an example of a hierarchical model, the three-layered model of self-regulated learning proposed by Boekaerts (1999) is described in the following section, followed

by an overview of the process-oriented self-regulated learning model by Schmitz (2001). Both models are frequently cited in the literature on behavioral self-regulation and self-regulated learning, and highlight the key features of hierarchical versus process models (see Table 3.1).

The three-layered model of self-regulated learning: Monique Boekaerts

A well-known and often-cited theoretical model of self-regulated learning in the research literature has been developed by Monique Boekaerts (1999). In her *three-layered model of self-regulated learning*, Boekaerts differentiates between three levels of self-regulation (see Figure 3.2) including the regulation of processing modes, the learning process, and the self. All three levels are to be evaluated in order to provide a comprehensive analysis of one's ability to engage in self-regulated learning.

Regulation of processing modes. The capacity to use and to regulate one's cognitive processes that are directly related to learning outcomes (e.g., specific learning strategies such as rehearsal) is presented in Boekaerts' model as a core ability upon which more generalized competencies are based. The ability to use specific learning strategies is assumed to be a necessary precondition for the development of

Table 3.1: Models of self-regulated learning.

Model	Authors	Focus
Three-Layered Model of Self-Regulated Learning	Boekaerts (1999)	Hierarchy
Model of Adaptable Learning	Boekaerts and Niemivirta (2005)	Process
Process-Oriented Model of Metacognition	Borkowski, Chan, and Muthukrishna (2000)	Process
General Framework for Self-Regulated Learning	Pintrich (2005)	Hierarchy
Model of External- and Self-Regulated Learning	Schiefele and Pekrun (1996)	Process
Process Model of Self-Regulated Learning	Schmitz (2001)	Process
General Cybernetic Model of Regulation	Wiener (1948)	Process
Four-Stage Model of Self-Regulated Learning	Winne and Perry (2005)	Process
Social-Cognitive Model of Self-Regulation	Zimmerman (1989)	Process
Phases and Subprocesses of Self-Regulation	Zimmerman and Campillo (2003)	Process

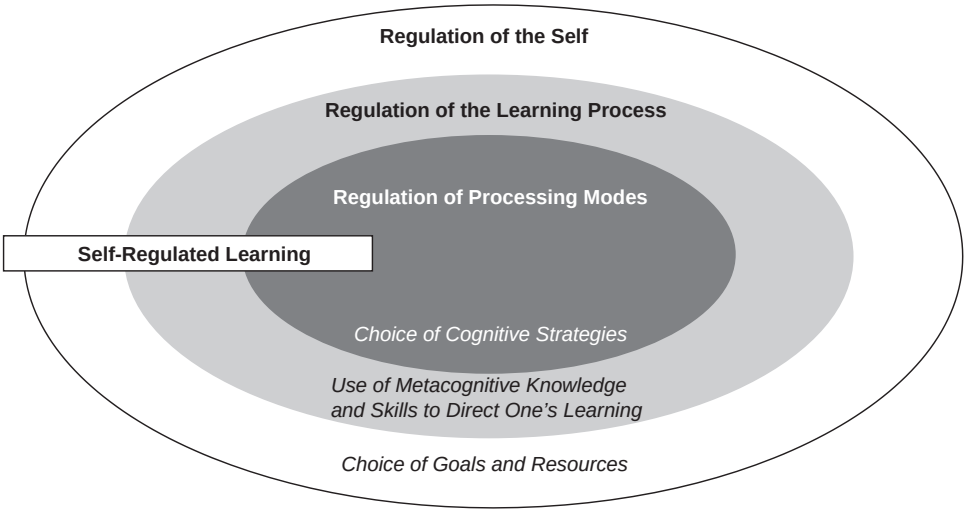


Figure 3.2: Boekaerts' three-layered model of self-regulated learning.

self-regulated learning, as learners should be better able to optimize their learning process when they have a repertoire of foundational cognitive strategies at their disposal. Therefore, it is ideal for students to be taught to use various cognitive strategies that promote learning and problem-solving as these abilities are assumed to form the foundation upon which more complicated self-regulatory processes are based.

Regulation of the learning process. Encircling the cognitive core of the self-regulation model is a middle layer of competencies related to *metacognitive processes* that involve how well one can successfully coordinate the use of various lower-order cognitive strategies. This layer includes higher-order learning strategies such as *planning* in which learners select and initiate appropriate activities to achieve specific learning goals (e.g., choosing specific learning strategies or estimating learning time prior to studying for a test). Another important metacognitive strategy is *monitoring* which ideally happens throughout the learning process and involves observing one's progress toward learning goals as well as identifying problems along the way. Monitoring thus allows for the ongoing assessment of the learning process, the evaluation of how well one is regulating the use of various learning strategies while pursuing learning objectives (how effective the student is in reducing the difference between the current and the target learning state), and ultimately modifying the learning process if necessary (e.g., changing one's learning strategy).

Regulation of the self. In the third layer of the model, the regulation of the self is addressed with respect to one's overall learning-related motivation. More specifically, this level of competencies pertains to how a student chooses their

learning goals, understands the value and importance they attach to these goals, and how well one makes decisions as to which, and to what extent, personal resources should be spent trying to achieve learning goals (''What do I want to achieve and how much effort am I willing to invest?''). Other abilities included in this layer include the ability to select current and future activities that best fit one's desires, needs, expectations, and resources, as well as to initiate these activities and to shield one's motivation to complete them against competing influences and behaviors not related to one's goal (e.g., the ability to start and complete one's math homework without chatting on a social networking site).

Relationships between the three layers. The three self-regulatory layers depicted in the model are very closely interrelated. Regarding the regulation of the self, individual short- and long-term objectives can be chosen based on one's motivational orientation (e.g., ''I want a good grade on the final exam and will study a lot in order to get it''), with these goals then impacting one's metacognitive learning processes (e.g., planning: ''I have four hours this afternoon to study for tomorrow's exam''). This higher-level decision regarding the learning process should, in turn, directly influence the specific types of cognitive learning strategies that are used (e.g., ''Because I have enough time, I will try to think of personal examples of the material, instead of just memorizing it, and then test myself to be sure I understand it''). In order for a student to become a successful self-regulated learner, this model suggests that it is necessary to acquire competencies within each of the three layers of self-regulation.

Implications for Practice: Three Layers of Self-Regulation

Since self-regulation in students can only succeed when students have acquired competency in strategies from all three layers, and are able to use them in combination with each other, it is important for teachers to instruct students on how, when, and in what combination these various skills can be used (see also Section 3.6). As a reflection exercise, consider the following questions:

- Do my students have a repertoire of learning strategies that they can effectively use depending on the task? (*Regulation of processing modes*)
- Do my students know what strategy is most appropriate for a specific type of task? (*Regulation of the learning process*)
- Do my students have the ''diagnostic ability'' to monitor their learning process and to recognize learning problems in a timely manner? (*Regulation of the learning process*)
- What specific goals do my students have? Are they unrealistically high and thus unattainable given their resources? Are the goals too easy to achieve and thus not maximizing learning resources? (*Regulation of the self*)
- Are my students flexible in changing their goals and cognitive strategies if the learning process is not optimal? Do they persist in using learning strategies that are clearly inefficient? (*Regulation of the self*)

The process model of self-regulated learning: Bernhard Schmitz

Bernhard Schmitz (2001) developed a process-oriented model of self-regulation in which the differentiation between the different phases of learning is of critical importance, and various theories of self-regulation are incorporated including those of Zimmerman (2000, 2005), Bandura (1991), Heckhausen and Kuhl (1985), and Schmitz and Wiese (1999). The self-regulation process model proposed by Schmitz (see Figure 3.3) separates the learning process into three phases: the preactional phase, actional phase (in which new knowledge is gained), and postactional phase. These three phases are assumed to occur in sequence yet are also hypothesized to have reciprocal effects on each other. In this model, a complete learning process entails the completion of several cycles of learning that helps the learner come progressively closer to achieving their learning goals.

Preactional phase. At the beginning of a learning process, the learner is presented with a task to be completed (e.g., gaining knowledge) either by an external source (e.g., homework assigned by the teacher) or by the learner themselves (e.g., a student who volunteers for a presentation on a topic of their choice). The physical learning environment or context (e.g., desk, classroom, books) as well as the parameters of the learning task (e.g., time allowed, grading system) also impact the

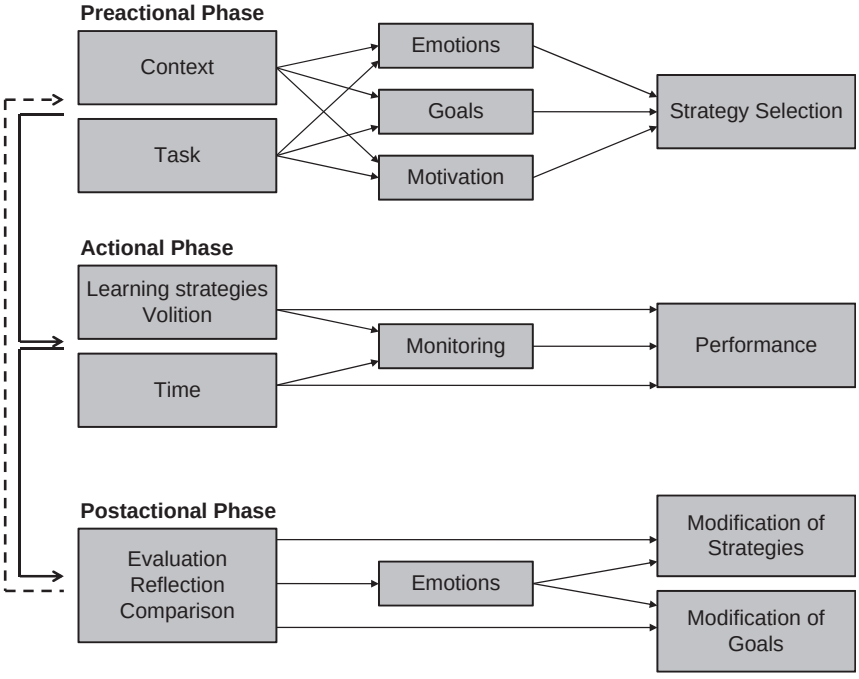


Figure 3.3: The process model of self-regulated learning by Schmitz (2001).

way in which the task is completed. The nature of the learning context and task are further assumed to impact the emotional state of the learner, as well as their goals and motivation. For example, a task that is perceived to be too difficult tends to result in the learner experiencing negative emotions (e.g., anxiety, hopelessness), setting subgoals that are insufficiently challenging, and low motivation due to the task being viewed as unachievable. These three aspects – emotions, goals, and motivation – can also impact each other to further compound the negative effects on task performance (e.g., hopelessness leads to low motivation; see Chapter 4). Finally, all three of these psychosocial variables influence the types of strategies the learner chooses to complete the task. For example, if negative emotions are experienced, or a student is motivated to avoid failing in front of others (i.e., a ''performance-avoidance'' goal orientation), more superficial learning strategies, such as rehearsal or repetition, tend to be used more often. In contrast, if positive emotions such as enjoyment are experienced, deeper learning strategies are more likely to be used, such as cognitive elaboration – strategies that enable the learner to actively connect new information with existing knowledge structures. Empirical findings on the effects of students' affective experiences on the learning process have been demonstrated primarily in research on affect or mood (see Chapter 1), specifically concerning the impact of positive or negative affect on the use of certain strategies (e.g., Isen, 2000).

Actional phase. Three variables are assumed to be particularly important when completing a task: learning strategies, volition, and time. With respect to learning strategies, they are typically selected during the preactional phase and should be used effectively to make the most of the time allotted for the task. In addition to strategy use and time, volition is also an important component of the actional phase (see Chapter 2). More specifically, volition refers to how well learners maintain their focus on learning without being distracted by environmental factors (e.g., nice weather affording outdoor activities) or by task-irrelevant thoughts (e.g., daydreaming about the weekend). It is important to note that the impact of these strategic, temporal, and volitional aspects on performance is further impacted by how effectively students monitor these variables during the learning process. The activity of monitoring involves continually comparing one's current state with a target state to determine the efficiency of the learning process, and identifying potential problems in achieving one's learning goals. Thus, monitoring is necessary for effective self-regulation because it allows the learner to optimize their learning and performance by identifying ineffective learning activities early on, and modifying them to improve comprehension, persistence, and achievement.

Implications for Practice: Elaborative Learning

Elaborative learning strategies generally lead to a deep processing of new knowledge and better storage in long-term memory. Generally speaking, it makes sense to acquire knowledge in such a way that it can be recalled long after the initial learning process. Of course there are exceptions, such as when last-minute learning is required for an impending test. In this case, short-term learning may help the student perform adequately on the test. Normally, however, the ability to quickly

and accurately recall information over an extended period of time is generally more highly valued in educational settings. Therefore, it remains an important priority of teachers to encourage the use of elaborative learning strategies in the classroom. What can you do as a teacher to promote deep processing in students? Here are a few suggestions:

- On tests, it is recommended not only to assess factual knowledge, but also to formulate questions that require deeper knowledge of the issue (e.g., in addition to asking for the formula of a parabola, a math test could also request examples of a quadratic growth in everyday life, such as the proportion of increase in pizza size relative to an increase in its diameter).
- Students' ability to store information in long-term memory can be rewarded (e.g., by having assignments or discussions requiring students to incorporate earlier class content with more recent topics, or including test questions in which prior content is assessed).
- Homework assignments can also be formulated such that elaborative strategies are necessary to complete the required tasks (e.g., in physics class, request examples how specific phenomena can be observed in everyday situations).

