Educ Psychol Rev (2010) 22:297–321
DOI 10.1007/s10648-010-9129-4

REVIEW ARTICLE

Emotional Competence and its Influences on Teaching and Learning

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Published online: 2 May 2010

Abstract This article provides an interdisciplinary review of theory and research linking aspects of emotional competence to learning and school-related outcomes across childhood. Drawing upon work in developmental psychology, educational psychology, and teacher education, this review also discusses the role of teachers in socializing students' emotions and considers the strategies and the challenges they face in regulating their own emotions in the classroom context. Future directions for research in this area are proposed.

Keywords Emotional competence · Emotion understanding · Emotion regulation · Teacher emotions

Emotional competence is a generic term that has been applied to many types of emotion-related skills. Early research focused on understanding more about the underlying essences of the construct. Most recently, emotional competence has been conceived as including the awareness of emotion, the ability to use and understand emotion-related vocabulary, knowledge of facial expressions and the situations that elicit them, knowledge of the cultural rules for displaying emotion, and skill in managing the intensity of one's emotional displays in ways that are appropriate to the audience and the situation (Cole *et al.* 2004; Eisenberg and Spinrad 2004).

Emotions are thought to be rooted in relationships because they provide information that is most meaningful in the context of social exchanges (Saarni 1999; Thompson 1991). Thus, for the past 15 years or so, researchers interested in emotions have tended to focus on individual differences in emotional competence and the implications of these differences for understanding social relationships. These studies have generally shown that, among children, the understanding of emotion is associated with peer popularity, the ability to initiate social exchanges with peers, positive conceptions of peer experiences, and prosocial and empathy-related behavior (Denham 1986; Dunn 1995; Garner and Estep 2001). In

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addition, children who cope with felt emotion in ways that minimize peer conflict tend to be rated as more likable by peers and have healthier friendships than other children (Fabes and Eisenberg 1992). In contrast, low levels of emotion regulation in the early years have robustly predicted long-term behavioral problems (Rydell *et al.* 2003).

Despite the progress that has been made with respect to understanding the role of emotional competence in the development of children's skill in the social arena, a full understanding of the construct and its utility for human functioning requires attention to other aspects of children's development. In this article, it is proposed that emotions are fundamental to children's academic and cognitive competence. Specifically, research adopting both psychological and educational perspectives will be reviewed, with the goal of integrating these diverse research areas so that a more complete and influential approach to the study of the emotion–cognition link can be established and the specific emotional competencies that are most crucial for academic success can be revealed.

This article will commence with a brief overview of the theories of emotions that have been used most often to study the linkage between emotion and cognition. Then, a summary and evaluation of the empirical research on the associations between emotional and academic competence and children and youth are presented. Next, research on teacher emotions will be discussed. The article concludes with a discussion of the methodological problems that currently exist in the literature and a presentation of possible research directions for furthering the research linking emotional competence and children's readiness for, adjustment to, and performance in school. This review is meant to be illustrative rather than comprehensive as the variation in theoretical frameworks and the accompanying variation in operational definitions, measures, and methods used across studies precludes an all inclusive review and synthesis of the research on this topic. However, by examining the existing research, the goal is to bring coherence to the findings so that we may begin to make some general conclusions regarding the connection between emotional competence and academic performance as it develops in the early years of development and changes as children progress through the grade school and adolescent years.

Emotion-Related Psychological Theories of Learning

Various theoretical perspectives have been used to understand and explain the emotion–cognition link. Motivational theories focus on how emotion regulation ability contributes to the quality of effort and the degree of persistence individuals exert in completing academic tasks (Schutz and Davis 2000). Research adopting this framework has shown that children who display curiosity about school tasks, who are engaged in learning, and maintain positive feelings when challenged academically tend to perform better in school and on standardized tests than do other children (Lepper *et al.* 2005). Research has shown that experiencing positive emotion may improve problem-solving ability, facilitate recall of affectively neutral and positive information, and improve decision making (Estrada *et al.* 1994; Isen and Shalker 1982). Alternatively, attentional control theory posits that optimal cognitive performance is most likely to occur when attentional resources are dispersed widely than when focused narrowly on a specific task (Eysenck *et al.* 2007). The idea is that allocating attentional resources to the management of emotion may detract from the ability to think and listen (Blankstein *et al.* 1989), skills that are important for learning both within and outside of school. In his differential emotions theory, Izard suggests that the emotion of interest is a central motivator and stimulant for creative thought and action and that it accounts for selective attention (Izard (1991). More recently, this theory has been expanded to consider

how overall emotion knowledge allows for the use of appropriate emotion in the completion of tasks that require high levels of focused attention (Izard 2009).

