

ABSTRACT

Title of Dissertation: Applications of Dweck's Model of Implicit Theories to Teachers' Self-Efficacy and Emotional Experiences

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The current study explored Dweck's (1999; Dweck & Leggett, 1988) model of implicit theories in the context of teaching in order to establish its usefulness for describing teachers' beliefs about students' ability and social behavior. Further it sought to explain the connections between teachers' implicit beliefs and their efficacy for instruction and classroom management, and their positive and negative emotional experiences. The factor structure of survey data for teachers in mid-Atlantic school districts was examined to test for classes reflecting implicit and entity beliefs, or beliefs that student attributes are malleable or fixed and unchangeable. Given that previous work in other populations has reflected important connections between individuals' implicit theories, their cognitive and emotional functioning, and their interactions with others, the current study explored whether implicit theories have similar implications for teaching.

The categorical distinction between entity and incremental theories was not supported in the analyses. Further analyses were conducted using structural equation models for implicit theories, efficacy, and emotional outcomes, including symptoms of burnout. Implicit theories were associated with efficacy such that tendencies toward incremental beliefs correlated with higher efficacy in well-fitting models. Although implicit theories predicted emotional outcomes in some models such that incremental beliefs were associated with positive emotional outcomes, the effect of the implicit theory variable was not significant in models that included the efficacy variable. In these models, only efficacy was a significant predictor of emotions such that higher efficacy was associated with positive outcomes. Finally, the interaction between implicit theory and efficacy was not significant. These findings fail to support the theoretical connections between the two variables in the implicit theory framework, where low efficacy is expected to predict negative emotional outcomes in the presence of entity but not incremental theories. Instead, with respect to emotional outcomes, teaching self-efficacy appeared to be a more salient predictor than student-directed implicit theories of teachers' emotional experiences overall.

Keywords: teachers, teaching motivation, implicit theories, teaching self-efficacy, emotions, affect, burnout.

APPLICATIONS OF DWECK'S MODEL OF IMPLICIT THEORIES TO
TEACHERS' SELF-EFFICACY AND EMOTIONAL EXPERIENCES

By

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Dedication

To my Lord and Savior.

He heard my cry and rescued me.

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This is probably one of the most difficult sections of the dissertation to write (I thought the *discussion* section was hard!). If I could acknowledge everyone who contributed to the creation of this work, and to the person I have become in the meanwhile, the acknowledgements might be nearly as long as the dissertation itself. I begin with the person who never gave up on me even though I am absolutely certain that I tempted her beyond belief. To my advisor, Dr. Kathryn Wentzel, I cannot offer enough thanks. Of the many, many lessons you have taught me about the process of the dissertation, probably the two most essential lessons are 1) that I can only succeed once I take complete ownership of my experience, and 2) that I must respect the time and assistance offered me by the people who care about me and are helping to bring about my success. Those people include but are not limited to Dr. Patricia Alexander, Dr. Ann Battle, Dr. Gregory Hancock, Dr. Judith Torney-Purta, and Dr. Allan Wigfield. Each of you has served an important role in my development through and completion of this program, and you have trained me to treat the pursuit of my degree as an opportunity to function as a professional in the field. I will continue to improve in an attempt to honor my experience with you. Finally, I would like to thank Dr. Melanie Killen, who believed in me when I knew so little, and encouraged me to discover more about myself and the field, opening up opportunities that I never knew were possible. Thank you.

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Chapter 1: Introduction

School teachers have been found to have an important impact on the academic, social, and emotional development of students (Alvidrez & Weinstein, 1999; Felner, Ginter, & Primavera, 1982; Furrer & Skinner, 2003; Jennings & Greenberg, 2009; Skinner & Belmont, 1993). Given the importance of the teaching role, recent research has begun to examine teachers' own development and well-being. Educational psychology researchers have made key discoveries about teachers' beliefs and motivation such as how their interpretations of students' performance and behavior relate to their motivation and emotional reactions. For example, teachers' beliefs about the controllability of academic outcomes have been linked to their motivation and emotional responses in ways similar to students' beliefs (Reyna & Weiner, 2001; Hammen & deMayo, 1982). Teachers' attributions are also linked to their self-described interactions with students (Brophy & McCaslin, 1992). These links illustrate both the positive and negative experiences that teachers have in the classroom and how such experiences can be predicted by teachers' beliefs about the changeability of their circumstances as well as those of their students (Fives & Buehl, 2008; Frenzel, Goetz, Stephens, & Jacob, 2009; Hammen & deMayo, 1982; Reyna & Weiner, 2001; Sutton & Wheatley, 2003).

However, compared to students, teachers' cognitive-emotional processes are not nearly as explored or well-understood. Moreover, the research literature that has addressed teachers' beliefs and related emotions most thoroughly – research on teachers' appraisals and attributions – has produced inconsistent findings. For example, the emotions that teachers experience following certain student behaviors

are not always as expected, and often teachers' subsequent behaviors and communications to students are also inconsistent (Liljequist & Renk, 2007; Reyna & Weiner, 2001). Accounting simultaneously for efficacy has complicated the matter (Liljequist & Renk, 2007).

How can the educational psychology literature better explain the connection between teachers' beliefs about students, their self-directed cognitions, and the emotional responses thought to follow from teachers' thoughts? One relatively unexplored possibility has emerged through research on implicit theories, a framework developed by Carol Dweck and her colleagues (Dweck, 2008; Dweck, Chiu, & Hong, 1995; Dweck & Leggett, 1988). Dweck and colleagues' implicit theory framework introduced an alternative way to understand how people make sense out of their everyday experiences. In this view, individuals' beliefs or "theories" of themselves and their social world can be either flexible or rigid. The perspective might be compared to attribution theory in its use of the concepts of stability and controllability, but it more directly addresses the influence of beliefs about whether or not a person or situation can change or improve and whether or not efforts to control or influence specific outcomes can be successful (Urdu & Turner, 2005). For example, a teacher might consider her students' intelligence to be malleable such that even repeated failure can be overcome.

According to Dweck's model, implicit theories can influence subsequent cognitions, motivation, affect, and behaviors in important ways. Empirical work supports this notion. For instance, elementary and secondary students' and young adults' implicit theories predicted the expectations and judgments that these

individuals formed about their own and others' capability in achievement settings (Dweck et al., 1995). Similarly, teachers might form judgments about the flexibility of students' capability in the classroom, either expecting stable student performance or believing that changes are possible. Implicit theories have also predicted students' emotional reactions to and interpretations of their context-specific successes and failures, as well as those of others (Dweck & Leggett, 1988). Applying this to teaching contexts, teachers might become excited and feel a challenge in their daily interactions with students, or they might become frustrated and hopeless in the face of student failure or lack of engagement. Finally, implicit theories have predicted students' task and strategy choice and persistence in academic and social tasks, even when accounting for their efficacy beliefs concerning their ability to complete these tasks (Dweck & Leggett, 1988). Similarly, perhaps both implicit theories and efficacy in teaching would explain teachers' motivation more consistently than previous theoretical frameworks, including how teachers are affected emotionally by their classroom experiences and even their desire to persist in their teaching efforts.

Despite the usefulness of the implicit theories model as a motivational framework, it has not been applied in the context of teaching to the extent that attribution models have. Therefore, the current study extended Dweck and colleagues' (Dweck & Leggett, 1988; Hong, Chiu, Dweck, Lin, & Wan, 1999) model of implicit theories to investigate the link between teachers' beliefs about their students and themselves, and teachers' emotional processes. Specifically, the current study examined teachers' implicit theories, sense of teaching efficacy, and discrete emotions and burnout symptoms in an attempt to build a fuller picture of teachers'

experiences in the classroom. The next section will introduce the basic implicit theories framework upon which the study was based.

Model of Implicit Theories and Associated Constructs

Much of the previous research on teachers' thoughts and emotions has used an attributional framework - one which defines the causes of specific events by their locus, stability, and controllability - but the findings about teachers' reactions have been inconsistent. In several studies, teachers' attributions that should have been stress- or anger-inducing according to theory, were inconsistently associated with outcomes such as distress, depression, and retributive goals (Liljequist & Renk, 2007; Reyna & Weiner, 2001). Teachers' negative attributions about students did not predict, for instance, anger at these students or intentions to punish them as expected (Butler, 1994; Reyna & Weiner, 2001). In explaining these relationships, the researchers suggested that other variables such as self-efficacy, or background factors like previous training or teaching experience, could impact the associations between teachers' attributions and their motivational or emotional outcomes. Expanding on these possibilities, Weiner (1983) discussed the tendency to find inconsistent relationships in attribution research by criticizing researchers' assumptions that their participants see causal attributes in the same way as they are defined by theorists; he commented that "the a priori categorization of causes is accepted without considering the situation as perceived by the subject" (p. 535). Weiner's criticisms highlighted the importance of understanding how participants view the various subjects of their attributions. Studies of teachers yielded inconsistent findings because they were not

accounting for the basic characteristics of attributes like ability as they are defined by teachers.

A solution to the problem appeared in Dweck and her colleagues' social-cognitive research on the implicit theories of students and young adults (Dweck & Leggett, 1988). Including implicit theories as part of the general category of cognitive appraisals or attributions, Dweck described them as individuals' fundamental beliefs about the nature of personal and interpersonal attributes (Molden & Dweck, 2006). These fundamental beliefs about the nature of attributes like intelligence, ability, and social behavior allow researchers to account for the problem of erroneous assumptions about construct meaning; participants can indicate their personal views of the constructs, that is, whether they see them as fixed entities or as malleable and changeable. However, while implicit theories have been associated with specific emotional and motivational outcomes, this work has not been extended frequently to studies of teaching.

Findings about teachers' appraisals of their students and their emotional experiences (including burnout) seem to parallel the work on implicit theories and emotions in research on students and young adults (e.g., Bar-Tal & Saxe, 1979; Hammen & deMayo, 1982; Kokkinos, Panayiotou, & Davazoglou, 2005; Martin, 2006). To date, however, no study has explored the relations between teachers' implicit theories about specific aspects of their social-academic lives, their efficacy for affecting students' social and academic outcomes, and teachers' emotional experiences, all of which likely have an important impact on their teaching. The existing research, in fact, has yielded inconsistent findings that might be explained

through applications of Dweck's model, which describes specific cognitive and motivational processes that link teachers' appraisals of attributes with their emotional and goal-related outcomes.

Dweck and Leggett (1988) defined implicit theories as individuals' domain-specific conceptions about fundamental human attributes such as ability, personality, or morality. In self-directed implicit theories, some individuals believe that their own ability is fixed and cannot be changed; it can simply be demonstrated or proven to exist. These individuals would be said to hold an entity theory about ability, and the focus of their achievement goals would be to perform as well as possible given the unchangeable, *trait-like* nature of their ability. Other individuals might believe that their ability is malleable, and that it has the potential to improve and adapt. These individuals would be said to hold an incremental theory about ability, and the focus of their goals would be to add to the current *state* of their ability; their goal would be to learn. Thus, Dweck and Leggett stated that a fundamental difference between entity and incremental theorists is that entity theorists focus on *proving* their ability, while incremental theorists focus on *improving* their ability.

What are "theorists," according to Dweck? Chiu, Hong, & Dweck (1997) say that "an individual's implicit theory about the fixedness or malleability of personality sets up an interpretive framework for understanding the social world," (p. 28). In other words, a person uses information that is relevant to a specific attribute differently – and pays attention to and interprets information differently – if her guiding implicit theory about that attribute is different from others'. Generally speaking, a theory might be defined as an organized set of statements that describes,

explains, and predicts behavior (Berk, 2008). Therefore, with implicit theories, individuals use their experiences (and attitudes and moods), their internal basic set of statements about change and malleability, to describe, explain and make predictions about others and themselves. Thus, by calling someone a theorist, Dweck is saying that this person has a basic internal guide for using information in his or her perceptions. This guide helps the person describe what is happening, explain why it might have happened, and try to predict with some degree of certainty what is likely to occur in the future. Incremental theorists might tend to base their predictions on intentions, goals, or other situational and temporary conditions, whereas entity theorists might be more likely to make a global judgment about who someone *is* or what his or her stable traits are (Molden & Dweck, 2006).

What this means for teachers is that, as teachers attempt to organize, instruct, and manage their classes, they might be more or less susceptible to forming stable judgments of their students based upon only a little information, which could influence their future interactions. For example, in a vignette study using summary transcripts of a murder trial, Dweck and her colleagues examined adults' judgments of hypothetical defendants. Entity theorists used "character" information that tended to be less relevant to the actual circumstances of the case, whereas incremental theorists used situation-specific information to make their judgments (Gervey, Chiu, Hong, & Dweck, 1999). Applying this to teaching situations, teachers sometimes must assess students' "guilt" or "innocence" in terms of their performance and social behavior, and if teachers with tendencies toward entity thinking are more likely to make global trait judgments, they might not notice when students change or improve

their behavior. In contrast, teachers with incremental tendencies might be more likely to observe subtle differences in behavior or achievement. (see Erdley & Dweck, 1993).

Dweck and her colleagues noted further distinctions between entity and incremental theorists' motivational patterns that could help predict their affective and behavioral differences. In their research on students and young adults, they found that entity theorists, who believed that given attributes were fixed, focused on the adequacy of their ability and sought positive evaluations of their ability (Blackwell, Trzesniewski, & Dweck, 2007; Dweck & Leggett, 1988; Kammrath & Dweck, 2006). These individuals tended to avoid challenge in experimental tasks, seeking the easiest tasks as positive indications of their ability, and they tended to give up when they encountered resistance or failure. The authors noted that a "helpless pattern" emerged when entity theorists experienced difficulties. These theorists became doubtful of their ability, felt frustrated and anxious, and made irrelevant verbalizations that hindered their successful completion of the task. Both the effectiveness of their strategies and their overall performance decreased when they experienced failure.

In comparison to entity theorists, incremental theorists, who believed that specific intellectual and interpersonal attributes could be changed, focused on the improvement of their ability and sought information that would provide feedback about how they were doing. They tended to use the outcomes of events as part of a process related to their learning rather than an indication of the product of their ability, and thus sought challenge in experimental tasks instead of avoiding it. When

incremental theorists encountered resistance or failure, Dweck and her colleagues noted that they maintained their focus, and in some cases, did not even define the feedback as failure. Instead, the authors noted a solution-oriented “mastery pattern” in which the participants engaged in task-relevant self-instruction and motivational monitoring, viewed challenge as opportunity, experienced positive affect often in the form of “unflagging optimism” (Dweck & Leggett, 1988, p. 258), and maintained or increased their use of effective strategies.

Note that the motivational, affective, and behavioral relationships that Dweck and colleagues found for the two types of theorists were centered around their beliefs about their *own* ability. The authors said that these outcomes were results of the theorists’ “self-systems,” that is, the combination of the implicit theories and goals (e.g., mastery or performance) which impact how individuals evaluate themselves and their capabilities (Dweck, 2008). However, implicit theories are also focused externally on social relationships and evaluations, such that individuals might form beliefs about whether *others* are able to change or not. For example, people might hold entity or incremental beliefs about others’ personalities, morality, or competence. Dweck and colleagues also found patterns in these social implicit theories as well (Dweck et al., 1995; Dweck & Leggett, 1988). For example, entity theorists, who viewed others’ attributes as fixed or uncontrollable, tended to form a “judgment” orientation, evaluating others’ attributes in order to form future expectations of them (Molden & Dweck, 2006). Their beliefs about the attributes tended to be oversimplified. For instance, Dweck et al. (1995) found that, when asked about whether certain positive or negative behaviors are indicators of another

person's morality, entity theorists were more likely than incremental theorists to state that these behaviors implied something about their stable underlying moral traits, regardless of whether the behaviors were good or bad. Additionally, when challenged or faced with the negative behaviors of others, entity theorists would not initiate or persist in attempting to resolve social conflicts, or they would reject or aim to punish the offending individuals (Dweck, 2008; Dweck et al., 1995). Their affective reactions in these situations tended to be evaluative as well, such that they were more likely than incremental theorists to experience contempt or anger.

Conversely, incremental theorists' views of others' attributes as malleable or controllable tended to form a "development" orientation such that their goal was to understand and possibly improve the attributes of others. When evaluating others' attributes, they tended to focus more on circumstantial or psychological factors that could help explain other individuals' behavior. They focused on analyzing the process of the behavior rather than making a simplified evaluation. For instance, when asked about positive or negative behaviors as indicators of another person's morality, incremental theorists were less likely than entity theorists to use a trait explanation, and instead made more allowances for intent or external social pressures than did entity theorists (Dweck et al, 1995). Additionally, when faced with social challenge or difficulty, incremental theorists focused on mastering challenges and initiating positive exchanges rather than seeking retribution. Their affective reactions tended to be more symmetrical with the experiences of those who opposed them, such that they were more likely to feel empathy toward those with whom they were in disagreement compared to entity theorists.

In summary, entity theorists seem to be more focused on deciding what kind of person they or others are, whereas incremental theorists are more focused on increasing mastery over personal or social circumstances. These differences in beliefs can impact goal choices, interpretations of and responses to various events and outcomes, and how people interact with others in their social context. Based on their beliefs, the amount of control that people assume over events might have a strong impact on these interactions. Dweck and her colleagues “suggest that the way something is categorized has important consequences for the way it is treated; fixed or uncontrollable things that are important will tend to be monitored, measured, and judged, whereas controllable things that are important will tend to be acted on and developed” (Dweck & Leggett, 1988, p. 266). This observation has important implications in teacher practice. Consider, for instance, how teachers who “monitor and measure” ability would be quite different from those who “develop” it.

In the following sections, Dweck’s model is extended to teachers’ motivation and experiences, particularly those related to their general interactions with students. A discussion of Dweck’s model as applied to the teaching context is presented, followed by specific connections between the model and teachers’ sense of efficacy and their emotional experiences in the classroom.

Teachers’ Implicit Theories

At times, teachers might ask questions like, “Can students who are failing improve?”, “Can unmotivated students ever become engaged?”, or “Can disruptive students learn to get along with others?” Teachers who ask these questions might feel discouraged if they think the answer is no. Brophy and Good (1974) stated that

teachers' beliefs in the changeability of their circumstances will determine the active or passive nature of their approaches to teaching. These beliefs can range from those about fixed intelligence or personality to those about the flexibility of their curriculum. Teachers' implicit theories can impact both their internal motivational processes and their social interactions. As noted earlier, research findings concerning students and adults have linked implicit theories to the amount of effort and persistence exhibited in achievement settings (Molden & Dweck, 2006), emotional and motivational responses to failure (Dweck, 2008; Dweck & Leggett, 1988; Molden & Dweck, 2006; Tamir, John, Srivastava, & Gross, 2007), or even the amount of help offered to and received from others (Fives & Buehl, 2008; Heslin, Vandewalle, & Latham, 2006; Tamir et al., 2007). Similar investigations within teaching contexts could reveal key links between teachers' beliefs and the motivational and emotional consequences of their attributions.

When considered as a subset of teachers' attributions about their students, implicit theories might be quite powerful in determining teachers' responses to stressful stimuli. Implicit theory researchers have found that even information that is potentially threatening to one's identity or sense of self, when paired with an incremental theory, can be adapted into positive motivational and emotional outcomes such as persistence in academic tasks, resilience in emotional well-being, and positivity in social interactions (Dweck, 2008; Dweck et al., 1995; Molden & Dweck, 2006; Tamir et al., 2007). The authors state that incremental theorists interpret even failure outcomes as information that can be used for improvement

instead of a fixed, unhappy ending; they still see the potential for goal attainment rather than simply thwarted, unachievable goals.

What implications do these findings about implicit theories have for teaching? When teachers are faced with undesired classroom outcomes such as student failure or unruly behavior, perhaps entity theorists would believe that their students are incapable of significant improvement, whereas incremental theorists would believe that their students' circumstances are changeable and controllable. Specifically, given that implicit theories provide an explanation for how individuals react (e.g., with approach or avoidance of tasks in immediate contexts, in their experiences of emotions, and in their long-term academic behavior and relationships; Tamir et al., 2007) and how they cope (Hong et al., 1999), a better understanding of these and related processes in teaching contexts could be helpful for teaching practices. Implicit theories could help explain individual differences in teachers' efficacy for improving students' achievement and classroom behavior, the emotions that teachers experience, or even their development of burnout over time. Such explanations could then be used to maintain or improve teacher effectiveness and to develop supportive instructional contexts.

The current study applies the implicit theory model to teachers' general beliefs about students' ability and behavior, and examines how this model might be used to explain teachers' efficacy and emotions. The previous section addressed general research about implicit theories and how it can be applied to teachers. The next section will address the relationship between implicit theories and self-efficacy, and the implications that this relationship has for teaching contexts.

Teaching Efficacy

Self-efficacy is an important part of Dweck's model as a link between lay theories and motivated behavior. Self-efficacy is defined as an individual's belief that he or she is capable of performing some context-specific future goal or task (Bandura, 1989a; Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003). While both entity and incremental theorists have varying levels of efficacy according to Dweck, the relation between efficacy and behavior differs for each type of theorist. Dweck and Leggett (1988) found that high-efficacy entity and incremental theorists both tend to exhibit mastery patterns in achievement and social settings. In contrast, when low in efficacy, incremental theorists continue to exhibit mastery patterns, but low-efficacy entity theorists begin to exhibit helpless patterns, in which their motivation and performance deteriorate.

The association between implicit theory types and efficacy can be extended to understanding instructional practices, classroom management, and teachers' emotions. Teaching efficacy, individual teachers' beliefs that they can have a positive impact on students' achievement despite barriers (Skaalvik & Skaalvik, 2007), is commonly thought of in three ways: efficacy for classroom management, student engagement, and instructional practices (Tschannen-Moran & Wolfolk Hoy, 2001). High teaching efficacy is related to adaptive teaching practices such as provision of student choice (Flowerday & Schraw, 2000), increased teacher motivation such as intentions to provide needed assistance to students (Brady & Woolfson, 2008), and positive emotional experiences in the classroom (Fives, Hamman, & Olivarez, 2007). Teachers with high efficacy might experience more positive emotions such as feeling

relaxed, happy, and optimistic compared to low efficacy teachers. In contrast, teachers with low efficacy might feel more anxious, sad, ashamed, or guilty, and over time, these might be the teachers who are most at risk for burnout and depression (Hammen & deMayo, 1982; Winograd, 2003; Zembylas, 2007). Bandura (1989a) noted that “[s]elf-judgments of operative capabilities function as one set of proximal determinants of how people behave, their thought patterns, and the emotional reactions they experience in taxing situations” (p. 42). Despite this association between emotions and self-efficacy, little research has addressed the process of how teaching efficacy is connected to emotions like anger or happiness (Sutton & Wheatley, 2003).

Dweck’s model has been used to guide research on efficacy and motivational-emotional outcomes in other populations, and it is therefore a good candidate for making predictions about such relationships in teaching contexts. In the current study, teachers’ efficacy for classroom management and instructional practices will be of focus in order to account for how teachers’ implicit theories might be related to both social and academic functioning in students. The two categories were chosen because of their expected relation to teachers’ implicit theories about students. Specifically, efficacy for instructional practices can be thought to relate most closely to teachers’ theories about student ability in that they both concern student learning. Similarly, efficacy for classroom management can be thought to relate most closely to teachers’ theories about student behavior in that they both concern students’ ability to behave appropriately. While efficacy for student engagement will likely also have some bearing on the emotional outcomes of teaching, it does not overlap conceptually with

the constructs of student ability and social behavior specifically, so it might not be as effective a predictor given that the efficacy construct tends to be domain and even task-specific (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). The following section further elaborates on the applications of implicit theories in teaching through an examination of the link between implicit theories and teachers' emotions.

Teachers' Emotional Experiences

Emotions are viewed as an adaptive component of human functioning in that positive and negative emotional reactions provide both feedback about goal achievement and motivation to attempt to achieve goals (Keltner & Gross, 1999; Lazarus, 1995). For example, emotions can be described as multicomponential "processes that relate environmental input to adaptive output" over time (Gross, 1998; Keltner & Gross, 1999, p. 472). This means that emotions can link people's attributions about causal objects to their personal goals and perceptions of what can be done to maintain goal outcomes (Russell, 2003), connecting current "input" conditions and perceptions to "output" – what should be done next. With respect to teachers, knowledge about this process can lead to an understanding of how emotions are related to teaching and classroom interactions as well as to opportunities to provide support in teaching contexts. In particular, given recent research findings about teachers' experiences of specific positive and negative emotions (e.g., Frenzel, Goetz, Pekrun, & Wartha, 2006), teachers' experiences of burnout (Chang, 2009), and the association between stressful teaching experiences and teachers' sense of efficacy (e.g., Fives et al., 2007), examination of teachers' implicit theories could

provide an important link between their teaching efficacy and emotions, particularly those that could negatively impact their performance and interactions with students.

Dweck and colleagues found that negative emotions such as anxiety and frustration are associated with helpless patterns in students and young adults, whereas positive emotions such as enthusiasm and enjoyment are associated with mastery patterns (Dweck & Leggett, 1988; Hong et al., 1999). Additionally, in helpless patterns, individuals distract themselves from their tasks and goals and sometimes begin to dissociate themselves so that they value the task less over time. For instance, Dweck and Leggett (1988) noted that students who were encountering difficulties while completing concept formation problems would sometimes alter the rules or talk about irrelevant activities in which they were more successful. In mastery patterns, however, individuals maintained or increased their focus on solving problems relevant to the task as a way of coping with challenges (Dweck & Leggett, 1988; Hong et al., 1999). In these studies, individuals who exhibited mastery patterns seemed unconcerned about failure entirely; rather than offer explanations for why they were unsuccessful, they became more engaged in self-monitoring and self-instruction, and they were excited about the opportunity in the challenge. In applying the implicit theory model to teaching contexts, there are several parallels that can be made for teachers' emotional experiences.

Emotions are an important aspect of teaching. Sustained negative experiences in particular can hinder teachers' effectiveness and student interactions, and can permeate other aspects of teachers' lives (Grayson & Alvarez, 2008; Hughes, 2001; McPherson, Kearney, & Plax, 2003; Sadowski, Blackwell, & Willard, 1986). Frenzel

et al. (2009) suggest that consistent experiences of particular kinds of emotions (i.e., pleasant or unpleasant) can affect teachers' motivation and their interactions with their students. Even emotional expressions that teachers attempt to conceal can be perceived by and have an effect on their students (Frenzel et al., 2009; McPherson et al., 2003). Additionally, attribution research has found relations between effort attributions for failure and teachers' anger, because teachers see effort as malleable, or controllable by students (Butler, 1994). However, a consistent lack of effort in students, while interpreted as changeable, also leads teachers to expect similar results in the future; their anger may increase or turn to helplessness (Givvin, Stipek, Salmon, & MacGyvers, 2001; Reyna & Weiner, 2001).

Along these lines, teachers who experience negative emotions like anger and helplessness over a sustained period might be at risk for certain coping difficulties such as excessive stress and burnout (Hammen & deMayo, 1982; Kieschke & Schaarschmidt, 2008; Yoon, 2002). Such difficulties are not only unhealthy for teachers, but they can harm the teacher-student relationship, which can affect student motivation and learning as well. Burnout is described as emotional and physical exhaustion or depletion related to individuals' work conditions (Fives et al., 2007). While emotional depletion or exhaustion tends to be most emphasized in the literature, depersonalization and reduced personal accomplishment have also been discussed (Fives et al., 2007; Maslach, Jackson, & Leiter, 1997). Emotional exhaustion occurs when teachers feel out of energy and resources resulting from investing too much of themselves in their work. Depersonalization occurs when teachers feel negative, cynical emotions toward students, and this may affect how

teachers treat their students. Finally, teachers who feel a reduced sense of personal accomplishment evaluate themselves poorly, are unhappy with teaching, and feel distressed, as if they have failed (Fives et al., 2007).

Given Dweck's findings of helpless patterns in low efficacy individuals who tend toward entity thought patterns, it is reasonable to expect teachers with these motivational tendencies to be most likely to suffer burnout. Indeed, researchers have already shown a connection between low efficacy and negative coping in young adults (Tamir et al., 2007), and entity theorists tend to see effort as playing less of a role in determining their success than incremental theorists do in determining their success (Hong et al., 1999; Tamir et al, 2007). Considering that incremental teachers would be expected to persist in their problem solving efforts with students, this tendency might make them prone to burnout, too, since they might throw themselves into their work longer than is emotionally healthy for them. However, Dweck (1999) noted that incremental theorists are perfectly capable of knowing when to give up – they are just buffered from the perception that failure is a reflection of their static ability. Instead, it is feedback, perhaps about what to do differently in order to succeed the next time.

The current study, described next, will attempt to bridge gaps in the literature by combining teachers' implicit theories with their efficacy and emotional experiences in a single investigation.

The Current Study

The goal of the current project is to examine relations among teachers' implicit beliefs, efficacy toward teaching, and emotional experiences. Based on

Dweck's model, teachers' implicit theory categorizations will be used to explore whether teaching efficacy and emotional experiences relate differently to the theory types (see Figure 1). The types of implicit theories that are of interest concern teachers' entity or incremental beliefs about students' academic ability and social behavior. Teaching efficacy will be examined in a way that is specific to teaching practices and classroom management, thus paralleling implicit theories about students' ability and social behavior. Finally, teachers' emotional experiences will be examined concerning the experience of both positive and negative emotions (i.e., enjoyment, anxiety, and anger) and teachers' experiences of symptoms of burnout (i.e., emotional exhaustion, depersonalization, and reduced personal accomplishment).

The sample consists of 183 U.S. high school teachers from mostly Mid-Atlantic states. Most teachers chose to participate based on information shared with them about the study from their principal after school district approval; a few high school teachers also participated who heard about the study via word of mouth. The constructs were measured using Likert-type scale measures for implicit theories, efficacy, and emotion, as described above, and compared quantitatively.

Research Questions and Predictions

1. **To what extent do high school teachers fall into unique classes that are consistent with their implicit theory beliefs about student ability and social behavior?**

The answer to this question will establish the structure of teachers' beliefs about students' academic and social ability. Given the dichotomous nature of

Teachers' Implicit Theories

Implicit Theory Tendency (beliefs about student ability and social behavior)

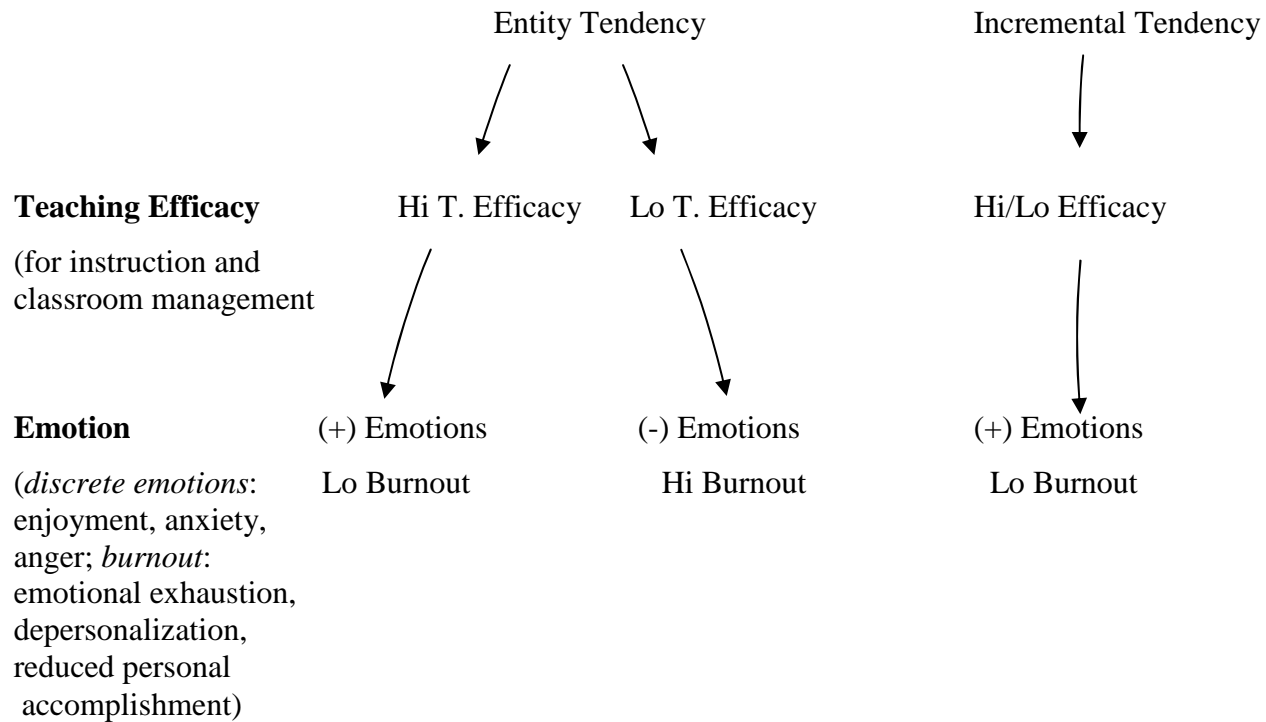


Figure 1. Conceptual Links Among Implicit Theories, Efficacy, and Emotions Based on Dweck (2009)

the implicit theory concept in distinguishing between entity and incremental theories, this question is designed to test the current data for the presence or absence of multiple classes, which might correspond to different ways of thinking about the flexibility of students' attributes. The outcome of this question will determine whether subsequent questions will address implicit theories as continuous or discontinuous variables corresponding to incremental and entity beliefs.

