Re-conceptualizing Emotion and Motivation to Learn in Classroom Contexts

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Abstract To better inform and improve classroom teaching and learning, now more than ever before, educational researchers need to effectively and efficiently describe essential components of positive learning environments. In this article, we discuss how our research findings about motivation in classrooms have led to a closer examination of emotions. We describe how motivation theories such as Academic Risk Taking, Flow Theory, and Goal Theory have helped us better understand emotions in our classroom research. Our findings suggest that engaging students in learning requires consistently positive emotional experiences, which contribute to a classroom climate that forms the foundation for teacher–student relationships and interactions necessary for motivation to learn. We conclude that we need to integrate emotion, motivation, and cognition theoretically and methodologically to move our research forward. New theories and methods, even new forms of intellectual discourse, are required. Therefore, we end this article by beginning a discussion of new directions for conceptualizing and researching classrooms in ways that will involve examining the emotions of students and teachers.

Introduction

The expression, identification, and understanding of emotions are central in students' and teachers' effective participation during instructional interactions, which helps to create

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positive classroom climates. Yet, emotions have not figured prominently in motivational or instructional research. Our perspective on emotions emerged from the study of students' reports of academic motivation in classrooms and has developed into an interpretation of how teachers and students co-create positive climates for learning. Therefore, we view emotions as shared and generative factors in learning and motivation, bound to the context. Thus, emotions have become central in exploring classroom interactions and in understanding patterns of motivation and learning.

Emotions comprise students' and teachers' appraisals, action tendencies, desires, feelings, and physiological responses (Ortony & Turner, 1990). They evolve through interactions and serve as important indicators of the participants' motivations and cognitions, communicating what has been experienced, is being experienced, as well as was anticipated (Ford, 1992). For example, in Motivational Systems Theory, Ford (1992) explained that emotions serve as signals of what is happening in the current situation or what is anticipated, and as such, their meanings are context-bound:

> The perception or evaluation of these conditions may be inaccurate or maladaptive, but the emotions that flow from the way a person construes a situation will almost always 'make sense' within those parameters. Emotions, therefore, can provide clues about other properties of behavior episodes (p. 141).

Ford (1992) also described emotions as "...an empowering source of information about how to influence motivational patterns" (p. 145). Pintrich and Schunk (2002) highlighted Ford's *responsive environment principle*, which involved: (a) the alignment between a person's goals and the goals of the classroom, (b) the teacher's responsiveness to the student's competencies, (c) the provision of realistic and appropriate tasks, and (d) support for an emotional climate that fosters trust among teachers and students. Similarly, we view emotions as bound to the context, arising from it and at the same time integral in creating or negotiating it. This contextualized view of emotions was also central to Lazarus' (1991b) Relational–motivational–cognitive Theory in which he defined emotions as neither generated by the environment nor the individual, but emerging through person–environment interactions that change over time and situations. Contemporary emotion theorists who focus on educational contexts have further argued that emotions are contextualized. For example, Boler (1999) and Zembylas (2003) have made separate cases that emotions are not private or universal because they are "inseparable from actions and relations, from lived experience" (Boler, 1999, p. 2).

In our research, we have found emotions to be ubiquitous in classrooms and important for understanding instructional interactions. For example, we have replicated our finding that positive teacher support, which includes positive emotions, is associated with students' reports of their motivation (Patrick, Turner, Meyer, & Midgley, 2003; Turner et al., 1998a; Turner et al., 2002; Turner, Meyer, Midgley, & Patrick, 2003; Turner & Patrick, 2004). Furthermore, in our classroom studies it has been difficult, if not impossible, to separate emotions, cognitions, and motivations captured in observing instructional interactions as well as in student self-reports. Re-conceptualizing the relationships between emotions and motivation in teaching and learning is becoming increasingly pivotal to making progress in our classroom research (Meyer & Turner, 2002). Therefore, in this article we discuss the theories that have informed our work, methodological approaches and issues that have arisen, our evolving thinking with respect to the study of emotions and affect in classrooms, and future directions for theory and classroom research that involves emotions.