Postactional phase. After completing the learning phase, the outcomes achieved are typically evaluated in reference to the initial learning objectives. Schmitz differentiates between three factors involved in evaluating a learning process: quantitative factors (e.g., the number of tasks completed), qualitative factors (e.g., how well was the new material learned and elaborated upon), and subjective factors (mainly emotion-related; e.g., satisfaction or pride). The standard against which performance is compared can be individually referenced (e.g., improvement relative to prior achievement) or externally defined (e.g., meeting a minimum cut-off score; see Chapter 2). The outcome of the evaluation is then assumed to impact subsequent learning processes. If the student is satisfied with the outcome, similar learning strategies will likely be adopted for future learning tasks, as will self-regulatory strategies aimed at further expediting and shortening the learning process (e.g., identifying unnecessary or inefficient learning strategies). In contrast, an unsatisfactory result may prompt the learner to change their learning strategies and slow down the learning process to better identify potential problems. For example, the student may attempt to modify their learning environment (e.g., studying alone vs. with friends), set more realistic goals (e.g., self-improvement vs. best in class), try out more effective learning strategies (e.g., elaboration vs. rehearsal), or begin the learning task sooner (e.g., weeks vs. days before the due date).

3.2.5. Further Theoretical Development

As optimal self-regulated learning entails the dynamic interaction of numerous cognitive, metacognitive, motivational, and emotional aspects, there exist several theories in the research literature on self-regulated learning, many of which are notably complex. From a practical perspective, theoretical models that are especially

helpful are those in which the constructs, and the relationships between them, are clearly defined – those in which the critical cognitions and actions in a given learning phase, and how they interact, are specifically addressed. In other words, these models should ideally allow for concrete suggestions on how to best optimize the learning process. However, such large and complex models are often difficult to be empirically verified in their entirety.

In contrast, other models focus on "key issues" related to self-regulated learning (e.g., Zimmerman & Campillo, 2003), for example, on principles of regulation (e.g., comparing current with target learning states). Although these models can provide greater insight into a specific perspective on self-regulated learning, they are more limited with respect to relevant contextual aspects of self-regulated learning that are addressed in more comprehensive models. Similar to more complex models, simpler theoretical models can also be difficult to test empirically as a number of important variables that are important to assess (with respect to the antecedents and effects of self-regulated learning) are not considered. Taken together, both complex and specific models of self-regulated learning pose analytical challenges resulting in no single model having been generally accepted as a standard template for conceptualizing what self-regulated learning is. Instead, several overlapping models can be found in the research literature, each taking a different perspective on the nature, sequencing, and consequences of self-regulated learning processes. Concerning future directions, one way in which this complexity may be reduced by researchers is to focus on specific key elements of individual models and conduct systematic empirical evaluations of these components in order to compile the results into an empirically supported holistic framework (see Chapter 4). In this manner, several models could be integrated into a cohesive theoretical framework in which self-regulated learning as a whole is accurately reflected.

Conclusion

Self-regulated learning represents an independent and self-motivated way of learning that requires a repertoire of skills related to cognition and motivation. Although the importance of self-regulated learning has been consistently addressed in the research literature since the 17th century, research in the educational psychology domain on this topic began around 1980 resulting in self-regulation currently receiving considerable empirical attention. Self-regulated learning is largely considered to be a core competency not only in educational settings but in modern society at large. There are at present several theoretical models of self-regulated learning, such as the three-layered model of Monique Boekaerts and the process model proposed by Bernhard Schmitz. Although these models of self-regulated learning differ, each of them highlights the importance of understanding the learning process as a dynamic interaction between cognitive, metacognitive, and motivational processes, and to a lesser extent, the emotional aspects of learning.

3.3. The Assessment of Self-Regulated Learning

3.3.1. Reasons for Evaluating Self-Regulated Learning

There are many different reasons for evaluating self-regulated learning and given the complexity of the self-regulated learning process, attempts to evaluate this learning process can address various facets of the topic. For example, it is possible to empirically evaluate the mechanisms of self-regulation that are hypothesized in the above theoretical models (e.g., to analyze the relationship between motivation and strategy use during the preactional phase; see Figure 3.3). Additionally, one could also attempt to identify specific variables that promote or inhibit self-regulated learning activities (e.g., academic self-concept, test anxiety). The effects of self-regulated learning on performance (e.g., grades or career success) can also be investigated, given its considerable practical relevance. From a diagnostic perspective, the multifaceted assessment of self-regulated learning enables one to clearly identify the strengths and weaknesses in specific learning behaviors, or the overarching regulation of these processes, and in so doing, provide more targeted and useful support for individual students at any point in the learning process.

Given the multifaceted nature of self-regulated learning, it can often be difficult to assess. However, it is possible for teachers to assess specific self-regulation skills of their students in the classroom. Although such assessments are often not theoretically or scientifically based, the importance of assisting students in this area suggests that any attempt to identify and improve upon students' self-regulatory capabilities should lead to better learning and performance.

What are some specific behaviors in students that provide clues as to the presence or lack of specific self-regulated learning competencies? What self-regulated learning competencies can be detected easily, and which are more difficult to diagnose? Are you aware of your own strengths and weaknesses concerning self-regulated learning? Does this awareness help you to detect strengths and weaknesses in your students more easily? Do you have any friends or colleagues you consider particularly competent or inadequate in how they regulate their learning? Do you have any role models (e.g., public figures such as politicians, artists, or business professionals) who demonstrate an extraordinary ability for self-regulated learning?

3.3.2. Methodical Aspects

What is assessed? Concerning the assessment of self-regulated learning, the main question to be asked is: What is the specific objective of the evaluation? It can be challenging to empirically assess a dynamic process that involves the interaction of numerous variables of a cognitive, metacognitive, motivational, and

emotional nature. Thus, empirical studies inevitably focus on specific aspects of self-regulated learning as opposed to the dynamic process as a whole. For example, in numerous studies on self-regulated learning, only one's knowledge of how to perform certain cognitive learning strategies, or metacognitive competencies, is assessed. If the assessment aims to evaluate a specific aspect of self-regulated learning, it is advisable to refer to a theoretical model having this element as its focus (e.g., Schmitz, 2001) and to carefully indicate the specific aspects of this model to be investigated (e.g., "monitoring" as a metacognitive process that occurs during the actional phase).

Who is being evaluated and where? Just as identifying the specific self-regulatory processes to be assessed is important, the questions of who is to be assessed, and in what context does the assessment occur, are also critical. The meaning and importance of different aspects of self-regulation vary for different types of learners and across situations. For instance, university students generally have more opportunities for self-regulation than high-school students due to post-secondary programs and scheduling providing greater freedom regarding course selection. Moreover, the opportunity for self-regulation, as well as the need for it, can vary significantly from one situation to the next. For example, undergraduates typically have one final exam per subject at the end of the term that allows considerable flexibility in terms of when and how they prepare for it. In contrast, high-school students usually have a clear and consistent classroom and testing schedule as well as a teacher who provides the learning material. Consequently, whereas evaluating specific learning strategies (e.g., elaboration, rehearsal) can be used by either high-school or university students, higher-order self-regulatory strategies such as planning what to learn or monitoring the learning process might be more applicable for university students. Thus, prior to investigating the use and effectiveness of a specific cognitive or metacognitive strategy, it is important to consider for whom and in what context this strategy is most relevant (Boekaerts & Niemivirta, 2005).

When does the assessment occur? After determining the specific variables, individuals, and contexts to be assessed with respect to self-regulated learning, the question arises as to the optimal time at which assessment should occur — namely before, during, or after the learning process. "Prospective Assessment" refers to the assessment of activities that are engaged in before the learning process has begun, such as planning (e.g., choice of learning strategies) and motivational aspects (e.g., goal orientation). "Concurrent Assessment" refers to the assessment of information processing (e.g., use of specific learning strategies) and volitional activities (e.g., maintaining motivation, reducing distractions) that occur during the learning process. "Retrospective Assessment" refers to the assessment of activities that occur after the learning process and involve evaluation (e.g., concerning the quantity and the quality of content learned) as well as motivation to pursue further learning

activities. Using an assessment method referred to as "stimulated recall," all three points in time can be assessed by asking participants to mentally recall a certain learning situation (before, during, or after the learning process) and to retroactively describe their use of cognitive and metacognitive strategies, as well as their motivational and emotional experiences, at that time. In order to gain better insight into the full nature and extent of self-regulated learning, it is useful to investigate not just one but multiple learning phases.

How is the assessment done? Having defined the specific variables, population, environment, and timing related to self-regulated learning, one must then determine the best method for collecting the required information. In the research literature on self-regulated learning, various methods for evaluating numerous aspects of self-regulated learning aspects have been proposed. Although these methods are most often not unique to the self-regulated learning domain (e.g., similar methods are used to assess general problem-solving strategies), they have proven to be particularly useful for the assessment of self-regulated learning skills (e.g., Boekaerts et al., 2005; Veenman, Van Hout-Wolters, & Afflerbach, 2006) and are outlined in greater detail in Table 3.2.

From the preceding discussion about the multidimensional nature of self-regulated learning, it is obvious that statements such as "self-regulated learning is conducive to performance" are not very useful if the nature, timing, and assessment of the learning behavior is not clearly defined. Similarly, a potential cause of mixed or contradictory results across empirical studies evaluating the effectiveness of self-regulated learning strategies is that these studies often use different methods of assessment or explore different variables in differing populations (e.g., evaluating high-school students' use of cognitive learning strategies through questionnaires vs. university students' metacognitive strategy use through learning diaries).

Implications for Practice: Teacher Assessments of Self-Regulated Learning

The evaluation methods mentioned above are generally not applicable to teachers as they require knowledge of research methodology that is not typically taught in teacher education programs (e.g., quantitative analysis of questionnaire data). If an empirical survey is to be conducted, it is advisable to contact a school psychologist or counselor who has the required research skills. Soliciting the cooperation of relevant university, college, or teacher education programs (e.g., departments of education, educational psychology, or empirical pedagogy) can result in mutually beneficial research collaborations. Beyond empirical approaches, informal discussions with students can also provide much-needed insights into students' use and the effectiveness of various aspects of self-regulated learning strategies.

Table 3.2: Methods of the assessment of self-regulated learning

Method	Description
Questionnaire	Self-report; open-ended or structured response formats. Examples: Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia, & McKeachie, 1993), Learning and Study Strategies Inventory (LASSI; Weinstein, 1988), Leuven Executive Regulation Questionnaire (LERO; Minnaert & Janssen, 1997).
Interview	Self-report; interviewees provide oral responses to questions about how they think, feel, and act in learning situations. Guidelines for structured interviews are available, such as the Self-regulated Learning Interview Schedule (SRLIS, Zimmerman & Martinez-Pons, 1986).
Thinking aloud	Self-report; participants' verbal utterances during the learning process are recorded, transcribed, and coded for content. Participants explicitly describe their thoughts, strategies, motivation, and emotions during the learning process.
Learning diary	Self-report; enables the continuous assessment of learning, and may also serve as an intervention in stimulating reflection (i.e., metacognition) concerning the learning process. Studies show learning diaries to be particularly effective in assessing and promoting self-regulated learning when completed in response to specific questions or prompts (e.g., "What did you learn today?" "What have you not yet understood and need to review today?") that stimulate the use of cognitive and metacognitive learning strategies (e.g., Hübner, Nückles, & Renkl, 2009; Nückles, Hübner, & Renkl, 2009).
Experience sampling	Self-report; participants answer multiple short questionnaires concerning their actual learning behavior after being signaled on multiple occasions during a real-life learning situation (e.g., entering responses on a handheld device three times per day during school hours for one week). As the signal times can be randomized (usually within specified intervals), this method allows for candid evaluations of learning as it occurs in real time. This method may also serve as an intervention in stimulating greater reflection about the learning process in real-world learning situations (e.g., Nett, Goetz, Hall, & Frenzel, 2012).
Behavioral observation	Assessment of the learning behavior through observations of others. Checklists or questionnaires may be used by the observer to provide more objectivity and to allow for a greater quantity and variety of learning behaviors to be assessed (e.g.,

Table 3.2: (*Continued*)

Method	Description
	taking a break, using a dictionary, engaging in distracting activities).
Analysis of documents	The evaluation of learning behavior by analyzing material prepared by the learner for evaluative purposes, such as homework, exams, or portfolios.
Analysis of log files	The assessment of learning activities completed using a computer through the evaluation of log files containing detailed records of participants' engagement with learning materials and tasks (e.g., type, duration, sequencing, etc.).
Multimethod assessment	Combination of different methods of evaluation; enables one to determine the validity of data on learning activities by evaluating convergence across multiple modalities of assessment.

Conclusion

Adequate assessment of self-regulated learning is required in order to promote self-regulated learning competencies in students. It is only by appropriately evaluating the present state of the students' abilities that the difference between the current and the target states can be assessed. As self-regulated learning represents a repertoire of related skills, it is necessary to have a specific focus on which aspects of self-regulated learning are most relevant and important to assess. To this end, empirical assessments should be based on appropriate theoretical models that can best inform the identification and evaluation of specific self-regulated learning competencies. There are numerous methods for measuring self-regulated learning including questionnaires, interviews, diaries, experience sampling, log file analysis, or behavioral observations. Aside from these scientific approaches, teachers can also gain valuable insight into their students' self-regulatory competencies by simply starting a conversation about how they learn and how this process can be improved.

3.4. Effects of Self-Regulated Learning

The importance of self-regulated learning in classroom settings, and consequently, whether it should be fostered in learners, is judged mainly by the *effects*

of self-regulatory activities on academic outcomes. The research literature in this domain includes a large number of studies on the effects of various facets of self-regulated learning on achievement and other variables. However, it is often difficult to compare findings on the effects of self-regulated learning across studies due to differences in both the specific aspects of self-regulated learning being evaluated (e.g., learning strategies vs. metacognition; see Zeidner, Boekaerts, & Pintrich, 2005) and the dependent variables assessed (variables on which the effects of self-regulated learning are evaluated; e.g., grades, comprehension, motivation to learn). Thus, when looking at the effects of training programs related to self-regulated learning, it is important to take in to account the various aspects of self-regulated learning that can be promoted, as well as the specific dependent variables to be assessed. Despite the heterogeneity of research on the effects of self-regulated learning, and some studies finding no or weak effects of programs aimed at enhancing self-regulated learning, empirical evidence generally suggests that fostering self-regulatory competencies can lead to better motivation, strengthen effective ways of learning, and lead to achievement gains (Hattie, Biggs, & Purdie, 1996; Zimmerman, 2001).