2. **To what extent does teachers' efficacy for instruction and management covary with their implicit beliefs?**

Prediction: According to Dweck's previous findings, no significant relation is expected between efficacy and implicit theories such that higher and lower efficacy are equally likely for incremental or entity beliefs.

3. **To what extent are teachers' positive and negative emotional experiences, including burnout symptoms, predicted by teachers' implicit theories?**

Prediction: Incremental theories are expected to relate significantly and positively to positive emotions (i.e., enjoyment), and negatively to negative emotions (i.e., anxiety and anger) and symptoms of burnout (i.e., emotional exhaustion, depersonalization, and low sense of personal accomplishment) such that incremental theories are predictive of adaptive emotional outcomes. Conversely, entity theories are expected to relate significantly and negatively to positive emotions and positively to negative emotions and burnout, indicating less adaptive emotional outcomes.

4. To what extent do implicit theory beliefs and efficacy explain jointly teachers' positive and negative emotional experiences, including burnout?

What does a consideration of both variables' interaction explain about teachers' emotional experiences beyond their individual contributions?

Predictions: Following previous implicit theory findings in other populations, incremental theories are expected to be related positively to positive emotions regardless of high or low efficacy. However, entity theories are expected to be related positively to positive emotions as long as efficacy scores are also high, but to be related positively to negative emotions with lower efficacy scores. In this description, "positive emotions" refer to high positive emotions (enjoyment), low negative emotions (anxiety and anger), and low burnout symptoms (emotional exhaustion, depersonalization, and low personal accomplishment). "Negative emotions" refer to low positive emotions (enjoyment), high negative emotions (anxiety and anger), and high levels of burnout symptoms.

Chapter 2: Review of the Literature

Introduction

In many achievement contexts, children are taught from an early age that natural intelligence is the sole means to learning and achievement. Particularly in U.S. culture, many parents praise their children's successes by saying, "You're so smart," (Dweck, 1999). However, there are also many adages and words of wisdom that encourage us to persist in achievement settings by rejecting exactly that belief (e.g., "Some of the world's greatest feats were accomplished by people not smart enough to know they were impossible" – attributed to American journalist Doug Larson). Evidence of the major difference between the two ways of thinking arises in the emotions experienced during academic and social challenges. For instance, Dweck and her colleagues have found that those who rely on intelligence often become afraid or irritated if they cannot solve a problem with minimal to moderate effort, which is a possible indication that their intelligence is insufficient, whereas those who rely on continuous effort to solve problems often remain encouraged to persist (Diener & Dweck, 1978; Dweck & Leggett, 1988).

What happens if divergent ways of thinking about intelligence and other attributes operate in teachers, whose impact on students' motivation and achievement has been well-documented (e.g., Hamre, Pianta, Downer, & Mashburn, 2007)? What are the implications for teachers' emotions, and how does this relate to their efficacy in the face of students' academic and social challenges? Dweck's implicit theories framework is one framework that can be used to understand how teachers' thoughts about students and their emotions related to teaching are connected to one another.

Specifically, the application of Dweck's implicit theories framework, based on beliefs about the flexibility or stability of fundamental attributes, might extend the domain of research on teachers' appraisals, which has revealed important connections between cognitions and emotions in teaching. The framework also can be used to explore these relations with respect to the self-efficacy construct, which is an important aspect of teachers' self-theories and also relates to social behavior in teaching.

In this chapter, research on implicit theories will be presented and described in terms of the distinctions between the two main theory types: entity and incremental theories. These two types will then be explored with respect to their connection to self-efficacy, which has been studied more extensively in research on teaching. Finally, the relation between implicit theories and emotions will be examined, including a discussion of burnout. Where little research exists on teachers' experiences, the review will include findings in other populations, typically research with students and occasionally other adult professionals. The goal of the review is to gain a sense of a motivational process in which the tenets of the implicit theories framework are tested. In particular, the review explores the extent to which the implicit theories framework can provide a clear motivational connection between teachers' thoughts about students and teachers' self-efficacy and the emotions that they experience in the classroom. Specifically, the review explores how well the framework's concepts of entity and incremental theories might apply to teachers' general motivational experiences and how they integrate with the concepts of teaching self-efficacy and emotions in particular.

Implicit Theory Background

As noted by motivation researchers, it is often individuals' interpretations of the causes of outcomes, rather than simply the outcomes themselves, that affect their motivation and emotional reactions. In educational contexts, for instance, teachers' reactions are often affected by how teachers interpret students' achievement and social behavior. Traditionally, this connection between cognitions and motivation has been demonstrated in research on teachers' attributions, their interpretations of why unexpected or undesirable events occur (Weiner, 1985). However, in traditional attribution research, teachers' interpretations of the causes of student outcomes have been studied in a way that prescribes how certain attributes are categorized (Weiner, 1983). Primarily, attributions about students' effort are often restricted to categorizations as temporary or unstable, internal, and controllable in nature, whereas ability is categorized as stable, internal, and uncontrollable. This means, for instance, that students who fail due to low ability have little chance of controlling or changing their future outcomes, and for the most part, the research on teachers' emotions corresponding to such interpretations has supported this generalization. However, some studies have shown discrepant connections or have lacked a connection between teachers' attributions about such student outcomes and their subsequent reactions and goals. This discrepancy suggests that not all teachers think the same way about students' fundamental attributes and behaviors, at least not in terms of the stability and controllability of attributes like ability and effort.

A different way of addressing the problem of how to categorize attributes has been presented in the implicit theories approach. In their early research with students,

Dweck and her colleagues tried to understand why a group of students might have similar ability, but some of them tend to give up when presented with challenge – a helpless pattern - while the others persist and seem to flourish in challenging tasks – a mastery-oriented pattern (Diener & Dweck, 1978). Their research led them to emphasize the importance of malleability in beliefs about fundamental attributes and the role of effort. Dweck identified two modes of thinking about fundamental human attributes, and she referred to each mode as a type of basic “theory” such that people could hold either an entity theory or an incremental theory about a particular attribute. An entity theory ascribes a fixed quality to attributes such that they cannot be built upon or adapted, only measured as a permanent trait. Thus, attributes are seen as unchanging entities. An incremental theory, conversely, allows for flexibility and malleability in attributes such that they can be adapted and developed – they can be built upon in increments (Molden & Dweck, 2006). The description of such beliefs as theories comes from people’s tendency to form ideas about how to explain and make predictions about their own and others’ fundamental attributes or characteristics, as is also the case with attributions. Thus, these ideas might be thought of as rudimentary theories, because they attempt to describe, explain, or predict behavior in an efficient way (Berk, 2008).

Dweck noted that implicit theories are often stable, but they are not unchangeable. She noticed that most people tend to apply a predominant implicit theory – entity or incremental – across contexts in consistent ways that might seem trait-like (Dweck, 1999). However, despite often predictable tendencies to apply certain theories, people’s thoughts and interpretations can vary across situations and

even in similar situations at different times, and they are responsive to education, training, and other developmental influences, which will be discussed below.

The Role of Effort

The role of effort emerged in Dweck's research as an important way to distinguish between implicit theories, particularly with respect to emotional outcomes. For entity theorists, exerting effort indicates low ability because those who are "smart enough" or "good enough" at something should be able to do it with ease. When a task is challenging, entity theorists tend to become worried, anxious, or easily discouraged (Dweck, 1999). In contrast, incremental theorists see effort as probably the most important influence contributing to their success. Current relationships, abilities, or circumstances can change, according to incremental theorists, and therefore effort is necessary for creating that change. In general, there is positive emotionality associated with this kind of flexible thinking. For instance, several studies have documented the benefits of flexible beliefs for a broad range of age groups from school-aged children to adults. Flexible beliefs predict finding value and enjoyment in academic work, obtaining a higher GPA, improved conscientiousness and effort in learning, persistence despite obstacles, social outreach and conflict resolution, and help-seeking (Blackwell et al., 2007; Dweck, 2008; Gerverey et al., 1999; Kammrath & Dweck, 2006; Karafantis & Levy, 2004). In each of these studies, the authors make a distinction between entity and incremental theorists in terms of the role of effort. Effort is *futile* for the entity theorist, because if ability is natural and cannot be enhanced, then adding more effort only demonstrates weakness. Conversely, effort is *essential* for the incremental theorist.

Thus, if ability is achieved, according to the incremental theorist, then effort is key to that achievement. Using likability as an example, if entity theorists experience social rejection, they might conclude after only one instance that they are unlikable - a trait quality – and experience dejection. In contrast, incremental theorists might meet rejection with the explanation that maybe they said something inappropriate or the person who rejected them was having a bad day. These theorists might still feel awkward or sad, yet there would be hope for future improvement as well, and within reason, they might decide to try again later. Thus, the difference between entity theorists and incremental theorists is that, for incremental theorists, there is an openness to possibility that leads to positive emotion in the face of difficulty.

The next section will describe available literature on implicit theories and similar frameworks for evidence to suggest that teachers hold different implicit theories. In particular, it will make conclusions based on evidence that teachers might hold different beliefs about students, particularly in terms of the malleability of students' ability and social behavior. The first subsection examines how the implicit theories framework has been studied in other populations. Then the limited research on teachers' implicit theories is discussed specifically. Finally, some of the more extensive literature on teachers' appraisals about students' intelligence and behavior is discussed, particularly regarding how much these attributes can change.

Judgments About Others

An extensive amount of Dweck's research has involved implicit theories about others' attributes, and she has observed specific emotional outcomes that result from entity or incremental theories. For instance, when participants were asked to

explain others' behavior, their answers could be separated broadly into two categories: making judgments of others or considering the circumstances which, if changed, might help them to develop (Dweck & Leggett 1988; Dweck et al., 2005). Entity theorists tended to see others' behavior in a static way, such that once they made a judgment, they were less likely to change it than incremental theorists. Entity theorists often formed quick judgments and stereotypes based on superficial or arbitrary qualities, and they tended to describe people with respect to traits rather than situational context; incremental theorists tended to consider circumstances rather than character information, and they were more open to new information in making decisions rather than making quick judgments or conforming to stereotypes (Dweck et al., 1995; Chiu, Hong, & Dweck, 1997; Levy, Plaks, Hong, Chiu, & Dweck, 2001). For example, Gervy et al. (1999) used vignettes describing a murder trial to examine adults' judgments of hypothetical defendants. Entity theorists tended to fixate on "character" information, information about defendants that tended to bias the participants toward certain conclusions, and that was irrelevant to the actual case facts. Thus, information such as whether a defendant had tattoos or was wearing a suit and tie in the vignettes was important to entity theorists in making judgments about guilt or innocence. In contrast, incremental theorists used situational facts in order to make their judgments, and their decisions were unaffected by dispositional information presented about the defendant.

The above studies suggest that entity theorists are more prone to use trait information and group stereotyping than incremental theorists, who tend to consider situational factors as did the participants in the jury study (Dweck et al., 1995; Levy

et al., 2001). Chiu et al. (1997) described entity and incremental theorists as “differentially liable” to potentially biasing information. This means that entity and incremental theorists may not be equally susceptible to or affected by trait-based stereotyping. The authors found that when making social judgments, entity theorists seemed to absorb trait information and stereotypes more readily than incremental theorists, who used a broader array of information to form their expectations and interpretations of events.

These findings have important implications if similar tendencies exist in teaching contexts. If teachers who hold an entity theory form judgments of students that undermine their goals to help students improve, then their interactions with students will likely be very different from those of incremental theorist teachers. Exploring these kinds of beliefs will add to current understandings about teachers in important ways. Specifically, if the distinction between entity and implicit theories is meaningful for teaching contexts, it might help explain why teachers’ reactions in previous appraisal studies have differed from traditional theoretical expectations (see e.g., Reyna & Weiner, 2001).

Teachers’ Beliefs About Students

Although research on teachers’ implicit theories about students’ attributes is not very common compared to research in other populations, there is some general evidence of implicit theories in teaching and other professions. Research that has been conducted in management contexts will also be included in this section because of managers’ similar position of leadership or other developmental guidance of

groups of people who are working toward common goals, and often require training and education to reach those goals.

Research in teaching contexts has suggested that implicit theories function in teachers, although the evidence is limited. Studies of K-12 teachers' beliefs about student ability have found differences in entity versus incremental thinking in teachers and related these differences to the amount of control teachers exercised over students, their efficacy, and even their support of IQ testing for giftedness (Garcia-Cepero & McCoach, 2009; Midgley, Feldlaufer, & Eccles, 1988; Looney, 2003). Across studies, higher control was associated with entity versus incremental thinking, and higher efficacy was associated with incremental versus entity thinking. Entity theorists were also more likely to endorse IQ-based testing for giftedness, although there was no correlation between incremental thinking and endorsement of multiple approaches to measuring intelligence, as Garcia-Cepero and McCoach (2009) expected. Other constructs have also been explored in teachers' theories, including teachers' thoughts about the nature of teaching ability. In their case study of practicing and pre-service teachers' perceptions of whether teaching ability is inborn, Fives and Buehl (2008) identified several themes in teachers' thinking that indicated a *spectrum* of beliefs rather than a clear separation between entity and incremental beliefs. The themes that emerged were: 1) teaching is an innate, inborn, or natural ability or talent, 2) it is somewhat innate but requires polish, 3) it is innate for some but learned for others, 4) it is learned entirely, and 5) it is a calling or a gift. In their discussion, the authors expressed the most concern for those who viewed ability as innate for two reasons: if teachers with entity-type beliefs ever struggle with teaching

effectively, they might be less receptive to assistance if they think their teaching talent is insufficient because it cannot improve. Also, as mentors, these teachers might be more likely to think that developing teachers do not belong in the classroom if they are not already good at teaching, and they might be less likely to help developing teachers to improve. Conversely, Fives and Buehl expressed the most approval of teachers who believed that teaching is a learned ability because they would be most receptive to teacher education - both as mentors and as those being trained – and they also might be more resilient when difficulties arise in their daily classroom interactions. Their observation that there was substantial overlap between theory types is one that will be revisited.

Implicit theories have also been explored in other management contexts outside of teaching. In a series of studies involving the implicit theories of managers and their ratings by subordinates, entity theorist managers were rated by their employees as less willing to invest in helping others to improve (Heslin, Vandewalle, & Latham, 2006). In a targeted training of entity theorists, however, managers exposed to training that involved incremental thinking did respond to what the authors referred to as “induced incrementalism” (Heslin et al., 2006, p. 895). Compared to a group that received training without an incremental component, the induced managers were more willing to train a hypothetical employee who had performed poorly, they offered more suggestions for coaching, and their suggestions were of higher quality than non-induced managers. These findings provide evidence similar to Dweck’s (Hong et al., 1999) that theories can be induced, at least

temporarily, and are especially promising for possible applications in teaching contexts.

Implicit Theories and Efficacy

When considering teachers' thoughts about students, what role does efficacy play? When teachers think about students' potential, does this relate to their efficacy to teach their students effectively? Teaching efficacy is connected to teachers' emotional and social experiences in the classroom and so is of interest in this study. Teaching efficacy has been explored in appraisal research, and is considered to be a key component of teachers' thought processes in predicting their emotional reactions. This component delineates how teachers with different efficacy levels also tend to have different emotional experiences in the classroom; for example, teachers with low efficacy for teaching a subject might experience higher anxiety than teachers with higher efficacy. Research also shows differences in teacher-student interactions as well as student achievement for teachers with high versus low efficacy (Tschannen-Moran et al., 1998). The following discussion expands on these findings.

Bandura (1993) described general self-efficacy as "people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives. Efficacy beliefs influence how people feel, think, motivate themselves, and behave" (p. 118). Expanding on this general definition, teacher (or teaching) efficacy refers to teachers' beliefs that they can have a positive impact on their students' academic and/or social outcomes despite situational and contextual barriers (Skaalvik & Skaalvik, 2007; Tschannen-Moran & Woolfolk Hoy, 2001), and is one of the more frequently studied constructs in teaching motivation. The first

descriptions and measurements of teaching efficacy originated with the RAND studies, which used two simple items aimed at tapping teachers' beliefs about the extent of their contribution to students' outcomes, given that other groups and contexts also determined students' outcomes (see Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998, for review). These items were, "When it comes right down to it, a teacher really can't do much because most of a student's motivation and performance depends on his or her home environment," and "If I really try hard, I can get through to even the most difficult or unmotivated students" (Armor et al., 1976 cited in Tschannen-Moran et al., 1998, p. 204). The RAND items distinguished general teaching efficacy (GTE; first item) from personal teaching efficacy (PTE; second item) to form overall teaching efficacy (TE).

The initial teaching efficacy construct in the RAND studies was predictive of a number of outcomes, including student achievement, teacher stress, and teacher-student interactions during classroom instruction. Many studies followed which used a combination of the same and different measures, in which the researchers tried to improve upon the original items. Often, researchers increased the number and specificity of the items in order to improve reliability and capture finer dimensions of the constructs, such as math or science, or special education contexts. The subsequent measures by authors such as Gibson and Dembo, Guskey, and even Bandura, were largely successful to some degree, in that they maintained their correlations with the original RAND items as well as their relations to both student and teacher outcomes (Tschannen-Moran et al., 1998). However, their attempts to obtain context- and subject-specificity and therefore predictive strength sometimes raised questions about

their items possibly being *too* specific such that they might not be useful beyond very narrow applications.

Tschannen-Moran et al. (1998) reviewed the various scales and their correlates. Overall, the RAND items, the TLC (Teachers' Locus of Control - Rose & Medway, 1981), the RSA (Responsibility for Student Achievement - based on Weiner's attribution dimensions - Guskey, 1981), and the Webb Efficacy Scale (Ashton, Olejnik, Crocker, & McAuliffe, 1982) revealed positive correlations between higher teaching efficacy and higher student achievement. Other studies have supported this finding, associating higher teacher efficacy with improved student performance and classroom behavior across several domains (Ashton, 1985; Looney, 2003). Efficacy was also shown to be correlated with teachers' willingness to implement innovations, their willingness to stay in the teaching field, lower stress (including that caused by student behavior), lower negative affect, and fewer negative student interactions (Tschannen-Moran et al., 1998). Additional studies further supported these findings (Guskey, 1982; Yoon, 2002). For example, in a study of elementary and secondary teachers based on Weiner's attribution theory, Guskey (1982) found that when faced with successful and unsuccessful classroom situations in general, teachers tended to credit more internal responsibility for successes than for failures. When students failed, the teachers emphasized insufficient student effort more than insufficient ability to teach, which would imply that they could not obtain different results with different classes.

Overall, findings revealed that teachers with high efficacy approached their teaching with confidence, encouraged their students to take academic risks, and used

effective teaching strategies (Tschannen-Moran et al., 1998). Compared to teachers with low efficacy, high efficacy teachers experienced more enthusiasm for teaching, resilience to setbacks, and willingness and determination to work through student difficulties themselves rather than refer students (Ashton, 1985; Tschannen-Moran et al., 1998). Conversely, fitting with Bandura's general conceptualization of self-efficacy in which lower efficacy is characterized by negative affect (Bandura, 1993), teachers with lower efficacy experienced more anxiety, anger, and depressive symptoms than teachers with high efficacy, and they were more likely to be dissatisfied with their jobs and leave the profession (Tschannen-Moran et al., 1998; Yoon, 2002). Low teacher efficacy was also associated with burnout symptoms and patterns of self-handicapping (Skaalvik & Skaalvik, 2007). Thus, self-efficacy has been well-established in its relevance for teaching contexts in general and with respect to teachers' emotional outcomes in particular.

In terms of teacher development, teachers with more years of experience or specialized training were more confident about their ability to teach their curriculum and exercise classroom management (Wolters & Daugherty, 2007). Looney's (2003) study of high school teachers revealed that efficacy for classroom management and for instructional practices was related positively to years of teaching experience . Additionally, across suburban, urban, and rural contexts, student teachers reported higher efficacy following their training (Knoblauch & Woolfolk Hoy, 2008), particularly when they received strong guidance in their programs. Further, Fives et al. (2006) found an increase over time in the relation between high provision of

guidance, higher efficacy, and lower symptoms of burnout by the end of student teaching.

Context, however, does appear to play a role. Student teachers' sense of collective efficacy tended to be lower overall in urban contexts compared to other contexts (Knoblauch & Woolfolk Hoy, 2008). Collective efficacy is the perception that the school faculty can have a positive impact on students, and while it is not of focus of the current study, it does relate to teachers' experiences of positive and negative events in the school setting.

Additional research has further connected teachers' efficacy beliefs to their experiences of emotion. In a study that examined the effect of Irish teachers' positive and negative experiences on their efficacy and commitment to teaching, Morgan, Ludlow, Kitching, O'Leary, and Clarke (2010) suggested that positive events are perceived differently than negative events, and that each has a qualitatively different effect on teachers' efficacy. The authors suggested that it is not so much the presence of negative events that impacts teachers' efficacy as the absence of positive events. In this way, even if students fail or misbehave, for instance, teachers might still feel powerful to help them improve if they have other positive experiences or receive helpful support. Similarly, Guskey (1987) also posited that efficacy functions differently given positive versus negative performance outcomes because these outcomes are discrete dimensions that do not fall on a continuum from positive to negative. According to Guskey, positive outcomes are experienced in a different way from negative ones, and thus will provide qualitatively different feedback to teachers

with respect to their efficacy (as is the case with hedonic bias, in which teachers might blame students for failure but take credit for students' successes).

The authors discussed above emphasized the importance of considering how teachers perceive events that are in line with or in opposition to their teaching goals, how their interpretations of such events are related to their efficacy for teaching, and the impacts that these interpretations might have on their emotional experiences and ability to cope. Efficacy tends to vary by context, even within the same teachers (Woolfolk Hoy, Hoy, & Davis, 2009) and efficacy might be enhanced in supportive contexts such as in schools with a responsive administration that gives clear, timely feedback for improvement of teaching methods and includes teachers in the decision-making process (Cervone, Mor, Orom, Shadel, & Scott, 2004). As Skaalvik and Skaalvik (2007) and Bandura (1993) noted, individuals with low efficacy might dwell on coping difficulties and engage in avoidant or "escapist" (Skaalvik & Skaalvik, 2007, p. 692) emotional patterns. However, people who receive adequate support and helpful efficacy-relevant feedback might be empowered to reverse such patterns (Bandura, 1993; Tschannen-Moran et al., 1998).

Implicit theories and efficacy often covary in research and thus are an important aspect of the current study. Initially, teachers' self-related implicit theories might appear to be similar to self-efficacy. Both address the teacher's capability or competence. The distinction between them is that a self-directed implicit theory in Dweck's framework is defined as whether one can *become* or *improve*, whereas self-efficacy in Bandura's framework is defined as whether one can *do* or *perform* a task outright. One denotes change, the other denotes an absolute ability to accomplish a

task. The distinction becomes clearer when considering teachers' implicit theories about students, which are of interest for the current study. Regarding students, teachers' implicit beliefs are about whether students can become or improve, and their efficacy beliefs concern whether they can help students improve. Both of these types of beliefs might influence teachers' interactions with their students and their emotional outcomes. However, whereas these outcomes have been demonstrated in teaching efficacy research, the application of the implicit theories framework in teaching is relatively new.

Beyond the definitions of the constructs, there are other connections between implicit theories and efficacy. Previous discussion has indicated that Dweck found both high and low efficacy entity theorists AND incremental theorists (Dweck, 1999; Dweck & Leggett, 1988). However, theorists' views of efficacy appeared to differ. Regarding efficacy, entity theorists might agree with the statement, "I'm not good at that," while incremental theorists might agree with, "I'm not good at that *yet*." So although there is a correlation between incremental theory and high efficacy (Looney, 2003), there also might be a definitional difference because of a tendency for incremental theorists to answer positively in general; even if they do not know as much about a given subject at the moment, their belief in their potential to learn or change is stronger. Dweck noted that this type of responsiveness to unknown circumstances is typical of a mastery pattern, in which even individuals with low efficacy still aim for and see the possibility for improvement, improve their strategy use over time with new experiences and feedback, stay on task, and experience more

positive affect such as enthusiasm compared to entity theorists (Dweck & Leggett, 1988).

Training in incremental theories also has been shown to impact efficacy outside of teaching contexts. In a study of young adults, Martocchio (1994) found that computer program trainees experienced positive changes in their efficacy and reductions in anxiety when they were taught incremental beliefs about their skills as acquirable. Thus, although both types of theorists might have high and low efficacy, there seems to be an increase in high efficacy when incremental motivational patterns are active.

The research on implicit theories and efficacy has revealed a link between the two constructs that is relevant for teaching contexts. In general, incremental theories appear to be connected adaptively to efficacy such that even people with lower efficacy might still believe in their capability to improve and thus be more likely to have higher efficacy over time, whereas entity theories might be more detrimental for people with lower efficacy. Additionally, regarding emotional outcomes, research has demonstrated that efficacy is a consistent predictor of positive affect in teachers, with benefits for teachers' supportiveness and responsiveness, enthusiasm, resilience, and determination to resolve student difficulties (Tschannen-Moran et al., 1998). Beyond the current findings, however, there is no comparable research demonstrating how useful implicit theories are for predicting teacher emotions – the outcomes of interest in the current study – as there is for efficacy. Thus, the goal of the current study is to test the tenets of the implicit theories framework while considering teaching efficacy in the prediction of teachers' emotional outcomes.

The Role of Emotions

The current study examines teachers' implicit theories and their connection to teachers' emotional experiences, particularly the good and bad experiences that can affect teachers' work. However, the simple task of defining emotions can be a difficult one; "[everyone] knows what an emotion is until asked to give a definition," (Fehr & Russell, 1984, p. 464, as cited in Oatley & Jenkins, 1996). Simple descriptions of emotion can vary drastically; researchers have described emotions alternatively as painful or pleasurable physiological experiences (van Veen, Slegers, & van de Ven, 2005), physical expressions such as changes in facial appearance, verbalizations, or body posture (Sutton, 2004), cognitive states involving a strong feeling of wellbeing or discontent (Hargreaves, 1998), or a mild to intense desire or tendency to do something – to act – as a result of strong feelings (Hargreaves, 1998; Lazarus, 1991; Zembylas, 2005). Hargreaves (1998) stated that "The Latin origin of emotion is *emovere*: to move out, to stir up. When people are emotional, they are moved by their feelings" (p. 835). These descriptions are different from another, but they are not necessarily discrepant. Descriptions of emotions often tell of experiences that can take over the entire body, including thoughts, physical sensations, and even actions.

In order to overcome disparities in emotion definitions, contemporary researchers often combine the various ways of describing emotions into a process where thought patterns and physiological experiences form indicators of what is personally meaningful or valuable in a given moment. Emotions *move* people in a sense, in a direction either toward or away from a goal or emotional trigger – they call

attention to the trigger, making it a temporary mental priority (Lazarus, 1991). Emotions and emotional episodes can be difficult to distinguish; they can blend together. People can feel several emotions – even conflicting ones – in a given moment, and emotions are such a part of everyday experiences that people sometimes fail to notice them (Lazarus, 1995). People can also get into “moods” that are not tied to any specific event (Lazarus, 1991). In order to clarify the types of affect, Russell and Feldman Barrett (1999) described *core affect* as “the most elementary consciously accessible affective feelings,” (p. 806). These kinds of feelings are accessible to people’s awareness but not necessarily always at the forefront of their consciousness. Core affect is part of *prototypical emotional episodes*, or the kinds of emotion processes that involve conscious awareness of the associated event, goal, or trigger, that can be said to have a beginning and end. Each labeled emotion falls on a continuum of two intersecting axes: high to low levels each of pleasure and arousal (Russell & Feldman Barrett, 1999). Some emotions can be subtypes of others, so, for instance, anxiety and panic would be sub-categories of the broader category “fear”. Russell and Feldman Barrett asserted that a prototypical emotional episode represents an entire psychophysiological and social process rather than a static, isolated incident; they provide highly specified physical indications of what is personally meaningful, calling our attention to events and goals that can be acted upon, and they are also socially meaningful and often can be perceived and interpreted by others. Because of these characteristics, the process components can be explored theoretically and empirically in specific ways, particularly with respect to their social implications.

Emotions are often referred to as positive and negative, but this is not meant to imply that positive emotions are good and always desirable and negative emotions are bad and undesirable; they simply refer to our interpretations of how events are aligned to our desired goals. Lazarus (1991) distinguished between positive and negative emotions only as the results of appraisals of a "beneficial or harmful person-environment relationship," (p. 6). Emotions are a fluid and constantly changing part of the motivation process. This means that there can be positive consequences to negative emotions and negative consequences to positive emotions (Lazarus, 1991). Oatley and Jenkins (1996) referred to emotions as the "guiding structures of our lives – especially for our relations with others," (p. 124). They direct our attention to values, goals, and needs, and let us know whether these have been – or are likely to be – advanced or threatened (Lazarus, 1991). Emotions are subjective, and while some have argued that emotions oppose or inhibit rational thought, under normal circumstances they are simply a beneficial and necessary part of the cognitive-motivational process (Oatley & Jenkins, 1996).

In order to account for the process of emotions, the current discussion addresses "discrete" emotions – relatively intense and brief feeling states that are "focused on a specific target or cause - generally realized by the perceiver of the emotion," (Barsade & Gibson, 2007, p. 38; Lazarus, 1991; Sutton, 2007). The discussion examines theoretically some types of cognitions that are thought to be important parts of the emotion process, and thus might be correlated empirically with discrete emotion indicators. Specifically, the ways that people think about others' and their own abilities appear to predict emotional outcomes; these kinds of interpretive

or evaluative thoughts – implicit theories and efficacy – are thus examined for their association with positive and negative emotional experiences. Given that teachers are the population of focus, their thoughts about students and their own ability to influence students’ academic development and social behavior are explored in relation to teachers’ emotional experiences in school.

Many studies on emotions in teaching are qualitative, so some of the evidence presented draws upon detail from key studies describing complete classroom scenarios, particularly those on teachers’ thoughts about their emotions related to teaching. However, the available survey research for quantitative comparisons between different emotions and cognitive-behavioral constructs is also included to provide a broader range of experiences.

Teachers’ Emotions

The study of teachers’ emotions might lead to the questions, “Is there anything unique about teachers’ emotions that they need to be studied over other professionals? Doesn’t everybody feel the same emotions?” Teachers’ emotions might follow the same process as other professionals’ emotions, but their career context requires that they be very aware of their emotional expressions and reactions in consideration for the students that they teach (Oplatka, 2007). Research has demonstrated the influence that teachers’ emotional and behavioral expressions can have on their students, both positive and negative (Hamre et al., 2007; McPherson, Kearney, & Plax, 2003; Yoon, 2002). Additionally, the U.S. teaching population has suffered from high attrition in recent years, and this also creates difficulties, particularly for students when the school year is interrupted. Teachers who leave

often cite high stress and lack of control over their teaching and the school policies that affect them, with relatively low pay and little administrative support in many instances (Wallis, 2008). It is therefore very important to study the psychological processes involved in teaching, especially considering teachers' thoughts, emotions, and evidence that they are becoming unable to cope with daily stressors, which is an indication of burnout. Insights about how these elements are connected can lead to innovations in providing support and education for teachers, particularly those in more stressful educational contexts.

Research on teachers' experiences has revealed a broad array of emotions related to teaching and their positive and negative causes. Despite their being less inclined than other helping professionals to report their negative feelings for reasons of social desirability (Sutton, 2004), teachers have reported feeling anxiety, frustration, disappointment, and anger relatively frequently (Frenzel, Goetz, Stephens, & Jacob, 2009). In interviews and case studies, for instance, teachers have reported a range of negative emotions related to students' misbehaviors or negative emotion in the classroom, from simply feeling frustrated to feeling (jokingly) like strangling a student (Hargreaves, 1998; 2000). Some teachers have noticed their colleagues getting frustrated simply because students are frustrated (Hargreaves, 2000).

In most cases, however, the strongest student-directed anger and frustration seem to result from intentional noncompliance. It is the poorly behaved, uncooperative rule-breakers – those who argue with teachers, insult them, or refuse to try – who are seen as deliberately or intentionally insubordinate, and who consequently tend to anger teachers the most, especially when teachers have tried to

help them (Hargreaves, 2000). Revisiting the implicit theories approach, do teachers view these kinds of behavior as uncontrollable or unchangeable? The answer is likely no. When teachers become angry at students, appraisal theory suggests that they believe that this behavior can change; appropriate displays of anger are likely to be interpreted to mean that the student is the source of a teacher's distress and that the student can do something about it (Lazarus, 1991). However, if a teacher instead becomes sad or helpless, this might indicate that she believes that the situation cannot change, that either she or the student, or both, are powerless to improve the current situation.