Lessons from the Past

In our published work as well as informal conversations, we have used the terms "emotion" and "affect" interchangeably. In retrospect, and with support from the theoretical literature, we realize that "emotion" appears to be the appropriate term for our research goal of studying instructional interactions in classrooms. Emotions are short, intense episodes, or states, as distinguished from affective traits or more generalized moods (Rosenberg, 1998). One would expect student emotions to vary over time and contexts. Although we have never worked from a particular theory of emotion, when considering student emotions, we have applied Frijda's (1988) definition that emotions are subjective experiences with situational meaning that evoke action states. We also have used Lazarus' (1991b) relational–motivational–cognitive perspective, viewing emotions as personally relevant appraisals of a situation (e.g., harm, threat, challenge, or benefit) that involve a potential for action as well as physiological changes. In contrast, "affect" seems the best term to describe our broader focus on the patterns of instructional interactions over time, which might be more accurately described as the "affective classroom climate." Linnenbrink and Pintrich (2002) distinguished among (a) general affective states that included moods and emotions, (b) mood states, and (c) emotions. Our research indicates that general affective states help characterize different classroom climates, which, in turn, are related to students' emotions and perceptions of contexts.

Because they represent different levels of affect, emotions and affective classroom climates may operate differently in relation to motivation. In our classroom research, positive emotions have become "markers" for us of highly supportive instructional interactions as well as positive classroom environments. When we observe in classrooms and code classroom discourse, we analyze when emotions are displayed and interpret the meaning of a teacher–student interaction, in part, based on whether the emotion supported or detracted from the learning activity. For example, we have found that instruction associated with positive student motivation is often intertwined with explicit displays of emotion, such as laughter at a teacher's joke about his mistake on the board or a student's expression of pride at understanding a difficult problem. We have also asked students to self-report their emotional experiences during specific learning activities to find that patterns emerge among their motivations and emotions to help us better understand their learning experiences.

At the same time, the consistency or ambivalence in emotional support over time is an important contributor to classroom climate. The affective climate "sets the stage" for the appraisal process, goal setting, strategy choice, and taking action. In our classroom research, emotions are captured in our classroom climate characteristics. Positive classroom environments reflect, in part, the re-creation of positive emotional experiences. We have asked students about their perceptions of support and enjoyment more generally and at the same time analyzed patterns of supportive motivational–emotional–social teacher discourse over time to gain a classroom-level perspective. Instruction that students report as more motivational correlates with teacher support, including positive emotional support and statements of caring, as well as other characteristics of a positive classroom climate. Furthermore, these classroom climate characteristics reappear consistently across observations of the same classrooms.

Theoretical Frameworks for Studying Emotions in Classrooms

Motivational theories were the starting point for our eventual interest in emotion and affect. As we explored the nexus between students' reports and the classroom-level measures of

motivation, the instructional interaction—what teachers and students said and did when the goal was to understand—became our focus. It became clear that affect, both positive and negative, was central to understanding motivation and motivational climates. We began our research program from the student perspective by examining *how* and *why* students took academic risks, or avoided them. Starting from an individual (i.e., "student") perspective, we gradually moved to study instructional interactions that promoted challenge seeking, engagement, and involvement in learning. During this evolution in our research, we applied three different, but related, theoretical perspectives on motivation—Risk Taking, Flow Theory, and Goal Theory. Furthermore, we frequently combined these perspectives using a multi-method and multilevel approach (Meyer & Turner, 2002). Each theoretical framework originally was chosen because it contributed a unique structure for researching and understanding students' motivation during their participation in classroom learning activities. However, each theory also involved methods that helped us collect student reports of emotions and perceptions of the climates in their classrooms. Therefore, in attempting to research *why* and *how* students approached or avoided challenging learning activities and under what instructional conditions they experienced intrinsic motivation, we came to discover that the theories, individually and collectively, helped us understand better how emotion is integral not only to student motivation and learning, but also to effective teaching.