Emotion-Related Educational Theories of Learning

Educational researchers have also done significant theoretical work linking emotion and cognition. Some of this work has borrowed from social psychological theories that focus on goals and motivation (e.g., Linnenbrink 2006). For example, according to the control value theory of achievement emotions proposed by Pekrun (2006), individual's appraisals of control and their values regarding achievement are central to the arousal of emotions associated with learning in school. Some of these emotions are related to the effort associated with completing the academic task (e.g., enjoyment, frustration, and boredom), and other emotions are associated with children's experiences of success or failure in completing the task (e.g., joy, hope, pride, anxiety, hopelessness, shame, and anger).

Still another viewpoint of the emotion–cognition linkage is characterized by the premise that student goals and the emotions they experience in relation to these goals are influenced by the social and historical context. That is, students' emotional expressions are a function of how they were socialized as well as how the emotion is currently being experienced (Schutz *et al.* 2006). This approach resembles the emotion socialization conceptual framework adopted by developmental scholars to understand how children learn about emotions from parents (Eisenberg *et al*. 1998).

Although less well established than the previously discussed theories, another important and more controversial perspective of the emotion–cognition connection is the emotional intelligence (EI) framework. EI is a term that has been applied to the ability to correctly perceive facial, behavioral, and situational cues of emotions in the pursuit of a social goal (Mayer and Salovey 1997). Whereas EI has similarities to the emotional knowledge construct discussed earlier, it encompasses personality and motivational traits and other affective skills such as empathy, self-concept, and assertiveness (Zeidner *et al*. 2002) that are not captured in traditional measures of emotion understanding, such that a strong case could be made that EI reflects something different than emotional knowledge.

Several theoretical perspectives have been proposed to explain the association between emotion and cognition. Most emphasize the importance of having awareness and understanding of emotional cues and the ability of regulating and managing the experience and expression of emotion, although they sometimes differ in the emphasis that they place on intrapersonal versus interpersonal cues. In the immediately following sections, I will survey the research linking these two aspects of emotional competence to children's cognition and learning, after first providing a chronology of how each develops.

Method

Literature search strategy

Several methods were used to locate the studies included in this review. To begin, a computer search of Psychological Abstracts (PsychLIT) was conducted using search terms connected directly with the understanding and regulation of emotion. For emotion knowledge, relevant articles were chosen if they specifically mentioned the word emotion knowledge, emotion situation knowledge, emotion understanding, affective knowledge,

emotional/affective perspective taking, emotion recognition, emotion perception, emotional/affective intelligence, emotional display rule knowledge or if the words knowledge, understanding, intelligence, recognition , or perception were paired with a specific emotion type (e.g., happiness, sadness, anger, and fear). These terms were chosen based on the work of prominent researchers and theorists who study children's knowledge of emotions, including Harris (2000), Izard (2001), Michalson and Lewis (1985), and Saarni and Harris (1999). Emotion regulation was the sole term used to search for the emotion regulation studies. Once located, studies were chosen for inclusion in this review if they met the criteria of focusing on emotion knowledge and/or emotion regulation in conjunction with academic or cognitive outcomes in school settings. From this search, relevant articles referenced by those articles located using the computer search method were also located. Finally, a manual search was conducted of the following journals published between 1979 until 2009: *Child Development, Developmental Psychology, Social Development, Early Education and Development, Journal of School Psychology, School Psychology Quarterly, Early Childhood Research Quarterly, Educational Psychologist, Educational Psychology Review, Emotion, Cognition and Emotion, Journal of Nonverbal Behavior*, and *Teacher and Teacher Education.*

Emotion Knowledge

Emotion knowledge is a construct that has been studied across the life span, and it has come to play a central explanatory role in predicting the quality of social relationships in many different contexts for people of all ages. However, investigations of emotion knowledge typically focus on young children and, as will become clear later, those that include older individuals tend to be limited in the modes of assessment that are used to measure the emotion knowledge construct.