Another common negative emotion in teaching is anxiety or uncertainty, which illustrates the temporal differences in teachers' thoughts. In an illustrative self-exploration study, an education professor-turned-elementary teacher of science, math, social studies, and language arts examined his emotion-based journals from his first year (Winograd, 2003). He felt unhappy "butterflies" (p. 1653) when his students were about to enter the classroom, and felt anxiety or fear that began even as he got out of bed in the morning. Winograd was often reluctant to face the day and his students simply because of *anticipated* frustration. This study's findings emphasize the role of future expectancies in determining teachers' emotions (Pekrun, 2006; Weiner, 1985); Winograd believed that his bad situation would continue on, that it was stable, and he became frustrated and anxious even in the absence of immediate threats.

Teachers' different understandings of their students' backgrounds can also influence the emotions they feel. This difference demonstrates the complexity

involved in teachers' interpretations of classroom events. For example, in an ethnographic study of emotion in teaching, a teacher was threatened physically by her student; she received a death threat but felt only disappointment. Although she was affected by the incident, especially because she had worked hard and struggled to help the student academically and socially, she did not feel angry. The author noted that the teacher did not want to blame the student because she believed him to be a victim of circumstances beyond his control (Zembylas, 2007).

The above examples are meant to illustrate the contribution that certain types of cognitions – interpretations and judgments of behavior, and how much teachers understand their students and their circumstances – contribute to the emotion process. This means that teachers' interactions with students will be affected by how teachers think about them, and by teachers' emotional responses to those thoughts.

Of course, there is also a very positive side to teaching; some teachers even describe teaching as a thrill and get immense fulfillment from it. An examination of the emotion literature on teachers' perceptions reveals that teachers experience enjoyment when their students seek mastery and are self-directed; this fulfills teachers' goals for students and portrays respect for teachers, which makes them feel happy and perhaps more connected to students (Frenzel, Goetz, Pekrun, & Wartha, 2006; Martin, 2006). Despite the frequency of many negative emotions discussed above, enjoyment tends to be the most frequently mentioned emotion among both elementary and secondary school teachers, and student motivation is the strongest predictor of teacher enjoyment, whereas problems with student discipline tend to predict anger and anxiety (Frenzel, Goetz, Stephens, & Jacob, 2009). Additionally,

there is evidence that teachers' enjoyment impacts the subsequent enjoyment of students via teacher enthusiasm (Frenzel, Goetz, Ludtke, Pekrun, & Sutton, 2009).

There are several common instances in which teachers experience enjoyment. In many interview descriptions of enjoyment of teaching, teachers have used the terms "affection" or even "love" (Hargreaves, 2000; Sutton, 2004). Maybe the most common instance of this occurs when students succeed. When their students do well, teachers sometimes experience feelings of love or affection toward students; they also report feelings of pride, exhilaration, or contentment when their students advance through academic content or overcome social difficulties (Hargreaves, 2000). Elementary and secondary teachers in Hargreaves' (1998; 2000) studies felt affection when students were unlikely achievers, when they saw evidence of students' growing maturity throughout the school years, and when they felt expressions of love from their students. For example, teachers experienced positive emotion when students changed their negative attitude toward learning to a positive one, when students missed them during absences, when they were their students' favorite teachers, when previous students volunteered to help younger students, and when they were able to share spontaneity, humor, or "warm fuzzies" with students (Hargreaves, 2000, p. 818).

The feeling of pride in particular shows how involved teachers can be in their students' educational experiences. In Hargreaves' (1998) interview study of noted 7th and 8th grade teachers in Ontario, Canada, the teachers felt proud when students were respectful and tolerant of one another's differences. The study noted that these teachers tried to create a respectful and safe emotional climate for their students, and

they used teaching methods which encouraged students to contribute to that climate in their interactions with one another. Thus, their observations of students' positive interpersonal behavior reflected on their own contributions and exhibited a fulfillment of their goals. All of this highlights the interplay between teachers' thoughts toward students and the emotional, bi-directional experience of teaching and learning.

Another example of positive emotion is feeling encouraged or satisfied. Hargreaves (2000) found that the majority of secondary teachers were encouraged by their students' positive emotionality – respect, humor, and appreciation, for instance – especially when other forms of support were lacking. Teachers also felt encouraged by students who simply said hello or thanked teachers for allowing them to do something (Hargreaves, 2000). Encouragement might be thought of as a feeling of renewal that reinforces a teacher's goals and efforts. These occurrences were reported especially in secondary teachers, whose interactions with students tended to be more brief or distant emotionally (Hargreaves, 2000).

Positive emotions like encouragement are not restricted to ideal classroom circumstances. Oplatka (2007) conducted semi-structured interviews of teachers of disadvantaged children who felt emotionally rewarded and obliged to help children, even when students were having difficulties. These K-12 teachers were sampled based on their outstanding socially-oriented behavior in their schools. Oplatka noted that, rather than placing blame on the more difficult children, the teachers instead sought them out *more*: they asked the students about their lives and provided a place of emotional safety in their classroom. These teachers expressed positive emotion, and they chose deliberately to express caring despite negative circumstances (e.g.,

Sutton, 2004), emotional actions which they said brought about positive change in their classroom interactions and thus validated their actions.

Oplatka's study suggests that having a flexible view of students might be important for positive emotional outcomes when difficulties arise. Perhaps the reverse - *being* viewed by students in a way that is considerate of circumstances rather than stereotypes – is also important. The research supports both sides. Teachers are rewarded emotionally when they believe that students view them as individuals rather than in a stereotyped way. Similarly, teachers like to see their students as individuals with unique experiences. Examples include when teachers are recognized by students for their roles outside of the classroom contexts in which they typically interact, such as their skills in leading extracurricular activities, or when teachers have the opportunity to help students outside of class, whether with their own subject or an entirely different one. In cases where these situations occurred, both teachers and students felt more relaxed, engaged in fewer power struggles, and looked forward to participating in the interaction (Hargreaves, 2000; Zembylas, 2007). Teachers also felt more respect toward these students, whom they understood in a flexible rather than a static way (Hargreaves, 2000).

A change in how teachers view even individual students might have a broadening effect. In one of Zembylas' (2007) case studies, a teacher changed her view of a student with learning difficulties and subsequently emphasized a more caring atmosphere for all of her students including the target student. This student was previously maladjusted and insubordinate, and although the teacher still felt frustrated when the student acted out, she also felt joy when he was responsive to her

efforts to encourage and build a connection with him. The teacher reported that her caring actions and emotional responsiveness provided him a more adaptive climate. Over time he responded well to the class and his other classmates and teachers, and he even achieved better grades. This is evidence of positive emotional and academic outcomes following a teacher's deliberate attempt to emphasize a student's potential to improve, both to him and to herself. The anecdotal evidence opens up the possibility that implicit theory research – whose main emphasis is on the interpretation of students' abilities as having or lacking potential to change – could explain connections between teachers' thoughts about students, emotions, and motivation that are not yet well-understood.

In summary, research on positive and negative emotions supports the notion that teachers are impacted affectively by their interactions with their students, particularly with regard to how they think about student achievement and social behavior. The participants in such studies often hold goals for high student achievement and for positive interactions with their students, and they attempt frequently to make sense out of why their students behave the way they do. These tendencies create a context for further exploration of teachers' beliefs and “sense-making” through examinations of their implicit theories.

Other Theoretical Approaches to Teachers' Emotions

Implicit theories concern the perceived changeability of attributes like intelligence and social behavior, which is most similar to the combination of controllability and stability in attribution research. Thus the current section will consider how teachers' attributions about students' control and responsibility over

their outcomes predict teachers' positive and negative emotions in attribution theory research.

There is a good amount of overlap between implicit theories and the similar constructs of basic appraisals and attributions, so it is important to address these constructs and their similarities and differences. Generally, each of these approaches note that there are predictable emotional outcomes that follow from certain interpretations of behavior. For instance, if the cause of an undesirable behavior is thought to be stable and uncontrollable, one's approach might be relatively minimal in trying to change the circumstances surrounding that behavior or the behavior itself. If a behavior is unstable and/or controllable, however, one's approach to addressing the cause might tend to be more involved, effortful, and proactive. A good example might be found in the distinction between personality and habits. Personality is usually viewed as a static trait – it cannot be changed. Thus, people might choose to stay away from others who are “crabby” or “mean”. However, if people know someone's *habits*, that person might be allowed more flexibility. Thus, someone who is crabby in the morning before he or she has had coffee is not viewed – or treated – the same way as someone who is simply “crabby”. The former person might be given more opportunities to interact with others – maybe post-coffee – and approached with more openness in general compared to the generally crabby person. In this example, both attribution theories and implicit theories frameworks could explain others' behavior toward the crabby people by examining the perceived controllability, stability, or – in the case of the implicit theories - the malleability of the behavior. In essence, these all examine the capacity for change in some way.

Additionally, implicit and attribution theories distinguish between internal, self-directed beliefs and external, socially-directed beliefs, which also influence the types of emotional outcomes experienced. For example, whereas pride and shame are self-directed emotions with certain cognitive precursors, sympathy and envy are directed at others for specific reasons, too. These connections will be explored more below.

There is also an important *difference* between implicit theories and attribution research. While the implicit theories framework focuses on the changeability of the attribute in question – which is most similar to a blending together of the two of three major features of attributions mentioned above – controllability and stability – it refrains from pre-assigning whether or not an attribute is changeable. In this way, effort might not be as controllable or unstable to one person as it is to another, nor might ability be as uncontrollable or stable. How does the possibility for this kind of interpretive difference affect how people approach achievement situations? In particular, how does it affect how teachers approach and react to their students' achievement and social behavior?

Although the current review is not about attribution or appraisal theory specifically, it addresses the frameworks to answer the question of how teachers' thoughts and interpretations affect their emotional outcomes. Therefore, appraisal theory and attribution theory might often appear as if they are interchangeable. However, it is acknowledged that they comprise very different fundamental approaches and lines of research (see Smith, Haynes, Lazarus, & Pope, 1993, which compares the two types of cognitions to one another in predicting emotional

outcomes). It is important to acknowledge this difference to prevent generalizing or trivializing the extensive research in these areas that still contributes new knowledge to understandings in achievement motivation and other diverse fields.

A quick overview of cognitive appraisals and attributions will help to illustrate teachers' thinking about students and their emotional outcomes where there is little background in implicit theories. Appraisal theory addresses immediate reactions to emotion-provoking events, particularly unexpected or undesirable ones. The typical reaction involves an initial positive or negative feeling about what happened, the event itself, and almost simultaneously but subsequently, an interpretation regarding who or what caused that event to happen – why it happened; these are primary and secondary appraisal. Using anger as the emotion and teaching a student who failed an exam as the context, in primary appraisal a teacher's basic goal has not been met so the teacher might experience an initial distressed reaction. This distress might be followed by a cognitive search for why that event occurred, which would be called secondary appraisal. A teacher who thinks that the student failed the exam because he did not study – that is, insufficient effort – is likely to blame the student and feel anger or disappointment in that student. This is a relatively common finding in research on teachers' emotions (Yoon, 2002). Conversely, a teacher who thinks that the student was not smart enough to pass the exam might be more likely to feel sympathy for that student, certainly not blame. Applying attribution theory, this connection between the teacher's interpretation and her emotions might be explained by noting that attributions of insufficient effort are characterized as internal, unstable, and controllable, so the student is responsible for

the failure, whereas attributions of lack of ability are characterized as internal, stable, and uncontrollable, so the student is *not* responsible. The common expectation, based on appraisal and attribution theories, seems to be that no one can do much about low ability, so there will be a lower expectation for significant improvement compared to low effort.

However, there are studies that show that teachers do not always have these exact reactions. Bernard Weiner, a pioneer of attribution theory, suggested that there is a problem inherent in pre-determining study participants' views of attributes or causes of outcomes, like effort and ability (Weiner, 1985). He noted that there is more flexibility in the ways that people perceive attributes and other outcomes than appraisal theory allows for in claiming, for instance, that ability is *always* seen as stable and uncontrollable. Research on teaching seems to support this observation. As described in later sections, sometimes teachers react without anger or goals to punish students for not putting forth enough effort toward their work, and sometimes they even tell perceived low-ability students that they should try harder. These might be simple discrepancies, but they could be very important for understanding deeper patterns of thinking about and interacting with students.

Implicit theories and emotions about academic performance

When do teachers react positively and negatively to students' academic performance? As noted above, when students succeed especially after trying hard despite previous failures, teachers often feel exhilaration and affection for the students. Some teachers might become angry, surprised, or disappointed when their students cheat or otherwise fail to try to achieve their potential, and they might

eventually feel apathetic with repeated student failures, an occurrence that has implications for burnout. The research on attributions can help to understand teachers' emotional tendencies associated with student academic outcomes.

A major reason why teachers might experience negative emotions like anger and disappointment is due to perceived student responsibility – the belief that a student could have prevented failure but chose not to. Several vignette studies have investigated the likelihood that students who fail assignments or tests are held responsible if these actions are seen as being due to their lack of trying to conform to academic or social standards (Butler, 1994; Clark & Artiles, 2000; Liljequist & Renk, 2007; Reyna & Weiner, 2001). Some of these studies incorporated physiological and social indicators of emotional episodes, namely teachers' observable reactions, communications, and goals subsequent to their reaction. In each case, the researchers expected that teachers would not hold students responsible if they viewed them as unable to meet such standards. For example, elementary school teachers in one study reported feeling angry and disappointed when students could not answer homework-related questions correctly in class because they had not studied (Butler, 1994). Communication analyses revealed corresponding behaviors and cognitions indicating the teachers' goals; teachers told the students that they had not spent enough time studying and that the teachers had expected better performance from them. On the other hand, when students failed due to low ability, teachers in the study tended to feel compassion and, sometimes, helplessness. In these cases, teachers were much less likely to offer direct outcome information (i.e., saying "That's wrong"), and more likely to call on another student or guide the low ability student through another

attempt to answer the question. Two things are important to note in the teachers' feelings and their communications. First, the feeling of helplessness was not commonly reported – this is particularly relevant for implicit theory research in teachers because it might indicate that those teachers saw their students' low ability as a stable trait that could not be helped through increased student or teacher effort. This trait – or entity – view could be distinguished from a view that, perhaps, the student *could* improve, but the teacher did not have the ability or skill to make the necessary impact. The second note is about teachers' behaviors and communications. Sometimes teachers called on someone else, but other times they would guide students through the problem rather than say outright that the student answered incorrectly. This might indicate a difference in teachers' thinking about what the student was able to achieve. In one case – calling on a different student – the teacher communicated that she did not believe the student capable of arriving at the solution eventually (or maybe she had insufficient time). In the other case – coaching the student through the problem – the teacher communicated that the student could improve and that the teacher was able to help the student get there.

Other studies have also found inconsistencies in teachers' behaviors. Reyna and Weiner (2001) provided questionnaires to two separate groups, one of undergraduates who pretended to be teachers as part of the study, and the second of experienced high school teachers. Both groups responded more negatively to students who failed for reasons that teachers interpreted as controllable, such as laziness or a temporary lack of effort. In particular, the lazy student, whose failure was due to controllable *and* stable causes (versus the student whose lack of effort was

inconsistent), was met with the most negative affect and feedback in the pretend teacher group, although this interaction was not significant in experienced teachers. In contrast, students who failed due to low ability received sympathetic reactions by both groups because their failure was seen as outside of their control.

There was another important difference between the two groups' subsequent goals following their attributions, however. Reyna and Weiner incorporated participants' decisions about punishment into their study. They found that students pretending to be teachers reported goals of retributive punishment (punishment for its own sake) rather than utilitarian punishment (that meant to help the student learn or improve in some way) when students' failures were seen as controllable and stable. Experienced high school teachers, however, endorsed utilitarian goals without regard to the type of student failure. Additionally, their endorsement of utilitarian goals was significantly higher than their endorsement of retributive goals even for lazy students, who received the most negative responses in the study overall. This finding demonstrates again that attributions are not sufficient on their own to account for teachers' reactions. In this case, especially, the difference between aspiring teachers and experienced in-service teachers was apparent as well. This last finding has implications for implicit theory research in that experience over time, or training, might make teachers more likely to adopt an attitude that students are "teachable" even when their behavior is stably negative. The reader might note that "lazy" is a trait-based label compared to a situational explanation for why a student did not complete her homework on several occasions.

Researchers of teachers' perceptions of student achievement have also suggested that incorrect interpretations of stability in students' attributes can have negative outcomes. In teachers' consideration of the stability and intentionality of students' behavior and motivation, their reactions and decisions about how to respond are sometimes based on inflexible appraisals of students' behavior, as indicated in some teachers' tendencies to ignore students' changing individual circumstances over time (Givvin, Stipek, Salmon, & MacGyvers, 2001). These inaccuracies may prevent students from transitioning to more positive motivational and social patterns if their teachers do not take notice (Ford & Smith, 2007). However, Reyna and Weiner's (2001) finding that in-practice teachers formed utilitarian goals to help students learn and improve regardless of the perceived stability of their misdeeds suggested that many teachers do often create contexts that allow students to demonstrate improvement; perhaps these teachers are more open to acknowledging positive changes in students' social behavior as well.

Implicit theories associated with managing students' social behavior

Given that a major aspect of teachers' classroom life concerns the management of students' social behavior in addition to helping them achieve academic goals (Wentzel, 2002), how teachers think about students' behavior will also be important determinants of their subsequent interactions with their students. Teachers' judgments and consequent emotions vary depending on how a teacher views the controllability of students' social successes and failures to meet teachers' goals. In a vignette study of K-6 teachers designated by principals as either outstanding or average in handling behavioral problems in the classroom, teachers

responded to children's behavioral problems with concern when the problems were perceived to be uncontrollable, and when the problems were stable (Brophy & McCaslin, 1992). Non-disruptive students, such as shy, distractible, or perfectionistic children, received more teacher sympathy and less blame than aggressive or defiant children, whom teachers rejected. The latter students' behaviors were viewed as controllable and intentional, and they thwarted teachers' goals for the class overall. These results parallel the findings in Brophy and Rohrkemper's (1981) earlier vignette study of elementary school teachers, in which teachers' attributions of controllability and especially intentionality predicted student blame versus feelings of empathy. Similar trends – anger, distress, and rejection accompanying controllable appraisals, and supportiveness accompanying uncontrollable appraisals – have been found in teachers of elementary children with emotional and behavioral difficulties (Poulou & Norwich, 2002).

Actual teacher-student relationships have also illustrated how teachers' emotions reflect teachers' differential interpretations of social problems. Liljequist and Renk (2007) studied general and special education teachers' appraisals of a current or previous year's student for their reactions to the target students' behavior. Teachers reacted differently to externalizing and internalizing student problems; they became more distressed over externalizing problems that affected teachers' goals than for internalizing problems, and their distress for externalizing problems tended to be in the form of student blame versus pity. The more students were judged to act out in class, the more likely their behavior was to be judged as controllable; consequently, teachers' emotional responses were increasingly negative.

Interventions and training programs that target teachers' interpretations also contribute to our understanding of the link between teachers' cognitions and their emotional reactions. In a vignette study of training effects on teachers' appraisals, elementary and middle school teachers who received special training in emotional-behavioral management, or who had trained to work with students with emotional difficulties, were significantly less likely to experience negative emotional responses following their students' aggressive behaviors, even when they saw them as intentional (Alvarez, 2007). Their preparation provided a buffer against debilitating emotions via their cognitive and behavioral techniques for coping with the behavior and increasing their efficacy to handle it. Alvarez' (2007) findings suggest that teachers' emotions do not always follow a predictable pattern; that this pattern can alter significantly depending on what a teacher thinks about his or her student during emotion-provoking events. In this case, training played a key role, but other background experiences and personality characteristics might also contribute as well (see Sutton & Wheatley, 2003).

Conclusions about implicit theory-relevant emotion research findings

Similarly to implicit theories, the appraisal and attribution research discussed above examines the cognitive consequences and meaning-making that often occur after a teacher's initial emotional reaction to an event. A teacher might get angry at a student who disrupts class, for example, if the disruption was seen as controllable (Weiner, 1983; 1985). A relatively common or typical reason for teachers to feel angry or disappointed is when students fail because they did not try hard enough (Butler, 1994). Appraisal theory suggests that stronger reactions might occur when

undesirable events are very important to the teacher and if they occur repeatedly, illustrating the influences of value and stability on resulting emotional reactions (Lazarus, 1991). Value and stability considerations might be especially important when studying teachers' implicit theories because when teachers' goals for students are not met, their beliefs about students' ability as stable or changeable might determine how likely they are to make consistent efforts to help students improve.

Conversely, empathy and sympathy are likely to occur when one believes that another person could not influence a negative outcome, even when the outcome is personally important to the attributor. Teachers seem to feel these emotions and respond with concern to behavioral and academic problems when students are not disruptive and their actions are uncontrollable and unintentional (Brophy & McCaslin, 1992; Brophy and Rohrkemper, 1981; Clark & Artiles, 2000; Poulou & Norwich, 2002). Empathic feelings are especially thoughtful. They show that a teacher is thinking about students' circumstances and identifying with or feeling concerned about them. What does this mean for implicit theories? Sympathetic feelings imply pity that a student lacks the *ability* to perform well, but for an incremental theorist, this is a temporary phenomenon. Teachers with incremental theories might feel sympathy in the moment when they realize that students lacked experience within a subject, *and* still hold them responsible for improving in the future. This might help to explain inconsistencies in teachers' thinking found in previous attribution research.

Thus, a common conclusion based on research in attribution and appraisal theory disciplines is that predictable emotional responses typically follow decisions

regarding the causality of events, including physical reactions, communications to students, punishments, and rewards. Across studies, there is support for the notion that teachers' judgments about the various causes of student behavior lead consistently to specific emotional reactions. Namely, when teachers ascribe students' failure to low ability, they tend to feel sympathy or pity toward those students (Butler, 1994; Clark & Artiles, 2000; Reyna & Weiner, 2001). When students are seen as putting forth low effort, however, teachers instead report feelings of anger or disappointment. According to Brophy and McCaslin (1992) "adults tend to respond with concern, assistance, and attempts at long-term solutions when children's problems do not threaten or irritate them, but to respond with anger, rejection, and emphasis on short-term control or punishment when they do" (p. 44).

It is also important to note, however, that while *most* findings on teachers' emotions and their interpretations of students' behavior conform to theoretical expectations in general and demonstrate the contributions of classical appraisal approaches to understanding teacher motivation, several studies have yielded findings that were inconsistent with typical appraisal or attribution theory-based inferences (e.g., Butler, 1994; Liljequist & Renk, 2007; Reyna & Weiner, 2001). These inconsistencies regarding teachers' motivation and emotions could be explained further by implicit theory research, which has not been applied consistently to teaching.

It is of note that the attribution studies discussed often sampled outstanding teachers. These teachers often experienced positive emotions and made attributions to unstable causes even in difficult student circumstances, and pushed students to exert

effort through tasks. There were not as many studies of struggling teachers' experiences, but the existing ones indicated that teachers had difficulty concentrating and helping students, especially when anxiety was pervasive. There is still much to understand regarding how teachers' thoughts are connected to their emotional experiences, but the findings in different groups of teachers suggests that there might be an important implication for understanding the connection between teachers' implicit beliefs and their emotions, even in terms of how effective teachers are judged to be.

Emotions and Burnout

The study of teachers' emotions often leads to a discussion of the negative consequences that can result from the intensity of teaching. Burnout is the result of ongoing negative experiences, cognitions, and affect that drain teachers' energy. Teachers who work in distressed or impoverished contexts are particularly at risk (Grayson & Alvarez, 2008). Applying previous discussions about qualitative differences between negative and positive events, burnout can also occur as the result of the absence of positive experiences. An example of a teacher at risk of burnout can be found in a case study by Zamblyas (2007), who investigated a White female teacher's emotions involved in teaching social justice in a majority African American high school. The teacher experienced self-doubt and disappointment as a result of continuous student disruptions. Her power struggles with students stifled her efforts to plan creative exercises during her first semester, and she experienced a complex cycle of anxious feelings and poor outcomes that made her want to give up on her goals: "...the vicious cycle of anxiety → planning → mediocre outcomes →

disappointment → anxiety perpetuates within me, to the point that I nearly abandon the social justice aspects.” (Zembylas, 2007, p. 363). The teacher noticed her disappointment at current outcomes and her subsequent anxiety that was caused by her interpretation of the events – she feared that the “mediocre outcomes” were stable and might continue despite her planning.

What themes characterize burnout? Burnout is the physical and emotional depletion associated with long-term effort toward one’s occupation accompanied by negative emotion, and is characterized in most studies by some combination of emotional exhaustion, depersonalization, and decreased sense of personal accomplishment (Fives et al., 2006; Maslach, Jackson, & Leiter, 1996). Emotional exhaustion is the feeling of being emotionally and physically drained as the result of the intensity of and lack of replenishment from one’s work; depersonalization is the loss of concern for the individuals whom one serves or helps in one’s occupation; and decreased sense of accomplishment is the sensation that one’s efforts have not been rewarded with positive experiences, acknowledgments, and interactions. Burnout is a consistent, pervasive feeling of negativity and futility; the individual has lost all positive feelings, sympathy, and respect for those whom he is supposed to support (Maslach, 1978).

Researchers have noted that burnout affects teachers’ perceptions of the severity of student misbehavior (Hamre, Pianta, Downer, & Mashburn, 2007). For example, in a study of Greek primary school teachers and undergraduate education majors, Kokkinos et al. (2005) found teacher experience and student gender to relate to participants’ reports of the severity of student behaviors. As in Liljequist & Renk,

(2007), antisocial or externalizing behaviors were seen by all teachers as more severe than internalizing behaviors. Additionally, the authors concluded that burnout inflated participants' responses to negative behaviors, and they handled aversive student behaviors less adaptively when experiencing burnout symptoms.

These findings highlight that it is important to consider teachers' circumstances when they show symptoms of being burned out. Maslach (1978) asserted that, despite the fact that certain aspects of burnout might be associated with personality, it is better to focus on characteristics of the stressful job situations in which people function, including client factors, rather than focusing on "identifying the bad people" who stop caring about their clients (p. 114). It was this latter kind of thinking that Dweck aimed to counteract when she identified variations in the ways that people can view themselves and others; Dweck (2008) showed in her research that not only do the different ways of thinking, the implicit theories, lead to differences in the way that individuals react emotionally, approach situational barriers, and interact with others, but they can also change from less adaptive – entity – beliefs to more positive ones.

Implicit Theories and Burnout

How do teachers' thoughts about students' potential relate to burnout in teaching? While there is not much research on teachers' implicit theories and their emotional experiences and outcomes, especially with respect to burnout, Dweck and her colleagues examined motivational patterns that can lead to predictions about some of the connections between teachers' implicit theories and emotions. Their research is

particularly helpful for understanding negative patterns that can lead to helplessness and burnout.

Dweck's research explored implicit theories in order to provide an explanation of why some individuals display mastery patterns and others helpless patterns in school and social settings. In particular, they asked why, when background knowledge and accomplishments are similar among individuals, some adapt successfully to their subsequent challenges and failures, and others do not fare as well, using ineffective strategies, becoming distracted, and often giving up (Dweck & Leggett, 1988). The researchers described the role of implicit theories, the tendency of individuals to view their attributes like intelligence or morality as either flexible or fixed, in determining these adaptive differences. Dweck (1999) noted that some students, for instance, would become anxious about not being intelligent enough, as if they could never develop enough skill to reach their academic goals. These students believed, according to Dweck, that when it comes to intelligence, "You only have a certain amount of it, so you'd better show that it's enough and you'd better hide it if it isn't" (p. 21).

In a longitudinal-multimethod study of implicit theories of emotion, Tamir et al. (2007) connected college students' views of emotion as malleable or fixed to their later adjustment. College students who began their freshman year with an entity theory about emotion regulation had lower self-efficacy for emotion regulation, used fewer cognitive reappraisal techniques, and had fewer positive emotional experiences throughout their first term compared to incremental theorists. Over time, entity

theorists received less social support, and their emotional and social adjustment suffered.

There are similarities between teacher burnout research findings and results that Dweck has found regarding learned helplessness, a defeated motivational pattern in which people give up easily when met with difficulty, have low efficacy for accomplishing tasks, and exhibit little help-seeking (Henderson & Dweck, 1990). Learned helplessness is characterized by goals to demonstrate or prove ability, which tends to be seen as fixed, and which is also considered to be low. In achievement situations over time, it is concluded either that appropriate effort cannot be executed in order to achieve success, or that such effort, once executed, will not pay off. Thus eventually people refrain from trying altogether, and this decision is accompanied by feelings of loss and lowered self-esteem.

Researchers have also found positive adaptation and coping patterns to be related to emotion. In a study about participants' actual relationships, Kammrath and Dweck (2006) used prospective and retrospective examinations of conflict situations to assess how individuals dealt with social conflict. Even though both entity and incremental theorists experienced the same amount of conflict, when entity theorists felt strong negative emotion, they tended to become increasingly silent, refusing to discuss their experience with the person with whom they were in conflict. However, incremental theorists became more likely to voice their concerns constructively with the other person the more negative emotion they felt. These findings might be interpreted to suggest that teachers' implicit theories might affect their positive and

negative emotional patterns, which is important, especially when considering the prevalence of burnout in the teaching profession.

Implicit Theories, Efficacy, and Emotions

Is there a “most adaptive” combination of implicit theory type and efficacy in predicting teachers’ emotional process? Considering the evidence that has been presented about the positive motivational and emotional benefits of incremental theory beliefs and high efficacy, it might be reasonable to suspect that there is an added benefit of having the “best of both worlds” – both an incremental belief approach to challenges *and* high efficacy to influence students’ academic and social growth. Assuming that incremental theories and high efficacy predict positive emotionality separately as they have in previous studies, might their interaction form a magic bullet of sorts for teaching adaptively and avoiding burnout? Or would high efficacy be sufficient regardless of theory type, or an incremental theory enough regardless of efficacy to predict positive emotional and motivational patterns, as Dweck and her colleagues have suggested?

Dweck noticed that efficacy seems to serve a different function in entity versus incremental thinking. In a way, efficacy seems to matter more for entity-type motivational patterns than it does for incremental patterns. While entity theorists with high efficacy and incremental theorists in general are similar – they approach and persist through difficult tasks with enthusiasm rather than avoiding difficulty and they tend to use effective strategies for problem solving – entity theorists with *low* efficacy tend to become discouraged or anxious, and they give up when they are challenged (Dweck, 1999; Dweck & Leggett, 1988). The authors were surprised to find that

incremental theorists did not seem to be affected when their efficacy was low; they still exhibited the positive affect and effective persistence that high efficacy entity theorists had, and sometimes found even *more* enthusiasm for the more challenging tasks (Dweck & Leggett, 1988).

No known studies have examined the interaction of implicit theories and efficacy in predicting emotional outcomes for teaching, but several studies have demonstrated that the basic constructs are connected. As discussed earlier, differences in implicit theories predicted emotional and social outcomes in college students in Tamir et al.'s (2007) longitudinal study; specifically, incremental theories correlated positively with higher efficacy over time. The relevance for this connection in teaching has been discussed by researchers: "Teachers' beliefs regarding ability (malleable vs. fixed) ... and their own efficacy to teach (Ashton & Webb, 1986; Midgley et al., 1989) should affect the teaching practices used, which, in turn, create a climate that focuses children's attention on either improving or demonstrating competence, or avoiding demonstration of incompetence" (Urda & Turner, 2005, p. 307). As demonstrated in previous studies (McPherson et al., 2003) teachers' emotional reactions and experiences have an impact on their teaching practices and the classroom climate that Urda and Turner referenced.

Although studies that link teachers' implicit theories about student ability to constructs like efficacy or emotion are rare, some studies have examined these relations. In a study about the transition to junior high school, Midgley, Feldlaufer, and Eccles (1988) found moderate relations between teachers' beliefs about student ability, the amount of control teachers exercised over students' activities, and their

efficacy such that fixed ability beliefs were associated with being more controlling and feeling less efficacious. Looney (2003) also found teacher efficacy to be correlated with teachers' beliefs about student ability, such that higher efficacy was related to incremental versus entity beliefs. Studies of other adult professionals have found similar results. In an experiment by Taberner and Wood (1999), managers-in-training who possessed an incremental theory developed higher self-efficacy and more satisfaction during a management simulation, and their managerial performance was superior to that of entity theorists. These results show basic evidence that, across professions, incremental beliefs and efficacy show a positive relation to one another, and that they predict positive emotional and behavioral outcomes.

Other studies have emphasized the connection between teacher efficacy and constructs that are relevant to implicit theories, including mastery-oriented classroom structure and openness to improvements in student behaviors. High efficacy K-12 teachers in Wolters and Daugherty's (2007) study tended to emphasize a mastery (i.e., incrementally-based) structure in their classrooms more than a performance (i.e., entity-based) structure; compared to lower efficacy teachers; these teachers emphasized learning and improvement at each student's current level rather than competition and social comparison. Dweck has noted that a mastery approach to learning is associated with incremental theories, and tends to keep students focused and effective (Dweck, 1999). Supporting this, high efficacy teachers have also been found to notice changes in students' behavior more frequently than low efficacy teachers, who tend to focus more on a single characteristic or trait (Tournaki & Podell, 2005). These findings provide more support for the connection between

higher efficacy and incremental theories, both of which are associated with positive emotional outcomes.