Risk taking Clifford (1988, 1991) described an academic risk taker as a student with a preference for difficult tasks, a tolerance for failure, and the capability to use strategies flexibly when confronted with obstacles. She viewed risk takers as more mastery-focused (i.e., attempting to understand) than performance-focused (i.e., trying to score well or outperform others). Risk takers would be expected to choose optimally challenging tasks because such tasks maximize learning and feedback on goal progress. They are assumed to tolerate uncertainty, mistakes, and confusion because of their ability to see them as important to their larger goal of understanding. Risk takers also demonstrate greater self-regulation by monitoring their learning and adjusting their strategies effectively. Students who endorsed academic risk taking would be expected to approach academic challenges, to give intrinsic reasons for attempting difficult schoolwork, to report taking action when they did not understand, as well as to effectively cope with negative emotions after failure in pursuit of their learning goals (Boekaerts, 1993).

   We first used Clifford's risk taking survey (*School Failure Tolerance Scale*, SFT; Clifford, 1984) in a descriptive study of upper-elementary students during project-based mathematics (the "kite project") in which we investigated 14 student cases (Meyer, Turner, & Spencer, 1997). The SFT has three subscales: affect after failure, preferred difficulty, and action after failure. Eight of the students reported a risk taking profile on the SFT and six of the students reported a risk-avoiding pattern in their survey answers. At the individual case level, all eight of the risk takers reported higher preference for difficulty and higher action after failure, while seven of them reported lower negative affect after failure. In contrast, five of the six risk avoiders reported higher negative affect after failure than did their peers. Furthermore, we were able to connect the students' survey responses with unprompted interview statements about their kite project experiences. During these interviews emotions were prevalent. For example, Adam, a risk avoider, spoke of how he felt "mad" when other students bragged about their grades. Amy, another risk avoider, described how she wanted to feel the "least bit respected" for her work. Arnold, whose survey also reflected the risk-avoiding pattern, gave the analogy of how math tests were like soccer games because his "heart beats hard" in both situations.

In contrast, Sam, a risk taker, explained that he chose challenging work even though it might jeopardize his grades "[b]ecause it's more fun, and I like to have fun in school. And I just do my best and never came out below a C, and I never want to." Similarly, two other risk takers, Susan and Samantha, echoed Sam's positive affect for math when asked about the importance of the kite project, saying: "It's just really really fun," and "'Cause I like math a lot, and like doing good in it." Our findings suggested that students who persist when faced with negative self-thoughts or who respond to error with strategic actions were more likely to achieve in terms of the higher level of learning as evidenced in their kite projects. These students' positive appraisals probably influenced the values and attitudes they formed toward academic subjects, such as mathematics, and certain types of academic work, such as projects.

Conversely, we found that students who reported experiencing negative affect after failure seemed to devalue the work, sought ways to escape it, and held more negative attitudes toward effort- and strategy-intensive assignments such as project-based mathematics. We also found that risk avoiders often attempted to "negotiate down" the level of challenge that the teacher had planned, making the task easier than their capabilities. They seemed to want to be successful without taking any risks—seemingly choosing between their emotional well-being and their learning (Boekaerts, 1993). In sum, students' interpretations of their experiences during the project revealed the "hot" side of motivation and illustrated the very real emotional ramifications of academic risk-taking.

Flow theory A second theoretical perspective that we have used is Flow Theory, which integrates cognition, motivation, and emotion. We were drawn to this theory because it helped us describe the quality of students' experiences in classroom learning activities in a multi-faceted way (Csikszentmihalyi, 1975; M. Csikszentmihalyi & I. S. Csikszentmihalyi, 1988). An assumption of Flow Theory is that optimal learning experiences are intrinsically motivated and related to positive emotions and enhanced cognitive processing (M. Csikszentmihalyi, & I. S. Csikszentmihalyi, 1988; Csikszentmihalyi & Nakamura, 1989; Csikszentmihalyi, Rathunde, & Whalen, 1993). Csikszentmihalyi (1975) found that when experiencing *flow* individuals reported: (a) clear goals and progress toward achieving them; (b) highly focused, effortless, attention or concentration during the activity; (c) a sense of time passing quickly and loss of self-consciousness; and (d) a balance between the challenges of the activity and their ability to meet them (i.e., they felt that their skills were "stretched" to meet the challenge). These descriptions of *flow* appeared to reflect the descriptions of the risk-takers' involvement in their mathematics projects. Therefore, we attempted to investigate whether *flow* could be experienced simultaneously by students participating in the same classroom activities.