3.4.1. Meta-Analyses

As an analytical method, meta-analyses across multiple studies are a useful way in which the effects of efforts to foster self-regulated learning can be assessed. Although this approach is very broad and relatively undifferentiated as compared to study-specific analyses, they allow for findings across several studies on a specific topic to be evaluated as a whole and can provide an overall picture of the phenomenon under investigation. In one meta-analysis, Hattie et al. (1996) analyzed the effects of training programs that focused on fostering cognitive strategies for completing learning tasks, as well as self-management and issues related to motivation and emotions (e.g., fostering academic self-concept). The effects of those programs on achievement, learning behavior, and learning-related emotional experiences were then analyzed. This meta-analysis included 51 studies published prior to 1992 that evaluated the effects of training programs in various age groups (from kindergarten to adult populations). Each study compared participants in training programs (experimental group) with nonparticipants (control group) resulting in a total of 2700 treatment effect sizes (across 51 studies) that comprised the data for the meta-analysis.

Effect sizes are statistical values that indicate the strength of group differences, or relations between variables, independent of the unit of measurement employed (e.g., a 1–5 scale vs. a 1–100 scale), with the most commonly used effect size measure being *Cohen's d* (Cohen, 1988). Using this effect size measure, Hattie et al.'s (1996) meta-analysis showed an average effect size of 0.45 – a value indicating an effect of medium strength. The average effect size was 0.57 for the effects of the program on achievement (medium to strong), 0.16 for effects on learning behavior

(weak), and 0.48 for effects on emotions (medium). The meta-analysis further showed that training programs are particularly successful if they (a) are "in context, (b) use tasks within the same domain as the target content, and (c) promote a high degree of learner activity and metacognitive awareness" (Hattie et al., 1996, p. 131).

Two more recent meta-analyses (found in Dignath & Büttner, 2008) investigated the effects of intervention programs promoting self-regulated learning on motivation, strategy use, and achievement. Results from a total of 74 school-related studies published between 1992 and 2006 were included in this meta-analysis, including 49 studies with primary-school students and 25 studies with secondary-school students that combined to provide 8619 students and 357 effect sizes for analysis. The average effect size across all dependent measures was 0.69, an effect that is medium to strong in magnitude. Although the mean effect size was nearly identical for the two grade levels (0.68/0.71 for primary/secondary school levels), a closer look revealed an average effect size of 0.61/0.54 for achievement (primary/secondary level), 0.72/0.88 for strategy use, and 0.75/0.17 for motivation (this discrepancy should be interpreted cautiously as the latter mean value was based on only six effect sizes). For both primary- and secondary-school students, the effects of the intervention were stronger if the training was conducted by researchers (as opposed to students' regular teachers), if it involved several sessions, and when conducted in mathematics classes (as compared to reading/writing or other subjects). Taken together, the results of these meta-analyses across 125 studies (and 627 effect sizes) provide convincing evidence to suggest that training programs in which self-regulation strategies are encouraged tend to have medium-to-strong effects on critical academic outcomes such as learning, motivation, and achievement in class.

3.4.2. Empirical Research: An Example

Whereas meta-analyses evaluate the effects of self-regulated learning by summing across the effects reported in numerous studies, individual research studies are more focused and offer empirical findings on the effects of fostering specific facets of self-regulated learning on specific aspects of learning and achievement in specific populations. As an example, the following sections outline in a step-by-step manner how a recent empirical study evaluating the effects of an intervention program on academic achievement that promoted several specific self-regulation strategies was conducted. For more information on the study details, the reference for the original publication is provided below:

Perels, F., Dignath, C., & Schmitz, B. (2009). Is it possible to improve mathematical achievement by means of self-regulation strategies? Evaluation of an intervention in regular math classes. *European Journal of Psychology of Education, 24*(1), 17–31.

Type of Study

- Intervention study (training in self-regulated learning) with pre/post-design, control, and experimental group
- Conducted with 53 sixth-grade students (~11 years old)
- Domain: Mathematics (topic "divisors and multipliers")
- Sample: Two classrooms having the same teacher (female, 52 years old). In one classroom (experimental group, 26 students), self-regulation (8 strategies) was encouraged during instruction (9 lessons over 3 weeks). In the other classroom, self-regulated learning was not discussed (control group, 27 students)
- The following issues were discussed and promoted in the experimental group: (1) learning strategies in the context of self-regulated learning, (2) attitudes toward math and goal-setting, (3) goal pursuit and goal control, (4) self-motivation, (5) planning how to solve a problem and how to concentrate, (6) dealing with internal and external distractions, and (7) handling mistakes.

Theoretical Framework

- The study was based on the *process model of self-regulation* developed by Schmitz and Wiese (2006), an extended version of Schmitz's (2001) model outlined in this chapter (see Figure 3.3).
- Three phases during the learning process are differentiated: the preaction phase (forethought), the action phase (performance and volitional control), and the postaction phase (reflection).

Variables Assessed

- *Strategy use*: (1) goal setting, (2) motivation, (3) volition, (4) learning strategies (problem-solving and resource-based strategies), (5) monitoring, (6) attributions, (7) handling mistakes, and (8) self-efficacy. These components can be summarized and collectively referred to as "self-regulation."
- *Knowledge test on self-regulation*: (1) goal setting, (2) planning, (3), self-motivation, (4) concentration, (5) volitional strategies (e.g., dealing with distractions), and (6) dealing with mistakes.
- *Math skills*: Summed score across five math exercises (e.g., multiplication, division; e.g., "Is it possible to divide 132 by 12? Give reasons for your answer!"; Perels, Dignath, & Schmitz, 2009, p. 24)

Method of Assessment

- *Strategy use*: Questionnaire (completed by students before and after the intervention in the control and experimental groups).

- *Knowledge test on self-regulation*: Questionnaire (completed by students after the intervention and only in the experimental group).
- *Math achievement*: Mathematics test (completed by students before and after the intervention in both the control and experimental groups).
- In addition, students completed learning diaries and video recordings of classroom activities were obtained (little detail is provided on these methods as no results on these outcomes were reported).

Main Findings

- *Strategy use*: Comparisons of the control and experimental groups show that, with the exceptions of motivation and problem-solving, improvements in strategy use were more significant in the experimental group.
- *Knowledge test on self-regulation*: The experimental group showed high knowledge levels concerning self-regulation variables (this questionnaire was not administered to the control group, thus preventing between-group comparisons).
- *Math achievement*: The intervention had a significant ($p < .10$) positive impact on math achievement.

Implications

- It is possible to effectively foster specific aspects of self-regulated learning in a classroom setting, specifically in the domain of mathematics, with respect to subsequent learning behavior and achievement outcomes.
- Including a combination of general and domain-specific aspects of self-regulated learning in an intervention appears to be beneficial for academic development.
- Findings suggest that the potential benefits of teachers' efforts to foster various aspects of self-regulated learning in their students should be highlighted in teacher education programs.

Limitations

- As only students' self-reports were assessed, it is unclear whether the strategies students' reported using (strategy use) or simply knowing about (knowledge test on self-regulation) were actually employed or adequately understood. An objective assessment of observable behavior could serve to significantly bolster the validity of the self-report findings.
- Given that students in both classrooms had the same teacher, this raises the issue of generalizability of the study findings to classes taught by different types of teachers (e.g., male, younger, etc.).
- The mathematics test included only five tasks, thus evaluating only a specific subset of mathematics competencies.

Conclusion

When evaluating the effects of self-regulated learning, it is important to identify the specific facets of self-regulated learning of interest (e.g., planning, use of learning strategies) and what outcomes these variables are hypothesized to impact (e.g., achievement, motivation). Empirical studies clearly demonstrate that various aspects of self-regulated learning can lead to significant benefits for students' learning and achievement. Moreover, meta-analytic findings that incorporate results from several empirical studies suggest that programs aimed at fostering self-regulated learning can have positive effects, that are moderate in magnitude, on learning and achievement in the classroom.

3.5. Development of Self-Regulated Learning

Before considering the development of self-regulated learning abilities over time, one must first specify the type of self-regulation variables to be explored. For example, whereas simple learning strategies (e.g., rehearsal) are obviously utilized at an early age, it is less clear at what age students become able to use more complex self-regulatory strategies. Given that metacognitive skills are assumed to be the most complex, involving the dynamic interplay of cognitive, motivational, and emotional aspects of learning, it can be assumed from a developmental perspective that one's self-regulated learning competencies are optimal when metacognition is possible.

According to Jean Piaget (1971), the "awakening of the abstract self-reflection," and consequently, the "awakening" of metacognitive skills, can be detected at about 8 to 10 years of age. Piaget assumed that children at this age become able to think about themselves in an abstract sense, including their own knowledge and how they learn. However, empirical studies on the development of metacognitive activities show that metacognitive strategy use can be observed in children at much younger ages (Kuhn, 1999; Veenmanet al., 2006), with research on the so-called "Theory of Mind" showing this phenomenon to develop between 3 and 5 years of age (Flavell, 2004). "Theory of Mind" refers one's conceptualization about how one's own knowledge, thoughts, and feelings are organized, and also one's beliefs concerning the psychological states of others. According to research in this area, basic metacognitive competencies are required in order for children to develop a "Theory of Mind" (e.g., recognizing the intentions of others). For example, metamemory (beliefs about one's memory) and metacognitive knowledge (beliefs about the nature of knowledge, i.e., epistemological beliefs) have been demonstrated at age 6 (Alexander, Carr, & Schwanenflugel, 1995), and basic planning skills have been observed at age 5 (Whitebread, 1999). Thus, although more complex metacognitive skills (e.g., monitoring, regulation) tend to be evidenced between 8 and 10 years of age (Veenman & Spaans, 2005), empirical studies suggest that more basic metacognitive skills may already be utilized at earlier ages (e.g., the ability to plan tends to develop before the ability to monitor).

Metacognitive skills can be evident even in young children, and are of critical importance with respect to self-regulated learning. Try to recall an instance in which you taught or interacted with a young child.

Did you see evidence of metacognitive processes? At what age have you noticed that children start to think about their learning-related abilities? What types of planning strategies do children use? Was the child able to monitor or regulate their activities? Have you noticed differences in metacognitive skills between children of different ages? Concerning your own self-regulated learning, do you think your metacognitive capabilities have improved in the last few years?

Overall, research findings suggest that at least basic metacognitive skills, such as planning, start to develop early in childhood and can thus be fostered before attending school (Dignath, Büttner, & Langfeldt, 2008; Veenman et al., 2006). Similarly, simple monitoring activities, such as judging the difficulty of learning specific pairs of words, are commonly observed in 6-year-olds. However, findings indicate that older children are better able to connect these monitoring processes with self-regulation activities and thus can also adjust the time allotted for learning to the difficulty of the material (Schneider, 2008). There is also empirical evidence that metacognitive skills first develop in specific domains and then become increasingly generalized over time (Veenman & Spaans, 2005). Empirical results on the development of metacognitive skills clearly indicate that self-regulated learning can already be fostered in pre-school-aged children. Finally, just as cognitive and metacognitive skills have been found to improve from earlier to later grade levels, empirical studies suggest that self-regulatory behavior also increases during that period (e.g., from grades 5 to 11; Zimmerman & Martinez-Pons, 1990).

Conclusion

Different aspects of self-regulated learning develop at different points in time. Generally, metacognitive skills are the most difficult to use effectively. In contrast to theoretical assertions that higher-order metacognitive skills do not develop until 8–10 years of age, research indicates that at least simple metacognitive skills, such as planning, can be observed much earlier in young children.

3.6. Fostering Self-Regulation in Students

3.6.1. A Meta-Model for Promoting Self-Regulated Learning

Given the complex and dynamic nature of self-regulated learning, there are various ways in which self-regulated learning can be promoted. Regardless of the focus of

such proposed interventions, the previous sections of this chapter highlight the importance of clearly defining the variables to be encouraged and basing one's approach on a specific theoretical model. After clarifying one's focus on specific variables, it becomes easier to choose between theoretical models that can best guide intervention development and implementation (e.g., models that focus on how to appropriately use specific learning strategies vs. those that focus on higher-order, self-regulatory processes). However, as it is often unclear how a theoretical model can best be used to inform the development of specific intervention techniques, the following sections outline an overarching conceptual model aimed specifically at helping one link their chosen model with effective self-regulated learning interventions. In other words, the heuristic below represents a kind of "meta-model" to be used after a specific self-regulation theory has been selected (e.g., the three-layered model of Monique Boekaerts, see Figure 3.2) to guide subsequent theory-based efforts to foster students' self-regulatory competencies.

Knowledge and competencies related to self-regulated learning. Knowledge and abilities concerning the various aspects of self-regulated learning, as outlined in a given self-regulation model, play a crucial role with respect to fostering self-regulated learning in students. Further, knowledge with respect to the interplay (interaction) between specific self-regulated learning variables is of particular importance (e.g., use of learning strategies, monitoring of strategy use in terms of their efficiency; see the circle in Figure 3.4). In this regard, a useful first step could be to provide students a visual heuristic in which one or more theoretical models of self-regulated learning are outlined. Depending on the students' age, simplified versions could be used. In the meta-model provided above, it is assumed that the efficiency of knowledge acquisition and effectiveness of learned competencies can be facilitated by encouraging students to consider an overarching conceptual perspective on how these processes work and interact. In other words, if students have been previously exposed to the concept of self-regulated learning, the process of actually acquiring and using these skills should be faster and more effective as compared to students who are encouraged to use these skills with less understanding of why they are important.