Other findings suggest that the connection between implicit theory-relevant beliefs, efficacy, and affective outcomes might be more complex. In a study of various adult professionals that included educators undergoing an inter-rater calibration training common in management contexts, Dierdorff, Surface, and Brown (2010) examined motivational correlates of three types of goal orientations: learning goals (LGO), prove performance goals (PPGO), and avoid performance goals (APGO). The authors explained that learning goals are characterized by a mastery approach to understanding new material and learning new skills, and that performance goals are characterized by a desire to prove one's ability or avoid demonstrating failure, which is interpreted as evidence of a lack of aptitude. The authors also noted that learning goals bear similarities to incremental theories while performance goals bear similarities to entity theories (Dierdorff et al., 2010). In the study, goal types and efficacy to learn the required material were used as predictors of cognitive (concept memory test), behavioral/skill (trainee-trainer rating matches), and affective outcomes (confidence to perform the skills learned during training).

The results of this study were mixed. Learning goals - in which learners were interested in self-improvement – predicted confidence and trainee-trainer agreement, but not the concept memory task score. They also predicted transfer in the form of passing a subsequent exam that qualified raters in the field. In a preliminary analysis, participants with learning goal orientations were more likely to attempt the voluntary qualification exam. Prove performance goals predicted trainee-trainer agreement and

memory task score but did not predict confidence or passing the qualification exam. Avoid performance goals negatively predicted rater agreement and memory task scores but did not predict confidence; avoid goals also negatively predicted transfer. Thus, most of the results corresponded to the authors' predictions in that learning goals predicted positive affect, rater agreement, and transfer; prove performance goals – thought to be more adaptive than avoid goals – also predicted learning outcomes positively; and avoid goals were least predictive of adaptive outcomes. Neither performance goal type predicted affective outcomes, however; it surprised the authors that even prove performance goals were unassociated with confidence. They explained this outcome by noting the link between performance goals and entity thinking. The authors stated that individuals high in PPGO might believe that ability is unchangeable, making them “less likely to experience increases in their confidence to accomplish the trained task (i.e., task-specific self-efficacy)” (Dierdorff et al., 2010, p. 1187).

In this same study, high and low efficacy also interacted with goal types in some cases. For rater agreement and memory task outcomes, avoid performance goals were a strong negative predictor when efficacy was low. Additionally, for confidence outcomes, there was a positive effect of prove performance goal orientation when efficacy was low, but no impact of PPGO when efficacy was high. Finally, there was also an interesting interaction for qualification exam transfer outcomes: participants with a PPGO and low efficacy had the *least* likelihood of passing the qualification exam, while participants with a PPGO and high efficacy had the *most* likelihood of passing the exam out of all participants.

In summary, although goal orientations are a different construct from implicit theories, the commonalities justify further exploration of the implicit-efficacy contribution beyond the individual constructs alone. The study illustrates the sometimes complex relations between goals based on beliefs about attribute malleability and their cognitive and affective outcomes. For instance, when examining the interaction between goal orientations and efficacy, there is evidence that the combination of performance goals - based on entity thinking - and low efficacy might be especially deleterious for certain kinds of achievement outcomes, *but*, when efficacy is low, a prove performance goal orientation might actually be associated with *improved* confidence. More research in this area is justified for clarifying these relations.

Further studies illustrate the complexities involved in the connection between efficacy and emotional outcomes based on the type of student behaviors that teachers encounter. Liljequist and Renk's (2007) analysis of teachers' self-related beliefs in the attribution process yielded results that were not predicted by the theory. Specifically, teachers' efficacy predicted the relationship between attributions and distress based on the type of problem behavior. The higher teachers' personal and general efficacy for teaching (the belief that teachers and the larger academic context could improve students' learning or behavior), the higher their attributions of students' control over their externalizing problem behavior, and the more likely they were to be distressed by internalizing but *not* externalizing problem behavior (Liljequist & Renk, 2007).

Thus, the more problematic of the two types of problem behavior as assessed by most teachers – externalizing behavior – failed to yield a negative emotional response in teachers with higher personal efficacy. Instead, these teachers appeared to have become more concerned with the children with internalizing problems, for whom they generally had more compassion. This particular finding could have many explanations, however, and thus deserves more exploration; for instance, more efficacious teachers might feel more comfortable addressing externalizing behavior, thus giving them more opportunity to focus on other student behaviors such as their students' shyness or anxiety. Although the current study does not examine the relation between teachers' efficacy and specific types of problem student behavior that can lead to teacher distress, it does examine the motivational process connecting teachers' efficacy to their emotions, and it uses teachers' implicit theories as factors that could help explain that process.

There are no known studies relating both implicit theories and efficacy to burnout. However, Fives et al. (2006) examined teacher training programs for elementary and secondary school teachers in order to relate dimensions of efficacy and burnout. Before training, two efficacy types in particular, efficacy for instructional practices and for classroom management, predicted both teachers' sense of personal accomplishment and their depersonalization of students (negatively in the case of the latter dimension). The authors noticed in particular that while student teaching was stressful to participants, depersonalization of students tended to lower across both elementary and secondary teachers. This effect appeared stronger for elementary trainees, whose depersonalization scores began higher and ended lower

than secondary trainees' scores. The authors also found that the student teachers with higher efficacy at the end of the study showed lower burnout symptoms across all three indices.

While burnout was not included in Ashton's (1985) study of middle and high school teachers specifically, correlations did associate higher teaching efficacy with supportiveness and acceptance toward students, and even tolerance of student disagreement. Higher personal efficacy was also associated with encouragement and attention paid to all students, which created a responsive learning environment. These beneficial characteristics tend to be lost when teachers suffer from burnout (e.g., teachers are less able to understand how students feel, deal with their problems, and create a relaxed atmosphere for them; Maslach, Jackson, & Schwab, 1986). Ashton also emphasized the importance of specificity in the measurement of efficacy and suggested a relationship between efficacy and teachers' attributions but did not expand upon this statement.

Finally, evidence has also shown that teachers in stressful working conditions are more likely to suffer burnout and its consequences like attrition and depression (Chang, 2009; Gold, 1984). One study examined the connection between stress and efficacy in elementary school teachers' interactions with their students. Yoon (2002) found that elementary teachers' reports of stress caused by behaviorally challenging students and teachers' thoughts about leaving the profession predicted the number of students with which elementary school teachers reported having difficult relationships, but efficacy was not predictive. Also, there was no relationship between stress and positive student relationships in this study, suggesting that the association

between stress and positive teacher-student relationships might be qualitatively different the association between stress and negative relationships. There is also evidence of a connection between stress and burnout in which efficacy is an important contributor, however. In a study of teachers' implementation of a new curriculum, Ransford (2007) noted that efficacy provided a buffer between burnout and low quality of implementation such that higher efficacy increased implementation quality even when teachers experienced burnout. Guskey (1982) called for the continued and urgent exploration of the connection between long-term effects of stress and efficacy, stating that teachers with low efficacy might become debilitated by stress, leading to reduced effectiveness in their interactions with their students.

Maybe because Dweck did not study as many adults, she did not present evidence of burnout, per se, but she did see a similar helpless pattern in younger children and adults that could characterize similar symptoms as burnout and have similar cognitive predictors. Even though the tasks that participants completed were brief, some entity theorist children became sad and distressed when they did not perform well, believing that they were not good enough to solve the problem (Dweck & Leggett, 1988). Molden and Dweck (2006) have also noted the connection between entity theories and long-term negative outcomes in social interactions in college students, including lower performance and isolation due to negative social perceptions.

For these reasons, a different way of understanding teachers' emotions and cognitions is found in Dweck's (1999) approach to implicit theories as beliefs about fundamental attributes, which might underlie how teachers approach student

achievement and social interactions. Dweck's framework differs from other appraisal theories by allowing participants to define the stability of attributes themselves, and she has noted how experiences – like being told how smart you are as a young child - can influence these definitions. Dweck proposed that implicit theories about characteristics like ability and intelligence impact many aspects of educational contexts, including the emotions associated with achievement and failure. Therefore, these beliefs should be informative in research about teachers' emotions and related cognitions.

Developmental and Other Demographic Considerations

There are several developmental and demographic issues that might impact the study of teachers' beliefs and motivational experiences. Included in these are the age groups taught by teachers, and teachers' gender and nationality. Teachers of older students might think differently about the students that they teach compared to teachers of younger students. For instance, teachers of high school students might be likely to think that their students' learning patterns – good or bad - are more stabilized than those of younger students; if entity theories are more common in high school teachers, the importance of high efficacy might be especially important for teachers with entity beliefs in order to serve as a buffer against maladaptive teaching practices and interactions with students when students are not performing well. Supporting this, in Guskey's (1982) comparison of elementary and secondary teachers' efficacy, the author noted that teacher efficacy was associated positively with attributions of effort (which is particularly valued in incremental thinking), and he suggested that secondary teachers expected older students to enter the classroom having established

patterns of learning; thus any negative motivational patterns in students would be more difficult to change, according to secondary teachers. Ransford's (2007) study also found that efficacy – along with administrative support – was more critical for teachers of upper grade levels in quality of curriculum implementation. The current study will focus on high school teachers in order to explore the connection between implicit theories and efficacy in predicting emotional outcomes in this population.

Gender differences have also been important in the study of implicit theories, efficacy, and emotions – particularly in the study of burnout in teaching - although results have been mixed. While gender differences were not found in teachers' efficacy in Looney's (2003) study, male teachers were found to have a more fixed view of student ability than female teachers. Inconsistent gender effects have also been found in burnout studies: while some studies have found that female teachers tend to report higher levels of emotional exhaustion, male teachers more often report depersonalization or cynicism toward students (Chang, 2009; Gold, 1985). Ransford (2007) did not find gender differences in reports of burnout, however.

Differences in reports of burnout have also been reported across nationalities. Kokkinos et al. (2005) found that Greek teachers scored moderately in symptoms of physical and mental exhaustion similarly to standardized samples in the U.S., although they did not display the negative symptoms of depersonalization and diminished personal accomplishment common to U.S. samples. This finding illustrates that, as with other outcomes, teachers might not score similarly across all of the dimensions or all populations, and differences in scoring patterns could predict

coping differences. Population differences might highlight contextual dissimilarities in teaching and academic conditions.

It is also important to note developmental differences between the samples used to establish Dweck's framework and the adult samples of interest for the current study. There are two important differences between these samples: the first difference concerns their age groups in that Dweck and her colleagues' studies examined children and young adults' beliefs, whereas the current study examines the beliefs of adults who are often well-established in their careers. Beyond age, the second difference involves the status of students, or those who are taught or guided, versus the status of teachers, or those who manage or lead others.

Regarding the age difference in the samples, students in Dweck's first studies tended to be in late elementary school (e.g., Dweck & Leggett, 1988), and their goals were usually to accomplish tasks with explicit goals and outcomes. Some tasks were easier while others were designed to be more difficult such that students were not expected to complete them. In other studies, Dweck and her colleagues examined the beliefs and relationships of older students who were often in college, comparing their implicit beliefs to their cognitive, emotional, and social outcomes (e.g., Kammrath & Dweck, 2006).

Would the findings based on these samples normally generalize to the current population of teachers? Developmentally, the school-aged samples that Dweck and her colleagues selected for their original studies were experiencing major periods of developmental change and transition that likely affected their beliefs about the nature of fundamental abilities and characteristic behaviors, particularly their own. In school

and at home, it is likely that these students were taught actively or indirectly about their ability to change one or another type of attribute (e.g., personality, intelligence, appearance). Even by high school and college, students are still answering the questions of who they are and what they are capable of, the answers to which often also require asking whether they can change or have an impact on important outcomes and attributes (e.g., Schwartz et al., 2011).

In comparison, career-aged adults' beliefs might be expected to be relatively stable compared to those of children, adolescents, or even many college students. Adults might experience changes in their beliefs about their own or others' competence, for instance, with important, transformative experiences or unfamiliar environments, and their certainty about the qualities of attributes might be called into question in these circumstances. However, the frequency of major changes might be expected to be lower in working adults than during earlier years and school experiences. Consequently, the findings of previous implicit theory research would need to be replicated in adult samples in order to establish whether the types of thinking that are associated with entity or incremental theories are similar across working adults and younger students. For instance, given the possible differences in stability of beliefs between these groups, would adult samples yield the same proportion of entity and incremental theorists? Are there changes in theory that occur over time as people get older? Although the current study is not longitudinal and is thus unable to address change over time, it examines the composition of implicit theories in the adult teaching population, so it will help begin to address these kinds of concerns.

A second, related issue involves the status of the current sample in that teachers are in positions of authority or management, whereas students in previous studies were under others' authority. For adults who have management positions, and for teachers in particular, implicit theories of others have very specific constraints – the adults need to meet broader organizational requirements and standards of performance in a set amount of time, they need to keep the classroom or office running smoothly, and they need to maintain multiple students' or groups' productivity simultaneously. Sometimes these constraints can be stressful, and they might lead to limited emotional margin for mistakes or misbehavior. For instance, under more stressful conditions, it can be difficult to maintain some of the more adaptive ways of thinking about and interacting with people that allow them to improve over time. Additionally, as with the case of hedonic bias where people tend to take credit for successes but blame others for their failures (Weiner, 1983), teachers' theories about their own ability to change might be different, perhaps more flexible, than their theories about their students. Thus, teachers' beliefs about students should be further examined in research.

The responsibility that accompanies teaching or management can yield a very different experience from that of students or subordinates, who do not necessarily need to consider how their behavior and interactions affect the functioning of the classroom or office to the same extent. Students might be inconvenienced by one another's misbehavior, for example, but they will not necessarily consider how that misbehavior will impact learning objectives that need to be met for the day or week. How this difference in responsibility for others impacts teachers' implicit beliefs is of

interest for the current study; thus, the structure of teachers' beliefs about students, and how those beliefs relate to teachers' efficacy and emotional experiences of teaching, are examined.

Conclusion

Despite the important contributions of current findings in research on implicit theories, more research is needed in teaching contexts overall, especially to establish how teachers' implicit theories about students are related to their motivation and affect. The studies discussed in the present review show preliminary evidence that teachers hold implicit theories about different subjects, and that their theories are related to teachers' sense of efficacy and even background variables such as gender. The current study will test the tenets of the implicit theories framework in the teaching context, and it will extend the work by examining how teachers' implicit and efficacy beliefs relate to their emotional differences. Dweck has found emotion to be an important indicator in how efficacy functions differently in entity versus incremental theorists (Dweck & Leggett, 1988), and it might therefore be a valuable aspect of the teaching motivation process.

For the current discussion, these outcomes are especially important because aspects of implicit theories and the efficacy construct have similar motivational and emotional outcomes for teachers. In particular, individuals who hold entity theories and those with low efficacy are found to be more susceptible to negative emotions and experiences of burnout (Skaalvik & Skaalvik, 2007). Because teaching tends to be a profession in which strong emotions are common, there might be important consequences of teachers' beliefs for the emotional health of teachers, especially for

those whose students are not meeting educational standards, lack motivation, or misbehave in class (Fineburg, 2010).

In a discussion that parallels the implicit theories concept, Woolfolk Hoy et al. (2009) suggested that higher teacher efficacy might effect attributions of controllability both for teacher and student outcomes. The authors noted that research has not addressed this connection, but that higher efficacy teachers believe in their own potential and the potential of their students such that they both model and seek out behaviors in their students that reflect what the authors call an “agentic” approach to learning – one that is active, strategic, and effortful in addressing challenges (p. 14).

Thus, according to these authors, teachers with higher efficacy might have an inherent tendency toward incremental beliefs, or at least teaching behaviors in accordance with incremental thought patterns. The current study allows for an investigation of how high and low efficacy relate with teachers’ implicit theories, potentially providing a better understanding of how efficacy plays out for teachers according to Dweck’s (1999) framework.

A final question might be asked as to whether there is always a benefit to holding incremental theories. In the general framework of implicit theories, incremental theories always seem to “win out” over entity theories in terms of cognitive strategies, mastery goals, and adaptive emotions. Why, then, would individuals hold entity theories at all? Weiner (1985) talked about the benefit of stability, which is being able to make a prediction about what will happen in the future because current conditions will remain unchanged, whereas with instability it is

difficult to make a prediction – the future is unknown and uncertain, which is uncomfortable. Dweck (1999) and colleagues also discuss this same appeal of being certain about outcomes, even if the certainty is not necessarily that the outcome will be *good*. Dweck says that entity theories give us a sense of security in knowing the future, knowing what to expect, and having a sense of predictability. Also, because an entity theory is easy to transmit and learn in its simplicity, it is easy to pass on to others as truth. In his book *Outliers*, Malcolm Gladwell discussed the tendency for adults to base decisions about how successful children can be on arbitrary circumstances, both in educational and extracurricular contexts. He cited research demonstrating how creating certain structural contexts for students in achievement settings puts some at a disadvantage, and one of his conclusions about why such disadvantages are allowed to continue relates to why entity theories appeal to us:

Do you see the consequences of the way we have chosen to think about success? Because we so profoundly personalize success, we miss opportunities to lift others onto the top rung. We make rules that frustrate achievement. We prematurely write off people as failures. We are too much in awe of those who succeed and far too dismissive of those who fail. And, most of all, we become much too passive. We overlook just how large a role we all play – and by ‘we’ I mean society – in determining who makes it and who doesn’t (Gladwell, 2008, pp. 32-33).

In other words, entity theories allow individuals to make conclusions about concrete traits quickly – both in themselves and in others – and this quick certainty is

very appealing because it is reassuring and comfortable. However, if certainty is achieved at the expense of opportunities for development, which could happen in educational contexts, then the teacher's role could become increasingly difficult and student's likelihood of success compromised, particularly for those students who are not performing well. This is not to say that teachers with a tendency toward entity thinking will be bad teachers. They might, however, show different – perhaps less adaptive – thought patterns toward their students, which might then have important impacts on their emotional outcomes.

Measure and Design Considerations

During the previous discussions of the research that supports this study's goals, several concerns about the measurement of the constructs arose. They will be discussed in the following section. Specifically, the section will address issues in the measurement of implicit theories and efficacy.

Measuring Implicit Theories

Several theorists have noted the difficulty of designing studies of motivation and emotion that are both theoretically sound and ecologically valid (Lazarus, 1995; Weiner, 1983). Quantitative survey or vignette approaches to studying attributions and emotions tend to isolate attributional or emotion “types.” These approaches are often based on hypothetical vignettes, and tend to lack ecological validity. Experimental approaches, while using actual problem-solving approaches in academic or social settings, also tend to be very controlled such that there is difficulty in extending the conclusions beyond, for instance, solving word or math problems or

befriending a pen pal. Alternatively, whereas many quantitative studies are too narrowly focused on a few constructs, some qualitative studies are too contextually immersed to make controlled associations between environmental and personal variables or establish cause-effect relationships.

An alternative is to utilize measures based on self-reports that provide information concerning participants' subjective perceptions of these phenomena. The current study was designed to address such concerns, not only by accounting for teachers' views of the fixedness or malleability of student attributes, but also by examining the factor structure of the data with the aim of clarifying the cognitive (efficacy) and emotional (burnout) relations to implicit beliefs. In particular, the current study attempted to improve upon previous work by using analyses of the data structure to examine whether the data support a clear distinction between theory types that corresponds to implicit theories regarding student ability and behavior.

The analysis of the implicit theories data structure in the current study involved factor mixture models as a way of testing for a clear separation of theory types versus a continuum from entity to incremental beliefs. The use of mixture models allowed for an examination of both categories and dimensions in the constructs of interest. In the current study, the question was asked whether high school teachers' implicit theories should be considered as distinct categories, as designated in Dweck's framework, or whether there is a continuous structure with more overlap between entity and incremental beliefs. Researchers have used several different methods for analyzing implicit theories in previous studies, but none have examined the structure of the data in terms of whether there is a natural separation

among theory types. For example, researchers have, alternatively, measured and analyzed implicit theories as continuous despite their conceptualization as dichotomous variables, they have used cut scores to divide participants despite there likely being minimal difference between scorers who fall just above and below the cut point, and they have eliminated scores altogether that fell within a middle range (see e.g., Chiu et al., 1997; Dweck et al., 1995, Gervey et al., 1999; Hong et al., 1999).

Despite the fact that previous research has consistently imposed a categorical structure on implicit theory data in order to conform to theory without actually testing the nature of the data, Dweck (1999) has discussed the possibility of overlapping beliefs consistent with aspects of entity and incremental theories. However, the question remains to be answered whether entity and incremental theories can coexist, and what that means motivationally. Fives and Buehl (2008) interpreted their qualitative findings to indicate that – in contrast to Dweck and colleagues’ findings – implicit theories might fall on a continuum rather than existing as an entity-incremental dichotomy. Even when their participants talked about teaching as a skill that can be learned, there was also evidence of entity thinking within their discussion. As described earlier, the researchers noticed many mixed views and inconsistencies in teachers’ descriptions about whether teaching ability was a learned or inborn skill. Thus, given that teachers’ implicit theories about teaching ability seem to be somewhat complex, it is reasonable to explore the potential complexities in their theories about student ability as well. Therefore, the current study accounted for the latent, or unobserved structure of the complete data rather than forcing cut-offs in scores or analyzing only extreme values and removing middling ones. In other words,

the study examined how the expected theoretical structure compared to the latent structure of the teacher data. It explored, prior to further analyses, whether a clear distinction between entity and incremental theories was supported in the teacher sample versus a continuum from entity to incremental thinking, and whether meaningful conclusions could be made in the event that a group of unclear scores emerges, i.e., the “bunch in the middle,” whose scores have been discarded entirely in some studies.

Finally, the study considered the theoretical expectation that entity theories are related to lower efficacy and negative emotional experiences compared to incremental theories, which predict positive emotional experiences regardless of efficacy levels. Because of the lack of research on implicit theories in teaching, there was not enough known about teachers’ implicit theories to assume that previous findings connecting higher efficacy with incremental theories would play out in teachers. Additionally, Dweck’s work has demonstrated that there can be substantial differences in efficacy regardless of theory type. Therefore, the current study explored the various possibilities without an expectation that incremental theories would necessarily correlate with higher efficacy.

Measuring Efficacy

In the current study, previous research informed the selection of efficacy measures. The current study explored efficacy’s relation to implicit theories and emotion using two of three subscales of the Teachers’ Sense of Efficacy Scale (TSES/OSTES; Tschannen-Moran & Woolfolk Hoy, 2001). These two scales, efficacy for instructional strategies and classroom management, were chosen as

conceptual matches for the two implicit theory domains of interest: student academic ability and social behavior, and to predict teachers' emotional outcomes related to the domains. In Fives et al.'s (2006) study, two specific types of efficacy – efficacy for instructional strategies and classroom management – were particularly useful for predicting burnout outcomes. Ransford (2007) also found efficacy to be specific to the tasks of interest: although efficacy was an important predictor of curriculum implementation quality, the classroom management subscale was not a significant predictor. The author suggested that this kind of efficacy might “not quite equate to being more efficient in delivering lessons” (p. 60). Because of the specificity of the outcomes of interest, in the current study, only two types of efficacy were expected to relate to the two implicit theory types of interest. Specifically, efficacy for instructional strategies was expected to correspond to teachers' implicit theories about students' academic ability, and efficacy for classroom management was expected to correspond to teachers' implicit theories about students' classroom behavior. For this reason, these two types of efficacy were measured, whereas the third type, efficacy for student engagement, was not included.

Based on some definitions in several studies, there also appeared to be substantial overlap between the conceptualization of efficacy, incremental theory constructs, and even affect, highlighting the difficulty of separating motivation and emotion from one another. For example, the affective outcome variable in Dierdorff et al.'s (2010) study was measured using an efficacy scale. In particular, both efficacy and implicit theories are connected conceptually to the potential of future accomplishments. Thus, there might be a true correlation in that people with high

efficacy also tend to “think incrementally,” so that both constructs are tapping into the same underlying phenomenon (Looney, 2003). The current study examined the separate and combined contributions of implicit theories and efficacy to outcomes like emotions and burnout, as the fourth research question explored, to try to uncover any distinction. Future work, however, should explore the similarities between the efficacy construct and teachers’ implicit thoughts about their *own* ability, which was not part of this study.

Chapter 3: Methodology

The current study investigated teachers' implicit theories about student ability and social behavior, their teaching efficacy for instructional strategies and classroom management, and their emotional experiences in the classroom. Specifically, the following research questions were examined:

- 1. To what extent do high school teachers fall into unique classes that are consistent with their implicit theory beliefs about student ability and social behavior?**

This question established the structure of teachers' beliefs about students' academic and social ability. Given the dichotomous nature of the implicit theory concept in distinguishing between entity and incremental theories, this question was designed to test the current data for the presence or absence of multiple classes, which might correspond to different ways of thinking about the flexibility of students' attributes. The outcome of this question determined which analyses would be used to answer the remaining questions, whether based on analyses of latent classes or analyses of continuous factors, which indicated whether responses fell closer to the "entity" or "incremental" end of an implicit theories continuum. (see further explanation in the design and analysis section at the end of this chapter).

- 2. To what extent does teachers' efficacy for instruction and management covary with their implicit beliefs?**

Prediction: According to Dweck's previous findings, no significant relation was expected between efficacy and implicit theories such that higher and

lower efficacy were equally likely given tendencies toward incremental or entity beliefs.

3. To what extent are teachers' positive and negative emotional experiences, including burnout symptoms, predicted by teachers' implicit theories?

Prediction: Incremental theories were expected to relate significantly and positively to positive emotions (i.e., enjoyment), and negatively to negative emotions (i.e., anxiety and anger) and symptoms of burnout (i.e., emotional exhaustion, depersonalization, and low sense of personal accomplishment) such that incremental theories were predictive of adaptive emotional outcomes. Conversely, entity theories were expected to relate significantly and negatively to positive emotions and positively to negative emotions and burnout, indicating less adaptive emotional outcomes.

4. To what extent do implicit theory beliefs and efficacy explain jointly teachers' positive and negative emotional experiences, including burnout?

What does a consideration of both variables' interaction explain about teachers' emotional experiences beyond their individual contributions?

Predictions: Following previous implicit theory findings in other populations, incremental theories were expected to be related positively to positive emotions regardless of high or low efficacy. However, entity theories were expected to be related positively to positive emotions as long as efficacy scores are also high, but to be related positively to negative emotions with lower efficacy scores. In this description, "positive emotions" referred to high positive emotions (enjoyment), low negative emotions (anxiety and anger),

and low burnout symptoms (emotional exhaustion, depersonalization, and low personal accomplishment). “Negative emotions” referred to low positive emotions (enjoyment), high negative emotions (anxiety and anger), and high levels of burnout symptoms.

Participants

Sample and Sample Size

Teachers from high school districts in the mid-Atlantic region were sought for the current study via proposals presented to each district, although any in-service high school teachers were eligible for participation and some teachers responded to direct word of mouth requests from associates and colleagues.

One hundred eighty three teachers participated in the study. Over 98% of the sample was obtained from school districts in the Mid-Atlantic United States. Six teachers did not supply information about gender, and 15 did not supply their ethnicity; of the remaining sample, 121 (68%) teachers were female, and 161 (96%) were European American. Of the remaining sample, three (1.6%) teachers were African American, two (1.2%) were Native American, and one each (.6%) were Hispanic or listed themselves as Other. Due to low ethnic representativeness in the sample, ethnicity was not included in the main analyses as a control variable (see “Additional variables” section at the end of this chapter). The sample was representative of the gender and ethnic distribution in the counties from which the majority of the sample was obtained.

Procedures

Approval of the research was sought at the district level and subsequently at the school level via principals. Principals were contacted by email or phone with a proposal that explained the general purpose of the study. Principals were given the opportunity to ask questions and raise concerns about the study; for interested principals, the researcher arranged a time frame for data collection with teachers in his or her school. Prior to data collection, the principal and the researcher notified teachers about the study and encouraged their participation. Teachers were informed that participation was voluntary, their responses were not accessible by anyone except the researcher and her advisor, and there was no penalty for not participating. An incentive was provided for participation in the form of a raffle for eight \$25 prizes in the form of school supplies or cash. Informed consent was obtained for all participants prior to data collection.

Participants completed questionnaires either through pencil and paper forms or through an online survey. Participants' responses were kept confidential in a locked location that was accessible only by the researcher; information submitted online was password protected and also accessible only by the researcher. Each participant survey was anonymous so that it did not contain other identifying information, except where participants could opt in for the raffle, providing their names and email addresses.

Given that the current study used online surveys, there were a few issues to consider. Online surveys tend to have significantly lower response rates than paper and pencil surveys, but online questionnaires also have the stronger likelihood of

being completed in their entirety without missing data (Kongsved, Basnov, Holm-Christensen, & Hjollund, 2007; Nulty, 2008). Among populations where internet use is more common, response rates tend to be higher. In the current sample of teachers in which use of online grade reporting, training, and academic interaction was predominant (for instance, with parents and administrators), there was a better likelihood of obtaining a desirable internet-based response rate (for instance, response rates for internet-based surveys can range between 30% and 60%; Kongsved et al. 2007; Nulty, 2008).

Nulty (2008) recommended that the method of survey administration should be in alignment with respondents' needs, abilities, and preferences. Teachers with busy schedules might not have the time to meet in person for a paper-and-pencil survey, but they might respond to a small number of reminders as has been found in other studies; too many reminders become annoying and are not shown to be very effective (Kongsved et al., 2007, Nulty, 2008). The available results are inconclusive about a best method of collection, however, and therefore most studies recommend that researchers use multiple methods of collection that make both internet-based and paper and pencil forms available, make use of reminders (but not many), and provide sufficient time for participants to complete the surveys. Consequently, teachers in the current study were offered multiple forms of the survey as desired, and, in cases where the researcher had access to participant emails, they were reminded to participate once by the researcher or the principal.

In the current study, response rates for schools ranged from a few teachers per school to between thirty and forty-five for several schools in which principals allowed

teachers to have free time to complete the survey. Ultimately, the online format helped to access teachers who were unable to be present for data collection days, but some teachers did prefer the paper and pencil format and these were also provided.

Variables and Measures

This section describes the measures used in the current study. Scale reliabilities for each measure are listed in Table 1. Items for each measure are included in the Appendix.

Implicit Theories

Teachers' implicit theories about students' ability were measured using the six-item Theories of Intelligence scale (Dweck & Henderson, 1989 adapted in Looney, 2003). Sample items include, "How much a student learns depends more on their natural ability than my teaching strategies," and "If students are having trouble with a subject, they will probably continue to have trouble with it in the future." Teachers' implicit theories about students' social behavior were measured using an adapted version of the three-item Implicit Theories of Others' Morality (for Adults) scale. The adaptation included changing words like "others" to "students" and words like "morality" to "ability to behave appropriately," and adding three similar items to increase reliability. Sample items therefore included, "Students' ability to behave appropriately is something basic about them and they can't change it much," and "There is not much that can be done to change students' classroom behavior." For both implicit theory subscales, responses ranged from "1 – Strongly agree" to "6 – Strongly disagree."

Table 1

Sample and Original Scale Descriptions and Reliabilities

Scale	Teacher sample (α)	Original Scale Reliability (α)	Number of Items	Likert Range	Teacher Sample Mean (SD)	Orig Scale Mean (SD)
Implicit Theories						
Theories of Intelligence scale (Scale and reliability data from Looney, 2003)	.81	.83	6	1-6	3.62 (.81)	3.29 (.91)
Implicit Theories of Others' Morality (Dweck, 1999; Reliability data from Dweck, Chiu, & Hong, 1995; cites multiple studies' reliabilities)	.88 (6 items)	.85-.94	3	1-6	4.74 (.80)	3.27 - 3.78 (.95 - 1.24)
Efficacy						
Ohio State Teachers' Sense of Efficacy Scale – Instruction & Management Subscales (Short Form; Tschannen-Moran & Woolfolk, Hoy, 2001)	.74	.86 (instruct)	4	1-9	7.28 (.95)	7.3 (1.2)
	.90	.86 (mgt)	4	1-9	7.17 (1.16)	6.7 (1.2)
Emotion						
Assessment of Teacher Enjoyment, Anxiety, and Anger Related to Teaching (Frenzel, Goetz, Stephens, & Jacob, 2009)	.79 (enjoy)	.92 (enjoy)	4		3.46 (.54)	3.44 (.45)
	.71 (anger)	.89 (anger)	4	1-4	1.77 (.61)	2.03 (.56)
	.74 (anxiety)	.86 (anxiety)	4		1.52 (.53)	1.45 (.44)
Maslach Burnout Inventory – Educators Survey (Maslach, Jackson, & Leiter, 1996)	.91 (exhaust)	.90 (exhaust)	9		30.19 (11.13)	21.25 (11.01)
	.77 (deperson)	.79 (deperson)	5	0-6	10.65 (5.19)	11.00 (6.19)
	.80 (accomp)	.71 (accomp)	8		47.53 (6.11)	33.54 (6.89)

While Looney (2003) did not address the construct validity of the scale for implicit theories about student ability, there was some evidence for convergent and discriminant validity in her correlational comparisons between these beliefs and other study constructs. There was a moderate relation between the ability measure and teacher efficacy, school size, and department size, such that teachers with stronger incremental (versus entity) beliefs tended to also exhibit higher efficacy and teach in smaller schools and departments overall. Teachers' beliefs about student ability were not correlated significantly with other school contextual conditions, such as sources of efficacy information or perceptions of departmental organization, nor were they correlated with student performance or years of teaching experience. Correlations between implicit theories and contextual measures might indicate a confound between teachers' fundamental beliefs and other factors that have been shown to impact their attitudes toward teaching. Similar "fixed ability" items in Midgley, Feldlaufer, and Eccles' (1988) study of junior high and high school teachers were related inconsistently across samples to teachers' efficacy and control beliefs. In the sample of teachers who taught pre-transitioning students who were preparing for middle school, implicit theories about fixed ability were unrelated to efficacy or control. However, post-transition middle school teachers' beliefs were related to efficacy and control such that more entity-focused beliefs were associated with higher efficacy and a less-controlling approach to teaching..