The balance between high challenges and skills was initially the most interesting aspect of Flow Theory for us because it was related to our earlier work focusing on the motivational value of optimal challenge from the risk taking literature. In addition, levels of challenge and skill appeared to be readily accessible through both student self-reports and classroom observation. However, we immediately rediscovered the importance of emotions in studying classroom *flow* and *nonflow* experiences (Meyer & Turner, 2002). We adapted the experience sampling method developed by Csikszentmihalyi and his colleagues (Turner et al., 1998a). Modifying this method, students were given 13 semantic differential items on a scale from zero to nine, for example:

Happy   Happy   Happy   Happy   neither   Sad   Sad   Sad   Sad

Using affectively related items as indicators of motivation further illuminated the emotional experiences of students in the classrooms. Experience sampling was used in conjunction with observations and discourse analysis of instructional interactions. This multi-method approach allowed us to describe classroom environments in which students reported experiencing different levels of involvement. This was also the first time we incorporated both student- and classroom-level measures into our methods and analyses. We found that students in two of three "high involvement" classrooms reported significantly more experiences of *flow* than students in the other four classrooms that we studied (Turner et al., 1998a). In one classroom, we found "high involvement" but "low flow." From our observational data and discourse analysis we concluded that the teacher's instructional practices were consistently challenging and highly conceptual, however the student self-reports indicated higher levels of anxiety than their peers in other classes and that the high level of challenge had exceeded their skills. In the three "low involvement" classrooms the students were more likely to report "non flow experiences," such as apathy or boredom.

An interesting finding, and one which corroborated the investigation of Csikszentmihalyi et al. (1993) of American teenagers, was that in boring situations (i.e., higher skills than challenge) students reported high levels of happiness. On the other hand, they did *not* report pride in these easy accomplishments. These research findings were very important in informing our work on classroom motivation because they highlighted that instructional strategies characterized by high levels of challenge and student involvement were not necessarily indicative of positive learning experiences for students, and also that academic emotions are quite nuanced (e.g., happy, but not proud). These findings also were not predicted by motivational theories, highlighting how the context of the experiences (i.e., low levels of challenge in a classroom activity) might explain the emotional experience shared by students in a particular situation. Thus more information about the classroom context—the types of interactions, their content, duration, intensity, and levels of challenge, and emotions —became essential for understanding our classroom findings.

Goal theory Finally, our work began to explore a goal theory framework within which we examined the relationships among classroom goal structures, instructional discourse, and student reports of motivation. Goal orientation theory was an important addition to our eclectic theoretical model because it helped explain why students would take or avoid academic risks and what instructional characteristics might contribute to high involvement classrooms. Although the emotion–motivation link had now evolved as an important finding in our previous work, it was not readily apparent in goal theory. When emotions were mentioned, they were theorized as outcomes of goal attainment or failure (e.g., Ames, 1992; Dweck & Legget, 1988). However, at this time emotion was receiving attention in the motivational literature. In his Motivational Systems Theory (MST), Ford (1992) proposed that emotion, agency, and goals form the central processes in motivation and that they work interactively. Ford stated that emotions provide "clues about the content of a person's goals by influencing selective attention, recall, event interpretation, learning, decision making, and problem solving in predictable ways" (p. 252). Recent reviews on the importance of emotion in theories of motivation (Schutz & Lanehart, 2002) together with research like Linnenbrink and Pintrich's (2002) bi-directional model have helped to infuse Goal Theory with emotion. Thus in our classroom research, we began exploring why students approach or avoid different types of achievement goals.