Predictors of knowledge and competencies related to self-regulated learning. Emotions, motivation, available resources, and metacognition, as they specifically relate to the self-regulatory processes involved in the learning process, are each important predictors of how well a student acquires knowledge and competencies relevant to self-regulated learning (see Figure 3.4). Moreover, these variables not only impact such knowledge and competencies, they can also result from these higher-order processes (e.g., success due to effective self-regulation can enhance students' motivation to further improve the way one learns). Furthermore, students' emotions, motivation, resources, and metacognition related to self-regulation are all assumed to impact each other (e.g., positive emotions about the learning process can enhance one's intrinsic motivation to optimize the learning process; see Chapter 4).

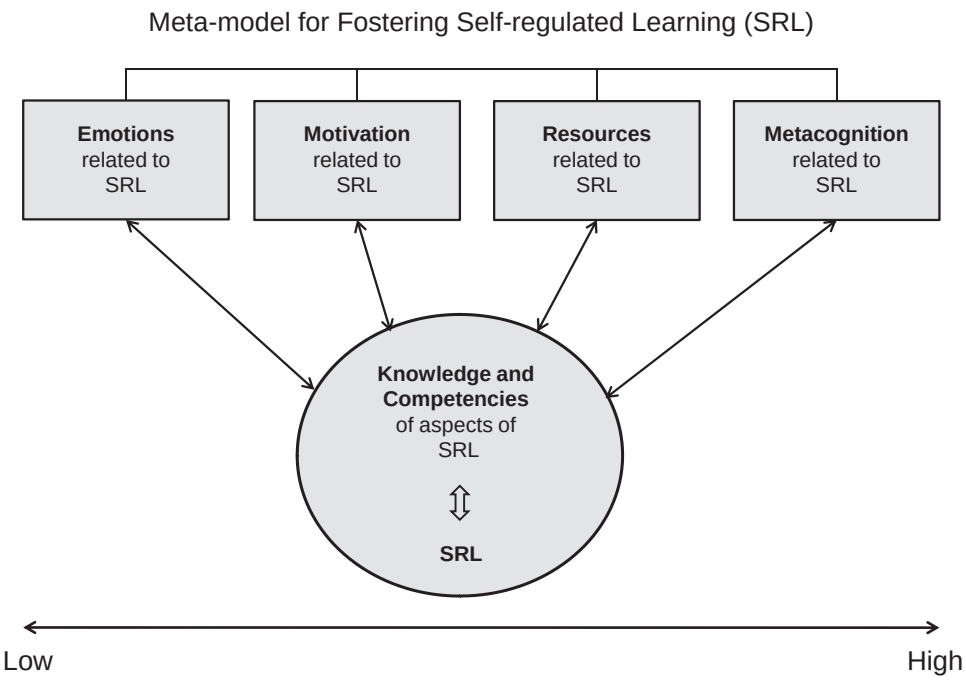


Figure 3.4: Fostering self-regulated learning.

Emotions related to self-regulated learning. The importance of emotions for learning has been increasingly recognized over the past decade in theories and empirical research in the domains of educational psychology and empirical pedagogy (e.g., Schutz & Pekrun, 2007). Overall, findings suggest that problem-solving is more holistic in nature, knowledge is more deeply processed, and competence acquisition is longer lasting if the learning experience is characterized by positive emotions (e.g., enjoyment, hope, pride). Concerning the way in which emotions should affect competence levels, emotions are assumed to influence competence gains through their impact on motivation (see Chapter 1). Important variables to consider with respect to fostering positive emotions about self-regulatory knowledge and competencies are teacher enthusiasm (Frenzel, Götz, Lüdtke, Pekrun, & Sutton, 2009) and emphasizing to students the relevance of self-regulated learning in terms of saving them time, increasing their knowledge, and improving their grades.

Motivation related to self-regulated learning. Students' motivation to acquire self-regulatory competencies can also be fostered by showing them how improving their abilities in this area can lead to personally meaningful consequences. For example, providing an overview of findings from empirical results in this field could be informative (e.g., show how the exact probability of obtaining an A grade

significantly changes based on the frequency with which elaborative learning strategies are used, based upon specific findings from recent studies). Another way in which students' motivation for self-regulated learning can be encouraged is by enhancing their self-efficacy beliefs related to self-regulated learning (e.g., by providing easily completed sample tasks to increase feelings of mastery; see Zimmerman & Bandura, 1994; see also Chapter 2). This suggestion is supported by findings from Caprara et al. (2008) that show self-efficacy beliefs to have a strong impact on students' use of self-regulatory strategies (see also Bouffard-Bouchard, Parent, & Larivée, 1991; Eilam, Zeidner, & Aharon, 2009).

Resources related to self-regulated learning. Fostering self-regulated learning is a long-term venture, and thus requires a significant investment in learning resources (e.g., time, personnel, books, study areas). In order to optimally foster self-regulated learning, it is critical that educational institutions invest in the resources needed to bolster efforts to enhance students' competencies in this area. For example, it is important for schools to incorporate into their curriculum activities that facilitate and require self-regulation and also consider the extra-curricular resources that are available to students to support their learning (e.g., time for studying, parental support). These issues become especially important when homework is assigned (see Dettmers, Trautwein, Luedtke, Kunter, & Baumert, 2010). However, it is also important to note that students must themselves recognize the importance of their own personal investment in improving their self-regulated learning abilities.

Metacognition and self-regulated learning. Metacognition refers to "cognitions about knowledge and actions," and with respect to self-regulated learning, may involve important higher-order processes such as knowledge concerning the relevance, efficiency, development, and domain-specificity of self-regulated learning. For example, students could be encouraged to consider the domain-specificity of self-regulated learning processes; that how a student approaches one class may not be the best way to approach another. In other words, teachers could summarize or develop exercises based on research studies showing that some self-regulatory activities acquired in a given domain (e.g., mathematics) may not generalize to, or be as effective in, other domains (e.g., English).

Degrees of freedom in self-regulated learning. Self-regulated learning can only be engaged in if the learning situation affords students a sufficient level of freedom to independently pursue activities that require self-regulation (Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009). For example, if the content to be learned, the appropriate learning strategies, and the time frames for completing the activity are explicitly defined and restricted by teachers, students may have few opportunities to engage in self-regulated learning. Referred to as "degrees of freedom," these possibilities for self-regulation that are provided to students should take into account their level of knowledge as well as competencies related to self-regulation. Generally speaking, higher levels of self-regulation competencies in a student should allow for greater degrees of freedom for self-regulated learning to be

provided. Further, if students' self-regulatory competencies are not appropriately matched to the degrees of freedom, students can be over-challenged (overly high degrees of freedom), or conversely, unable to fully utilize their self-regulatory skills (overly low degrees of freedom). Examples of providing greater degrees of self-regulatory freedom in schools include allowing sufficient time for group work or independent study, providing students projects that are framed in a domain-general way (where self-regulatory skills can transfer to other academic domains), and modifying homework tasks (e.g., content, amount, time allowed; see Dettmers et al., 2010). In recent studies, the phrase "Powerful Learning Environments" (e.g., De Corte, Verschaffel, & Masui, 2004) is used to indicate a learning setting that optimizes students learning and provides learners appropriate degrees of freedom to engage in self-regulated learning. More generally, the importance of allowing individuals sufficient choice in learning situations is also a critical element in other theoretical approaches not directly related to self-regulated learning. For example, in self-determination theory as proposed by Deci and Ryan (1985), individual autonomy is presented as a core psychological need that must be satisfied in order for optimal learning and psychological development to occur.

3.6.2. Techniques for Promoting Self-Regulated Learning

Domain-specific versus domain-general approaches. At present, there exist relatively few published studies exploring whether it is better to teach self-regulatory competencies in a domain-specific or a domain-general way. However, available findings suggest that a domain-specific approach may be preferable. In a meta-analysis conducted by Hattie et al. (1996), the results indicated that the teaching of self-regulatory competencies was more effective if embedded in a specific context. This assertion is consistent with a more recent meta-analysis by Seidel and Shavelson (2007) showing generally stronger effects for domain-specific as opposed to domain-general interventions. This research follows from an increasing interest in recent years in the domain-specificity of psychosocial constructs. For emotional and motivational constructs, empirical findings suggest that the correlations between such variables across subject domains are very weak (e.g., enjoyments related to math and English), and consequently, that domain-specific interventions might be most effective (e.g., Bong, 2001; Götz, Frenzel, Pekrun, Hall, & Lüdtke, 2007).

Nevertheless, existing research on domain-specific programs aimed at fostering self-regulated learning suggests that in addition to encouraging competencies specific to a given academic domain, it is also important to promote self-regulatory strategies that can transfer to other areas in which students wish to improve (see Hattie et al., 1996). For example, when learning about a strategy known to be effective in a specific domain (e.g., elaboration in English), a teacher could also highlight the potential to effectively use this approach in a different subject area (e.g., mathematics). In so doing, the competencies encouraged become de-contextualized (not restricted to the initial domain in which the strategy was taught) which should lead to teachers in other domains being able to more efficiently encourage, and build upon, this

existing knowledge. Moreover, it is possible that this transfer could be further optimized by directly encouraging teachers to cooperate with each other and share ideas concerning best practices for promoting students' self-regulatory skills.

Of course, it is important to consider the cost of implementing such programs for fostering self-regulated learning (e.g., time, personnel, funds, physical resources). For example, teachers must invest a significant amount of time in improving their own competencies in these self-regulated learning strategies, as well as how to teach them, before attempting to instruct their students on these topics (see Section 3.7). It therefore becomes important to integrate instruction in self-regulated learning on a gradual basis by introducing specific elements one at a time so as to not exhaust limited resources early on. For example, a reasonable first step would be to teach self-regulatory competencies in one subject domain (e.g., planning in English) and then carry this approach over to other classes in which additional strategies are promoted (e.g., planning and self-monitoring in math). One main goal of encouraging learning strategies that transfer to other domains is that students will use these strategies not only in other classes, but also outside the classroom setting (e.g., homework). In this regard, Schreblowski and Hasselhorn (2006) suggest that to increase probability that students will engage in self-regulated learning both within and outside of class, teachers should vary the context of the self-regulated learning tasks assigned to students, and also vary the practice materials and task demands (e.g., practice planning strategies in English class, then actually use these strategies when organizing an experiment in science class, or preparing for a math test for which planning is required).

Direct versus indirect techniques. Efforts to promote self-regulated learning, or various other learning-related competencies (e.g., problem-solving), can typically be differentiated as direct or indirect in nature. Concerning more *direct* methods, the topic of "self-regulated learning," and specific facets thereof, has often been explicitly introduced, taught, discussed, and reflected upon in a classroom setting (Paris & Winograd, 2003). To this end, various materials are provided to students, such as illustrations of theoretical models and questionnaires that encourage reflection and provide feedback to the teacher, and class activities are conducted in which self-regulated learning strategies are clearly defined and practiced (e.g., training exercises).

Concerning *indirect* ways of fostering self-regulated learning, such activities may similarly encourage self-regulation processes but without explicit mention of the intention to do so ("learning by doing"). For example, classroom exercises that require problem-based learning (e.g., teams solving problems within time constraints), or collaborative activities in which students monitor their own progress (e.g., a "school garden" in which plant growth is analyzed from different perspectives; e.g., biology, chemistry, math) can indirectly promote self-regulatory competencies without directly informing students of this objective. With respect to indirect teaching behaviors, one example could involve a teacher assisting a student during a problem-based task by encouraging them to integrate aspects of self-regulated learning into the problem-solving process (e.g., to develop a plan, monitor their progress, and to evaluate the effectiveness of the strategies they chose) without

explicitly mentioning self-regulation. It is important to note that regardless of whether a direct or an indirect approach is used, intervention efforts should be guided by a clear objective involving what specific self-regulated learning abilities are to be promoted, as well as a clear theoretical model. Of course, optimal methods of promoting self-regulated learning will likely incorporate both direct and indirect methods to inform students of the importance of these strategies, but not overburden them with having to consistently consider the higher-order objectives of already effective classroom activities.

Programs for fostering self-regulated learning. Since the 1980s, various training programs intended to encourage self-regulated learning in students have been developed and implemented, but few have been empirically evaluated. These approaches differ with respect to the theoretical models on which they are based, the specific self-regulatory abilities to be fostered (e.g., motivation vs. learning strategies), the target group (e.g., elementary vs. secondary school students), the type of methods used (e.g., direct vs. indirect approaches), and the context-specificity of the techniques used (e.g., teaching strategies as part of a mathematics class vs. in a comprehensive, domain-general seminar for all students). A relatively new area of research focuses on promoting self-regulated learning competencies through the use of digital media (Azevedo, Behnagh, Duffy, Harley, & Trevors, 2012; Fischer, Mandl, & Todorova, 2009) in which, for example, intelligent programs can adapt learning content to individual achievement levels, analyze written material constructive feedback (e.g., degree of elaboration identified), or suggest more adaptive sequences of learning strategies through real-time assessments of the order in which learning modules were completed. The following sections describe two instructional methods and one intervention program as specific examples of classroom-based activities aimed at improving self-regulated learning in students.

Example 1: Seven educational strategies

In an educational psychology textbook by Ormrod (2006, p. 356), seven aspects of classroom instruction and teacher–student interactions are assumed to play a crucial role in fostering self-regulated learning in students. The specific aspect of self-regulated learning being encouraged in each intervention component below is indicated in parentheses.

- Help students set challenging yet realistic goals and standards [Goal Setting].
- Have students observe and record their own behavior [Monitoring].
- Teach students instructions they can give themselves to remind them of what they need to do (e.g., while completing a multiple-choice test, students can remind themselves to (a) first read the question completely, (b) carefully review each option and decide if each is correct, and (c) choose the answer that appears more correct than the alternatives) [Planning].
- Encourage students to evaluate their own achievement (e.g., a science teacher might give students a list of criteria to evaluate lab reports they have written) [Evaluation].

- Teach students to reinforce themselves for appropriate behavior (e.g., calling friends after homework is completed) [Motivation].
- Give students opportunities to practice learning with little or no help from their teachers [Degrees of Freedom].
- Provide strategies that students can use to solve interpersonal problems (e.g., identifying the source of conflict, taking the perspective of others, verbalizing different perspectives, proposing compromises) [Regulation].