The Implicit Theories of Others' Morality (for Adults) scale, was established by Dweck et al. (1995) as a separate subscale from two others, beliefs about the changeability of intelligence and of the world as a whole, using factor analyses across

five separate studies. In each study of students or young adults, theories about morality loaded consistently on a separate factor from intelligence and world theories. In multiple regression analyses, theories about morality were shown to be independent from respondents' sex, age, political affiliation, and religion, and the subscale was not confounded with self-presentation concerns such as self-monitoring or social desirability.

Dweck and colleagues' implicit theory scales were chosen for their ability to measure teachers' views about how much students can adapt their learning and social or interpersonal behavior on a fundamental level.

Teacher Efficacy

Teacher efficacy was measured using two of three subscales of Tschannen-Moran and Woolfolk Hoy's (2001) Teachers' Sense of Efficacy Scale (TSES), Short Form. The subscales for Instructional Strategies and Classroom Management included four items each, and sample items included, "To what extent can you provide an alternative explanation or example when students are confused?" and "How much can you do to control disruptive behavior in the classroom?" The response format ranged from "1 – Not much/ Not well" to "9 – A great deal." To establish construct validity, Tschannen-Moran and Woolfolk Hoy (2001) used factor analysis to find three moderately-correlated factors that distinguished the three efficacy types: student engagement, instructional practices, and classroom management. The authors noted that the factor structure was less distinct for pre-service teachers, so they recommended using the full 24-item scale for this population; the current study used only in-service teachers, however, so the short

form was justified. The three-factor structure was also replicated using principal components analysis by Looney (2003).

The TSES scale was chosen because of its focus on teachers' perceived ability to influence students' academic and social functioning, which complemented the implicit theory measures. Additionally, in accordance with previous theoretical discussions of teacher efficacy, the TSES assessed teachers' personal sense of efficacy, or how much they believe they can help students improve. This was distinguished from other measures that assessed teachers' general teaching efficacy, or their beliefs about the extent that teachers in general can help students improve. The latter measures have been debated as to whether they truly measure teachers' efficacy or some other construct such as Bandura's 1986 discussion of outcome expectancies (Tschannen-Moran & Woolfolk Hoy, 2001; Tschannen-Moran et al., 1998), and therefore were not included. The TSES was developed following extensive validity testing that stemmed from consideration of several commonly used scales (e.g., Armour et al., 1976; Gibson & Dembo, 1984).

Teacher Emotions and Burnout

Teachers' emotional experiences were measured using Frenzel et al.'s (2009) three trait measure subscales of the Assessment of Teacher Enjoyment, Anxiety, and Anger Related to Teaching scale (ATEAA; adapted from the Academic Emotions Questionnaire; Pekrun, Goetz, Titz, & Perry, 2002) and Maslach et al.'s (1996) three subscales of the Maslach Burnout Inventory – Educators Survey (MBI-ES).

Each subscale of the Assessment of Teacher Enjoyment, Anxiety, and Anger (ATEAA) scale consisted of four items; sample items included, "I often have good

reason to be happy when teaching this class,” and “I am often worried that my teaching in this class is not really going well.” Responses were Likert-type and ranged from “1 - strongly disagree” to “4 - strongly agree.” Due to the high school context, scales were adapted to fit teachers’ experiences across multiple classes rather than specific to single classes (e.g., “I often have good reason to be happy when teaching.”).

The ATEAA scale was tested by its developers for convergent and discriminant validity using correlations between the scale items and other affect, burnout (i.e., the MBI), and social desirability measures. The ATEAA correlated with other measures in some expected ways: teacher enjoyment was correlated moderately and positively with positive affectivity; anxiety and anger were correlated moderately and positively with negative affectivity, while enjoyment was correlated negatively with negative affectivity (absolute values of correlation coefficients ranged from .25 to .37). The strongest correlational relationships were found between the ATEAA scale items and teacher burnout, such that enjoyment was correlated negatively with emotional exhaustion and depersonalization, and positively with the sense of personal accomplishment subscale of the MBI. Anxiety and anger correlated negatively with sense of personal accomplishment, and positively with emotional exhaustion and depersonalization, with the exception that the relationship between anxiety and depersonalization was not significant (absolute values of significant correlation coefficients ranged from .32 to .56). According to emotion theory, positive and negative discrete emotions fall under the broader category of affect that also includes such constructs as mood and stress (Lazarus, 1999; Russell, 2003); discrete emotions

like enjoyment and anger, therefore, would be expected to share similarities with such constructs under the larger affective umbrella. Finally, the ATEAA was uncorrelated with self- or other-directed social desirability measures except that anxiety was significantly and negatively correlated with self-directed social desirability, such that higher anxiety scores correlated with very low scores on self-deceptive positivity (Paulus & Reid, 1991).

The ATEAA scale was chosen because the three positive and negative academic emotions represented major affective aspects of teachers' reported experiences (Sutton & Wheatley, 2003); moreover, these emotions would be expected to occur when teachers are in both the "development" and "judgment" patterns associated with teachers' implicit theories and efficacy (Dweck & Leggett, 1988).

The Maslach Burnout Inventory – Educators Survey (MBI-ES) also measured teachers' emotional experiences. The three subscales of the MBI-ES included Emotional Exhaustion (EE, 9 items), Depersonalization (DP, 5 items), and Personal Accomplishment (PA, 8 items). Sample items included, "I feel emotionally drained from my work," "I feel I treat some students as if they were impersonal objects," and "I feel I'm positively influencing other people's lives through my work." Scores on each item of the MBI-ES ranged from "0 – Never" to "6 – Every Day." In other studies, item scores for each subscale were added such that high, moderate, and low total scores indicated corresponding levels of burnout for the Emotional Exhaustion and Depersonalization subscales, and opposite levels of burnout for the Personal Accomplishment subscale. So for example, scores of 27 or higher for the EE subscale, 14 or higher for the DP subscale, or 30 or lower for the PA subscale would

each indicate high amounts of burnout. However, the scale manual also noted that averages in educational research were common, as with other Likert scales (Maslach, Jackson, & Leiter, 1996). The MBI-ES was chosen for the current study as an indicator of teachers' coping reactions to the emotional demands of their work.

To establish initial construct validity for the MBI, Maslach et al. (1996) used principal axis factoring and retained items with high loadings on only one factor. They then reevaluated the scale with new samples to find four factors, with three of the four fitting the inventory subscales and having acceptable eigenvalues. Maslach et al. (1997) also cited other authors who replicated the three-factor structure of the general MBI (e.g., Enzmann, Schaufeli, & Girault, 1995; Golembiewski, Scherb, & Boudreau, 1993) and the MBI-ES (e.g., Iwanicki & Schwab, 1981; Gold, 1984). While the educators survey was mainly validated in U.S. teacher samples, validity was also established in other populations. In a study of Dutch teachers, the three-factor structure was confirmed, and burnout according to the MBI-ES was distinguished from symptoms of psychological strain and somatic complaints, providing evidence of discriminant validity, although the emotional exhaustion subscale did show similarities to these other symptoms based on its factor loadings on both the MBI and, to a lesser extent, the general symptom scales (Schaufeli, Daamen, & van Mierlo, 1994). The MBI-ES was linked to other convergent measures of depression, job stress, and coping styles by other studies (Konert, 1997; Meier, 1984).

Additional Variables

A demographic questionnaire assessed additional background variables for teachers (gender, ethnicity, years teaching, grade levels taught. School principals

were asked to provide information about the school overall (number of teachers, students; class size; and department size), but only two schools participated and this information was not used. Teacher background variables have been related to teachers' beliefs and emotional experiences in previous studies, but relations have not been consistent across studies (Dweck et al., 1995; Fives & Buehl, 2008). Thus, the study included several self-reported background control variables in the analyses. As stated above, self-reported ethnicity was not used in the control analyses due to homogeneity in the sample. Thus, control variables included gender, years teaching, and grade levels taught, the last of which was categorized as whether teachers taught early grades (9th or 10th grades) or not. Dummy variable codes were created for the categorical variables such that for gender, a "0" designated males and a "1" designated females, and for early grades, a "0" designated that a teacher only taught 11th and/or 12th grades and a "1" designated that a teacher taught 9th and/or 10th grades at least (i.e., they might also have taught later grades). Years teaching was a continuous control variable and did not receive a dummy code.

Design and Analysis

The design of the current study is correlational, utilizing self-report, quantitative Likert-type scale items to measure teachers' implicit theory beliefs about students' ability and behavior, teaching efficacy, and emotional experiences related to teaching.

The analytic strategy used factor mixture modeling (FMM) to identify whether the structure of the data suggested the presence of classes based on implicit theories. One historical challenge of implicit theory research has been that theories

are defined as categorical conceptually but often measured continuously. Factor mixture analyses tested for the “best” measurement model of the data based on the number of classes and factors. In the current study, the best model was a single-class model, indicating that the data were composed of a single continuous factor with entity beliefs falling on one end and incremental beliefs falling on the other.

Thus, the current study modeled teachers’ thinking about students in a way that varied from most previous work based on Dweck’s implicit theory model. Once the first research question was answered regarding the presence of classes in the data, all subsequent comparisons were made between implicit theories and teachers’ efficacy and emotional experiences using structural equation models (SEM).

In this last section, the research questions are accompanied by a brief description of the analytic strategy that addresses the questions most adequately.

1. To what extent do high school teachers fall into unique classes that are consistent with their implicit theory beliefs about student ability and social behavior?

A one-factor mixture model with one and two classes was tested for fit with the data. If the two-class solution had acceptable fit, then the meaning of the classes would be interpreted with the expectation that the differences reflected separation between classes based on implicit theory beliefs (i.e., latent factors for entity and incremental theorists based on their beliefs about student ability and social behavior). However, the structure of the data suggested a single class, and subsequent analyses used scores on implicit beliefs about student ability and implicit beliefs about student

social behavior as latent factors, as determined by theory, and compared their relations to the other variables discussed in research questions two through four.

Structural models were specified for all remaining analyses based on the domain specificity of the types of implicit theories. Therefore, in each full structural equation model, one factor modeled implicit theory type, either for beliefs about students' ability or for beliefs about students' behavior, and one corresponding factor modeled efficacy type, either for instructional strategies or for classroom management. Additionally, in each model, a single outcome emotion factor was specified. Factors for implicit theories are labeled F1, factors for efficacy are labeled F2, and factors for emotions are labeled F3 in the remaining discussion.

2. To what extent does teachers' efficacy for instruction and management covary with their implicit beliefs?

The bidirectional path between the factor for implicit belief (F1) and the factor for efficacy (F2) was examined for significant correlation in each full structural equation model. The factor models disattenuated error variance better than correlational analyses, and thus the joint relations could be compared in their prediction of the emotion outcomes in research question four.

3. To what extent are teachers' positive and negative emotional experiences, including burnout symptoms, predicted by teachers' implicit theories?

For this research question, a reduced series of SEMs was specified to examine only the path from implicit theory (F1) to emotion (F3), and the results of the well-fitting models were compared to the results of the full SEMs that included efficacy

(F2). In each model, the latent unidirectional paths were examined from the implicit theory factors to each positive and negative emotion variable, including burnout.

4. To what extent do implicit theory beliefs and efficacy explain jointly teachers' positive and negative emotional experiences, including burnout? What does a consideration of both variables' interaction explain about teachers' emotional experiences beyond their individual contributions?

To answer this question, the full SEMs with all three variables tested the individual paths of implicit theories (F1) and efficacy (F2) in predicting the emotion outcomes (F3); subsequently, an interaction term of implicit theory beliefs by efficacy was included in a latent variable interaction model to examine any multiplicative effects on teachers' emotional experiences.

Chapter 4: Results

This study investigated teachers' implicit theories about student ability and social behavior, their teaching efficacy for instructional strategies and classroom management, and their emotional experiences in the classroom. Results are presented for the following research questions:

1. To what extent do high school teachers' beliefs fall into unique classes that are consistent with their implicit theory beliefs about student ability and social behavior?
2. To what extent does teachers' efficacy for instruction and management covary with their implicit beliefs?
3. To what extent are teachers' positive and negative emotional experiences, including burnout symptoms, predicted by teachers' implicit theories?
4. To what extent do implicit theory beliefs and efficacy explain jointly teachers' positive and negative emotional experiences, including burnout? What does a consideration of both variables' interaction explain about teachers' emotional experiences beyond their individual contributions?

The current chapter is structured as follows: 1) a discussion of preliminary analyses includes coverage of missing data, tests of assumptions and diagnostics, and descriptive statistics; 2) the primary SEM analyses of interest are explained according to the research questions; and 3) supplemental discussion follows, which includes a consideration of power.

Preliminary Analyses

Missing Data

Missing data can be systematic, having patterns that are important for analyzing the data because they can either be systematic, inflating or underestimating the relations between the variables of interest, or non-systematic, having no identifiable patterns that do not affect the relations between variables. There are several types of missingness: Missing completely at random (MCAR), missing at random (MAR), missing not at random (MNAR), the last of which is the most problematic because it means that there is a discernible and unignorable pattern or reason why participants did not respond to particular measures, and this violates the assumptions of most data analysis procedures (Brown, 2006; Peugh & Enders, 2004). Conversely, many techniques are robust to minor violations such that data that is missing at random is acceptable. Most missing data patterns do not meet the requirements of missing completely at random (Brown, 2006). However, there is no statistical test for distinguishing between missing at random and MNAR patterns. One option is to examine the data visually for consistent patterns of missingness.

Upon examination of the data, two teachers did not complete the survey and thus had data missing at the end of the survey. Other teachers missed one or two questions throughout the survey, with tendencies to miss questions later in the survey. The skipping of random items might have been due to the presentation of multiple questions on a single page, up to 22 questions in the online format which the majority of teachers completed. Teachers were not required to complete all items on a page in order to advance to the next sections of the survey. Therefore, they were not informed

when items were skipped unintentionally. Other teachers appeared to choose not to include demographic information such as gender, ethnicity, or years that they have taught, all of which were freeform responses. The “ethnicity” variable was the least-responded-to variable, with 15 responses missing, which could suggest that the data were not missing at random if the missingness was related to the variable being measured (e.g., if underrepresented groups were more likely than majority ethnic groups to omit this response, then the majority representation could be inflated). However, had all responses to this variable been provided, the sample would still have lacked sufficient representativeness of non-majority ethnic groups. Therefore, this variable was not included in the analyses. Otherwise, there was no discernible pattern to missing responses and thus missingness was not determined to be related to the nature of the variable; variables with any other missing data were assumed to have at least MAR status. In factor analyses, Mplus uses the full information maximum likelihood (FIML) estimation method for missing data (Muthén & Muthén, 2010). Use of the FIML estimator accounts for missing data by determining the likelihood for each case using only the variables for which that case has data. An exception of this occurs with the observed covariates, which are not allowed to be missing. Of these, there were 10 teachers who had data missing on the demographic responses that were used as covariates, and these cases were excluded from the analyses involving the controls (i.e., n for these analyses was 173 rather than 183). Otherwise, all cases with missing data were included in the analyses.

Tests of Assumptions and Diagnostics

The presence of non-normality and outliers in data can cause unreliability in several ways. Non-normally distributed data patterns such as skewness and kurtosis can cause standard errors (SE) and chi-square values to be unreliable, thus affecting the tests of model and path significance. Based upon visual analysis of histogram plots, the data in the current sample were normally distributed with some observed skewness. Implicit theory and efficacy variables were not as skewed as variables reflecting positive and negative emotional experiences. In the emotion variables, however, there was a tendency toward a positive skew for negative experiences (i.e., teachers reported lower frequencies of experiences of anger, anxiety, emotional exhaustion, and depersonalization) and a negative skew for positive experiences (i.e., teachers reported higher frequencies of experiences of enjoyment and personal accomplishment).

One variable, Depersonalization, was highly kurtotic, having a narrow, tall distribution, which indicated that the responses were piling around a single response with fewer responses spread about the mean.

Muthen (2011) recommended an alternative to the traditional corrections for skewness and kurtosis common in assessments of normality because more recent data estimation methods are robust to the effects of non-normality so that such corrections are not necessary. For instance, due to the robustness to non-normality in current maximum likelihood estimation methods in Mplus, he recommended that models be specified using both ML (maximum likelihood) and MLR (maximum likelihood – robust) and comparing the standard errors and chi-square values. Inspection of these

values in the current data revealed that the standard errors and chi-square values did vary slightly across the two estimation methods, and therefore the results of the MLR estimator, which is robust to non-normality, are described for each model.

Descriptive Analyses

Means and standard deviations are presented in Tables 1 and 2. The means and standard deviations in the current sample were comparable with findings for similar variables in previous studies. However, there was a slightly higher mean for the current study's emotional exhaustion and personal accomplishment variables than for the previous reported original MBI scale indicators for teachers. For control variables, mean differences were assessed using t-tests for gender and for grades taught in terms of whether teachers taught early secondary grades. The latter variable was assessed in order to account for any difference in thinking regarding younger high school students (in 9th or 10th grades) and older students, whose ability and behavior might be thought of as more stable than younger students.

T-tests were not significant for the majority of mean differences for gender or for any variables for grades taught, with one exception for the implicit theories variables. In the gender t-test for implicit theories about ability, women ($M = 3.74$, $SD = .777$, $N = 120$) had higher mean scores than did men ($M = 3.39$, $SD = .823$, $N = 56$), $t(174) = -2.713$, $p = 0.007$, $d = 0.44$. In the gender t-test for implicit theories about behavior, women ($M = 4.85$, $SD = .769$, $N = 119$) also had higher mean scores than did men ($M = 4.57$, $SD = .819$, $N = 55$), $t(172) = -2.203$, $p = 0.029$, $d = 0.35$. This indicated that women had a small to moderate mean tendency toward incremental thinking versus entity thinking compared to men, using the general rule that Cohen's

d values of 0.2 are considered to be small effects, while values of 0.5 are considered to be medium (Cohen, 1992).

Pearson correlations among variables of interest in the main analyses are presented in Table 2. The number of years that participants had been teaching correlated significantly and positively with enjoyment of teaching and negatively with anger such that teachers who had taught longer reported more frequent enjoyment and less frequent experiences of anger than teachers who taught for fewer years. Among the other main variables, almost all correlations were significant with modest to moderate magnitudes in expected directions (between $|0.20|$ and $|0.50|$ with a few values above and below). For instance, correlations were positive among mutually positive experiences such as enjoyment and sense of personal accomplishment or mutually negative experiences such as anger and emotional exhaustion, and correlations were negative among combined negative and positive experiences – such as efficacy for instructional strategies and depersonalization. Theories about ability and behavior were measured on a continuum from tendencies toward entity beliefs on the low end and tendencies toward incremental beliefs on the high end (i.e., strong disagreement with entity-like statements); these were correlated positively with both types of efficacy, enjoyment, and personal accomplishment, and negatively correlated with anger, anxiety, emotional exhaustion, and depersonalization. However, there were two exceptions: the variable for theories about student ability did not correlate significantly with anxiety, and efficacy for instructional strategies also did not reach a significant relation with emotional exhaustion. The strongest correlations, with $r > 0.50$, occurred between the two types of implicit theories such that, for instance,

Table 2

Correlations, Means, and Standard Deviations

<i>Variables</i>	1	2	3	4	5	6	7	8	9	10	11
1 <i>Years Teaching</i>	14.771 (10.705)										
2 <i>Theories About Student Ability</i>	-0.147	3.618 (0.811)									
3 <i>Theories About Student Behavior</i>	-0.019	.581**	4.744 (0.795)								
4 <i>Efficacy for Instructional Strategies</i>	0.091	.167*	.325**	7.276 (0.950)							
5 <i>Efficacy for Classroom Management</i>	-0.072	.262**	.486**	.622**	7.166 (1.163)						
6 <i>Enjoyment</i>	.150*	.209**	.296**	.411**	.300**	3.461 (0.540)					
7 <i>Anger</i>	-.152*	-.226**	-.249**	-.239**	-.288**	-.499**	1.767 (0.609)				
8 <i>Anxiety</i>	-0.139	-0.114	-.191*	-.200**	-.308**	-.422**	.396**	1.518 (0.529)			
9 <i>Emotional Exhaustion</i>	-0.098	-.290**	-.293**	-0.122	-.264**	-.388**	.501**	.368**	3.354 (1.237)		
10 <i>Depersonalization</i>	-0.142	-.279**	-.342**	-.156*	-.282**	-.471**	.504**	.304**	.545**	2.130 (1.039)	
11 <i>Personal Accomplishment</i>	0.122	.207**	.300**	.439**	.427**	.599**	-.472**	-.462**	-.336**	-.400**	5.95 (0.762)

Note: * $p < .05$; ** $p < .01$. n ranged from 167 to 181 per correlation. Means (SDs) along diagonal.

responses indicating incremental beliefs about ability were associated with similar incremental responses about student behavior. Correlations above 0.50 also occurred between the two types of efficacy, between the two positive emotion outcomes of enjoyment and sense of personal accomplishment, and among three of the negative emotion outcomes: anger, emotional exhaustion, and depersonalization.

Main Analyses

This section presents the results of the analyses that addressed the four research questions of interest. Each question is listed with its rationale and expected variable relations based on theory. All of the main analyses were performed with a robust maximum likelihood estimator (an estimator that is robust to non-normality) using Mplus version 6.12 (Muthén & Muthén, 2010).

1. To what extent do high school teachers fall into unique classes that are consistent with their implicit theory beliefs about student ability and social behavior?

This question established the structure of teachers' beliefs about students' academic and social ability. Given the dichotomous nature of the implicit theory concept in distinguishing between entity and incremental theories, this question was designed to test the current data for the presence or absence of multiple classes, which might correspond to different ways of thinking about the flexibility of students' attributes. The outcome of this question determined which analyses would be used to answer the remaining questions, whether based on analyses of latent classes or analyses of continuous factors, which indicated whether responses fell closer to the "entity" or "incremental" end of an implicit theories continuum.

To address the first question, a one-factor confirmatory mixture model (FMM) with two classes was specified with the goal of modeling the theoretical distinction between entity and incremental beliefs while allowing for some difference in magnitude. This kind of mixture model incorporates aspects of confirmatory factor analyses in that the data are modeled at the latent level and allow for variation along a factor continuum, but the population from which the data were drawn can be thought to have two or more theoretical (unobserved) groups that therefore have different factor means. This is called population heterogeneity (Lubke & Muthén, 2005), and was the interest of the current study. FMM assumes measurement invariance, or that parameters other than factor means do not vary across classes. Other parameters that could potentially vary across subpopulations include factor loadings, intercepts, and residual variances; however, if these vary, the observed measures risk measuring different constructs in each different group. In Mplus, all other parameters are constrained to be equal across groups so that measurement invariance is maintained. An additional assumption is that the observed continuous variables are multivariate normally distributed. In order to account for non-normality in the data, Mplus also uses a robust maximum likelihood estimator for this analysis.

Essentially, the FMM analyses imposed class distributions on the data and tested whether two models that differed by one class provided better or worse fit (or “badness of fit”) to the data. The Vuong-Lo-Mendel-Rubin likelihood ratio test and the Lo-Mendel-Rubin adjusted LRT are two methods used by Mplus of comparing two models, and each produces a fit statistic for a significant improvement of the current model over a model with one fewer class. The current models were assessed

for the probability that a two-class representation of the implicit theories factor was a better representation of the hypothesized true model than a single-class representation. If so, the classes would be interpreted with the expectation that one would represent entity theorists and the other would represent incremental theorists. However, both tests were non-significant for the presence of two classes versus a single class (see Table 3), indicating that high school teachers' beliefs about students' ability and behavior appear to be distributed within a single grouping. Thus, the categorical distinction between entity theories and incremental theories as discussed in the literature was not supported; the two theories would need to be addressed as a continuous factor with entity theories on one end of the continuum and incremental theories on the other end.

Table 3

Factor Mixture Model Information for Ability and Behavior Theories

Theory Model	Loglikelihood	AIC	Vuong-Lo-Mendel-Rubin LRT (p-value)	Lo-Mendel-Rubin Adjusted LRT (p-value)
<i>Academic Ability</i>	-1504.091	3048.182	0.5354 (ns)	0.5526 (ns)
<i>Classroom Behavior</i>	-1229.528	2499.057	0.4815 (ns)	0.5081 (ns)

Specification of Structural Equation Models for Remaining Questions

Consequently, to address all research questions, a series of structural equation models (SEM) was specified. The SEM and previous FMM approaches were chosen for several reasons. First, they offer more statistical power to detect effects because they disattenuate error from the estimates. Second, they provide an estimate of the

relation between variables at the construct (i.e., latent) level rather than the measured level; this gives a better sense of the magnitude of the relation in the population and is the reason why standardized estimates serve as a type of effect size. Despite the advantages, though, there are also costs to using latent models versus measured models in that factor models tend to require larger sample sizes; insufficient sample sizes risk lacking power to detect smaller effects. Finally, simpler measured analyses might tend to reveal the same conclusions as latent ones, with more parsimony. In the current study, however, the sample size was deemed moderate enough to justify the latent approach and considerations of power are discussed following the findings.

Each model consisted of a factor for implicit theory about ability or behavior (designated as F1), a factor for one type of efficacy (F2), and a factor for a single emotion outcome (F3, see Figure 2 for path models). There were six emotion factors, which were comprised of three discrete emotions - enjoyment, anger, and anxiety – and three emotional categories associated with burnout – emotional exhaustion, depersonalization, and (lack of) personal accomplishment. Thus for each of the six emotion factors, two series of models were specified. One model series, the “ability-instruction” model, included the combination of implicit theory for *academic ability* and efficacy for *instructional strategies*, and the other model series, the “behavior-management” model, included implicit theory for *classroom behavior* and efficacy for *classroom management*. This combination yielded twelve models – six “ability-instruction” models and six “behavior-management” models (see Tables 4 and 6).

In order to address research question three, a series of reduced SEMs was also run that excluded the efficacy (F2) variable in order to establish a connection between

implicit theory (F1) and emotions (F3; see Tables 5 and 7). The outcomes of both the reduced SEMs and the full model SEMs are discussed in the research question three section. A final analysis introduced an interaction term in order to address the fourth research question.

Design and Preliminary Assessment of the Structural Models

The basic three-factor structural model was saturated, meaning that each factor was connected to each other factor; as a result, the measurement and the structural models yielded the same results. Therefore, for simplicity, only the structural model is presented, which shows the directionality of the effects specified without the measurement portion (see Figure 2). The portions not shown in the figures include the factor indicator paths, in which the first item of each scale was used as the factor marker, and the indicator error paths and variances. The factors for implicit theory type and efficacy were allowed to covary and there were no cross-loadings specified, so all indicators were congeneric, only loading on their designated factor. No error covariances or cross-loadings were allowed because there was no theoretically justifiable explanation for these relations.

Although reliability was assessed initially using Cronbach's alpha, this reliability indicator tends to be less preferred in analyses of latent variables due to its dependence on composites that do not account for error, leading potentially to overestimated or underestimated scale reliability (Brown, 2006). An alternative test of reliability that accounts for the likelihood of replicating a factor over repeated measurements is Coefficient H (Hancock & Mueller, 2001 as cited in Hancock & Mueller, 2010). This value was calculated for the basic and control full SEM models

(see Table 8), and the reliability for all factors was acceptable in that all of the values exceeded a reliability of 0.7 as recommended by Hancock and Mueller (2010). Coefficient H reliabilities were similar to but slightly higher than the Cronbach's alpha values. Compared to previous samples, there was lower consistency in general for the efficacy and discrete emotion variables, but the current values were still acceptable.

Table 4

Step 1b) Basic Structural Model Fit Indices- Emotion Variables Predicted from Both Implicit Theory and Efficacy

Predictors: Ability Theory (F1) + Efficacy for Instructional Strategies (F2)					
Emotion Variable (F3)	Chi-square (df)	RMSEA (C.I.)	CFI	SRMR	
<i>Enjoyment</i>	110.813 (74)	0.052 (0.030 0.071)	0.947	0.052	
<i>Anger</i>	106.846 (74)	0.049 (0.026 0.069)	0.947	0.053	
<i>Anxiety</i>	110.583 (74)	0.052 (0.030 0.071)	0.942	0.059	
<i>Emotional Exhaustion</i>	352.263 (149)	0.086 (0.075 0.098)	0.864	0.065	
<i>Depersonalization</i>	195.727 (87)	0.083 (0.067 0.098)	0.863	0.074	
<i>Personal Accomplishment</i>	205.700 (132)	0.055 (0.040 0.069)	0.914	0.061	
Predictors: Behavior Theory (F1) + Efficacy for Classroom Management (F2)					
<i>Enjoyment</i>	110.477 (74)	0.052 (0.030 0.071)	0.967	0.044	
<i>Anger</i>	109.670 (74)	0.051 (0.029 0.071)	0.965	0.052	
<i>Anxiety</i>	104.739 (74)	0.048 (0.024 0.068)	0.970	0.048	
<i>Emotional Exhaustion</i>	315.335 (149)	0.078 (0.066 0.090)	0.911	0.060	
<i>Depersonalization</i>	167.409 (87)	0.071 (0.055 0.087)	0.930	0.061	
<i>Personal Accomplishment</i>	205.734 (132)	0.055 (0.040 0.069)	0.941	0.051	

Note. n =183; Grayed values indicate models with poor fit.

Table 5

Step 1a) Basic Structural Model Fit Indices- Emotions Predicted from Implicit Theory Alone

Predictor: Ability Theory (F1) Alone					
Emotion Variable (F3)	Chi-square (df)	RMSEA (C.I.)	CFI	SRMR	
<i>Enjoyment</i>	44.726 (34)	0.042 (0.000 0.072)	0.977	0.041	
<i>Anger</i>	44.773 (34)	0.042 (0.000 0.072)	0.974	0.042	
<i>Anxiety</i>	51.734 (34)	0.053 (0.019 0.081)	0.959	0.057	
<i>Emotional Exhaustion</i>	253.722 (89)	0.101 (0.086 0.115)	0.872	0.067	
<i>Depersonalization</i>	112.511 (43)	0.094 (0.073 0.115)	0.880	0.067	
<i>Personal Accomplishment</i>	119.198 (76)	0.056 (0.035 0.074)	0.931	0.060	
Predictor: Behavior Theory (F1) Alone					
<i>Enjoyment</i>	62.477 (34)	0.068 (0.040 0.094)	0.953	0.041	
<i>Anger</i>	57.963 (34)	0.062 (0.033 0.089)	0.956	0.055	
<i>Anxiety</i>	59.912 (34)	0.065 (0.036 0.091)	0.954	0.047	
<i>Emotional Exhaustion</i>	246.911 (89)	0.098 (0.084 0.113)	0.883	0.064	
<i>Depersonalization</i>	108.897 (43)	0.092 (0.070 0.113)	0.903	0.066	
<i>Personal Accomplishment</i>	139.561 (76)	0.068 (0.050 0.085)	0.918	0.054	

Note. n =183; Grayed values indicate models with poor fit.

Table 6

Standardized Parameter Estimates: Emotions Predicted from Implicit Theory and Efficacy

Predictors: Ability Theory (F1) + Efficacy for Instructional Strategies (F2)				
Emotion Variable (F3)	F3 on F1	F3 on F2	F1 with F2	R²_(F3)
<i>Enjoyment</i>	--	0.501	0.227	0.309
<i>Anger</i>	--	-0.343	0.225	0.187
<i>Anxiety</i>	--	-0.274	0.227	--
<i>Emotional Exhaustion</i>	--	--	--	--
<i>Depersonalization</i>	--	--	--	--
<i>Personal Accomplishment</i>	--	0.543	0.227	0.319
Predictors: Behavior Theory (F1) + Efficacy for Classroom Management (F2)				
<i>Enjoyment</i>	--	0.271	0.484	0.150
<i>Anger</i>	--	-0.319	0.483	0.153
<i>Anxiety</i>	--	-0.326	0.484	0.120
<i>Emotional Exhaustion</i>	--	--	--	--
<i>Depersonalization</i>	--	--	--	--
<i>Personal Accomplishment</i>	--	0.439	0.484	0.239

Note. n =183; -- = model/path not significant; blank cell = value not measured. Grayed values indicate models with poor fit.