In our first major study using goal orientation theory, we once again used Clifford's (1984) *School Failure Tolerance Scale* with a measure of individual mastery and

performance goal orientations, self-efficacy, and strategy use, the *Patterns of Adaptive Learning Survey* (PALS, Midgley & Maehr, 1991), and found that emotion was a mediating influence between students' achievement goals and their resulting beliefs and self-regulatory behaviors (Turner, Thorpe, & Meyer, 1998b). In this study we focused on the relationship between students' perceptions of their emotion and motivation. We found that negative affect about failing or making mistakes could help explain why students with stronger endorsements of performance goals report beliefs and behaviors that are more oriented to ego protection than to learning and improvement. At the same time, we discovered that students with mastery goals either did not interpret mistakes negatively or somehow successfully regulated their negative affect, and so they did not report that negative emotions interfered with their beliefs and behaviors. Thus, we reported that self-reported negative affect after failure was a mediator between performance goals and self-regulated learning beliefs and behaviors.

The lack of a relationship between mastery goals and negative affect was an interesting finding, suggesting that students who can more effectively regulate their emotion may be the ones more likely to report a mastery goal perspective. For example, we conjectured that these students may have developed strategies such as the use of reassuring self-speech such as "don't worry" and "try harder" in an effort to control potentially debilitating states like anxiety (Corno, 1989). Although our findings initially challenged traditional views within goal theory on emotion as an outcome and not a mediator, our findings corroborated Kuhl and Kruska's (1989) research almost a decade earlier that had demonstrated a negative correlation between volitional strategies, such as emotion control, and fear of failure. In other words, students who reported patterns such as the one we found between performance goals and negative affect after failure may have difficulty regulating their negative emotions (Kuhl & Kraska, 1989).

In addition, we used goal theory to explore how features of instructional interactions might be a central source for understanding relationships among classroom values, beliefs, and practices that help to regulate affect, cognition, and motivation. Support for connections between classroom climate characteristics and classroom goal structures was just beginning to emerge in the literature at this time (e.g., Stipek et al., 1998; Urdan, Kneisel, & Mason, 1999; Vermunt & Verloop, 1999). We reported that students' perceptions of mastery goal classroom structures were consistently and positively related to their construals of teacher support, thus demonstrating the affective nature of supportive classroom instruction and motivationally positive classroom climates (Turner et al., 2002). In other words, mastery goal structures and teacher support did not appear to be distinct from each other in the students' self-reports or in our discourse analyses. This finding suggested that positive emotions, which were evidenced by both higher perceived teacher support and mastery goal structures, may be essential in defining what constitutes a mastery goal structure in a classroom.

In a subsequent study (Patrick et al., 2003), we were able to distinguish among three different categorizations of classroom climates: (a) consistently positive and supportive, (b) consistently negative and nonsupportive, and (c) ambiguous (i.e., sometimes supportive and sometimes nonsupportive). Surprisingly, we found that student reports of avoidance behaviors, disruptive behaviors, and cheating were almost identical in the ambiguous and negative classroom contexts, demonstrating the importance of consistent and positive affective climates for motivation. Moreover, the patterns of teacher support observed during these math classes later in the school year were consistent with interaction patterns observed on the first days of school, suggesting that these psychological environments were readily created and sustained.

As a body of work using a goal orientation theory framework, our research findings on supportive instructional contexts (i.e., positive classroom climates) also corroborated those of other motivational researchers who had documented how teachers' emotional support is important both in academic *and* in interpersonal contexts (e.g., Patrick, Anderman, Ryan, Edelin, & Midgley, 2001; Skinner & Belmont, 1993; Wentzel, 1997). Some common positive instructional characteristics found across these studies are the teachers' enthusiasm, humor, and passion for learning. Thus teachers' demonstrations of positive emotions and intrinsic motivation appear to be critical features of instructional interactions that correlate with student reports of positive emotions and motivation to learn. This evolving line of research underscores the synergy of students' and teachers' experiences in classrooms— how their understandings, perceptions, and actions are co-constructed and co-regulated in their daily interactions.