Example 2: Four educational strategies

In another popular educational psychology textbook, Woolfolk (2007, p. 340) outlines four elements that teachers should consider when attempting to promote self-regulated learning in students. The steps below are unique in that parents are explicitly included in the process of fostering self-regulatory competencies in their children.

- Emphasize the value of encouragement: (a) Remind students to encourage each other, and (b) communicate to parents the greatest learning challenge for their children and how they can keep their children motivated [Motivation].
- Model self-regulation: (a) Target small steps for improving academic skills and tailor goals to a student's current achievement level [Goal-setting], (b) show and discuss how to monitor progress toward one's goal [Monitoring], and (c) encourage parents to show their children how to set goals (e.g., for a given day or week), write to-do lists, or create schedules [Goal-setting, Planning].
- Make families a source of good strategy idea by encouraging parents to (a) implement a "strategy of the month" that students can practice at home [Teaching Strategies], (b) create a lending library of books on topics related to goal-setting, motivation, learning strategies, and time-management strategies [Metacognition], and (c) help their children focus on problem-solving during learning tasks (e.g., discourage prematurely looking at the answer booklet for practice exercises) [Motivation, Volition].
- Provide self-evaluation guidelines: (a) Develop categories for self-evaluation with students and outlining how to use it [Monitoring, Evaluation], (b) provide lists of tasks to be solved that can increasingly be replaced by lists developed by students themselves [Monitoring, Evaluation], (c) encourage parents to engage in self-evaluation concerning content areas in which they themselves wish to improve [Evaluation], and (d) show materials developed by other families as examples during parent–teacher conferences [Metacognition].

Example 3: An intervention program

Weinstein, Husman, and Dierking (2005) describe a program implemented at the University of Texas that promotes self-regulated learning in undergraduates by encouraging "strategic" learning – learning that is well-planned and efficient in nature.

Goal of the program. The goal of the program is to teach learners a repertoire of learning strategies [Declarative and Procedural Knowledge] as well as to increase their knowledge of how to use these strategies [Conditional Knowledge] and how to evaluate their efficiency [Evaluation]. In so doing, this program addresses the following questions: What strategies can I use and how do they work? When is a specific strategy most appropriate? How can I make my strategy use more effective?

Theoretical basis. Weinstein's (1994) model of strategic learning stands as the theoretical basis for the program. This model hypothesizes that learners should be aware of four critical aspects of self-regulated learning and aim to develop skills in each area. These four components include: (a) Skill (competencies, abilities), (b) Will (motivation, volition, emotion, attitudes), (c) Self-regulation (ability to regulate oneself), and (d) the Academic Environment (recognizing characteristics of the learning context).

Intervention procedures:

- Materials are provided to the learners (readings, self-evaluation instruments such as the Learning and Study Strategies Inventory, LASSI; Weinstein, 1988). The LASSI scale items provide insight into critical aspects of students' self-regulated learning competencies, including knowledge about themselves as learners (e.g., one's attitude, motivation, and anxiety level toward learning), different academic tasks (e.g., what competencies are necessary when performing specific activities), specific learning strategies (e.g., how to use elaboration), and the learning environment (e.g., recognizing the expectations of teachers).
- Weinstein's (1994) theoretical model of strategic learning is introduced with a particular focus on the interaction between Skill, Will, Self-regulation, and the Academic Environment. This overview allows students to later integrate the specific strategies to be taught into a comprehensive and meaningful conceptual framework.
- The Will component (desire to reach one's goal) is highlighted as a highly important aspect of Weinstein's (1994) model.
- Students are taught declarative, procedural, and conditional knowledge concerning three learning strategies related to knowledge acquisition: rehearsal, elaboration, and organization.
- Following principles of self-regulation are taught: (a) setting goals, (b) being aware of the task (e.g., difficulty, resources needed for solving it) and personal resources (e.g., time, effort available), (c) developing a plan, (d) how to choose strategies, (e) how to use strategies, (f) monitoring and evaluation concerning strategy use and learning progress, (g) when to change strategies or the way in which a strategy is used, and (h) final evaluation of results to determine whether the selected strategies should be modified for future learning endeavors.
- Basic elements of information processing theory are presented to show learners why the learning strategies being encouraged are more efficient than alternate approaches.

- In different courses throughout the semester (~14 weeks), students are provided opportunities to use these strategies while completing actual learning tasks. The use of learning strategies in different domains is assumed to increase metacognition as well as the generalizability of the strategies learned in various future learning situations.
- The strategies encouraged in the intervention are reflected upon in terms of how they fit with the theoretical model, as well as how the various strategies interact with each other to affect learning and achievement (Skill, Will, Self-regulation, Academic environment).

The authors report empirical findings showing the intervention program to have positive effects on learning behavior and achievement outcomes.

Conclusion

When attempting to improve students' ability to engage in self-regulated learning, it is recommended that such efforts are based on a specific theoretical model and clearly identify the specific elements of self-regulated learning to be encouraged. The research literature in this domain suggests multiple potential educational strategies and intervention programs that can be utilized and modified depending on the learning situation. Overall, it is important to provide students appropriate degrees of freedom, relative to their existing competencies and the learning activity, in order for them to optimally learn about and effectively use self-regulatory activities.

3.7. Teachers in Focus

Given the considerable amount of theoretical development and empirical research on self-regulated learning, it is surprising that notably little research has explored the self-regulatory competencies of teachers. Below are at least four reasons for why self-regulated learning in teachers is relevant and deserving of further empirical attention:

- To provide informed and convincing instruction to students concerning self-regulated learning, it is necessary that teachers' have sufficient competencies in this domain.
- Teachers with high self-regulated learning skills should be better able to diagnose and address self-regulation problems in their students (Paris & Winograd, 2003).
- In rapidly changing societies, life-long learning is necessary in order for teachers to keep up with the changing educational demands of their students (Paris & Winograd, 2003).

- Recent publications suggest that teachers experience significant levels of stress and negative emotions (McCormick & Shi, 1999; Roness, 2011; Stoeber & Rennert, 2008; Sutton, 2007). Greater self-regulatory competencies can clearly be assumed to contribute to better teaching experiences. Considering the high demands placed on teachers (e.g., large classes, achievement pressure due to standardized testing and achievement-based funding allocations), teachers' abilities with respect to planning, monitoring, and regulation concerning not only time management but also negative emotions (e.g., anger; see Chapter 1) should contribute to better physical and psychological health outcomes (e.g., prevent burnout).

There are numerous ways in which self-regulated learning (and instruction) can be encouraged in teachers. Some possibilities are outlined below:

Context	**Options for Implementation**
Preservice teacher education	• Integrating self-regulated learning strategy instruction into education programs for preservice teachers • Integrating self-regulation content into orientation and advising programs in teacher education departments at universities and colleges (e.g., "soft-skills" seminars)
In-service teacher programs	• Developing pedagogical programs for practicing teachers that address issues of self-regulated learning and teaching (with a focus on competencies in both students and teachers) • Integrating support for self-regulated learning into existing school-based counseling programs for students • Providing support and accountability for teachers' efforts to improve their self-regulatory abilities through group-oriented training exercises
Excursions	• Visiting schools in which programs for fostering self-regulated learning in teachers and students have been successfully implemented • Visiting nonacademic institutions in which personnel are required to demonstrate high levels of self-regulated learning (e.g., research and development departments of private companies)
Individual continuing education	• Attending continuing education courses at institutions in which self-regulatory competencies are addressed • Individual counseling focused on self-regulated learning • Acquiring knowledge and competencies in self-regulated learning through self-instruction (e.g., via the Internet)

In order to ensure the effectiveness of school-based programs for promoting self-regulated learning in students, it is important to also focus on bolstering these skills in practicing teachers who will ultimately be responsible for implementing these programs. Considering that changes in preservice teacher education can be assumed to not result in significant changes in school protocols until several years later, it is important to focus on fostering these competencies in practicing teachers through in-service teacher education programs.

It is critical for teachers to foster self-regulated learning not only in their students but in themselves to better assist students and cope with the challenges of instruction in modern-day classrooms. Therefore, it is important for teachers to be able to adequately evaluate their existing self-regulatory abilities and identify areas for improvement.

How often do you reflect on your ability to successful engage in self-regulated learning, or ways in which these abilities could be improved? Do you set specific occupational and/or personal goals? If so, do you tend to achieve your goals or are they often set too high? Do you set goals differently depending on whether they are teaching-related or personal in nature? Do you know your strengths and weaknesses with respect to self-regulated learning? Are you a good planner? Do you regularly monitor your activities? Do you notice early on if your chosen learning or teaching strategies become ineffective? How would you rate your overall competence for self-regulated learning on a scale from 1 (*very low competence*) to 5 (*very high competence*)? Are you satisfied with this rating, and if not, what rating would you (realistically) hope to achieve?

Teachers' acquisition of self-regulatory competencies is not all that different from the way in which students develop these abilities. Thus, theoretical models of self-regulation that are typically used to understand academic development in students may also be used to also inform teachers' efforts to improve their own competencies in this area. In an article by Paris and Winograd (2003), various theoretically based ways in which teachers can expand upon and improve their repertoire of self-regulatory strategies are described and elaborated on below.

Engaging in self-evaluation. Continuous reflection about one's own thinking, learning, and teaching is a critical prerequisite for optimizing classroom instruction and promoting student development. In this regard, one might compare one's own personal approach to learning and instruction (e.g., when seeking out new information, preparing for a class) with those of other teachers. For example, just as there are various ways for students to differ when writing a paper (e.g., in listing key words before starting to write, the number of revisions completed, how often preliminary drafts are shared with others), there are also differences between teachers in how they prepare their classes (e.g., in the extent of planning, rehearsal,

note-taking, and help-seeking demonstrated). It is anticipated that by encouraging teachers to invest more time in self-reflection that teaching quality will improve, be it thinking about their own strengths and weaknesses related to teaching and learning, or the degree to which higher-order metacognitive strategies are used in their own thought processes. Similarly, being able to reflect upon and prioritize the various aspects of teaching and learning in terms of what is most important for student development could help teachers place greater emphasis on critical elements of classroom instruction and utilize class time more efficiently (e.g., identifying three main goals for a given class, as opposed to pursing a list of 20 desired outcomes). Further, Paris and Winograd (2003) suggest that encouraging teachers to continuously monitor their learning process and outcomes can help them to recognize personal improvements, increase their teaching-related self-efficacy, and optimize their teaching methods by identifying and addressing ineffective strategies early on. For example, one might reflect on the efficiency of specific class preparation strategies or prepare a portfolio of teaching-related competencies in order to better conceptualize, monitor, and evaluate one's teaching and learning abilities.

Self-regulation of thinking, effort, and emotions. The self-regulation of one's thoughts, engagement, and emotional experiences allows one to solve problems in a more flexible, persistent, self-controlled, strategic, and goal-oriented manner. Therefore, it is important for teachers to set challenging yet realistic goals for themselves, for example, with respect to class preparation or the learning goals for a given class. Such goals might also be discussed with colleagues to get a second opinion on the importance or feasibility of one's teaching goals. Other aspects of self-regulation include anticipating the consequences of desired learning and teaching goals for one's personal resources (e.g., time, energy) and prioritizing goals (e.g., highly important goals which should be reached in any case vs. less important goals) in order to minimize frustration, as it may not always be possible to achieve every teaching goal. The self-regulatory strategy of time management is also relevant in this regard, for example, in that teachers could define for themselves a concrete time frame for preparing for class and lower the priority level of other activities (e.g., extending a personal deadline for grading to be completed) to achieve this goal. Another salient aspect of self-regulation is knowing whether to eliminate specific activities (e.g., if that they cannot be achieved within the original time frame; e.g., eliminating excessive class content), to optimize their activities (e.g., adopt more efficient strategies for achieving set classroom goals), or to continue with activities as initially planned (e.g., if progress is on track). As making mistakes represents an unavoidable and often informative part of the teaching process (e.g., inefficient teaching methods), greater knowledge about how to effectively deal with mistakes could help to improve the self-regulatory competencies of teachers which, in turn, should help teachers to better help students learn how to respond effectively to learning setbacks.

Conclusion

Self-regulated learning and instruction in teachers has been largely neglected in the research literature which is rather surprising, given its relevance to teaching quality, teachers' psychological health, and students' academic development. As the types of self-regulatory competencies to be encouraged in teachers largely parallel those already investigated in student populations, existing theoretical models, such as the three-layered model of Monique Boekaerts, may prove useful for informing effective self-regulation content and programs for teachers. Although teachers' own self-regulation is at present largely ignored in teacher education programs, it is reasonable to expect that increased research in this domain, and the incorporation of relevant findings into pedagogical content for preservice and practicing teachers, should lead to improvements in teachers' self-regulation skills, and consequently, the self-regulatory competencies of their students.

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Chapter 4

Emotion, Motivation, and Self-Regulation: Common Principles and Future Directions

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The preceding chapters clearly illustrate how emotions, motivation, and self-regulated learning are of critical importance for students' achievement as well as teachers' instruction and personal well-being. Furthermore, ways in which each of these psychological processes could be encouraged by teachers were suggested. However, after reading these chapters, it also becomes clear that the concepts of emotion, motivation, and self-regulation overlap considerably and are determined by a number of common principles. In this chapter, these conceptual and functional commonalities will be examined. Moreover, open questions and important areas to pursue in future research will be discussed. Answers to these questions will provide further insights into how educators can best promote students' development as well as their own well-being.