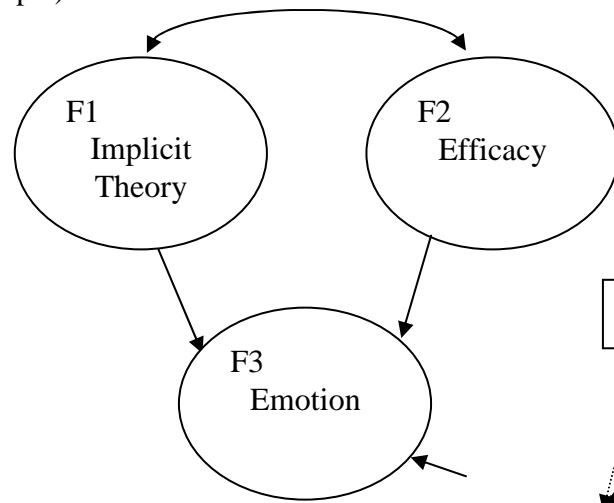
Table 7

Standardized Parameter Estimates: Emotions Predicted from Implicit Theory Alone

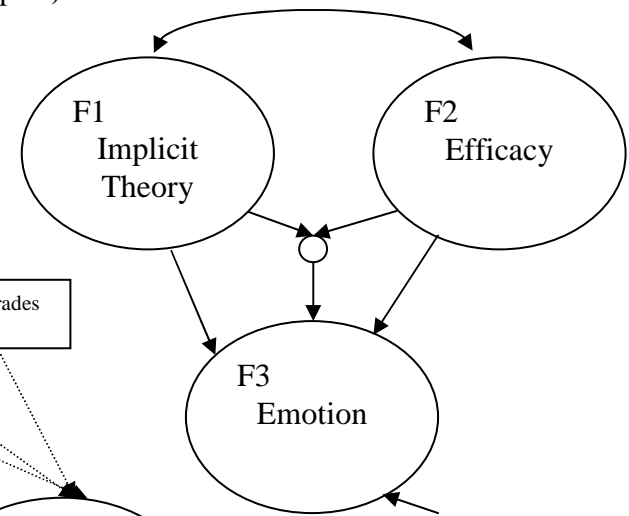
Predictor: Ability Theory (F1) Alone				
Emotion Variable (F3)	F3 on F1	F3 on F2	F1 with F2	R ² _(F3)
<i>Enjoyment</i>	0.265			--
<i>Anger</i>	-0.272			--
<i>Anxiety</i>	--			--
<i>Emotional Exhaustion</i>	--			--
<i>Depersonalization</i>	--			--
<i>Personal Accomplishment</i>	0.197			--
Predictor: Behavior Theory (F1) Alone				
<i>Enjoyment</i>	0.304			0.093
<i>Anger</i>	-0.274			--
<i>Anxiety</i>	-0.196			--
<i>Emotional Exhaustion</i>	--			--
<i>Depersonalization</i>	--			--
<i>Personal Accomplishment</i>	0.302			--

Note. n = 183; -- = model/path not significant; blank cell = value not measured. Grayed values indicate models with poor fit.

Step 1) Basic Structural Model - No Control Variables/Interaction.



Step 2a) Interaction Model –No Control Variables.



Step 2b) Control Variable Model –
Interaction Term Excluded.

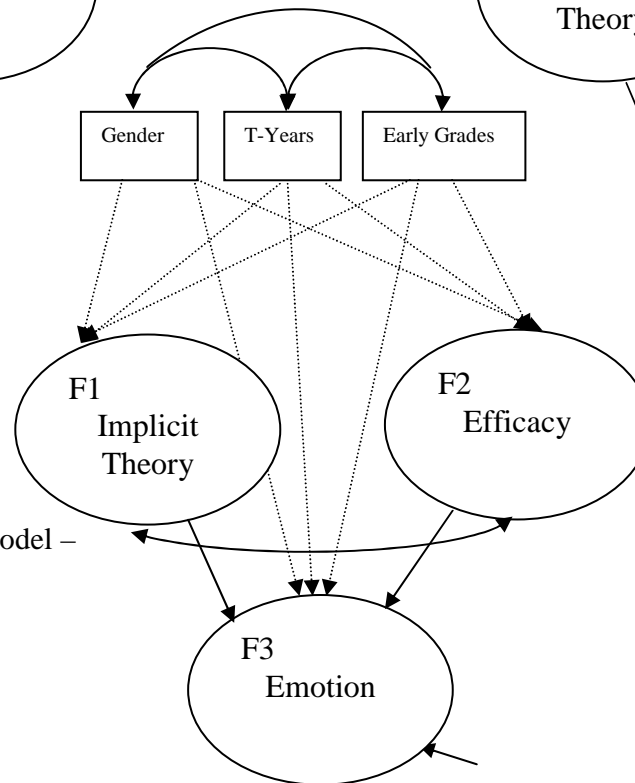


Figure 2. Full analysis structural models with no control variables or interactions (Step 1), interaction term only (Step 2a), and control variables only (Step 2b).

Table 8

Coefficient H Factor Reliabilities

<i>Emotion (F3)</i>	Model: Base			Model: Control		
	F1	F2	F3	F1	F2	F3
<i>Ability Theory (F1) and Efficacy for Instructional Strategies (F2)</i>						
<i>Enjoyment</i>	0.861	0.761	0.817	0.855	0.763	0.811
<i>Anger</i>	0.861	0.786	0.728	0.854	0.796	0.736
<i>Anxiety</i>	0.861	0.771	0.764	0.854	0.779	0.760
<i>Emotional Exhaustion</i>	0.860	0.774	0.926	0.854	0.779	0.927
<i>Depersonalization Personal Accomplishment</i>	0.861	0.772	0.900	0.855	0.777	0.902
	0.861	0.762	0.846	0.854	0.764	0.842
<i>Behavior Theory (F1) and Efficacy for Classroom Management (F2)</i>						
<i>Enjoyment</i>	0.920	0.907	0.817	0.918	0.907	0.808
<i>Anger</i>	0.920	0.908	0.725	0.918	0.907	0.734
<i>Anxiety</i>	0.920	0.907	0.762	0.918	0.906	0.756
<i>Emotional Exhaustion</i>	0.920	0.921	0.926	0.918	0.907	0.927
<i>Depersonalization Personal Accomplishment</i>	0.920	0.908	0.894	0.918	0.908	0.902
	0.920	0.907	0.849	0.918	0.907	0.845

Note: Values ≥ 0.7 are preferable

Factor validity was assessed by examining the output for 1) direction and magnitude of loadings and 2) recommendations for indicator cross-loadings. All indicators loaded in expected directions, although for some loadings the variance extracted was not above the sometimes recommended value of 0.5 (Hancock & Mueller, 2010). There were also some significant modification index recommendations for cross-loadings (above 4) in most models, suggesting some shared variance among the target factor and other factor indicators, such as between implicit theories and efficacy. Although the expectation was stated in the current study for a non-significant correlation between these two variables, previous work has shown correlations between these two types of cognitions (e.g., Looney, 2003). However, as discussed in the next section, cross-loadings were not allowed among variables.

Fit Assessment Strategy

Overall goodness of fit was assessed using a combination of fit indices as recommended by Hu and Bentler (1999). The current study used a specific combination of two out of three indices whose thresholds for acceptable data-model fit have been derived empirically, meaning that their accuracy in detecting fit has been tested and replicated across studies. The root mean square error of approximation (RMSEA) assesses models based on parsimony, penalizing models for additional parameter estimations whereas some other indices simply improve as more parameters are added; thus, parameters should be meaningful in order for the RMSEA to improve. Perfect fit values would approximate 0.00, but because obtaining this value is unlikely in studies, the recommended value for acceptable fit is at or below 0.06. Calculation of the RMSEA index also provides a confidence interval that gives a range of values; in a best-case scenario, the entire interval falls below the recommended 0.06 value, but in most cases this interval range falls above and below the cutoff, which means that the value, as with the other indices, should be interpreted cautiously. The comparative fit index (CFI) is a comparative or incremental index that assesses fit compared to a baseline model of no association between indicators. In this case, perfect fit is indicated by a value approximating 1.00, so a target value should be high, at or above 0.96. Finally, the standardized root mean square residual (SRMR) assesses the absolute fit based on the closest approximation of the observed variance/ covariance matrix. Given that a perfect, yet unrealistic, value would approximate 0.00, target values for SRMR are typically set at or below 0.09.

Specifically, model fit was considered adequate when the recommended criteria were met for the combined $CFI \geq 0.96$ and $SRMR \leq 0.09$ or $RMSEA \leq 0.06$ and $SRMR \leq 0.09$ indices. When RMSEA values were slightly above 0.06 but the lower value of the confidence interval value fell below 0.06, the model was treated as adequate if the SRMR was also acceptable. When comparing models, for instance, with the factor interaction models improvement over a previous model was assessed using Akaike Information Criteria (AIC, a parsimonious index in which smaller values indicate improved model fit) and loglikelihood values, which approximate a chi square distribution and whose difference statistic can be tested for significant improvement between models (Muthén & Muthén, 2010).

Examination of modification indices and standardized residuals was conducted to identify localized areas of poor fit (i.e., strain) either with parameters needed or extraneous parameters that could be eliminated. Although failing to specify a needed modification detracts from the interpretability of the parameter estimates (e.g., misspecification can cause the relations among other variables in the model to be inflated or underestimated), all modifications need a theoretically viable explanation in order for the final model to have a meaningful interpretation (Brown, 2006). In the current study, none of the recommended modifications were made; specifically, no additional parameters were freed by allowing for covariance between the error variances of two indicators or for loadings of indicators on factors. This decision was made because there was not a theoretically viable reason to allow the suggested connections without also needing to make other connections that would have been justifiable, either due to conceptual similarity of the overall constructs of

interest or similarity in wording of specific items. For example, in one of the ability-instruction models, a recommendation for significant model improvement was made to allow the errors to covary for the indicators, “Whether students can behave appropriately or not is deeply ingrained in their personality. It cannot be changed very much.” and “Students' classroom behavior is something that teachers can't change very much.” There was no previous work or theory that suggested that certain items should relate beyond the explanation of the included factors, nor was there a unique pattern of wording that applied only to these two items to indicate method variance; other items had similar phrasing and terminology. Therefore, model fit was assessed in the original, unmodified models.

Table 4 shows good fit for the basic models for all of the discrete emotions of enjoyment, anger, and anxiety, but unsatisfactory fit for two of the three burnout variables; for burnout variable models, personal accomplishment also had good fit, but not emotional exhaustion or depersonalization. Once adequate model fit was confirmed, the direction, magnitude, and significance of parameter estimates was assessed in order to interpret proximity to the expected theoretical relations among variables.

In the interpretation of the implicit theory portion of acceptable models in the full SEM, with respect to the first research question, all indicators loaded significantly and positively on their designated implicit theory (F1) factors. With respect to the implicit theory for student ability indicators, items two and five had the weakest loadings, and in the implicit theory for student behavior models, item six had the

weakest loadings (see Appendix A for descriptions of these items). Each loading had a standardized value above 0.4, however, so no changes were made to the scales.

Summary. Initial analyses suggested a single class to be a better fit for the data than two classes; the current data did not support the theoretical distinction between entity theories and incremental theories.

2. To what extent does teachers' efficacy for instruction and management covary with their implicit beliefs?

Prediction: According to Dweck's previous findings, no significant relation was expected between efficacy and implicit theories such that higher and lower efficacy were equally likely given tendencies toward incremental or entity beliefs.

In each of the full SEM models for ability-instruction and behavior-management, contrary to prediction, there was a significant positive relation between implicit theory (F1) and efficacy (F2; see Table 6). Greater magnitude was found in the relations for the behavior-management model versus the ability-instruction model, for which the relations were more modest. In particular, there appeared to be significant overlap for the variables for implicit theories for behavior and efficacy for classroom management with a standardized estimate of about 0.48 for each model. This indicated that for each change in implicit theory, there was close to a half standard deviation change in the same direction for efficacy. For example, as thinking about students became more incremental (versus entity-like), self-efficacy for management of students' classroom behavior became higher as well. This relation was weaker for ability-instruction with a standardized estimate of about 0.23, but the same trend was present such that teachers' incremental thinking about students'

academic ability was associated positively with their self-efficacy beliefs for adaptive and responsive academic instruction.

Summary. Counter to expectation, a tendency toward incremental thinking was associated with higher efficacy, whereas a tendency toward entity thinking was associated with lower efficacy in both ability-instruction and behavior-management model types for all emotion outcomes. Although the prediction that there would be no correlation between implicit theory and efficacy was based on previous research that found variability in efficacy given both entity and incremental theories, incremental theories and efficacy both assess the possibility for change and thus correlate positively.

3. To what extent are teachers' positive and negative emotional experiences, including burnout symptoms, predicted by teachers' implicit theories?

Prediction: Implicit theories, represented by a continuum with entity theories on the lower end and incremental theories on the higher end, were expected to relate significantly and positively to positive emotions (i.e., enjoyment), and negatively to negative emotions (i.e., anxiety and anger) and symptoms of burnout (i.e., emotional exhaustion, depersonalization, and low sense of personal accomplishment). Conversely, entity theories were expected to relate significantly and negatively to positive emotions and positively to negative emotions and burnout.

For this research question, a series of reduced SEMs was run with only implicit theory (F1) and emotion (F3) variables, excluding the efficacy (F2) variable. These models are discussed in addition to the full SEM models (with efficacy included) in this section (the reduced models are presented in Tables 5 and 7). Both

the reduced and the full SEMs fit the data well for all emotion (F3) outcomes except for emotional exhaustion and depersonalization. Consistent with prediction, the entire set of reduced, theory-only models resulted in a significant prediction of the emotion variables by both the ability and the behavior implicit theories except for the models for anxiety. Anxiety was not predicted significantly from the variable for implicit theories about ability. Absolute standardized estimates ranged from 0.196 to 0.304 ($p < 0.05$).

In the reduced models, only one model resulted in a significant R^2 for an emotion (F3) variable; the theories about behavior model that predicted enjoyment resulted in an R^2 value of 0.093 ($p < 0.05$), a very small effect. With respect to this model, teachers' enjoyment was predicted significantly and positively by theories about ability such that tendencies toward incremental thinking were associated with higher ratings of enjoyment and tendencies toward entity thinking were associated with lower enjoyment ratings.

Although implicit theories (F1) predicted emotions (F3) in all fitting models in the *reduced* SEM except for the anxiety model, in the *full* SEM, the inclusion of efficacy (F2) made the implicit theories (F1) effect non-significant, whereas efficacy (F2) now predicted emotions (F3) significantly for all fitting models. In all models, including the anxiety model for ability theory which originally resulted in a non-significant F3 prediction in the theory-only models, the absolute standardized estimates were now significant and ranged from 0.271 to 0.543 ($p < 0.05$).

All models except for the ability-instruction model predicting anxiety resulted in a significant R^2 for emotion (F3) variables. In these models, the R^2 values ranged

from 0.120 to 0.319 ($p < 0.05$). With respect to these models, the paths that tended to be the largest and result in the larger total F3 effects were in the models predicting positive emotionality. For instance, efficacy for instructional strategies predicted enjoyment and personal accomplishment significantly and positively with standardized paths over 0.500 ($p < 0.05$), and efficacy for classroom management predicted personal accomplishment significantly and positively with a standardized path over 0.400 ($p < 0.05$). However, the standardized path from efficacy for classroom management to enjoyment had the smallest value of the positive emotions.

The models for anger and anxiety that also resulted in a significant R^2 tended to have slightly smaller standardized paths that showed a negative relation to efficacy, ranging from -0.274 to -0.343 ($p < 0.05$). In these models, both efficacy for instructional strategies and efficacy for classroom management predicted negatively anger and anxiety (except that anxiety did not reach a significant R^2 effect in the efficacy for instructional strategies model). This indicated that teachers who reported higher efficacy in both categories also tended to report fewer instances of anger and anxiety.

Summary. In a set of *reduced* models that excluded efficacy, implicit theory predicted most emotion variables significantly such that tendencies toward incremental thinking were associated positively with the positive emotional experiences of enjoyment and personal accomplishment, and associated negatively with the negative experiences of anger and, less consistently, anxiety. Given that the more incremental responses were on the positive end of the implicit theory continuum, this indicated that the responses that were more incremental were

associated with higher reports of enjoyment and personal accomplishment, and lower reports of anger and anxiety overall in this reduced model.

However, analyses of the *full* models revealed that the effect of implicit theory on the emotion variables was non-significant once efficacy was included. In those models, efficacy also predicted emotional outcomes significantly and positively for the positive emotional outcomes of enjoyment and personal accomplishment and negatively for the negative emotions of anger and anxiety. Thus, although both implicit theory and efficacy showed similar relations to the outcome variables, the role of efficacy appeared to be most salient for predicting emotions, whereas implicit theory was not salient when efficacy was considered simultaneously.

4. To what extent do implicit theory beliefs and efficacy explain jointly teachers' positive and negative emotional experiences, including burnout? What does a consideration of both variables' interaction explain about teachers' emotional experiences beyond their individual contributions?

Predictions: Following previous implicit theory findings in other populations, implicit theories that were incremental were expected to be related positively to positive emotions regardless of high or low efficacy. However, entity theories were expected to be related positively to positive emotions as long as efficacy scores were also high, but to be related positively to negative emotions with lower efficacy scores. In this description, "positive emotions" referred to high positive emotions (enjoyment), low negative emotions (anxiety and anger), and low burnout symptoms (emotional exhaustion, depersonalization, and low personal accomplishment).

“Negative emotions” referred to low positive emotions (enjoyment), high negative emotions (anxiety and anger), and high levels of burnout symptoms.

A term was added to the full SEM without control variables to model the interaction between incremental theories (F1) and efficacy (F2) to create F1x F2 (See Figure 2). This term allowed for assessment of the contribution above and beyond individual contributions of the factors for implicit theory and efficacy. This joint contribution would mean that the score of the emotion outcome would vary based on whether *both* implicit theory and efficacy scores were high, low, or a combination, as pictured in Figure 1.

To assess the interaction models, the AIC value of the interaction models was compared with models whose fit had been acceptable before the interaction was introduced. Using the AIC criterion, only two interaction models showed improvement (i.e., had a lower AIC score): the ability-instruction model predicting anger and the behavior-management model predicting depersonalization (See Table 9); however, the test of model improvement of multiplying $-2 \times \log \text{likelihood}$ difference for the first model resulted in a non-significant improvement over the corresponding non-interaction model. The same lack of significant improvement was found in most of the other models except that the behavior-management model predicting depersonalization yielded significant improvement over the non-interaction model, based on the $-2 \times \log \text{likelihood}$ difference test. However, the initial fit for the non-interaction depersonalization model was poor (See Table 4); moreover, the interaction term for this model, which was of interest for addressing the current research question, was non-significant (See Table 10), meaning that there was no

Table 9

Step 2a) Model Comparisons for Interaction Added - Emotion Variables Predicted from Both Implicit Theory and Efficacy

Predictors: Ability Theory (F1) + Efficacy for Instructional Strategies (F2)							
Emotion Variable (F3)	No Interaction Term (Nested Model)			With Interaction Term (Comparison Model)			Model Improvement -2 times loglikelihood difference (w/1 df)
	Loglikelihood (H0)	AIC	Free Parameters	Loglikelihood (H0)	AIC	Free Parameters	
<i>Enjoyment</i>	-3251.112	6592.224	45	-3250.185	6592.369	46	1.854 (ns)
<i>Anger</i>	-3437.885	6965.769	45	-3436.727	6965.455	46	2.316 (ns)
<i>Anxiety</i>	-3316.431	6722.862	45	-3316.405	6724.809	46	0.052 (ns)
<i>Emotional Exhaustion</i>	-5214.134	10548.268	60	-5213.329	10548.657	61	1.61 (ns)
<i>Depersonalization</i>	-4057.478	8210.957	48	-4057.471	8212.942	49	0.014 (ns)
<i>Personal Accomplish</i>	-4662.578	9439.156	57	-4662.050	9440.100	58	1.056 (ns)
Predictors: Behavior Theory (F1) + Efficacy for Classroom Management (F2)							
<i>Enjoyment</i>	-2850.293	5790.586	45	-2850.144	5792.287	46	0.298 (ns)
<i>Anger</i>	-3028.984	6147.968	45	-3028.005	6148.010	46	1.958 (ns)
<i>Anxiety</i>	-2903.428	5896.857	45	-2903.355	5898.709	46	0.146 (ns)
<i>Emotional Exhaustion</i>	-4801.580	9723.159	60	-4801.005	9724.010	61	1.15 (ns)
<i>Depersonalization</i>	-3642.893	7381.785	48	-3639.937	7377.874	49	5.912*
<i>Personal Accomplish</i>	-4255.151	8624.301	57	-4254.631	8625.262	58	1.04 (ns)

Note. n =183

Table 10

Parameter Estimates: Depersonalization Interaction Model - Control Variables Excluded

Behavior Theory (F1) + Efficacy for Classroom Management (F2)				
Emotion Variable	F3 on F1	F3 on F2	F1 with F2	F3 on F1xF2
<i>Depersonalization (F3)</i>	-0.175	--	0.438	--

Note. n =183; Standardized estimates and R² not provided with interaction output.

meaningful additional contribution of the interaction between implicit theory and efficacy for this or any of the models. Additionally, the outcome variable depersonalization (F3) loaded significantly on the behavior theories variable (F1) and not on efficacy for classroom management (F2), which had not happened in any of the previous non-interaction models. It is unlikely that this final unexpected result is valid, however, because the model had poor fit in all previous analyses, so despite there being significant improvement for the depersonalization model, the improvement might not have resulted in acceptable fit overall.

Summary. Contrary to prediction, no interaction effect was supported in any of the analyses, indicating that the individual contributions of implicit theory (F1) and efficacy (F2) in the prediction of emotion variables (F3) were not improved upon by the additional consideration of the interaction between implicit theory and efficacy.

Relations to Control Variables

Once basic models were assessed for fit and it was established that the interaction term was non-significant, control variables (i.e., whether early grades were taught, teachers' gender and their number of years teaching) were introduced to the full SEM without interactions to measure population heterogeneity, or mean factor differences related to the control variables (Tables 11 through 14). These particular control variables were chosen for several reasons. Teachers of earlier high school grades might think differently about their students than teachers of later grades. Students in earlier high school grades are still making important adjustments academically and socially following their school transition while older students might be seen as more stable, which can affect teachers' efficacy (Guskey, 1982) Similarly,

gender differences have emerged in teacher motivation; for instance, if teachers begin to exhibit symptoms of burnout, female teachers might experience more emotional exhaustion than male teachers, while male teachers might be more cynical toward their students and thus report more effects of depersonalization. Finally, the number of years that teachers have taught is relevant in that more experienced teachers have shown different, often more adaptive, motivational and emotional responses to challenges than less experienced teachers or pre-service teachers (Fives et al., 2006, Looney, 2003; Wolters & Daugherty, 2007). Given that the variables of interest in the current study have shown correlations to these other variables, it is important to consider the potential impact that grade level, gender, and years of teaching can have on the relations between teachers' beliefs about students, their efficacy, and their emotional outcomes.

Recall that in the preliminary analyses, mean differences for men and women were found only for the implicit theories variables, and there were significant correlations between the number of years that participants had been teaching and only two emotion variables – enjoyment and anger. However, it was important to control for their relations to *all* variables in the model so that all linear relations could be accounted for simultaneously, giving a better sense of the relations among the variables of interest in the population. For the same reason, the teaching of early grades variable was also included in the full model; although there were no significant mean differences for this variable in the t-tests, the full model might have provided a better estimate of the relations among factors and control variables than the composites on which the original t-tests were based. Within the full model,

Table 11

Step 2b) Control Variable Model Without Interaction - Emotions Predicted from Implicit Theory Alone

Predictor: Ability Theory (F1) Alone

Emotion Variable (F3)	Chi-square (df)	RMSEA (C.I.)	CFI	SRMR
<i>Enjoyment</i>	85.396 (58)	0.052 (0.026 0.075)	0.941	0.047
<i>Anger</i>	92.023 (58)	0.058 (0.034 0.080)	0.922	0.051
<i>Anxiety</i>	98.896 (58)	0.064 (0.041 0.085)	0.908	0.060
<i>Emotional Exhaustion</i>	314.442 (128)	0.092 (0.079 0.105)	0.855	0.065
<i>Depersonalization</i>	152.473 (70)	0.083 (0.065 0.100)	0.864	0.065
<i>Personal Accomplishment</i>	170.751 (112)	0.055 (0.038 0.071)	0.904	0.062

Predictor: Behavior Theory (F1) Alone

<i>Enjoyment</i>	91.646 (58)	0.058 (0.034 0.080)	0.947	0.044
<i>Anger</i>	92.126 (58)	0.058 (0.034 0.080)	0.942	0.055
<i>Anxiety</i>	95.279 (58)	0.061 (0.038 0.082)	0.939	0.052
<i>Emotional Exhaustion</i>	297.331 (128)	0.087 (0.074 0.100)	0.879	0.064
<i>Depersonalization</i>	150.180 (70)	0.081 (0.063 0.099)	0.895	0.061
<i>Personal Accomplishment</i>	187.254 (112)	0.062 (0.046 0.078)	0.907	0.054

Note. n =173; Controls: Gender, Years Teaching, and Teach Early Grades (9th and/or 10th). Grayed values indicate models with poor fit.

Table 12

Step 2c) Control Variable Model Without Interaction - Emotions Predicted from Implicit Theory and Efficacy

Predictors: Ability Theory (F1) + Efficacy for Instructional Strategies (F2)					
Emotion Variable (F3)	Chi-square (df)	RMSEA (C.I.)	CFI	SRMR	
<i>Enjoyment</i>	160.388 (107)	0.054 (0.035 0.070)	0.920	0.054	
<i>Anger</i>	162.351 (107)	0.055 (0.037 0.071)	0.910	0.057	
<i>Anxiety</i>	162.671 (107)	0.055 (0.037 0.071)	0.910	0.061	
<i>Emotional Exhaustion</i>	417.505 (197)	0.080 (0.070 0.091)	0.851	0.064	
<i>Depersonalization</i>	233.561 (123)	0.072 (0.058 0.086)	0.861	0.070	
<i>Personal Accomplishment</i>	261.003 (177)	0.052 (0.038 0.065)	0.898	0.062	
Predictors: Behavior Theory (F1) + Efficacy for Classroom Management (F2)					
<i>Enjoyment</i>	163.573 (107)	0.055 (0.037 0.072)	0.949	0.047	
<i>Anger</i>	163.527 (107)	0.055 (0.037 0.072)	0.947	0.053	
<i>Anxiety</i>	166.231 (107)	0.057 (0.039 0.073)	0.944	0.053	
<i>Emotional Exhaustion</i>	381.578 (197)	0.074 (0.062 0.085)	0.902	0.060	
<i>Depersonalization</i>	233.093 (123)	0.072 (0.058 0.086)	0.911	0.060	
<i>Personal Accomplishment</i>	271.412 (177)	0.056 (0.042 0.068)	0.926	0.053	

Note. n =173; Controls: Gender, Years Teaching, and Teach Early Grades (9th and/or 10th). Grayed values indicate models with poor fit.

Table 13

Standardized Parameter Estimates: Control Variable Model With Emotions Predicted from Implicit Theory Alone

Predictor: Ability Theory (F1) Alone										
Emo (F3)	F3 on F1	F3 on F2	F1 with F2	Gender			Years Teach			R ² _(F3)
				F1	F2	F3	F1	F2	F3	
<i>Enjoy</i>	0.270			0.470			-0.159		0.260	0.116
<i>Anger</i>	-0.329			0.468			-0.160		-0.260	0.143
<i>Anxiety</i>	--			0.470			-0.159		-0.216	--
<i>EmoExhaus</i>	--			--			--		--	--
<i>Depers</i>	--			--			--		--	--
<i>P Accomp</i>	0.245			0.472			-0.159		0.200	--
Predictor: Behavior Theory (F1) Alone										
<i>Enjoy</i>	0.284			--			--		0.212	0.128
<i>Anger</i>	-0.263			--			--		-0.200	--
<i>Anxiety</i>	--			--			--		-0.195	--
<i>EmoExhaus</i>	--			--			--		--	--
<i>Depers</i>	--			--			--		--	--
<i>P Accomp</i>	0.317			--			--		--	0.125

Note. n =173; -- = model/path not significant; blank cell = value not measured. Grayed values indicate models with poor fit.

Table 14

Standardized Parameter Estimates: Control Variable Model With Emotions Predicted from Implicit Theory and Efficacy

Predictors: Ability Theory (F1) + Eff. for Instructional Strategies (F2)				Gender			Years Teach			$R^2_{(F3)}$
Emo (F3)	F3 on F1	F3 on F2	F1 with F2	F1	F2	F3	F1	F2	F3	
<i>Enjoy</i>	--	0.464	0.259	0.473	--	--	--	--	0.200	0.312
<i>Anger</i>	--	-0.300	0.249	0.471	--	--	-0.159	--	-0.226	0.226
<i>Anxiety</i>	--	-0.273	0.255	0.474	--	--	-0.158	--	-0.182	0.116
<i>EmoExhaus</i>	--	--	--	--	--	--	--	--	--	--
<i>Depers</i>	--	--	--	--	--	--	--	--	--	--
<i>P Accomp</i>	--	0.482	0.259	0.474	--	--	-0.158	--	--	0.294
Predictors: Behavior Theory (F1) + Eff. for Classroom Management (F2)				Gender			Years Teach			$R^2_{(F3)}$
Emo (F3)	F3 on F1	F3 on F2	F1 with F2	F1	F2	F3	F1	F2	F3	
<i>Enjoy</i>	--	0.265	0.503	--	--	--	--	--	0.227	0.181
<i>Anger</i>	--	-0.326	0.502	--	--	--	--	--	-0.220	0.190
<i>Anxiety</i>	--	-0.350	0.502	--	--	--	--	--	-0.213	0.157
<i>EmoExhaus</i>	--	--	--	--	--	--	--	--	--	--
<i>Depers</i>	--	--	--	--	--	--	--	--	--	--
<i>P Accomp</i>	--	0.408	0.503	--	--	--	--	--	0.180	0.248

Note. n =173; -- = model/path not significant; blank cell = value not measured. Grayed values indicate models with poor fit.

however, the early grades variable still did not predict any of the variables of interest significantly, so the results for that control variable have been excluded from the current discussion.

Compared to the original non-control models, the models that included the control variables of gender and years teaching showed similar fit patterns, with good fit for all outcomes except for the two burnout variables of emotional exhaustion and depersonalization (See Table 12). Additionally, related to research question two, once the linear relations for control variables were accounted for between implicit theory and efficacy, the correlation between these variables was slightly higher than the original models (Table 14), with a standardized estimate of about 0.25 in the ability-instruction models and about 0.50 in the behavior-management models. This outcome supports the expectation that accounting for effects of related variables that are not of theoretical interest can allow for a better sense of the relations of interest. In this case the relations between efficacy and implicit theory were slightly stronger.

Results of the control models were also similar to non-control models in assessing outcomes for research question three. For example, both control variable models for ability and behavior resulted in several significant R^2 predictions in the *reduced* SEMs that excluded efficacy as a predictor (Table 13). In the prediction of enjoyment, an R^2 value of 0.116 ($p < 0.05$) was obtained for the ability theory model and 0.128 ($p < 0.05$) was obtained for the behavior theory model; these were still small effects but they improved slightly from the non-control variable models. Thus, supporting the initial results, theories about ability and theories about behavior were

significant, positive predictors of teachers' enjoyment of teaching in the reduced model; tendencies toward incremental thinking were associated with higher ratings of enjoyment and tendencies toward entity thinking were associated with lower enjoyment ratings.

Additionally, in only the control variable models, teachers' anger was predicted negatively by implicit theories for ability such that, for the reduced models, higher anger ratings were associated with an entity tendency in thinking about student ability. Finally, teachers' sense of personal accomplishment was also predicted positively by theories about behavior in the reduced model such that higher personal accomplishment was more associated with beliefs that student behavior is malleable.

In the full SEMs with efficacy included, however, efficacy, and not implicit theory, predicted each emotion outcome, which resulted in a significant R^2 for the emotion (F3) variables (Table 14). Values ranged from 0.116 to 0.312 ($p < 0.05$). Here, as in the original full models, some of the larger effects of efficacy occurred in the prediction of the positive emotional outcomes, with standardized paths over 0.400 ($p < 0.05$). In these models, efficacy for instructional strategies predicted teachers' reports of enjoyment positively, while efficacy for instructional strategies and for classroom management both predicted teachers' reports of personal accomplishment positively. Both model types predicted anger significantly, but unlike the non-control variable models, the control models also predicted anxiety significantly. The standardized path from efficacy for classroom management to enjoyment had the smallest value of all emotions in the control variable models. Overall, the basic relations of interest were replicated in the control models, with some effects

becoming significant in the control models that were not before, indicating that including the control variables added to the explanation of the outcome variables of interest.

The specific effects of the control variables can be considered further. In the models that analyzed the linear relations of gender and years teaching to the factors, the implicit theories variable (F1) was predicted significantly by gender and years teaching in most ability models but not in behavior models (and not in the full-SEM model that predicted enjoyment; see Table 13). The standardized paths from gender to ability theory were about 0.470 and the paths from years teaching to ability theory were about -0.158 ($p < 0.05$). Women and, to a lesser extent, teachers with fewer years of experience, tended toward incremental beliefs about ability, but no significant difference emerged for implicit theories about behavior.