Future Directions in Integrating Emotion, Cognition, and Motivation

Theoretical Possibilities

When theories link emotion, cognition, and motivation, the processes are commonly placed either in hierarchical or chronological relationships to each other.[1] In other words, current theories appear to "foreground" one process. For example, Lazarus (1991a) suggested that the "solution [to the relation between cognition and emotion] is to recognize that emotion is a superordinate concept that includes cognition..." (p. 353). In explaining motivational systems theory, Ford (1992) stated that emotions were "an integrated part of motivational patterns" (p. 8). Thus, it appears common for theorists and researchers to highlight the interdependence among motivation, emotion, or cognition, but these are usually corollaries—theoretical starting points. We, too, have found that it is easy to be theoretically near-sighted. Our focus on motivation at the expense of emotion early in our research is an example of foregrounding one process for another. Our research now leads us to see motivation and emotion as integrated and simultaneous. At the same time, we continue to struggle with how to measure learning that is occurring during the classroom activities we study. In attempting to re-conceptualize classroom experiences, we strive to understand how motivations and emotions interact during learning and how classroom contextual features influence these patterns. Moreover, we are seeking ways in which to uncover which emotions are most salient to study in academic contexts.

There are a variety of directions that could help us integrate emotion, motivation, and learning. One approach would be to revisit theories, such as Attribution Theory (Weiner 1986, 1992) and Flow Theory, which integrated these processes and further test their theoretical assumptions and their applicability in classroom contexts. A related approach could be to accommodate or modify existing theories. An example of recent work that integrates emotion into existing theories of motivation and learning is Linnenbrink and Pintrich's (2002) conceptual bi-directional model linking achievement goals and affect (e.g., emotions and moods) in classroom settings. They focused on affect that emerges while students are working on tasks in school and on general school-related feelings. Their conceptual model posits that moods influence perceptions of the classroom goal structure

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[1] The ideas in this paragraph represent an innovative cognitive view of emotion, cognition, and motivation as expressed in an interview with Michael Wapner published in Baars (1986).

(either mastery or performance-oriented), which are related to adoption of personal achievement goals. These latter goals are predictive of positive or negative emotions. In contrast to prior research, Linnenbrink and Pintrich posited that emotions are not just outcomes, but they generalize to moods, thus initiating the goal cycle again, making emotions "bi-directional." Their finding that individual moods might influence student perceptions of classroom goal structures seems to corroborate our finding that classrooms with instructional interactions rich in positive emotions, motivational supports, and collaboration reflect learning goals and are more likely *to be perceived* as mastery goal structures (Turner et al., 1998a; Turner et al., 2002). Their findings also support our conclusion that effective instructional interactions respond to student emotions, suggesting how a classroom goal structure may be emotionally scaffolded (Meyer & Turner, 2006; Patrick et al., 2003; Turner et al., 2003; Turner & Patrick, 2004). In other words, students' and teachers' motivations and emotions during teaching and learning can create a supportive classroom climate.

Yet another approach for integrating motivation, emotion, and learning would be to build new models or theories that could be applied to classroom situations, as well as to situations outside the classroom. How emotion, motivation, and learning evolve as coordinated processes as well as conflict with each other are not well explained in linear or hierarchical conceptualizations. New theories might use patterns of interactions over time to explain and predict effective learning experiences within contexts. For example, we have found that the first days of school are windows into ways in which teachers take the lead in establishing psychological environments (Patrick et al., 2003), suggesting that classroom climates are, in part, created through social interactions that establish expectations, norms, and routines. Regardless of when we have studied classrooms across the academic calendar, teachers' instructional patterns appear to be highly related to their students' reports of their expectations, beliefs, and behaviors. We have posited that these relationships stem from the consistent daily interactions, which reflect established explicit and implicit classroom norms about learning and participating. Our data indicate to us that emotion, cognition, and motivation are interrelated in a complex system of co-regulation among teachers and students. Furthermore, we believe that "engaging classroom climates" have to be consistently recreated or sustained through positive interactions that build trust and promote student involvement in higher-level learning. Conceptualizing students' and teachers' emotions, cognitions, and motivations as an integrated whole that evolve from their interactions within an affective context might help us explain and predict classroom experiences in more compelling ways.