4.1. Students in Focus

"I was excited when I saw the grade I got on my English exam. I was highly motivated to continue studying and thought about which book to read next." (Ann G., 13 years)

Links between emotion, motivation, and self-regulated learning

"Math is fun for me – I always do some extra studying and plan ahead for the next math competition. But English and Spanish are boring. I don't care about these subjects and don't do any more studying for these classes than I have to." (Thomas D., 10 years)

Domain specificity of each of the three processes

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"I knew for sure that I would fail the next exam. This made me feel hopeless, and I had no motivation to invest effort in studying." (Lisa S., 17 years)

Cognitive appraisal as a common antecedent of emotion and motivation

"This year, science is the subject we enjoy most. My friend and I love the formulas, and we spend most of our study time on this subject. Why? Our teacher knows everything about science and exactly how to explain it to us. You can see how enthusiastic she is about science, and we are allowed to work in groups and do experiments ourselves. If we get stuck, she helps us solve the problem; plus, she tells every student they have the potential to learn science and get good grades." (Suzanne K., 16 years)

Aspects of classroom instruction as common antecedents of emotion and motivation

"Pythagoras really scared me, as geometry is not one of my strengths. However, I really wanted to avoid failing the exam, so I studied a lot. This approach actually helped me to better solve the sample problems, which led me to feel less panicked. In the end, I got a good grade and my fear was gone." (Richard F., 14 years)

Feedback loops between emotion, motivation, and performance

4.2. Conceptual Relationships

In Chapter 1, *emotion* was defined as a multidimensional phenomenon consisting of affective, cognitive, physiological, expressive, and motivational components. For example, test anxiety could be readily inferred from a student reporting feelings of nervousness and worries about possible failure, combined with indications of physical agitation, a concerned facial expression, and a tendency to avoid testing situations. In Chapter 2, *motivation* was defined as the psychological processes underlying the initiation, performance, and evaluation of actions, such as achieving mastery and performance goals. Finally, in Chapter 3, the concept of *self-regulated learning* was introduced. Self-regulated learning involves setting goals for one's learning activities, acting in accordance with these goals, monitoring the progress one makes, and evaluating the degree of one's goal attainment. These definitions imply that emotion, motivation, and self-regulation show considerable conceptual overlap.

- One essential feature of emotions is to trigger subsequent actions. For example, emotions serve to motivate individuals to react quickly and in flexible, goal-directed ways to feedback related to learning and achievement. From this perspective, motivation is a component of emotion.
- Motivation is defined as processes underlying the initiation, performance, and evaluation of action. Emotions can also prompt actions, directly affect the performance of these actions (e.g., test anxiety), and can bias the self-evaluation of one's actions. From this perspective, emotions are a component of motivation.
- Both emotion and motivation are essential components of one's self-regulation of learning. Without any emotional and motivational involvement, it would not be possible to begin or sustain an effective learning process, or to optimally evaluate one's progress at learning.

As such, emotion and motivation share common elements. Furthermore, both of them also overlap with *cognition*, that is, the mental representation of factual or possible reality. For example, a student's anxiety about failing his or her next exam can be regarded as emotional (nervous feelings), motivational (wanting to avoid the test), and cognitive in nature (anticipating negative consequences of failure). From a theoretical perspective, the three can be conceptually separated; however, in reality, they are closely interwoven. Accordingly, students' emotional status should be considered when evaluating their motivation to learn, and possible motivational consequences should be considered when dealing with their emotions.

Moreover, it follows from the definitions of these constructs that emotion and motivation are critically important for self-regulation in students and teachers alike. Emotions can influence the type of achievement goals one pursues (Linnenbrink & Pintrich, 2002), and they can promote or undermine the flexibility of thinking that is needed for self-regulated learning (e.g., enjoyment of learning can facilitate planning one's learning activities). In addition, emotions are important in evaluating goal attainment (e.g., pride and shame about one's accomplishments convey information about the quality of performance). Motivation is also necessary for self-regulated learning to occur; without sufficient motivation, self-regulated learning could neither be initiated nor sustained. With regard to educational practice, these links imply that any attempts to foster students' self-regulated learning should include efforts to promote the emotional and motivational competencies that enable self-regulation (see Chapter 3).

4.3. Common Principles

In the research literature on emotion, motivation, and self-regulation, different terms are often used to denote similar phenomena. Use of different terms can make it difficult to see commonalities. However, there actually are a number of clear functional similarities across these three psychological variables. All three are characterized by a number of common principles with regard to their causes,

consequences for learning and achievement, and potential to be improved through educational interventions.

4.3.1. Personality versus Situational Processes

Emotion, motivation, and self-regulation are defined as processes that occur within a given situation at a specific point in time (e.g., during a learning task, prior to a test). However, all three terms can also be used to refer to enduring individual dispositions underlying these situational processes. As such, from the perspective of stable individual dispositions, emotion, motivation, and self-regulation can be understood as part of an individual's *personality*. Unfortunately, the research literatures on emotion and motivation tend to each use their own terms when referring to these dispositions. As outlined in the preceding chapters, emotion researchers talk about "trait emotions," whereas motivation researchers use terms such as "motive" and "goal orientation." For example, from the perspective of emotion research, fear of failure is defined as a trait emotion; from the perspective of motivation research, it is defined as a motive (i.e., the motive to avoid failure). The two terms "fear of failure" and "motive to avoid failure" describe the same phenomenon — an individual's disposition to experience fear of failing tests and exams (Heckhausen, 1991).

Definition

Personality is defined as the organized whole of relatively stable, individual characteristics within a person.

Two types of dispositions can be distinguished. The first are "abstract dispositions" (Tuomela, 1978) that refer to the emotions, motivation, or approaches to self-regulation that are frequently experienced by an individual across situations. Prototypical cases are trait emotions, individual goal orientations, and styles of self-regulated learning. For example, *trait test anxiety* is defined as a student's propensity to frequently experience anxiety in testing situations. Although this type of dispositional term works well as a description of regularly occurring psychological processes, it is not well suited to explain why a process may occur (or not) in a specific situation. For instance, it would not make sense to explain the anxiety experienced by a student during a specific test by the student's trait anxiety — which itself is inferred from that or similar situations (explaining an event as caused by itself is circular reasoning, regardless of how frequently the event occurs). Recurring test anxiety is not a causal explanation for why a single episode of anxiety is observed, but rather, simply a general description of how frequently it is observed.

By contrast, a second type of disposition referred to as "concrete dispositions" involves processes that are independent from the corresponding phenomenon to be explained. Concrete dispositions can actually contribute to causing the phenomenon, and thus can represent a suitable explanation for it. One example is students'

self-concept of academic ability (i.e., their mental representation of their ability). Because self-concept of ability is conceptually independent from students' emotions, it can be considered as causally influencing emotional processes experienced in a given situation, thus helping to explain these processes. For example, a student's poor self-concept of ability in mathematics can impact their anxiety experienced before a math test, implying that self-concept can serve as an explanation for this anxiety.

Implications for Practice: Causal Evidence

To explain students' emotions, motivation, and approaches to self-regulated learning, it is necessary to examine their possible causes with respect to concrete variables that are conceptually independent of the process being explained. Such causal evidence is needed to optimally inform efforts to promote students' development. For example, were a student's test anxiety caused by low self-efficacy, it may be possible to reduce that student's anxiety by boosting self-efficacy through success experiences and positive performance feedback. By contrast, it would not be helpful to explain this anxiety as due to the student's proneness to experience anxiety — an explanation that would be logically flawed, would fail to identify specific independent causes, and thus would not contribute to meaningful recommendations for how the student's anxiety can be reduced.

4.3.2. The Importance of Cognitive Appraisals

As outlined in Chapter 1, many theories posit that emotions are shaped by cognitive appraisals that mediate between the learning situation and one's emotions. In other words, appraisal theories assume that how one perceives the learning environment is most important for how one subsequently feels about it, rather than the environment having a direct impact on one's emotional experiences. For example, appraisals of causation, personal controllability, relevance, and normative appropriateness of educational activities can instigate various emotions in both students and teachers. As discussed in Chapter 2, appraisals are also hypothesized to predict academic motivation. Specifically, this is true for one's expectancies and the subjective values attached to learning behaviors and outcomes. Finally, Chapter 3 outlines how cognitive appraisals are essential for self-regulation of learning and instruction. For instance, perceptions of the effectiveness of various cognitive and meta-cognitive learning strategies can determine how one chooses between them, appraisals of the discrepancy between one's current and ideal learning progress affect which strategies continue to be used, and the subjective evaluation of personal success or failure is required to determine if continued persistence toward a learning goal is needed and/or if new learning goals should be pursued.

Again, the differences in the terms used in these fields of research may lead to an underestimation of the commonalities. It is commonly assumed today that subjective

appraisals of one's competencies, situational constraints, achievement activities, and performance outcomes are important for emotions, motivation, and self-regulation in both students and teachers. Moreover, most types of appraisals are equally important for each of the three processes. This is particularly true for students' expectancies and subjective values related to the learning situation, possible courses of action, and the outcomes of learning, as well as for students' and teachers' causal attributions for their performance. Aside from subtle differences, the assumptions proposed in the various theories of emotion, motivation, and self-regulation (e.g., expectancy-value theories, control-value theory, and attributional theories) show considerable convergence with regard to the importance of these appraisals (also see Pekrun, 2006; Wigfield & Cambria, 2010).

4.3.3. Domain Specificity

Our everyday thinking suggests that anxious students tend to experience anxiety in many different types of learning situations, and that learners with high achievement motivation are always highly motivated to achieve whenever they encounter an evaluative situation providing success or failure feedback. However, do these assumptions reflect students' actual experiences in the classroom? For example, would it possible to infer from the emotions experienced by a student in English how they feel in mathematics? Do students who are anxious about tests feel that way in every school subject? Are highly motivated students always motivated to learn and succeed in every academic domain?

In fact, in contrast to everyday thinking, many studies have shown that the cognitive appraisals underlying students' emotions, motivation, and self-regulated can vary considerably depending on the subject area and academic task (Bong, 2001). For example, as discussed in Chapter 2, students' levels of *interest* can strongly vary across academic domains, most likely due to the typical process of differentiation in students' personal interests over time. Furthermore, for students' *self-concept of ability*, findings typically show very little or no correlation between self-concepts in mathematics and science, on the one hand, and in languages, on the other. This lack of correspondence stands in marked contrast to the positive correlations between students' achievement scores across these subjects.

In his *internal/external frame of reference model*, Herbert Marsh proposed a possible explanation for nonexistent correlations between students' self-concepts (see Marsh & Hau, 2004). Marsh suggested that students' academic self-concepts are based on two types of comparisons. The first is social comparison in which one's achievement is compared with the achievement of other students (external frame of reference). The second is a within-individual comparison (internal frame of reference) in which one's own achievement is compared across subject domains (e.g., mathematics vs. English). According to the I/E Model, having an external perspective would lead to positive correlations between self-concepts across domains, because students tend to perform similarly across domains. By contrast, adopting an internal perspective should lead to negative correlations, because this perspective

emphasizes the differences in one's achievement across domains. As positive and negative relationships offset each other, the net result is zero overall correlations between students' self-concepts across domains.

Given the domain specificity of the interests and self-concepts that shape students' cognitive appraisals, shouldn't their subsequent emotions, motivation, and self-regulated learning behaviors also vary across domains? In line with this hypothesis, recent research has demonstrated that students' emotional experiences and motivational variables also show weak correlations across academic domains (see Bong, 2001; Goetz, Frenzel, Pekrun, Hall, & Lüdtke, 2007). Beyond elementary school, such low correlations are quite typical, and should be expected as older students tend to have more differentiated interests and self-appraisals. Therefore, in contrast to common stereotypes, the empirical evidence implies that students who are highly anxious or highly motivated in some academic domains are not necessarily anxious or motivated in other domains. Research actually suggests that it is not possible to infer a student's emotion, motivation, or self-regulated learning style in a given domain from how they feel and act in another domain. Rather, it is necessary to take the learning context, the learning activities being undertaken, and the type of content to be learned into account.

4.3.4. The Influence of Classroom Instruction and Social Environments

Cognitive appraisals are thought to directly influence emotions, motivation, and self-regulation in students as well as teachers. By implication, it is assumed that classroom instruction and the social environment can influence these three psychological processes by impacting individuals' appraisals. As such, cognitive appraisals of one's self, the situation, and one's actions serve to *mediate* the effects of the learning environment on how one subsequently feels and behaves. Environments that change students' and teachers' appraisals also change their emotion, motivation, and self-regulatory behaviors.

The mediating role of cognitive appraisals has traditionally been addressed in *social-cognitive learning theories* (e.g., Bandura, 1986). However, principles of mediation by appraisals also are in line with constructivist views of human learning. Constructivist approaches suggest that individuals' subjective construction of how they view themselves and their external reality are critical determinants of their thoughts, feelings, goals, and actions. Today, most theories of classroom instruction and social environments incorporate principles of cognitive mediation by acknowledging the importance of students' and teachers' expectancies, values, and attributions, as well as the impact of student–teacher interactions, parents, and peers on these appraisals.

By implication, there also is considerable convergence with regard to important factors in classroom instruction and social environments that can be assumed to influence students' emotion, motivation, and self-regulation, as outlined in the preceding chapters. Regardless of differences in the terminology used, there seems to be convergence across theoretical approaches that five groups of variables

are especially important: (1) cognitive quality of tasks and learning environments (e.g., use of modeling tasks in mathematics); (2) motivational quality (e.g., displayed teacher enthusiasm); (3) teacher–student and student–student interaction (e.g., in terms of autonomy support and peer learning); (4) goal structures and expectancies in the classroom (e.g., cooperative vs. competitive classroom goals); and (5) type of feedback and consequences of student achievement (see Chapters 1 and 2).

4.3.5. Impact on Learning and Achievement

As discussed in the chapters of this volume, students' emotion, motivation, and self-regulation are critically important for their academic achievement. Sometimes the correlations reported in the literature are not very strong; however, this should not be misinterpreted as indicating that motivation is not relevant. In today's societies, the organization of education serves to ensure a common level of motivation across students. Specifically, the formal obligation to attend school (or to engage in home schooling) provides sufficient motivation for most parents and children to make use of educational institutions. Accordingly, the relevance of motivational engagement can be seen from a simple hypothetical experiment: What would happen if students were allowed to either attend school or not, just following their momentary inclinations? In other words, what would happen if they were provided a choice between attending school and pursuing extracurricular activities?