Similar to previous findings in other studies showing more years of teaching to predict adaptive outcomes, the number of years teaching was also a significant predictor of most emotion (F3) variables such that, in the full SEM, more years of teaching were related significantly to higher reports of enjoyment and lower reports of anger and anxiety within both ability-instruction and behavior-management model types. The absolute standardized paths ranged from 0.180 to 0.227 ($p < 0.05$).

Supplemental Analyses

Power Analyses

The power to detect effects of different sizes depends upon several things, including sample size and degrees of freedom, or the number of free parameters used to estimate effects versus the number of pieces of information in the variance-

covariance matrix used as parameter inputs. While it can be difficult to estimate power for SEM, one alternative that can be used post-hoc involves using information from the current data to find the minimum sample size that leads to significant path estimates. In the current study, small standardized path estimates of about 0.2 or below indicated that the effect size was small for the prediction of emotion by the implicit theory variable when accounting simultaneously for efficacy. For this reason, a larger sample size was needed to detect these paths. Whereas a raw data file would include information about the original sample size, a model covariance matrix file created from raw data requires the researcher to enter the sample size manually; this permits the researcher to assign different sample sizes when using the model covariance matrix rather than using the actual sample size. Therefore, if the same models are re-run and the sample size is increased gradually, the sample size at which previously nonsignificant effects become significant at $p < 0.05$ indicates the minimum sample size required to detect the smallest effects, holding all else constant (i.e., not changing the size of the estimates or errors).

All of the models were re-run to predict each emotion outcome from implicit theory and efficacy, including the control variables. A maximum likelihood estimator (ML rather than ML-Robust) was used because the robust estimator required raw data and could not be run from a covariance matrix. However, examination of the estimates for the two sets of models – the new ML models based on covariance matrices and the original ML-Robust models based on raw data – revealed only minor fluctuations such that the standard errors remained the same.

Across models, there was a broad range of sample sizes required to reach significance for all paths of interest (see Table 15); the range was from 173 (standardized path coefficient: -0.25) for predicting anger from ability theory to 750 (standardized path: -0.10) for predicting anger from behavior theory. With the exception of both personal accomplishment models and one of the anger models, the other model *ns* ranged between 173 and 300. In some cases, depending on the stability of the models, paths did not reach significance with a large *n* (i.e., 1000). These included both anxiety models and the ability-instruction model for depersonalization, however, the latter model had poor initial fit. Generally speaking, an additional 100 to 150 participants might have provided sufficient increases in power to detect the paths of interest for well-fitting models in the current study, assuming all else was held constant.

Table 15

Post-Hoc Sample Size Estimations (minimum n to reach significance of previously non-significant estimates)

<i>Emotion (F3)</i>	Ability Theory (F1) & Efficacy for Instruction (F2)	Behavior Theory (F1) & Efficacy for Classroom Management (F2)
<i>Enjoyment</i>	285 (0.14)	285 (0.15)
<i>Anger</i>	173 (-0.25)	750 (-0.10)
<i>Anxiety</i>	N/A (-0.02)	N/A (0.00)
<i>Emotional Exhaust</i>	300 (-0.29)	215 (-0.16)
<i>Depersonalization</i>	N/A (-0.22)	250 (-0.21)
<i>Personal Accomplishment</i>	425 (0.12)	500 (0.11)

Note. N/A = Effects not significant after *n* of 1000. Model fit decreases with increased *n*. Standardized path estimates are in parentheses.

Chapter 5: Discussion

The current study applied Dweck's (1999) model of implicit theories to the context of teaching by examining high school teachers' beliefs about the flexibility of students' ability and behavior, and examining how teachers' implicit theories about students were associated with teachers' efficacy and emotions. Previous research has measured implicit theories in students and young adult populations, but the current study aimed to examine the implicit theory construct in teachers and its possible relations to teachers' efficacy and emotional experiences, which are important elements of the implicit theory framework. The study also examined the structure of the data for support of previous conceptualizations of implicit theories as dichotomous, distinguishing between entity-type beliefs and incremental beliefs about attributes like ability.

The major premise tested in the current study is that people who see attributes as static will have a different motivational approach to especially negative events than people who see attributes as changeable. In particular, previous work has found that people who view attributes like academic ability as being unchangeable often have lower efficacy to overcome challenge that involves those attributes, and they will tend to have more negative emotional experiences than people who view attributes as malleable, that is, having the potential to improve (Hong et al., 1999).

Previous work has also focused on participants' views of others' attributes. In studies where participants interpreted the attributes of other people or interactions as static and therefore uncontrollable, the participants saw situations involving those people or interactions as incapable of improving, and they experienced negative affect

related to the relationship as a result (Kammrath & Dweck, 2006; Tamir et al. (2007). For teachers, this is an important consideration because, if such situations occur in the classroom, teachers with static views of their students' potential might give up too soon when students can still improve, or they might not notice when improvement has already taken place (Givvin et al., 2001).

In determining how well Dweck's framework applied to teachers, a first set of analyses examined the categorical distinction between entity and incremental theories, testing whether teachers' beliefs could be separated meaningfully into the two categories, or classes. Initial mixture analyses of the implicit theory data failed to substantiate the existence of multiple classes, indicating that, in the current sample, high school teachers' beliefs about students' ability and behavior appeared to be continuously distributed. Thus, the categorical distinction between entity theories and incremental theories as discussed in the literature was not supported. The remaining analyses treated the implicit theory variable as continuous to examine its relation to efficacy and the emotions of interest. These analyses examined the fit of structural equation models of the relations between 1) implicit theories and efficacy, 2) implicit theories and emotional experiences, and 3) the combined contribution of implicit theories and efficacy above and beyond their individual prediction of emotions.

Adequate fit was found for models with and without control variables. In SEM models predicting emotions from implicit theory only, implicit theory predicted emotion outcomes well, suggesting that an incremental theory was related to more adaptive emotional outcomes than an entity theory. Additionally, when efficacy was included in the models, efficacy and implicit theory covaried such that incremental

theories were associated positively with higher efficacy. However, two major unexpected findings emerged: when accounting simultaneously for efficacy, the implicit theory variables predicted emotions poorly, and no significant interaction effect was found between theory and efficacy in predicting emotion.. In all acceptable models, efficacy was a superior predictor of emotional outcomes compared to implicit theories. In general, higher efficacy was predictive of increased enjoyment and personal accomplishment, and decreased anger and anxiety. Therefore, overall, the connection between implicit theory and adaptive emotional outcomes was not supported, while previous findings of the emotional benefits of high efficacy were supported. The implications of this finding might be important for supporting teacher education and development, with teachers' self-beliefs about their ability to help and assist students through academic and social difficulties playing a key role in their emotional well-being, particularly in terms of their enjoyment of teaching and their sense of accomplishment in their career.

Despite the overall finding of the study that efficacy was a superior predictor of positive emotional outcomes compared to implicit theory, the reduced models predicting emotions from implicit theory did show a basic connection between the two variables. In general, incremental thinking appeared to be connected to the more adaptive outcomes (e.g., enjoyment of teaching, a sense of personal accomplishment, and less anger and anxiety), which supported previous findings and the theoretical premise that perceived flexibility of basic attributes is beneficial for motivational and emotional well-being. In teachers, beliefs in the malleability of students' academic ability and social behavior could predict improved teaching motivation and practice,

although this association would need to be demonstrated with further study that also accounts for teachers' efficacy. Overall, there is at least minimal initial support for the benefit of beliefs that are more incremental, as promoted by recent implicit theory studies in the teaching population (e.g., Fives & Buehl, 2008; Looney, 2003).

However, the combination of efficacy and incremental theories in predicting emotional outcomes appeared to result in efficacy's subsuming implicit theory effects instead of having a combined meaningful effect. Further study might reveal more in terms of what, if any, independent effects implicit theories have on teacher outcomes like experiences of emotions when considering efficacy simultaneously.

Additional discussion is presented in the order of the research questions, followed by a discussion of the study's limitations.

1. To what extent do high school teachers' beliefs fall into unique classes that are consistent with their implicit theory beliefs about student ability and social behavior?

When a two-class, single-factor mixture model was specified to allow factor means to vary across classes and holding the other estimates invariant across classes, the data did not support a two-class model. Specifically, the expectation was not supported that teachers' beliefs about students could be distinguished into categories of entity and incremental beliefs. Instead, implicit beliefs in the current sample were distributed about a single mean and could be modeled by a single latent factor for beliefs about student ability and a single factor for beliefs about student classroom behavior.

Implications. The purpose of this question was twofold: 1) to support previous distinctions in implicit theory research that indicated a dichotomous nature of implicit beliefs, and 2) to study the model of implicit theories in the teaching population given the potential impact of teachers' beliefs on student academic and social outcomes. Overall, in an application of theory, the question was asked whether it was reasonable to expect that teachers held distinct incremental and entity theories. This study attempted to apply a modeling strategy that would parallel theoretical distinctions where previous studies imposed such distinctions without testing the data directly. Given these two purposes, the previous conceptualization of implicit theories as categorically distinct was not supported in the current teaching sample. If this finding is replicated in other studies, it might imply that the conceptualization of entity and incremental beliefs as distinct theoretically is misleading.

In terms of theory, conceptual overlap between entity and incremental theories might mean that these two categories of beliefs might not exist as "unified" theories at all, or that the strict dichotomy between entity and incremental theories might be oversimplified, at least when applied to teaching contexts. The first possibility would imply that teachers do not hold distinct theories reflecting entity and incremental beliefs. Instead, teachers' interpretations of student performance and behavior might be based on the most salient information that is available for making decisions about themselves or others. Some teachers' beliefs about their students might be more or less rigid due to their current situational demands, their immediate interpretations of the situation and the people involved, and possibly their level of comfort with the uncertainty of having many possible interpretations. For instance, Dweck (1999)

proposed that the benefit of entity thinking is that individuals can impose a sense of stability or certainty on the qualities and attributes of individuals, why they behave the way they do, especially when they do things that are unpleasant. Accordingly, teachers' entity-type conclusions about students might be based on superficial information in situations when teachers are uncomfortable with not knowing why their students behave inappropriately in class. Teachers in high stress or high stakes teaching environments, for instance, might be more likely to believe that students who misbehave consistently over a period of time are simply "bad students" who are uninterested in learning. However, these same teachers' beliefs might change when they are in a good mood or when allowed more freedom to determine the course of student learning.

Dweck has also acknowledged recently that some circumstances, such as being overly-invested in the outcome of a situation (in terms of self-worth, for instance), can lead to maladaptive behavior like self-handicapping even in those whose beliefs are categorized as incremental. It is these circumstances that have led recent theorists to consider a reconceptualization of the original incremental and entity categories and the usefulness of such categorizations for adaptive motivational outcomes. In their longitudinal studies of high school students, for instance, Ziegler and Stoeger (2010) suggested that a combination of beliefs about one's weaknesses or deficiencies as changeable and beliefs about one's proficiencies as stable might be more adaptive. The authors found that students' stability beliefs about their current skills and abilities and their beliefs about adaptability of deficits and weaknesses were similarly predictive of adaptive achievement outcomes. For example, both types of

beliefs predicted students' confidence to learn the material of interest in the study (i.e., math and physics), students' mastery beliefs toward the material, and their perceived likelihood of choosing to enroll in similar courses in the future. Thus, there is evidence in recent research that a reconceptualization of the original implicit theories framework that allows for flexibility of beliefs might be more accurate than the current framework which imposes an incremental and entity dichotomy on implicit beliefs.

A more lenient conclusion given the empirical overlap between entity and incremental beliefs would be that a dichotomous conceptualization is somewhat accurate but *oversimplified*. Instead of two separate categories of beliefs which are relatively stable in most circumstances, as the framework suggests, the answer to whether a teacher interprets student attributes as fixed or malleable might be, "It depends." Dweck (1999; Levy et al., 2001) has suggested that it can be important to consider previous experiences and exposures, such as to meaningful events or specialized training, when determining people's interpretations of others' attributes, such as their social behavior or academic ability. Thus, for teachers, having training in intellectual, emotional, or behavioral disorders or disabilities could have a profound impact on how they view student behavior; trained teachers might have a more complex view of student behavior for instance, where they see some specific attributes as unlikely to change and others as more flexible, than teachers without such training. The implication for theory is that applications of Dweck's model in teaching, especially at the high school level, needs to account for individual variation both in the teachers who are evaluating students, with respect to previous experience

and training, and in the student populations that are being taught. For example, teachers in inclusion classrooms where students have intellectual disabilities might answer very differently about how much some of their students can change, compared to teachers of very high achieving students.

From a measurement perspective, therefore, asking teachers whether all students' "classroom behavior" in general can be changed or not might be an insufficient assessment of their implicit theories. The tendency to respond in the middle of the scale could be teachers' way of saying, "It depends," or that forcing an either-or response is unrealistic or not useful for teaching contexts. If it were, a more accurate way of measuring these theoretically dichotomous beliefs would be to offer measures with only two choices: "changeable" and "unchangeable."

Overall, the implicit theory framework that poses incremental and entity beliefs as opposites is not supported in the current teaching sample. Returning to Fives and Buehl (2008), the current findings might reflect teachers' tendencies to report a *range* – not a dichotomy - of responses to whether students' attributes can change, from beliefs that attributes are completely learned and therefore flexible, to being something that students are born with. As Fives and Buehl noted, teachers likely see these attributes as being affected by some combination of factors, changeable and unchangeable, thus allowing for individual differences and context.

2. To what extent does teachers' efficacy for instruction and management covary with their implicit beliefs?

Despite the imposed prediction of no correlation between implicit theory beliefs and efficacy, a tendency toward incremental beliefs was associated with

higher positive efficacy beliefs. This association was small but significant for implicit beliefs about ability and instructional strategies efficacy, but moderately larger and significant for implicit beliefs about student behavior and efficacy for classroom management. The findings imply that within the sample of high school teachers, a belief in the possibility for student change is positively connected to a belief that one can have a positive impact on student outcomes in both academic and social arenas, with a stronger tendency for these to be connected in the social-behavioral domain of the classroom.

Implications. Previous work has noted the connection between incremental beliefs and higher efficacy (e.g., Bandura, 1993). In particular, with poor performance, incremental theorists use negative feedback as information for improving performance, whereas entity theorists see it as diagnostic of low ability. Thus this question was designed to establish whether efficacy played a different role for incremental than entity tendencies later in research question four. That difference was not substantiated in the current study, however. The data from the current sample suggested that a very simple connection exists between implicit theory and efficacy, where responses on the “incremental” end of the implicit theory continuum are associated with higher efficacy, and responses on the “entity” end are associated with lower efficacy.

Conceptually, both constructs address *potential* – potential for change or potential to achieve a desired outcome. If there is no possibility for improvement, then there is likely less motivation to try to achieve the outcome in terms of positive affect, effort, or persistence. However, if improvement is possible, via either student

or teacher capability, then adaptive motivation is more likely to follow. For teachers, then, there might be an association between beliefs about the adaptability of student ability and behavior and beliefs that teachers can have a positive impact on their students.

3. To what extent are teachers' positive and negative emotional experiences, including burnout symptoms, predicted by teachers' implicit theories?

The relations among emotions and implicit beliefs were complex. Two sets of models predicting emotion from implicit theory were run: one with only these variables and one that also included efficacy as a predictor. In reduced models only allowing implicit theories to predict emotion outcomes, implicit theories for ability and behavior tended to predict emotional experiences significantly in expected directions. In general, beliefs about student ability and behavior as flexible predicted positive teaching experiences of enjoyment and a sense of personal accomplishment, and less anger and anxiety. However, beliefs about student ability as unchangeable predicted less enjoyment and personal accomplishment, and more anger and anxiety than the more incremental beliefs.

Once efficacy was introduced in the full models, however, in no model did implicit theory continue to predict the emotional outcome, contrary to expectations. Most variance in emotion variables was explained instead by efficacy in both the academic ability and the classroom behavior models. This outcome suggested that, in the current sample, teachers' thoughts about the flexibility of students' behavior and academic ability were less important than their efficacy to support students' achievement and behavior outcome in determining their emotions experienced while

teaching. In particular, instructional strategies efficacy was strongly positively predictive of enjoyment of teaching and personal accomplishment; classroom management efficacy was also very predictive of a sense of personal accomplishment. Both types of efficacy were moderately negatively predictive of anger and anxiety, such that higher efficacy was associated with lower levels of these emotions.

Implications. Why did implicit theories fail to predict emotional outcomes in the presence of efficacy? The result of this analysis hints at a mediating effect of efficacy, but a full test of mediation was not the purpose of this study and would need to be explored specifically. It is possible, however, that implicit beliefs feed into efficacy beliefs as an information source, either providing a sense of what challenges are to be overcome or what permanent barriers are in place.

In contrast, teachers' thoughts about their own capability to help students might simply be more salient than implicit theory for teachers, particularly regarding the emotions that were of interest in the current study, given that the positive or negative assessment of the ability to achieve a desired outcome (helping students learn and behave appropriately) will generate feelings like enjoyment and enthusiasm or frustration and anxiety. General beliefs about students' capacity for change are not likely to generate these very immediate, contextualized emotions to the same extent. Thus implicit theory might be more removed empirically from the self-directed efficacy and emotion variables. Efficacy has been shown in previous studies to predict emotional experiences (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998), so the effect of implicit theories toward others might be less predictive of these general emotional outcomes.

To illustrate this possibility, an example can be made of Bandura's (1989a; 1989b) statement that people's thoughts about their capabilities determine their emotional reactions during challenges. In particular, he saw the discrepancy between internal standards and personal attainments as differentially "motivating or discouraging ... partly determined by people's beliefs that they can attain the goals they set for themselves" (Bandura, 1989b, p. 33). In the current study, teachers' efficacy was demonstrated to be a consistent predictor of emotional outcomes, in support of the social-cognitive framework. The role of implicit theories might also support the framework if implicit beliefs about students contribute to teachers' goals, in line with their outcome expectancies, which Bandura stated are used as contextual information about how attainable a particular goal is likely to be. Thus, implicit theories might be more predictive of cognitive processing than they are of emotions, explaining their lack of connection to emotions when efficacy was also considered in the current study.

4. To what extent do implicit theory beliefs and efficacy explain jointly teachers' positive and negative emotional experiences, including burnout? What does a consideration of both variables' interaction explain about teachers' emotional experiences beyond their individual contributions?

Contrary to the prediction, the interactive contribution to the emotion variables was non-significant. Each model that included the interaction term failed to provide a significant improvement over the model without the interaction, with one exception for the model for theories about behavior predicting the depersonalization emotion outcome. In that model, however, fit was poor before introducing the

interaction, and the interaction term did not predict the depersonalization variable significantly. Given findings of no impact of implicit theory when efficacy was included in the model and the lack of an interaction effect, the efficacy factor contribution alone was the best predictor of variance explained in the outcome emotions.

Implications. As indicated in the previous discussion, implicit theories appear to be weak predictors of emotions given the contribution of efficacy. In order for any joint effect to be established between the two predictors, any direct effect of implicit theories would first need to be established. However, if the effect of implicit theories on emotions was indirect through a self-directed variable such as efficacy, this might also explain the lack of interaction. Further exploration can clarify the connection between these variables.

General Implications for Teaching

Given that the framework of implicit theories did not fit teachers' emotional experiences as expected, the question might be asked whether it is relevant to study teachers' implicit theories. Why might the idea that teachers hold dichotomous implicit beliefs about students be valid? Previous work has found that interpersonal relationships and interactions can be impacted by how people view their own and others' abilities, personalities, and related personal attributes – as either changeable or unchangeable (Chiu, Hong, & Dweck, 1997; Dweck, Chiu, & Hong, 1995). Studies have also shown that more intense negative emotions are associated with negative interactions (e.g., experiencing negative emotions intensely is related to rejection and communications that are harmful to the relationship), but not necessarily with positive

interactions (e.g., experiencing negative emotions does not predict voicing one's experience of the situation proactively or trying to accept one's differences with others; Kammrath & Dweck, 2006). These findings have not been assessed often in the teaching population, yet they seem to translate readily into emotional experiences that teachers might feel, like frustration and disappointment related to student behavior and academic performance and, especially, the interpretation that students cannot change these attributes.

The current study did not support the connection between implicit theory and emotion in teachers. However, the unique aspects of the study might have limited the ability to find a consistent relation between teachers' beliefs and their emotional outcomes. The Kammrath and Dweck study, for instance, was one of the only studies examining emotions related to beliefs about others. It did not conclude that implicit beliefs were related to emotional experience *directly*. It simply found relations between implicit views and similar views about relationships *and* also found connections between the emotions that participants experienced and other relationship outcomes. For example, incremental theorists believed that relationships could improve, and the number of negative emotional experiences that they had was associated with negative communications, lower satisfaction with relationships, and other challenges. Thus, in the current study, the attempt to make the leap from teachers' theories about students to teachers' emotional experiences might have been limited given that the connection from implicit theory to emotions has typically been found in studies of *self-directed* implicit theories about one's own attributes, but not about the attributes of others.

This distinction between findings from previous work on self-directed implicit beliefs versus implicit beliefs about others might also help explain why teachers' efficacy was strongly predictive of emotion. Efficacy has a focus on beliefs about adaptability similar to implicit theories (e.g., a teacher who feels efficacious might agree with the statement, "I can adapt my teaching strategies to meet the needs of my students"). These kinds of self-assessments, when valuable to the teacher, will be much more likely to predict her experiences of enjoyment or frustration during teaching because they are clearly connected to desired outcomes over which the teacher is assessing her influence. Thus, the connection between efficacy and emotion in the current study replicates connections from previous research (e.g., Fives, Hamman, & Olivarez, 2006; Guskey, 1987; Tschannen-Moran & Woolfolk Hoy, 1998).

Based on current findings, it is difficult to conclude whether or not it is meaningful to study teachers' implicit theories because the current study differed from previous studies in important ways. For instance, the current study used a new way of analyzing the data and did not first replicate previous methods (for example, where middle scores were excluded). A separation into groups did not emerge, however, so a current conclusion is that the theoretical distinction between incremental and entity theories is not supported for teachers. The likelihood is good that a general belief about *all* students might not apply well to the majority of teachers for several reasons. First, their experiences with many students on a daily basis demand that they approach student learning and behavior on a case-by-case basis for the most part. They know which students need more help and which do not

need as much direct guidance for each class they teach, and this might be a much more important consideration than an overall implicit belief about whether students can ultimately improve their ability or not. While their beliefs about students might tend to stabilize (Givvin et al., 2001), teachers also might challenge themselves to remain unbiased, being aware of changes and improvements in their students despite stable previous behavior (Ford & Smith, 2007; Zembylas, 2005).

Secondly, teacher training provides teachers with specific skills to address various academic and social needs which students present. Therefore, their confidence might override any fundamental beliefs about student ability and behavior. Also, asking experienced teachers to describe ALL students universally is a different challenge from asking students for their self-reported descriptions, since students will be very unlikely to have considered variations in the nature of student ability to the extent that teachers have. Perhaps a more realistic assessment for teachers might be a modified question set asking about *some* students: “There are SOME students who will never be able to improve their academic ability no matter how hard even the most skilled teacher tries.” This adaptation retains the essential distinction between entity and incremental beliefs while allowing some flexibility for individual differences.

It is also important to consider why the emotions of interest were chosen. Enjoyment, anger, and anxiety have been shown in teaching research to be relevant in educational contexts - these are simple emotions that are understood readily and thus might be some of the most salient for teachers. In particular, happiness and anger have been demonstrated to be some of the earliest emotions to emerge in children

because they are easily understood (Berk, 2008). Enjoyment is associated with pleasurable experiences in line with one's desired outcomes. Anger is distress from a threat to an individual and/or his belongings or loved ones. In qualitative research on teaching contexts, teachers have reported feelings of enjoyment in situations where their students work hard and enjoy learning, and they have expressed feelings of anger when their students did not try hard enough or behaved inappropriately (Hargreaves, 1998; Sutton, 2004). Anxiety can be more complex but is a feeling of pressure or uncomfortable uncertainty or lack of control over a valued outcome or goal, often one that the person is responsible for bringing about. For instance, teachers have described feeling unsure or anxious about managing the various responsibilities of teaching amidst their other life demands (Winograd, 2003). Thus, although many other emotions are likely in teaching contexts, the three emotions of enjoyment, anger, and anxiety were chosen because of their tendency to appear frequently in teachers' descriptions of their emotional experiences (Sutton & Wheatley, 2003).

The relative immediacy of the above emotions might also be relevant in explaining why efficacy was a better predictor of emotions than implicit theories. Implicit theories about various attributes, as they are conceptualized, are stable across contexts (Dweck, 1999). Thus, teachers' implicit theories about whether students can improve academically or behaviorally would not be likely to fluctuate along with immediate classroom demands and circumstances the way that efficacy might. Therefore, efficacy, and not implicit theory, might be likely to parallel situational changes in emotions like enjoyment, anger, and anxiety, which are also associated

with the immediate classroom context. As an extension, interventions targeting teachers' sense of efficacy for various classroom challenges can potentially influence emotional well-being because of this relation.

Also in terms of the possible masking or mediating effect of efficacy on implicit theories, it might make sense that implicit perceptions of how “teachable” students are – whether academically or behaviorally – translates for teachers into a general perception of self-efficacy for influencing students positively (e.g., “If my students can change then I can aid in that change and I can help in specific ways like adapting my teaching strategies to bring about that change.”). A similar tendency to “personalize” student attributes and behaviors has been discussed as a hedonic bias, as when teachers take responsibility for students' success and they experience resulting positive emotions like pride when students overcome a problem (Brophy & Good, 1974; Weiner, 1985). As mentioned earlier, this kind of self-perception might have a more direct influence on how a teacher feels about teaching than her general, implicit view of students, which would be more externally focused.

Thus, while incremental theories have been associated with positive adjustment, many circumstances will still likely put teachers at risk of burnout and other coping problems. However, if the difference in theory types is predictive of positive adjustment, taking steps to understand how to support teachers further given these findings will be integral to creating and maintaining positive teaching and learning environments. For an anecdotal example, the superintendent of Prince George's County Public Schools, Dr. William Hite, noted in 2010 that “effort creates ability,” and that it is his belief that all students, given the right effort, can achieve at

very high levels (Presentation at the Oct 13, 2010 colloquium of the Maryland Institute for Minority Achievement and Urban Education). However, he noted that a noticeable proportion of teachers do not hold this same belief, and that the experiences of these teachers and their students could be impoverished as a result. If the current and future studies are able to clarify and characterize the mechanisms surrounding the benefits of implicit theories for teaching contexts, then this framework might be very useful for teacher education and interventions.

Implications for Measurement of Implicit Theories, Efficacy, and Emotion Variables

The current study demonstrated that teachers' beliefs about students are linked inconsistently to their own emotional experiences. It attempted to make a conceptual leap by linking judgments of students to teachers' own emotions, without due consideration of other motivational factors related to emotional outcomes in previous studies (e.g., attributions, goals or expectations, social relationships or support from superiors or other teachers, and structural constraints such as school policies, in addition to the possible mediating role of efficacy; Brophy & Good, 1974; Fives et al., 2007; Ford, 1992; Frenzel et al., 2009; Reina & Weiner, 2001). A recommendation for future work, therefore, would be to include teachers' reports of their expectations and goals that they form based upon their implicit beliefs, and then relating these to teachers' efficacy to help students achieve those goals. Teachers' emotional responses to goal achievement or failure would thus have a clearer, indirect connection to implicit theories. If implicit theories continue to develop throughout adulthood, it is also possible that teachers' emotional and motivational experiences serve as feedback for their implicit theories. Following especially meaningful positive

or negative educational events, teachers' emotional reactions might cause them to change their current beliefs about students. A particularly disappointing series of student academic or behavioral failures, for example, might lead some teachers who previously held a belief in students' fundamental ability to improve to question this belief. The development of implicit theories in terms of how they change or stay constant throughout adult life experiences is another area that is relatively unexplored, however.

The current study identified an issue in the link from conceptualization to measurement of implicit theories that requires further attention. Simply, the way that implicit theories have been measured in the past does not match their conceptualization. Previous researchers measured implicit theories on a single scale comprised of one-sided statements designed to indicate both incremental and entity theories, despite the conceptual distinction between incremental and entity theories; typically, participants were asked to respond with agreement or disagreement to entity-oriented belief statements (cf. Chiu, Hong, & Dweck, 1997). This procedure was justified because participants tended to agree with incremental choices even when they had also indicated agreement with entity statements. According to the researchers, the incremental choices appeared to attract agreement but did not truly indicate incremental beliefs. However, as Fives and Buehl (2008) and the current study have found, teachers' beliefs also lack a strong distinction between incremental and entity beliefs, even with entity-only options provided. This lack of distinction has presented a challenge for implicit theories research, as noted by efforts to make choices corresponding to entity beliefs more salient given the tendency to agree with

incremental statements (Dweck et al., 1995). When incremental choices were included at all, some studies have made them more extreme in order to limit affirmative responses due to social desirability (e.g., “No matter who you are, you can significantly change your intelligence level,” Hong, Chiu, Dweck, Lin, & Wan, 1999, p. 591). However, if choices that indicate incremental beliefs are attractive, or socially desirable, to some participants, then how do researchers distinguish this attractiveness from a belief in the incremental nature of the attribute in question? A possible answer emerges in the connection between efficacy and incremental theories found in the current study.

In order to challenge the tenets of the implicit theory framework, it was predicted in the current study that implicit theory type would be unrelated to efficacy – or that both incremental and entity theorists hold a range of high and low efficacy levels (see Dweck & Leggett, 1988). However, the sample data did not support distinct incremental and entity categories, and in the continuous relations, higher efficacy was associated with stronger incremental beliefs. This association might be explained by the two variables’ conceptual similarity. Implicit theories and efficacy beliefs are conceptually similar in their assessment of malleability or the possibility for future change, so their distinction might be clarified in the teaching population between statements like “I can help students improve” and “students can improve.” As stated earlier, the latter type of statement might have more impact on what goals teachers set for helping their students improve, whereas the “I can help” statement might reflect how a teacher feels more directly given a particular desired outcome.

The current study did not include teachers' reports of their goals for students, however.

Rather than assessing goals, the current study examined the effectiveness with which teachers' emotions could be predicted directly by their implicit theories and efficacy. Although the connection between implicit theories and efficacy was also examined, the current study did not explore whether changes in efficacy might predict changes in implicit theories and vice versa over time. The previously discussed difficulty in distinguishing between teachers' incremental and entity beliefs might be resolved by studying possible causal connections between implicit theories and efficacy. During very challenging tasks, for example, people sometimes vacillate between affirmative and negative beliefs ("This can be done I can do this," and later, "No, this cannot be done. I can't do this."). In teaching, then, future research might examine whether teachers' entity beliefs are more salient when they are feeling less efficacious or vice versa, and, similarly, whether their incremental beliefs are more salient when teachers are feeling more confident or vice versa. This would explain why it is difficult to find a predominating entity or incremental belief in many study participants, and maybe particularly in teachers.

While it can be difficult to explain such subtle connections between implicit theory and efficacy, a possible feedback loop might be derived from Bandura's discussion of efficacy (Bandura, 1993). According to Bandura, entity theories predict a lowering of efficacy over time whereas efficacy tends to be more resilient in students with incremental theories. However, this process might continue to unfold if efficacy also *informs* implicit theories, particularly after the positive and negative

emotional reactions that call attention to changes in efficacy. For example, say that over a period of time a teacher's students performed particularly poorly on a series of standardized tests even after exerting high effort and dedicating extra class time to test preparation. This teacher's efficacy to help his students might decline, which would likely cause him to feel distressed personally beyond any general disappointment that he feels about the students' outcome. As a result of his reflections on his personal efficacy and his negative emotional reactions, he also might be more likely to question whether his students can improve in general. Thus, the personal change in efficacy might also lead to changes in the teacher's general, implicit beliefs about his students.

This possible connection between efficacy and implicit theories might be applied to the teaching context in general: if self-efficacy predicts adaptive cognitive-motivational strategies and personal goals as well as adaptive emotional reactions, the latter of which is supported in the current study, then teachers' existing implicit theories might be influenced over time by high or low efficacy. Teachers' changed implicit beliefs could then determine their general goals and expectations for students via their belief that students either can or cannot improve in specific domains. These general expectations, which might be similar to outcome expectancies in Bandura's model (Bandura, 1989b), could then feed back into teachers' specific self-directed goals for their interactions with students and their efficacy to meet those goals, thus completing the loop.