Methodological Possibilities

If theories can be developed that describe and predict emotions as part of an integrated learning process, then research methods will need to be created or transformed to study them. Although frequently taken for granted, methods are essential for testing theories and evoking new models for examination and development. In approaching complex questions such as how emotions are involved in teaching and learning, how we define the construals, interpretations, and actions that we are measuring or recording, how we achieve internal and external validity, and how we interpret our findings will necessarily include multiple perspectives and multiple measures if the ultimate goal is to understand classroom contexts (Urdan, 1999; L. H. Anderman & E. M. Anderman, 2000). Such multi-method and multilevel designs need to be rigorous and well coordinated to measure interactions over time. Thus two challenges to researchers will be to utilize multi-dimensional approaches

while at the same time developing new ones that can identify the best descriptors of positive classroom environments and predictors of effective instruction.

Multi-method and multilevel research As previously described, we have studied emotion by combining self-reported data with classroom observation and analyses of instructional discourse to describe associations between teacher support and student motivation. To reach multiple research goals concurrently, we use mixed methods and multilevel models (Tashakkori & Teddlie, 1998) by combining qualitative and quantitative research methods and analyses while incorporating data from the student and classroom levels. For example, we have asked students to self-report their affect during learning activities and we have asked them about more general classroom practices using the experience sampling method. We have recorded and analyzed students' affective experiences through constructed survey items such as, *I feel terrible when I make a mistake in school*, as well as by coding teacher and student affective responses during classroom interactions. Early in our research we assumed that students could readily recall and label their emotions, cognitions, and motivations in relation to generalized experiences (e.g., math class today), but we now acknowledge that such meanings are not self-evident and that students do not necessarily interpret items in the way theorists designed them. In other words, our traditional or favorite research methods need to be validated, and possibly revised, in each new context. We also found that our coding reliability improved when we allowed for multiple simultaneous codes, which were more representative of the multiple meanings of statements made by teachers. Finally, we have found that it is important to capture in the transcripts the tone, emphasis, and pacing of statements, as well as record the nonverbal behaviors of the speaker to help interpret meaning. All this detail could only be achieved through both audio recording and observation, and could be improved by adding video.

Innovative methodological approaches A second methodological area to explore is the development of new classroom-based research methods that not only capture details, but can also parse the complexity of what is being experienced in classrooms. Innovative methods could help us pull together multiple data sources, describing experiences in their historical contexts and during activities. New methods for collecting data on emotions and moods more reliably and validly are central to advancing research and theory building. However, innovation is especially challenging because we have learned that observing learning and analyzing affective or motivational indicators often does not reflect an individual's perceptions or experiences accurately or in predictable ways.

An example of an innovative methodology is experience sampling, which was used to capture the theoretical predictions from Flow Theory. We adapted experience sampling as an important methodological innovation in that it provided an "on-line" measure that asked students about their emotions (e.g., "sad–happy"), their cognitive processing (e.g., "clear–confused"), relationship to others (e.g., "loney–part of the group"), their levels of challenge and skill, and if they would rather be doing something else. Using such an integrated methodological approach we found that negative emotions may be reported in highly challenging classroom activities that appear optimal from an instructional perspective. At the same time, students engaged in similar challenging learning activities at the same grade level reported positive emotions in a different classroom climate. In yet another instance, positive emotions were reported in what appeared to be a cognitively simple learning activity. We were able to interpret, or parse, these variations in student reports and in our observations of the learning activities because the experience sampling form juxtaposed

"challenge", "skill", and "pride". Within the two activities regarded positively—the challenging and the simple—"pride" was associated only with the intellectually challenging learning. Thus we benefited from a unique data collection method that was multi-faceted in its design.

Innovative methods also could help us examine continuity of experiences rather than take "dip stick" samples of classroom experiences. In motivation research, for example, we have depended on self-reports from group-administered surveys for a vast majority of research findings and need to break from our traditional methods. More creative methodologies are vital for future research on complex social interactions in classrooms. Some innovations may stem from re-designs of methods from other disciplines that are adapted to classroom contexts. For example, methods used in laboratory settings for studying the physiological feelings of emotions, such as measuring autonomic nervous system responses through skin conductance responses (Damasio, 1994), could be explored for their potential use in classroom settings. Eckman's (1993) work on facial expressions as indicators of emotions may have viable classroom applications, especially with digital video recordings of instructional interactions. In sum, more thinking "out of the box" in terms of methodology is needed to fully investigate emotions in classrooms. Our own experience predicts that it is through diversity in our explorations that we will be the most successful, individually and collectively.