It is likely that some would accept the invitation to come to class, whereas others would prefer to sleep in, watch a movie, or meet up with friends. Accordingly, differences in students' motivation would have a much larger impact on the time spent learning, and on the acquisition of competencies in reading, writing, and mathematics, which would manifest in higher correlations between motivation and performance outcomes. Therefore, although the correlations between motivation and competence acquisition tend to be relatively low due to compulsory education, this should not be interpreted as contradicting the fundamental importance of motivational prerequisites for successful academic learning.

The empirical evidence also shows that emotion, motivation, and self-regulation have parallel effects that can be described in an integrated way. For example, as outlined in the first two chapters, positive emotions such as enjoyment of learning, and motivational variables such as interest and intrinsic motivation, are both found to facilitate the use of flexible learning strategies (e.g., elaboration and organization of learning material), to increase persistence at learning tasks, and to contribute to better learning outcomes. The effects of negative emotions and extrinsic or controlled types of motivation are more complex (e.g., anxiety can reduce interest and creative thinking, but enhance motivation to avoid failure; Pekrun, 2006), but they are generally less beneficial. Overall, the similarity of effects across the psychological variables of emotion, motivation, and self-regulation are to be expected given the close linkages between them. For example, positive emotions during learning are

closely associated with intrinsic motivation, and in turn, a flexible and "deep" approach to learning, whereas many negative emotions (e.g., anxiety, boredom) are associated with avoidance motivation and, as a result, more superficial learning strategies.

4.3.6. Reciprocal Causality

Try to remember an important success you experienced at college or university. How did your emotions, your motivation, and your learning strategies influence this success, and how did your achievement reciprocally influence your emotions, motivation, and learning behavior?

Traditionally, research in education and educational psychology has aimed to examine the determinants of students' academic achievement. Researchers proposed numerous models of achievement that addressed the individual and classroom antecedents of students' performance. In these models, achievement was clearly being regarded as an outcome variable, and students' emotions, motivation, and self-regulated learning have first and foremost been analyzed with respect to their importance for explaining achievement outcomes. This implies a unidirectional conceptualization which specifies some variables as causes and others as resulting outcomes.

However, such unidirectional conceptualizations only tell half the story and may misrepresent students' academic development which is instead characterized by bidirectional, reciprocal relationships between affective processes, academic achievement, and the environment. Just as students' emotion, motivation, and use of learning strategies influence their achievement, students' academic success and failure reciprocally impact their social environments and self-appraisals, which, in turn, influence their emotion, motivation, and self-regulated learning (see Figure 4.1). For example, attaining good grades tends to strengthen a students' academic optimism, positive emotions, and intrinsic motivation, and frees up the cognitive resources needed for self-regulated learning (that are otherwise occupied dealing with failure experiences). Cumulative failure may exert opposite effects — poor grades can promote attributions to lack of ability, deteriorate self-concepts of ability, trigger maladaptive emotions, reduce interest, and facilitate externally controlled or demotivated approaches to learning. From a developmental perspective, academic success and failure are among the most important determinants of students' emotional, motivational, and regulatory development throughout their education.

To put it more formally, emotion, motivation, and self-regulation are linked to their antecedents and effects through *reciprocal causation* and *feedback loops*. Empirical evidence to date corroborates the assumption of bidirectional relationships with learning and performance. The evidence is particularly strong for students' test anxiety and self-concepts of ability (Chapters 1 and 2; see Marsh, Trautwein, Lüdtke, Köller & Baumert, 2005; Pekrun, 1992). Accordingly, conceptualizations

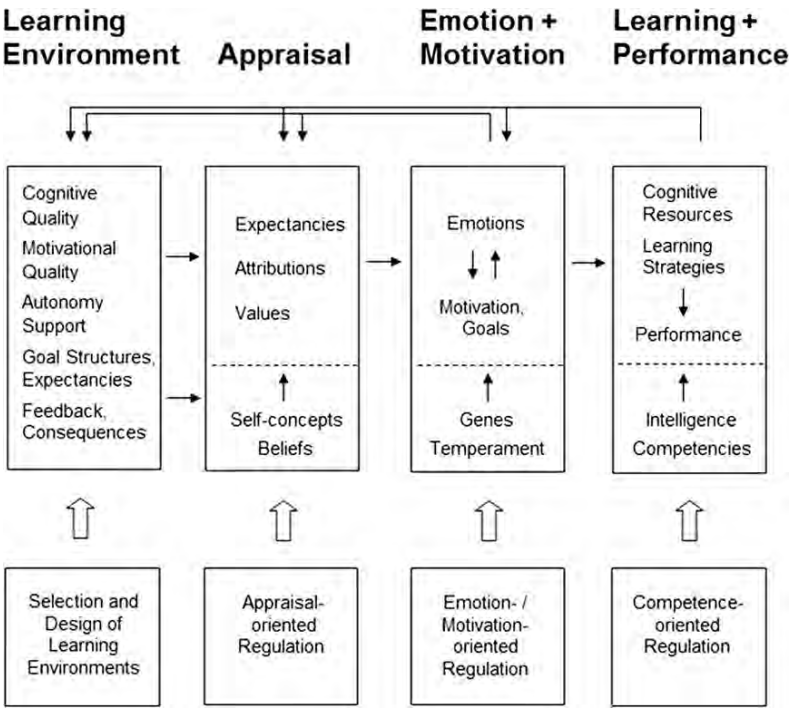

Figure 4.1: Reciprocal causality and regulation of emotion and motivation (adapted from Pekrun, 2006).

targeting emotion, motivation, and self-regulation only as antecedents of achievement should be abandoned — beyond being antecedents, they also are outcomes of education. Abandoning unidirectional models also makes it possible to acknowledge students' enjoyment of learning, intrinsic motivation, and self-regulatory competences as components of their personality development and educational goals that are important in and of themselves, beyond having instrumental utility for the acquisition of knowledge.

4.3.7. Regulation of Emotion, Motivation, and Self-Regulation

Most of us know how it feels to experience the fear of failing an exam. Try to recall an exam that made you feel anxious. What did you do to deal with your anxiety, and how well do you generally cope with this emotion? Can you think of additional, alternative ways in which you could have reduced your anxiety?

Reciprocal causality implies that emotion, motivation, and self-regulated learning can be changed by influencing any of the components of the respective feedback

loops with learning outcomes and the classroom environment. In other words, efforts to directly change these processes are not the only option; they can also be changed by influencing their antecedents and outcomes (Figure 4.1). A particularly clear example is the regulation of emotions in academic settings (Pekrun, 2006; for a general model of emotion regulation, see John & Gross, 2004; Ochsner & Gross, 2008; for research on the regulation of motivation, see Wolters, 2003). Traditionally, emotion regulation has been analyzed in research on coping with stress (Lazarus & Folkman, 1984; Zeidner & Endler, 1996). In recent research, coping-related perspectives of "down-regulating" stress and negative emotions were extended by also considering the "up-regulation" of positive emotions. Given that positive emotions can have far-reaching benefits for students' learning and health, and that negative emotions often are maladaptive (see Chapter 1), emotion regulation in academic settings typically aims to promote positive emotions and to prevent or reduce negative emotions. The following five groups of strategies are considered to be especially important for students' emotion regulation.

(1) *Emotion-oriented regulation* involves attempts to directly change one's emotions and to strengthen or weaken their symptoms. For example, anxiety can be reduced by consuming nicotine, alcohol, or sedatives, or by using relaxation training. A second way to reduce emotional tension is to just accept the emotion, without trying to change its symptoms (a type of "secondary control"; Morling & Evered, 2006). Furthermore, it may be possible to reduce negative emotions by inducing positive emotions that are not compatible with the experience of negative emotions (e.g., use of humor, music, or emotional support by others). Obviously, some of these strategies can facilitate health and achievement, whereas others are maladaptive.

(2) *Avoidance-oriented regulation* can be seen as a special case of emotion-oriented regulation (John & Gross, 2004). This type of regulation aims to avoid stress-inducing situations through behavioral or mental escape. Examples include seeking out distraction by engaging in task-irrelevant activities such as talking with friends during class or daydreaming (see Nett, Goetz, & Hall, 2011); procrastinating or restricting one's study time; skipping classes and exams; or dropping out of school. Avoidance-oriented strategies can temporarily reduce negative emotions; however, the long-term consequences can be quite detrimental.

(3) *Appraisal-oriented regulation* involves changing the self-related and situational appraisals that trigger the emotion. For example, students' control beliefs can be promoted by changing their causal attributions for success and failure (e.g., attributing failure to lack of effort not ability), which, in turn, may foster positive emotions and reduce negative emotions (e.g., attributional retraining; Hall et al., 2007). Negative emotions such as boredom can also be reduced by enhancing students' value-related beliefs — encouraging them to focus on useful, important, or personally relevant features of otherwise boring learning content (Nett et al.,

2011). Moreover, it is possible for students to bolster their psychological well-being and physical health by cognitively reappraising negative events as positive in some way (e.g., viewing failures as learning opportunities; Hall, Chipperfield, Perry, Ruthig, & Goetz, 2006). Cognitive therapies of emotion focus on this type of emotion regulation (Zeidner, 1998).

(4) *Competence-oriented regulation* aims to promote the acquisition of learning-related skills and competencies that are needed for academic success, thus strengthening positive emotions and reducing negative emotions. Use of resource-oriented strategies (e.g., attention, effort), cognitive learning strategies (e.g., elaboration, organization), and metacognitive learning strategies (e.g., monitoring one's progress) can help students to achieve these aims (see Chapter 3).

(5) *Situation-oriented regulation: Design of tasks and learning environments*. Finally, emotions can be regulated by selecting and changing situations in ways that promote adaptive and reduce maladaptive emotions (John & Gross, 2004). In an educational context, situation-oriented regulation involves selecting and designing tasks and learning environments that are "emotionally sound" (Astleitner, 2000; see Chapter 1). For example, Sansone, Weir, Harpster, and Morgan (1992) have shown how learners can physically reconfigure boring tasks in order to make them more interesting. Alternatively, students can attempt to persuade their teachers to do so (see Nett et al., 2011). Schools and teachers are responsible for designing tasks and classroom environments so as to promote motivation, positive affect, and independent learning in students. However, students may also contribute to optimizing learning activities if provided sufficient autonomy as well as training in self-regulated learning.

Definition

Emotion regulation is defined as intentional efforts to elicit, change, terminate, or avoid specific emotions (most often aiming to enhance positive emotions and to reduce negative emotions).

4.3.8. Universality of Emotion, Motivation, and Self-Regulation

Are the types, causes, and consequences of emotions, motivations, and self-regulation in students and teachers universal across academic domains, student groups, educational institutions, and cultures? To date, this question has been largely unexplored in the research literature and remains a source of controversy. However, it seems clear that two conceptually different problems should be distinguished in examining this issue. The first question is: What are the types, frequencies, and intensities of emotion, motivation, and self-regulation as experienced by students and teachers in a given context? The second, logically independent question is: What are the functional relationships of these psychological variables, that is, how do they relate to their causal antecedents and outcomes? Obviously, the types, frequency, and process-related

parameters (such as intensity) show considerable variation across domains, student groups, and cultures. In contrast, the functional principles of linkages with critical antecedents and outcomes appear to be universal in nature (Pekrun, 2009).

For example, as noted earlier, students' emotions and interests can vary depending on the *school subject*. However, across all subjects, positive emotions tend to relate positively to students' academic achievement, whereas negative emotions such as anxiety and boredom generally have negative relationships with achievement (Goetz et al., 2007). A second example pertains to *gender differences*. As outlined in Chapter 1, research suggests that female students, as compared with male students, suffer from lower self-confidence and more negative emotions in mathematics and science. However, the relationships between self-concepts of ability, anxiety, and academic achievement are actually quite similar for both genders (e.g., Frenzel, Pekrun, & Goetz, 2007). Finally, principles of universal functional relationships also seem to hold for different *cultures*. For instance, in a cross-cultural comparison of students' achievement emotions, we found that Chinese students reported more enjoyment and anxiety and less anger in mathematics, as compared with German students. However, the relationship between these emotions, self-appraisals, and parental expectations were very similar in both cultures (Frenzel, Thrash, Pekrun, & Goetz, 2007).

Therefore, it should be acknowledged that the nature, prevalence, and strength of emotions, motivation, and self-regulation can indeed vary widely based on contextual, cultural, or content-related factors. Nevertheless, the functional mechanisms discussed in the preceding chapters are likely to be universal. For example, achievement-related self-efficacy exerts positive effects on interest and enjoyment in both female and male students, as well as in students of various ethnic origins and social backgrounds, and interest and enjoyment, in turn, should have similarly positive effects on learning and achievement in these different groups of students.

4.4. Open Questions and Future Directions

As outlined in the preceding chapters, researchers have made considerable progress in describing and explaining emotions, motivation, and self-regulation in students, and to a lesser extent, their teachers. The available evidence is derived from basic research as well as intervention programs intended to improve classroom instruction and student development. Nevertheless, there are still many important questions that cannot be answered at present and need be tackled by future educational research. It is anticipated that furthering our knowledge in these areas will help us to fill remaining gaps in the existing research literatures, and to better inform the development of teaching methods and intervention programs for both students and teachers. In other words, attempting to answer these questions should prove useful not only for researchers, but also for educational practitioners. Beyond the obvious need to expand the emerging research literature on the emotional experiences, motivation, and self-regulation of teachers, as opposed to just their students, seven

open questions and directions for future research are the following (for a more detailed discussion, see Pekrun & Schutz, 2007).