The findings of the current study also suggest that certain positive emotions are not predicted at the same rate as negative emotions; positive emotions were

predicted by implicit theory and efficacy more consistently and, in some cases, with a greater magnitude than negative emotional outcomes. It is possible that emotions might function in a qualitatively different way that does not suggest that they fall on a continuum from negative to positive emotionality. For instance, feeling less of an emotion, such as happiness, can lead to a neutral feeling, but a continued decrease in feeling happy does not necessarily bring about feelings of sadness or distress. This is an important consideration because previous literature has suggested that it could be the perceived absence of positive experiences rather than the presence of negative experiences that leads to motivational decreases (Morgan et al., 2010). Tamir and colleagues (2007) also distinguished between participants' views of differential utility of positive versus negative emotions in the likelihood of their experiencing those emotions, indicating that emotional experiences can be predicted by aspects of individuals' belief systems. If positive and negative emotions relate differentially to implicit theory or efficacy, then understanding this process can contribute to advances in policies for teaching or improved support for teacher development.

Finally, teachers' implicit beliefs about ability paralleled their beliefs about behavior in the current study. This relation supported previous findings that theories can be relatively stable across contexts (Dweck, 1999) such that, for example, holding an incremental belief about student ability can predict incremental beliefs about student behavior. In the current study, beliefs were not specified to associate across domains, but their correlation might justify exploration of cross-domain relations. Theoretically, there is support for the connection between student achievement and social behavior, particularly in teaching contexts where students' academic progress

is often impacted by students' social behavior (Wentzel, 1993; 2006). Thus, it might be expected that teachers' beliefs about students would reflect a similar connection.

Limitations

Several limitations were present in the current study. This section will discuss the limitations associated with the lack of domain specificity in the variables, the tendency toward positive teacher responses, the lack of representativeness of the sample, and the failure to model variables shown to be related in preliminary analyses.

Conceptually, lack of domain specificity was an issue in that the study examined general beliefs and experiences not specific to any particular subject, learning activity, or group of students. Instead, teachers' general beliefs were assumed to predict their emotions in general for all students at all levels and across subjects. The problem with such assumptions is that, on a given day, teachers might form beliefs about specific students or even specific groups or classrooms of students, but it can be much more difficult to put a general label on *all* students regarding whether or not they can change their academic ability or social behavior. It might be unlikely that a general implicit view is what impacts teachers' general report of their emotional experiences in the classroom. Perhaps a better assessment in the future might explore whether certain domain- and group- specific implicit theories impact more specific teacher-student interactions such as their offering assistance to struggling students. These kinds of interactions might then influence particular emotional outcomes related to teaching.

An additional limitation occurred in the appearance of a positive bias in responses; for example, teachers in the current study reported higher than average personal accomplishment and lower emotional exhaustion than previous studies' respondents. Positive bias might be due to social desirability, where some teachers who think students are unable to improve might report the opposite. However, it is possible that responses fell on the positive end in the sample because of the tendency to obtain access to schools that are performing well and whose teachers do have a generally positive experience of teaching. The sample was also self-selected within schools, so perhaps teachers who had more positive experiences were more likely to participate compared to non-participants. Finally, it might simply be in the nature of the teaching population to have positive beliefs about students' potential and positive experiences of teaching on average. This statement is probably overly optimistic.

However, for example, one teacher responded after completing the survey that she did feel exhausted emotionally after teaching, but it was a "good" exhaustion almost like one feels after a good workout. She felt like answering some of the questions affirmatively implied a negative experience of her teaching that she did not intend. This is a fairly common issue in quantitative studies, in which certain statements can take on different meanings or make suggestions that participants cannot modify. Her comment also expressed some of the specificity that might need to be included in future studies: "after teaching" she felt exhausted, but she was referring to a temporary exhaustion that would subside within hours rather than one indicative of being worn down by one's teaching experience in a persistent, detrimental way. Future studies might account for temporary states of teaching such as time of day or

year and other contextual aspects or meaningful events in teachers' lives such as standardized assessments.

The previous paragraph hints at the need for a more representative sample. Future research might sample deliberately from various cultural backgrounds or training experiences. It might also target teachers in specific contexts for comparison, such as establishing a representation of teachers in disadvantaged schools in addition to the easier to obtain schools that tend to have more resources and support. A more representative study might be also be able to assess whether findings are replicated under conditions with sufficient power to detect small effects such as might occur with the implicit theories variables.

Additionally, in terms of design, the empirical connection between the two implicit theory variables and the two efficacy variables might necessitate an analysis of combined models where conceptually similar variables are allowed to covary. For instance, the theory types were strongly correlated with one another, and efficacy for instructional strategies was also strongly correlated with efficacy for classroom management; in fact, all of these variables were inter-correlated. Evidence of the importance of considering the connection between these predictors is found in the correlation between the variable for theories about student ability and each of the efficacy variables. The expected correlation to efficacy for instructional strategies was actually weaker than the correlation to efficacy for classroom management. Also, recall that the two efficacy measures were part of a scale that contained a third measure for student engagement. In order to maintain conceptual parsimony, the study did not assess the third efficacy measure, but the engagement efficacy variable

might play an important role in the overall story. Thus, in the future, studies should attempt to incorporate variables that have a conceptual connection, in addition to maintaining parsimony of the modeled relations.

Overall, the results of this and future studies could change the way implicit theories are conceptualized, at least with respect to teachers' thoughts about students. In the current study, the language changed as the study developed, from a description of "incremental versus entity theories" to one of incremental and entity "tendencies". This change in language reflected the lack of a clear distinction between incremental and entity beliefs with respect to measurement. The teachers' responses to the questions showed a clear middle majority rather than neat categories with responses closer to the extremes of the theory scales. Whether teachers' beliefs about students can be categorized into one theory type "or" the other in a distinct way might be determined by future studies that examine domain-specific relations that are closer to the original studies in other populations in their relatively narrow focus on specific tasks (i.e., within academic subject or activity, or specific to a particular kind of support or social relationship). Other constructs have experienced this kind of empirical exploration with researchers' attempts to understand exactly how fine the grain should be. Self-efficacy is one such construct (Bandura, 1993; Tschannen-Moran & Woolfolk Hoy, 2001) in which different kinds of efficacy, such as efficacy for instructional strategies and for classroom management, have predicted different outcomes such as time spent helping students or tendencies to give up on students. Despite some agreement about the need for domain specificity in the measurement of these kinds of self-perceptions, however, the likelihood that this is the reason for lack

of support of the implicit theory model in teachers is low. It is more likely that some reconceptualization of the dichotomy between incremental and entity theories is needed, at least in terms of applications to teacher motivation.

Appendices

Appendix A: Measures and Items

<i>Variable</i>	<i>Measure</i>	<i>Author</i>	<i>Items</i>
<i>Teacher Implicit Theories - Student Ability</i>	Theories of Intelligence Scale	Dweck & Henderson, 1989 (adapted in Looney, 2003)	<i>All Items - Beliefs About Student Ability (1 = Strongly Disagree to 6 = Strongly Agree)</i> <ol style="list-style-type: none"> 1. How much students learn depends more on their natural ability than on my teaching strategies. 2. Students have a certain amount of intelligence, and you really can't do much to change it. 3. If students are having trouble with the subject, they will probably continue to have trouble with it in the future. 4. Students' intelligence is something about them that you can't change very much. 5. Some students are born having more learning potential than others. 6. Students can learn new things, but you can't really change their basic intelligence.
<i>Teacher Implicit Theories - Student Social Behavior</i>	Theories of Student Social Behavior scale (adapted from Implicit Theories of Others' Morality scale; Dweck, 1999)	Dweck, 1999	<i>All Items (1 = Strongly Disagree to 6 = Strongly Agree)</i> <ol style="list-style-type: none"> 1. Students' ability to behave appropriately in class is something very basic about them and it can't be changed much. 2. Whether students can behave appropriately or not is deeply ingrained in their personality. It cannot be changed very much. 3. There is not much that can be done to change students' classroom behavior. 4. Some students have a tendency to misbehave in class, and there is little a teacher can do about it. JTP 5. Students' classroom behavior is something that teachers can't change very much. JTP 6. Some students are just born to misbehave. AYW
<i>Teaching Self-Efficacy</i>	Teachers' Sense of Efficacy (TSES)/ Ohio State Teacher Efficacy Scale (OSTES)	Tschannen-Moran & Woolfolk Hoy (2001)	<i>All SubCategories (1 = Not Much/ Not Well to 9 = A Great Deal) Note: Short form is first four items in each subscale.</i> <i>Efficacy for Instructional Strategies</i> <ol style="list-style-type: none"> 1. To what extent can you use a variety of assessment strategies? 2. To what extent can you provide an alternative explanation or example when students are confused? 3. To what extent can you craft good questions for your students? 4. How well can you implement alternative strategies in your classroom? 5. How well can you respond to difficult questions

<i>Variable</i>	<i>Measure</i>	<i>Author</i>	<i>Items</i>
			<p>from your students?</p> <p>6. How much can you do to adjust your lessons to the proper level for individual students?</p> <p>7. To what extent can you gauge student comprehension of what you have taught?</p> <p>8. How well can you provide appropriate challenges for very capable students?</p> <p><i>Efficacy for Classroom Management</i></p> <p>1. How much can you do to control disruptive behavior in the classroom?</p> <p>2. How much can you do to get children to follow classroom rules?</p> <p>3. How much can you do to calm a student who is disruptive or noisy?</p> <p>4. How well can you establish a classroom management system with each group of students?</p> <p>5. How well can you keep a few problem students from ruining an entire lesson?</p> <p>6. How well can you respond to defiant students?</p> <p>7. To what extent can you make your expectations clear about student behavior?</p> <p>8. How well can you establish routines to keep activities running smoothly?</p>
<i>Teacher Emotions</i>	Assessment of Teacher Enjoyment, Anxiety, and Anger Related to Teaching Scale (quantitative) - adapted from the Academic Emotions Questionnaire (Pekrun)	Frenzel, Anne C. Frenzel, Goetz, Stephens, & Jacob (2009)	<p><i>Trait Measures (1 = strongly disagree to 4 = strongly agree; adaptation note: "this class" was removed from all items or other minor adjustments were made to reflect teaching in general.)</i></p> <p><i>Enjoyment</i></p> <p>1. I enjoy teaching.</p> <p>2. Because I have so much fun teaching, I gladly prepare for it.</p> <p>3. I teach with enthusiasm.</p> <p>4. I often have good reason to be happy when teaching.</p> <p><i>Anxiety</i></p> <p>1. I feel tense and nervous when teaching.</p> <p>2. I am often worried that my teaching is not really going well.</p> <p>3. I feel distressed when preparing for teaching.</p> <p>4. I get worried when I think about teaching.</p> <p><i>Anger</i></p> <p>1. I often have good reason to get angry when I teach.</p> <p>2. I feel annoyed when I teach.</p> <p>3. When I teach, I occasionally get really mad.</p> <p>4. Teaching is really frustrating.</p>

<i>Variable</i>	<i>Measure</i>	<i>Author</i>	<i>Items</i>
<i>Teacher Stress, Coping, Burnout</i>	Maslach Burnout Inventory (Educators) - 22 items	Maslach, Jackson, & Schwab (1986)	<p><i>All Subcategories (0 = Never to 6 = Every Day):</i> <i>Emotional Exhaustion (9 items), Depersonalization (5), and Reduced Personal Accomplishment (8)</i> <i>Sample items:</i> EE = I feel emotionally drained from my work DP = I feel I treat some students as if they were impersonal objects PA = I have accomplished many worthwhile things on this job (reversed)</p>
<i>Background - Teacher Demographics</i>	Teacher Demographic Questionnaire	Looney (2003)	<p><i>All items (Fill in the blank)</i> Tell Us About Yourself 1. Sex (Male/Female) 2. Race (Fill in - no options) 3. How long have you been teaching? (Years/Months) 4. How long have you been teaching high school (Years/Months) 5. What grade level(s) do you currently teach? (Fill in - no options) 6. At which school do you teach? (Fill in - no options) 7. How long have you been a teacher at this school? (Years/Months) 8. To which department(s) do you belong? (English, Math, Science, Social Studies, Other Blank) 9. What subject(s) do you teach? (Fill in - no options)</p>
<i>Background - School Basics</i>	Principal Questionnaire	Looney (2003)	<p><i>All items (Fill in the blank)</i> Please provide the following background about your school 1. Number of students 2. Number of teachers 3. Teachers' average class size 4. Percentage of faculty turnover 5. Approximately what percentage of your teachers are: Caucasian, African-American, Hispanic, Asian 6. Approximately what percentage of your teachers are: Male/Female? 7. Approximately how many teachers are within the following departments: English, Math, Science, Social Studies, Art, Foreign Language, Physical Education, Special Education, Business Education, Other 8. What percentage of your students qualify for free or reduced price lunch?</p>

Appendix B: Permission Letters



ANITA WOOLFOLK HOY, Ph.D.

PROFESSOR
PSYCHOLOGICAL STUDIES IN EDUCATION

Dear Alexis Y. Williams

You have my permission to use the *Teachers' Sense of Efficacy Scale* in your research. A copy of both the long and short forms of the instrument as well as scoring instructions can be found at:

<http://www.coe.ohio-state.edu/ahov/researchinstruments.htm>

Best wishes in your work,

A handwritten signature in cursive script that reads 'Anita Woolfolk Hoy'.

Anita Woolfolk Hoy, Ph.D.
Professor

COLLEGE OF EDUCATION
29 WEST WOODRUFF AVENUE
COLUMBUS, OHIO 43210-1177

WWW.COE.OHIO-STATE.EDU/AHOY

PHONE 614-292-3774
FAX 614-292-7900
HOY.17@OSU.EDU



www.mindgarden.com

To whom it may concern,

This letter is to grant permission for the above named person to use the following copyright material:

Instrument: *Maslach Burnout Inventory, Forms: General Survey, Human Services Survey & Educators Survey*

Authors

MBI-General Survey: Wilmar B. Schaufeli, Michael P. Leiter, Christina Maslach & Susan E. Jackson

MBI-Human Services Survey: Christina Maslach & Susan E. Jackson

MBI-Educators Survey: Christina Maslach, Susan E. Jackson & Richard L. Schwab

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for his/her thesis research.

Three sample items from a single form of this instrument may be reproduced for inclusion in a proposal, thesis, or dissertation.

The entire instrument may not be included or reproduced at any time in any other published material.

Sincerely,

Robert Most
Mind Garden, Inc.
www.mindgarden.com

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Appendix C: IRB Consent Documents

University of Maryland College Park

Page 1 of 6 Initials _____ Date _____

Teacher Consent Form A: General Letter

Project Title	<i>Applications of Dweck's Implicit Theory Model to Teachers' Self-Efficacy and Emotional Experiences</i>
Purpose of the Study	This study invites you to share your experiences as a high school teacher. The purpose is to understand teachers' beliefs about their students as well as their motivational and emotional experiences in the classroom. This research is being conducted by Alexis Y. Williams, under the supervision of Kathryn R. Wentzel, Ph. D. at the University of Maryland, College Park.
Procedures	Permission to conduct this study has been granted by your principal. You will receive/may print a copy of this consent form for your records. The student researcher will give you the survey to complete in (school location) [Please follow the link provided to complete the online survey]; it is expected to take about 20 minutes. Items on the survey will ask you whether you agree with statements like, "How much students learn depends more on their natural ability than on my teaching strategies," and "Because I have so much fun teaching this class, I gladly prepare for it."
Potential Risks and Discomforts	There are no known risks associated with participating in this research study. Your participation is anonymous – you will not provide any information that would identify you as part of the study. Once you have completed the study, you may choose to provide basic contact information to enter an optional raffle, but this information will be separated from your survey responses. In any event, remember that you may skip items, stop at any time, and/or decline to participate without penalty.
Potential Benefits	This research is not designed to help you personally. However, given the relevance of the study to current literature on teacher motivation and teacher-student interactions, participating schools will be invited for feedback and discussion based on the findings of the study.
Confidentiality	Your survey is anonymous and will not contain information that may personally identify you. All data collected will be protected by password for digital information, and by lock and key for written information. Only the Principal Investigator and Student Investigator will have access to collected data.
Right to Withdraw and Questions	Your participation in this research is completely voluntary. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits for which you otherwise qualify. If you are an employee or student at UMD, your employment status or academic standing will not be affected by your participation or non-participation in this study. If you decide to stop taking part in the study, or if you have questions, concerns, or complaints, please contact Alexis Y. Williams or Kathryn R. Wentzel, Ph.D. at: 3304 Benjamin Building, University of Maryland, College Park, MD 20742; 301.314.1283; ayw@umd.edu or wentzel@umd.edu.

Participant Rights	<p><i>If you have questions about your rights as a research participant or wish to report a research related injury, please contact:</i></p> <p style="text-align: center;">University of Maryland College Park Institutional Review Board Office 0101 Lee Building College Park, Maryland, 20742 E-mail: irb@umd.edu Telephone: 301-405-0678</p> <p><i>This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.</i></p>	
Statement of Consent	<p>Your signature indicates that you are at least 18 years of age; you have read this consent form or have had it read to you; your questions have been answered to your satisfaction and you voluntarily agree to participate in this research study. You will receive/may print) a copy of this signed consent form.</p> <p>If you agree to participate, please sign your name/[type/click "I Agree/Consent"] below.</p>	
Signature and Date	NAME OF SUBJECT [Please Print]	
	SIGNATURE OF SUBJECT	
	DATE	

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JAN 06 2012

**UNIVERSITY OF MARYLAND
COLLEGE PARK**

Teacher Consent Form B: Word of Mouth Letter

Project Title	<i>Applications of Dweck's Implicit Theory Model to Teachers' Self-Efficacy and Emotional Experiences</i>
Purpose of the Study	This study invites you to share your experiences as a high school teacher. The purpose is to understand teachers' beliefs about students as well as their motivational and emotional experiences in the classroom. This research is being conducted by Alexis Y. Williams , under the supervision of Kathryn R. Wentzel, Ph. D. at the University of Maryland, College Park.
Procedures	Permission to conduct this study has been granted by the Institutional Review Board at the University of Maryland. You will receive/may print a copy of this consent form for your records. The student researcher will give you the survey to complete in (school location) [Please follow the link provided to complete the online survey]; it is expected to take about 20 minutes. Items on the survey will ask you whether you agree with statements like, "How much students learn depends more on their natural ability than on my teaching strategies," and "Because I have so much fun teaching this class, I gladly prepare for it."
Potential Risks and Discomforts	There are no known risks associated with participating in this research study. Your participation is anonymous - you will not provide any information that would identify you as part of the study. Once you have completed the study, you may choose to provide basic contact information to enter an optional raffle, but this information will be separated from your survey responses. In any event, remember that you may skip items, stop at any time, and/or decline to participate without penalty.
Potential Benefits	This research is not designed to help you personally. However, given the relevance of the study to current literature on teacher motivation and teacher-student interactions, participating schools will be invited for feedback and discussion based on the findings of the study.
Confidentiality	Your survey is anonymous and will not contain information that may personally identify you. All data collected will be protected by password for digital information, and by lock and key for written information. Only the Principal Investigator and Student Investigator will have access to collected data.
Right to Withdraw and Questions	Your participation in this research is completely voluntary. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits for which you otherwise qualify. If you are an employee or student at UMD, your employment status or academic standing will not be affected by your participation or non-participation in this study. If you decide to stop taking part in the study, or if you have questions, concerns, or complaints, please contact Alexis Y. Williams or Kathryn R. Wentzel, Ph.D. at: 3304 Benjamin Building, University of Maryland, College Park, MD 20742; 301.314.1283; ayw@umd.edu or wentzel@umd.edu.

Participant Rights	<p><i>If you have questions about your rights as a research participant or wish to report a research-related injury, please contact:</i></p>
	<p align="center"> University of Maryland College Park Institutional Review Board Office 0101 Lee Building College Park, Maryland, 20742 E-mail: irb@umd.edu Telephone: 301-405-0678 </p>
	<p><i>This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.</i></p>
Statement of Consent	<p>Your signature indicates that you are at least 18 years of age; you have read this consent form or have had it read to you; your questions have been answered to your satisfaction and you voluntarily agree to participate in this research study. You will receive/may print) a copy of this signed consent form.</p>
	<p>If you agree to participate, please sign your name/[type/click "I Agree/Consent"] below.</p>
Signature and Date	<p>NAME OF SUBJECT</p>
	<p>[Please Print]</p>
	<p>SIGNATURE OF SUBJECT</p>
	<p>DATE</p>
	<p align="center">IRB APPROVED EXPIRES ON</p>
	<p align="center">JAN 06 2012</p>
	<p align="center">UNIVERSITY OF MARYLAND COLLEGE PARK</p>

University of Maryland College Park

Principal Consent Form

Project Title	<i>Applications of Dweck's Implicit Theory Model to Teachers' Self-Efficacy and Emotional Experiences</i>
Purpose of the Study	This study invites teachers to share their experiences as a high school teacher. The purpose is to understand teachers' beliefs about students as well as their motivational and emotional experiences in the classroom. This research is being conducted by Alexis Y. Williams , under the supervision of Kathryn R. Wentzel, Ph. D. at the University of Maryland, College Park.
Procedures	Permission to conduct this study has been granted by the Institutional Review Board at the University of Maryland. You will receive/may print a copy of this consent form for your records. The student researcher will give you the survey to complete in (school location) [Please follow the link provided to complete the online survey]; it is expected to take about 20 minutes. Items on the survey will ask you for information relevant to teachers' backgrounds and experiences at your school, such as the number of students and teachers, subjects taught, and turnover rate.
Potential Risks and Discomforts	There are no known risks associated with participating in this research study. Your participation is anonymous – you will not provide your name or identifying information. In any event, remember that you may skip items, stop at any time, and/or decline to participate without penalty.
Potential Benefits	This research is not designed to help you personally. However, given the relevance of the study to current literature on teacher motivation and teacher-student interactions, participating schools will be invited for feedback and discussion based on the findings of the study.
Confidentiality	Your survey is anonymous and will not contain information that may personally identify you. All data collected will be protected by password for digital information, and by lock and key for written information. Only the Principal Investigator and Student Investigator will have access to collected data.
Right to Withdraw and Questions	Your participation in this research is completely voluntary. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits for which you otherwise qualify. If you are an employee or student at UMD, your employment status or academic standing will not be affected by your participation or non-participation in this study. If you decide to stop taking part in the study, or if you have questions, concerns, or complaints, please contact Alexis Y. Williams or Kathryn R. Wentzel, Ph.D. at: 3304 Benjamin Building, University of Maryland, College Park, MD 20742; 301.314.1283; ayw@umd.edu or wentzel@umd.edu.
Participant Rights	<i>If you have questions about your rights as a research participant or wish to report a research-related injury, please contact:</i>

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Institutional Review Board Office 0101 Lee Building College Park, Maryland, 20742 E-mail: irb@umd.edu Telephone: 301-405-0678							
This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.							
Statement of Consent	Your signature indicates that you are at least 18 years of age; you have read this consent form or have had it read to you; your questions have been answered to your satisfaction and you voluntarily agree to participate in this research study. You will receive/[may print] a copy of this signed consent form. If you agree to participate, please sign your name/[type/click "I Agree/Consent"] below.						
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SIGNATURE OF SUBJECT							
DATE							

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**UNIVERSITY OF MARYLAND
COLLEGE PARK**

Appendix D: Report of Examining Committee

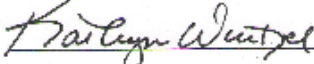
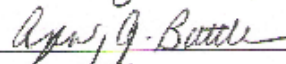
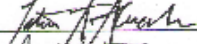
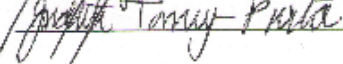

University of Maryland, College Park
Research and Graduate Studies

REPORT OF EXAMINING COMMITTEE

Report Date: April 04, 2012
 Name : Williams, Alexis Ymon University ID: 102-12-9203
 Program : Human Development Degree Sought: Ph.D.
 Date of the Oral Exam: 04/11/12 Committee Approved: 04/02/12

The above student's dissertation has been successfully defended and is approved by the following committee. By signing and submitting this form, the committee certifies that all dissertation corrections required by the committee have been made.

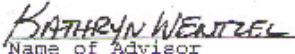
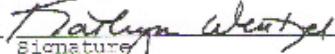

COMMITTEE MEMBERS:

Name	Signature	Date
CHAIR: Wentzel, Kathryn R.		7/23/12
MEMBERS: Battle, Ann Arlene		7/23/12
Alexander, Patricia A.		4/11/2012
Torney-Purta, Judith		7/25/12
DEAN'S REPRESENTATIVE: Hancock, Gregory R.		7/25/12

Optional for the Advisor:

I understand that grades of 'incomplete' (I) and 'no grade' (NG) must be changed prior to a student being cleared for graduation. I request that the Graduate School change all incompletes and no grades for dissertation credits (899s) to the grade of A. This same grade may also be assigned for dissertation credits for the current semester. (If this is not signed, Supplementary Grade Reports must be submitted by the advisor.)

If student has any departmental provisions, please Clear /Don't clear

		7/23/12
Name of Advisor	Signature	Date
Margaret J McLaughlin mjmc@umd.edu		JUL 25 2012
Graduate Director	Signature	Date

Please return this form to:

College of Education
Graduate Studies
University of M Rm. 1204 Benjamin Building College Park, MD 20742
PHONE (301) 405-2364 PH: (301) 405-2364 -9558
FAX: (301) 314-5887

Glossary

Implicit Theories – Beliefs about the malleability or stability of personal attributes; these include incremental theories, which are centered around beliefs that attributes are flexible and malleable, and entity theories, which are centered around beliefs that attributes are inflexible and unchangeable.

Teaching Efficacy – The belief that one can impact positively his or her students' academic and/or social outcomes despite barriers.

Emotions – Subjective experiences of discrete positive or negative affect (e.g., enjoyment, anxiety, anger) directed at a specific object (event, person), involving cognitive appraisals of cause related to one's goals or desires, and including physiological changes and expression as well as other tendencies to act.

Burnout – emotional and physical depletion associated with work; symptoms include emotional exhaustion, depersonalization, and decreased sense of personal accomplishment.

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RELATED EXPERIENCES

Date	Institution	Position
Summer 2010 – Spring 2012	University of Maryland	Coordinator of Graduate Student Programs – Center for Teaching Excellence (CTE)
		<ul style="list-style-type: none">▪ Designed, executed, and maintained graduate programs, trainings, workshops, and retreats, including the annual campus-wide fall graduate teaching assistant orientation and departmental orientations.▪ Collaborated and consulted individually with faculty and graduate TAs on professional and career development events and documentation.▪ Designed formative and summative assessments and quantitative and qualitative evaluations of graduate programs; reviewed and reported annually on all graduate programs with recommendations for future improvements.▪ Presented research at professional conferences on the scholarship of teaching and learning.▪ Planned and co-facilitated annual teaching portfolio retreat and Distinguished Teaching Assistant recognition ceremony.▪ Organized and oversaw semester professionalization activities for the University Teaching and Learning Program (UTLP), including teaching portfolio development and course observations of noted campus faculty.▪ Selected, mentored, and directed participants of the Graduate Lilly Fellowship and the International Teaching Fellowship through team research and publication, teaching philosophy writing and peer review, conference presentations, and other professional development activities.

- Spring 2009 – Spring 2010* *University of Maryland* *Graduate Instructor – Child Growth and Development (EDHD411)*
- Organized lectures and student-led weekly discussion groups on topics related to child development for education majors (Spring semesters) and general majors (Fall semester).
 - Guided students through steps to create and format a final research paper based on relevant empirical sources.
 - Designed syllabus and graded brief essays, exams, and final paper.
 - Designed and maintained online course space (average enrollment 25).
- Fall 2007 & Fall 2008* *University of Maryland* *Graduate Instructor – Human Development and Societal Institutions (EDHD230/S)*
- Planned and led lectures and discussions on contextual influences on human development through major institutions (e.g., family systems, school, child care, health care) for general majors and College Park Scholars: Advocates for Children cohorts.
 - Designed and graded weekly assessments and final policy paper and presentations.
 - Maintained online course space (average enrollment 40).
- Spring 2006 – Spring 2007, Spring 2008* *University of Maryland* *Graduate Instructor – Human Development Through the Lifespan (EDHD320)*
- Planned and led lectures and discussions in lifespan development
 - Organized online course content
 - Designed syllabus and graded quizzes, essays, and exams (average enrollment 75 total for two sections).
- Summer 2005 – Spring 2006* *University of Maryland* *Graduate Teaching Assistant - Child Growth and Development (EDHD411)*
- Assisted course instructor, Professor Nathan Fox, with syllabus construction and assignments.
 - Designed and graded exams.
 - Led three of six discussion sections, organized online course content, and worked directly with students' concerns (enrollment 144).
- Fall 2003 – Fall 2005* *University of Maryland* *Graduate Research Assistant*
- Assisted Principal Investigator, Professor Kathryn Wentzel, with collection and analysis of data for social and academic motivational research projects.
- Fall 2003* *University of Maryland* *Graduate Teaching Assistant - Team Research in Human Development (EDHD878)*
- Assisted course instructor, Professor Kathryn Wentzel, with preparation and class sessions (est. enrollment 15).
- Fall 2001 - Spring 2002* *University of Maryland* *Undergraduate Teaching Assistant - Basic Helping Skills: Research and Practice (PSYC433)*
- Co-taught small-group lab sessions for instructor, Dr. Misty Kolchakian.
 - Conducted single whole-class lecture as guest instructor.
 - Graded student research papers and contributed to exam content (average enrollment 33).
- Fall 1999 – Spring 2001* *University of Maryland* *Undergraduate Research Assistant*
- Assisted Principal Investigators, Drs. Melanie Killen and Charles Stangor, with data collection and entry for social and moral research on social inclusion/exclusion.

- Performed structured interviews with individual middle and high school students concerning their reactions to short vignettes involving various types of social exclusion based on race and gender.

Spring 1999 – Spring 2001 University of Maryland Gemstone Team Research Member

- Conducted research with the LearnUSA Gemstone team under guidance of advisor, Professor Allison Druin.
- Used hands-on methods of data collection for primary and secondary students.
- Conducted an educational conference through Gemstone Program in October 2000 for students, parents, administrators, and community members.

HONORS, AWARDS, and RECOGNITIONS

University of Maryland College of Education Graduate Student Research Support Award - Support Program for Advancing Research and Collaboration (SPARC), 2010-2011
 University of Maryland Center for Teaching Excellence Distinguished TA Award, 2008-2009
 University of Maryland Human Development Student Travel Award, Spring 2006 - 2009
 University of Maryland Doctoral Fellowship, 2003-2005
 University of Maryland Graduate Teaching Assistantship, 2003, 2005 - 2010
 University of Maryland Gemstone Honors Citation, Spring 2001
 University of Maryland Arts and Humanities Citation; Spanish Language and Cultures, Spring 2001
 National Society of Collegiate Scholars Member, Spring 2000
 University of Maryland University Honors Citation, Fall 1999

PROFESSIONAL ASSOCIATIONS

American Educational Research Association (AERA)

PRESENTATIONS

International/National Conferences

- Tomback, R. M., Williams, A. Y., Monzo, J. C., & Wentzel, K. R. (2007, April). *A longitudinal examination of student concerns: Consistency and change after the transition to high school*. Poster presented at the biennial meeting of the Society for Research in Child Development, Boston.
- Tomback, R. M., Williams, A. Y., & Wentzel, K. R. (2006, April). *Young adolescents' concerns about the transition to high school: A longitudinal study*. Poster presented at the annual meeting of the American Educational Research Association, San Francisco.
- Tomback, R. M., Williams, A. Y., & Wentzel, K. R. (2005, April). *Young adolescents' concerns about the transition to high school*. Poster presented at the annual meeting of the American Educational Research Association, Montreal.
- Wentzel, K. R., Monzo, J. C., Williams, A. Y., & Tomback, R. M. (2007, April). *Teacher and peer influence on academic motivation in adolescence: A cross-sectional study*. Poster presented at the biennial meeting of the Society for Research in Child Development, Boston.

Wentzel, K. R., Williams, A. Y., & Tomback, R. M. (2006, April). *Teacher and peer support as predictors of academic performance and classroom behavior: A longitudinal study*. Poster presented at the annual meeting of the American Educational Research Association, San Francisco.

Wentzel, K. R., Williams, A. Y., & Tomback, R. M. (2005, April). *Relations of teacher and peer support to classroom behavior in middle school*. Paper presented at the annual meeting of the American Educational Research Association, Montreal.

University Conferences

Druin, A., Fegely, A., Berger, E., Goodman, R., Lewis, J., Tucker, A., Williams, A., Tash, B., & Von Alt, W. (2000, October). *The classroom of the future: Giving kids a voice*. Gemstone/Honors program conference presented at the University of Maryland, College Park, MD.

SERVICE

National Service

Ad hoc Reviewer, *Contemporary Educational Psychology*

Campus and Departmental Service

PROMISE Mentor - Maryland's Alliance for Graduate Education and the Professoriate program, *University of Maryland*, 2003 – present

Human Development Graduate Student Organization, *Department of Human Development*, 2003 – present

Black Graduate Student Association, 2003-present

Dean Search Committee, *College of Education*, Fall 2006 – Spring 2007

Selection Committee, Outstanding Multi-Ethnic Student Organization Award, *Office of Multi-Ethnic Student Education*, Spring 2006

SOFTWARE PROGRAMS

Mplus, SPSS, EQS, Survey Monkey, Microsoft Office, Adobe, Google Docs/Forms, Blackboard/ELMS, WebCT