Finally, in as much as we have argued for more multi-method, multilevel, and innovative methods, as researchers we also need to learn how to parse the growing complexity of data that we collect. This would require researchers to "thin-slice"[2] the data in their research designs and analyses—to discover and then test the essential elements. In other words, we need to identify the fundamental patterns that are the most powerful among emotion, motivation, and cognition in terms of classroom learning experiences. Every relationship that is found will not contribute equally to explanation and predictions, nor will it be readily applicable for promoting more effective teaching and learning. Therefore, we need to more systematically and effectively focus our investigations on the core relationships that can be studied and communicated. Not all emotions are equally probable or important for understanding classroom teaching and learning, so the guiding question should be: *What emotional experiences are the most fundamental?* By "thin-slicing" our methods and data, we would hopefully be able to maintain empirical parsimony and to provide educators with some core principles to guide practice—perhaps even providing them with rich descriptions of contexts and specific examples of strategies within these contexts that may have the potential for maximizing learning in their classrooms.

Conclusion

Emotions emerge through interactions with our environments and they signal how well our expectations are being met in the current situation. In studying emotions in classrooms we

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[2] "Thin-slicing" is a term used in the sciences to describe a cross-sectional sampling method. Gladwell (2005) has popularly defined it as "the ability of our unconscious to find patterns in situations and behaviors based on a very narrow slice of experience" (p. 23). We use the term to denote a researcher's ability to determine the most significant constructs within a complex context for understanding and predicting human perceptions and behaviors.

have borrowed eclectically from three motivational theories—Risk Taking, Flow Theory, and Goal Theory—with some success and some failure. We have examined emotions using multiple methods at both the individual and classroom levels of analyses. From this experience, we have argued for more integrated models that explain emotion as part of a collective experience that can explain emotions in relation to motivation and learning—as an integrated process, not as a precursor or outcome. The study of emotions in classrooms is necessarily complex, which is part of its intrigue, and the reason that we need improvements in data triangulation, exploration of new methodologies, and a focus on parsing the complexity of such rich data sources.

As Graham (1991) wrote, "A viable theory of motivation for educational psychology must be able to incorporate emotions. After all, the classroom is a place of multiple affective experiences with motivational significance, including those feelings associated with achievement success or failure, as well as acceptance or rejection by others" (p. 16). In addition, we must not lose sight of the importance of documenting that student learning is being achieved in a meaningful way and looking at contexts outside the classroom to understand how to support high quality and effective teaching (Fenstermacher & Richardson, 2005). With a decade and half of classroom research behind us, we have come to embrace the importance of emotion in interpreting our motivation research in classrooms. Our work has led us to conclude, expanding Graham's argument, that if theories of human experience are to be useful for interpreting and predicting classroom interactions within contexts, then they will need to synthesize affect, cognition, and motivation.

Classrooms are unique places that evoke a myriad of possibilities for educational researchers to help support student learning through improved practice. Because students do not necessarily choose to be in particular classrooms or to participate in assigned learning activities (Brophy, 1999), they will naturally experience a variety of emotions, motivations, and construct diverse understandings, often conflicting ones. Furthermore, in classroom learning, students may be especially sensitive to the emotional meanings of their academic experiences (Boekaerts, 2001), as well as to the experiences of others, who are in such close proximity and socially relevant. Similarly, teachers are simultaneously interacting with multiple students experiencing a variety of emotions, and we believe, although it is rarely researched, that teachers' emotions are integral to their motivation and cognition and ultimately their teaching effectiveness. Understanding how positive classroom environments develop and are sustained is essential for improving educational opportunities through the quality of instructional interactions, which have relationships and emotions at their core.

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