(1) *Integration of theories, methods, and findings*. In the different research literatures on emotion, motivation, and self-regulation, theories tend to be developed in relative isolation from each other. As a consequence of this fragmentation, there exists at present a proliferation of concepts, theoretical models, and scattered pieces of empirical evidence that lack integration and have the potential to confuse even the most experienced experts in the field. Typical examples are the many overlapping constructs used to describe students' motivation (Chapter 2) or the various models used to explain self-regulated learning (Chapter 3). Due to the variety of concepts and theories currently employed, it is often difficult, if not impossible to interpret and integrate resulting empirical findings in consensual ways. For example, it is common for researchers to interpret seemingly simple terms such as "control" (Skinner, 1996) or "intrinsic motivation" (Heckhausen, 1991) in very different ways, which makes it difficult for researchers to communicate with each other and to compare findings from different studies. In addition, the interpretation of results from diagnostic instruments can also become difficult. For example, different questionnaires sharing the same purpose to assess student motivation may in fact measure very different phenomena. As such, it is important to carefully scrutinize conceptual definitions, measurement instruments, and empirical findings before interpreting and making use of them for educational practice.

Such a careful analysis can also lead to the insight that different constructs and theories often show more overlap and common assumptions than noticeable at first sight. For example, different definitions of terms such as "emotion" or "interest" share a common conceptual core that could be used to simplify the usage of these terms. Similarly, the basic assumptions of different theories often show considerable convergence. For example, various appraisal theories of emotion share common assumptions concerning the importance of specific dimensions of appraisals (e.g., perceived controllability), even if different labels are assigned to them (e.g., coping potential; Chapter 1). By implication, it should be possible to better integrate the current diversity of concepts and theories in order to facilitate scientific communication as well as practical usability for classroom purposes. To allow for research in these domains to be more useful, future efforts should be invested toward greater conceptual and theoretical integration.

(2) *Sample-based research versus single cases*. Traditionally, educational and psychological research has used sample-based methodological approaches involving many students or teachers to examine differences between groups or relationships between variables. For example, the effects of anxiety on cognitive performance were analyzed by comparing large groups of students with low versus high anxiety, and the relationship between students' anxiety and their academic achievement was investigated by correlating anxiety levels and achievement scores across large numbers of students (Zeidner, 1998).

Typically, the resulting group differences and correlations show no more than moderate effect sizes (e.g., a typical correlation for test anxiety and academic

achievement is $r = -.30$; Zeidner, 1998). These relationships reflect patterns across entire groups of individuals, but their moderate size implies that they do not necessarily apply to each and every subgroup or individual. For example, if the correlation between test anxiety and achievement in students is $r = -.30$, this correlation of course implies that low-achieving students typically suffer from higher anxiety. However, it also implies that there are many students who experience anxiety in spite of high achievement, as well as many students who do not experience anxiety despite performing poorly.

Even if the strength of these relationships were greater, however, it would still be problematic to infer from sample statistics (such as inter-individual correlations) how variables are related *within* individuals. The reason is that correlations across individuals and within individuals are statistically independent (Schmitz, 2006). This point can be illustrated using an example from our research on students' emotions (Pekrun, Goetz, Titz, & Perry, 2002): In a diary study with student teachers, we found that self-reported anxiety experienced before final university exams did not correlate with their motivation to prepare the exam when the correlations were calculated across individuals. However, for many of the participating students, there were strong intra-individual correlations between anxiety and motivation over the duration of the study. In some students, this relationship was negative (high anxiety was linked to low motivation); in others, the relationship was positive (high anxiety was associated with high motivation; for an interpretation of this finding, see Pekrun, 2006).

Definition

Idiographic statements pertain to individual cases (e.g., single individuals) and do not claim to be valid for other cases. In contrast, *nomothetic* statements are general statements that claim to be valid for all single cases within a defined category (e.g., all human beings).

Future research should examine to what extent sample-based findings related to groups of students or teachers are also valid for individual students and teachers. To this end, methodological strategies can be used that combine *idiographic* elements (related to single cases) and *nomothetic* elements (related to general principles across cases). Simply put: Single cases need to be analyzed first, then in a second step, it should be examined if the findings for these single cases can be generalized across individuals. For example, when investigating the effects of intrinsic motivation on students' achievement, the first step would be to examine the relationship between the two variables within each individual student by analyzing if intrinsically motivated episodes of learning lead to a greater increase in the student's achievement over time, as compared with extrinsically motivated learning. After this analysis, it should then be examined if similar relationships are found across individual students. In the absence of analyses exploring the relationships between variables within individuals, caution should be exerted when generalizing findings from sample-based research to specific students or teachers.

Implications for Practice: Idiographic versus Nomothetic Research

Research publications and textbooks on education primarily refer to empirical findings based on samples of individuals. This type of evidence is useful for understanding the types, causes, and consequences of emotion, motivation, and self-regulation for the average student or teacher. For example, the existing research literature suggests that positive emotions tend to have beneficial effects on students' learning, whereas anxiety is most often detrimental. However, this is not necessarily the case for all students and all types of learning tasks. In order to optimally promote emotion, motivation, and self-regulation in individual students, it is necessary to know more about how they interact with each other, as well as other relevant factors, within each individual student.

(3) *Explicit versus implicit processes*. Research on emotion, motivation, and self-regulation has primarily examined conscious, explicit processes that can be assessed by self-report methods such as questionnaires and interviews. One reason for this focus can be found in the recent history of psychological and educational research. Since the 1950s, behavioristic approaches that focused on observable behavior were replaced by cognitive research that concentrated instead on conscious cognitive processes (e.g., appraisal theories of emotion and motivation; Chapters 1 and 2). In addition, practical reasons also play an important role: It is relatively easy to administer questionnaires to students and teachers, as compared with applying time-consuming implicit methods such as neuropsychological instruments.

However, emotion, motivation, and self-regulation often are nonconscious and implicit in nature, rather than explicit and accessible for conscious, reflective reasoning. A case in point is the arousal of emotions. For example, a student's fear regarding an exam in mathematics could have originally been based on reflections on the importance of the exam and the likelihood of failure, as assumed in appraisal theories of test anxiety. However, after repeated experiences of exams in the respective subject, such appraisals can become automatic and integrated into students' *cognitive schemas* making it possible that the mere announcement of an exam immediately elicits feelings of anxiety. In such a case, situational perception and emotion would be short-circuited, and appraisals would no longer be required for anxiety to be aroused (Pekrun, 1988, 2006). Moreover, the resulting anxiety need not be conscious either: As a consequence of avoidance-oriented regulation, it could actually be the case that both cognitive appraisals and the emotion itself are no longer consciously experienced and cannot be reported on by the individual. Given these possibilities, further research is needed to explore the nature of such implicit processes in both students and their teachers.

(4) *Making use of neuroscientific perspectives*. Emotion, motivation, and self-regulation are deeply embedded in cortical and subcortical structures of the human brain. Over the past 20 years, neuroscientific research has made considerable progress in analyzing how each of these processes are supported and represented neurologically. For example, there is ample evidence today that documents the

critical role of feedback loops between components of the limbic system (e.g., amygdala, hippocampus) and other brain regions (e.g., areas of the prefrontal cortex that enable "executive control") in explaining emotional experiences, cognitive problem solving, decision making, and learning (Davidson, Pizzagalli, Nitschke, & Kalin, 2003). Researchers are now just starting to acknowledge the educational importance of such neuroscientific evidence.

Neuroscientific approaches may have multiple benefits for educational research, and have clear implications for how to conceptualize and assess each of the three psychological processes discussed in this volume. For example, findings from affective neuroscience research corroborate that emotional processes often remain implicit and outside of conscious awareness, as argued earlier (e.g., Öhman & Soares, 1998). This implies that self-report methods to assess emotions in students and teachers should be complemented by measures of implicit processes. In addition, neuroscientific approaches provide indicators to measure effects on cognitive problem solving and learning. For example, neuroimaging (e.g., EEG, fMRI) makes it possible to examine the influence of affective and motivational processes on attention (e.g., Meinhardt & Pekrun, 2003). Moreover, neuroscientific approaches allow us to further explore the relationship between emotional, motivational, and regulatory variables involving various subsystems of the brain (e.g., Immordino-Yang & Sylvan, 2010) and to examine the physiological mechanisms that are associated with maladaptive emotions, such as excessive test anxiety.

However, possible enthusiasm for neuroscientific approaches notwithstanding, the limitations of these approaches should also be acknowledged. Modern educational systems have been designed to promote the intentional, formal acquisition of culturally defined knowledge and competencies. As such, formal educational environments are expected to both direct and restrict the ways in which learning and instruction occur. By implication, formal learning has its own logic and cannot sufficiently be explained by referring to basic brain mechanisms that are the product of biological evolution. Accordingly, it should not be expected from the neurosciences to provide evidence on how classroom instruction and learning tasks should be designed, but rather, to inform our understanding of the basic neurological processes underlying human learning. In order to adequately address practical educational questions, it is necessary to also consider the contents and contexts of learning (Blakemore & Frith, 2005). This also is true for furthering our understanding of emotion, motivation, and self-regulation in the classroom — what is needed is an analysis of these processes and their functions in formal learning environments, and such an analysis cannot be provided by neuroscientific approaches alone.

(5) *Academic emotions beyond test anxiety*. In contrast to topics involving students' motivation and self-regulated learning that have for decades attracted researchers' interest, students' emotions have been neglected until recently. The only major exception is students' *test anxiety*. This single emotion has been examined in more than 1,000 empirical studies to date. From these studies, there is cumulative evidence on the development, antecedents, achievement outcomes, and individual therapy of test anxiety, as well as knowledge about ways to prevent or reduce test

anxiety by means of educational intervention (Chapter 1). By contrast, as researchers have just started to consider academic emotions other than anxiety, research-informed knowledge about these emotions is still largely lacking.

The little evidence available to date indicates that some of these emotions may be quite complex and do not simply follow current theoretical thinking. For example, students' *enjoyment of learning* is expected to have positive effects on their learning and achievement. Empirical evidence supporting this premise, however, is scarce and inconsistent. Some studies found positive relationships with problem solving and academic achievement (e.g., Pekrun et al., 2002), whereas others produced weak or zero correlations (see Linnenbrink, 2007; Pekrun, Elliot, & Maier, 2009).

Future educational research should invest more effort in examining the development, origins, and outcomes of academic emotions other than anxiety. More specifically, a potentially productive avenue for research would be to target three groups of educationally relevant emotions: achievement-related emotions such as enjoyment of learning, pride, shame, hopelessness, and boredom; epistemic emotions related to the cognitive qualities of learning tasks and the generation of knowledge, such as surprise, curiosity, and confusion; and social emotions experienced in teacher–student and peer interactions, such as anger, gratefulness, compassion, envy, contempt, and admiration (e.g., Immordino-Yang, McColl, Damasio, & Damasio, 2009).

(6) *Consequences for lifelong learning, personality development, and health*. As previously discussed in this volume, many studies have analyzed the development of students' emotions, motivation, and self-regulated learning over the school years as well as in higher education. By contrast, questions remain as to how affective, motivational, and regulatory dispositions that have been acquired in K-12 education continue to develop during adulthood. For example, is it possible to predict occupational careers from the individual interests that students develop during their schooling? Do individuals who experience cumulative failure and related test anxiety during their academic years suffer from achievement-related anxiety in their occupational career as well?

Generally, how do emotion, motivation, and self-regulation as experienced during the school years influence the subsequent development of an individual's personality, competencies, and career paths? Some research has attempted to extend relevant theoretical frameworks to adult populations (e.g., using attributional interventions to promote employment success in graduating students; Hall, Jackson Gradt, Goetz, & Musu-Gillette, 2011), but long-term studies examining developmental trajectories beyond the school years are needed to address these questions. Such studies would also be well suited to answer open questions as to how students' emotions and self-regulation during school influence their life-span development of psychological and physical health.

(7) *Education for freedom: Balancing self-regulation and external regulation*. As outlined in Chapter 3, enhancing students' competencies to engage in self-regulated learning and problem solving should be considered as an important aim of education. It would not be realistic to assume that children are able to develop such competencies on their own, without any assistance from parents and teachers. Instead, for

most students, structured educational activities and instructional support are needed to promote the development of these competencies. However, helping students to develop self-regulatory competencies results in an interesting paradox: How is it possible to design external assistance in such a way that it is no longer needed over time? In other words, how should external regulation best be used to foster self-regulation and independent learning abilities in students?

Obviously, the development of self-regulatory abilities requires sufficient opportunities to acquire and practice these competencies. Accordingly, it is necessary for teachers to provide students with sufficient autonomy to regulate their learning (Chapter 3). However, the available evidence also suggests that individuals need sufficiently high levels of competencies to make use of such autonomy. In case of insufficient self-regulatory competencies, learning environments that demand self-regulation can be detrimental for students' self-confidence, emotions, and learning. In these cases, scaffolding by teachers or parents is needed to support students' regulation (e.g., Azevedo & Hadwin, 2005).

How can autonomy support be designed in such a way that students can develop the competencies needed for self-regulation? What types of tasks and learning environments are most appropriate for different grade levels, academic domains, and individual students? Moreover, how can teachers more effectively help students develop competencies to regulate their emotions and social behavior beyond academic learning and knowledge acquisition? These questions are of critical importance for educators and researchers alike, but relevant empirical studies are scarce and preliminary to date. Future research should make an effort to provide meaningful answers and informed suggestions for educational practice.

Conclusion

Emotion, motivation, and self-regulation show considerable conceptual overlap and similar links to learning outcomes. Being embedded in students' personality, all of these psychological processes are influenced by domain-specific appraisals of situational demands and one's competencies. Although each of these processes is organized in domain-specific ways and can differ substantially across school subjects, they are influenced in similar ways by classroom instruction and social environments. Furthermore, they can combine to jointly influence students' learning and achievement. Their development is reciprocally influenced by the outcomes of learning as well as students' social environments, thus affording numerous possibilities for educational intervention. Whereas the type and prevalence of emotion, motivation, and self-regulatory processes can vary across students, institutions, and cultures, their functional relationships with critical antecedent and outcome variables seem to be universal in nature. Future research should provide further evidence on academic emotions other than test anxiety; on implicit emotional, motivational, and regulatory processes; on neurological foundations; on the consequences for lifelong learning and personality development; and on effective ways in which teachers and the education system can promote students' adaptive emotions, motivation, and self-regulation.

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