Emotion knowledge in early childhood

An important precursor of emotion knowledge is the ability to talk about internal states, a skill that emerges early in the second year of life. Indeed, some have even argued that the ability to talk about emotions is one of the earliest indicators of the emotion–cognition connection (Izard 2009). Young toddlers' ability to talk about internal states that include feelings is thought to demonstrate early self-understanding, moral awareness, and emotion regulation (Bretherton *et al*. 1986; Brown and Dunn 1991). Some 2-year olds can correctly sort photographs of facial expressions of happiness and sadness and can distinguish between high and low intensities of these emotions (Nelson and DeHaan 1997). Still, the bulk of research on emotion knowledge in early childhood has been concerned with children at least 3 years of age. These studies have considered children's understanding of emotional expressions and their knowledge of the normative reactions to emotion-eliciting situations (i.e., emotion situation knowledge). Knowledge of emotional expressions is concerned with the comprehension verbal labels for facial displays of emotion, whereas emotion situation knowledge involves the ability to reason about the contextual and situational cues of emotion.

Children learn the labels and expressions and situations associated with happiness, sadness, and anger before they learn about the facial and situational cues of fear and surprise. These findings hold regardless of whether emotion knowledge is assessed with emotion recognition tasks where children are asked to identify a facial label after first being given the verbal label or whether the stimuli focus on hypothetical or live events, line

drawings, real people or photographs of real people posing emotions, or puppets who "act out " emotions vocally, behaviorally, and contextually (Denham and Couchoud 1990; Fabes *et al*. 2001; Garner and Estep 2001; Michalson and Lewis 1985), but children may perform better if they are asked to interpret emotions of children belonging to their own ethnic group (Glanville and Nowicki 2002). Importantly, these results have been demonstrated in ethnic minority, low-income, and behaviorally maladjustment children (e.g., Downs *et al*. 2007; Garner *et al*. 1994; Smith and Walden 1999).

Emotion knowledge in school-age and adolescent children

As children move into grade school, they progress beyond the ability to label and understand facial expressions and emotion-eliciting situations to a fuller understanding of emotions that includes knowledge of complex emotions, an understanding that individuals can feel two different emotions about the same event, and emotional display rule knowledge. Higher-level emotion understanding requires a consideration for an audience (e.g., peers and teachers) and an awareness of the cultural norms for emotional expression (Saarni 1999).

Although some preschoolers can understand pride when facial cues are accompanied by behavioral cues such as chest expansion and pulled back shoulders (Tracy *et al*. 2005), school-age children have a more advanced understanding of shame, pride, and guilt. This is significant for understanding the emotion–cognition link because these emotions are commonly expressed in schools. Unlike most preschoolers, school-age children are also aware of the possibility that the same individual can experience different emotions simultaneously. For example, a child can experience sadness at the thought of moving away and leaving behind a treasured friend while also experiencing excitement at the prospect of meeting a new best friend. School-age children are also less reliant on external cues than younger children when evaluating the emotions of others (Harris 1989).

School-age children also know the importance of hiding their internal feelings because they understand better than younger children the negative consequences associated with expressing the "wrong" emotions during social interactions (Parker and Gottman 1989). Sometime around third grade, children begin to understand that it is sometimes necessary to appear regulated even when physiologically and affectively aroused (Gross and Levenson 1997). This is referred to as emotional display rule knowledge. Display rule knowledge involves an understanding that one can conceal his/her internal feelings by maintaining a neutral facial expression, varying the intensity of the emotional expression, or masking the "true" emotion by displaying a different emotion (Matsumoto *et al*. 2005; Saarni 1979). This type of emotion knowledge operates to help children to identify situations in which the expression of certain emotions would be socially unacceptable (e.g., Zeman and Garber 1996), such as expressing sadness, disappointment, or embarrassment at earning a poor grade or regulating the expression of pride at receiving an excellent grade when a friend receives a low mark. These more advanced skills are predicated upon the ability to understand emotional expressions and the normative response to emotion-eliciting situations described earlier, and some children show rudimentary ability to express complex emotions and a beginning understanding of the rules for displaying emotions as early as toddlerhood (Barrett *et al*. 1993).

As suggested in the research described above, the understanding of the most basic emotions (i.e., happiness, sadness, anger, fear, and surprise) is well established by the beginning of the middle-school grades (McClure 2000). However, children continue to show improvements in the understanding of emotion-eliciting situations and in the understanding of subtle cues of emotion as they move into the adolescent years and beyond (Markham and Adams 1992; Thomas *et al*. 2007). Interestingly, individuals began

to show age-related declines in the understanding of emotions at about 30 years of age (Mill *et al*. 2009), particularly for the emotions of anger and sadness (Phillips *et al.* 2002).

Emotion Regulation

Whereas emotion knowledge represents the acquisition and understanding of emotion, emotion regulation ability has to do with performance. Emotion regulation has often been defined as the ability to successfully manage emotional arousal and skill in controlling one's internal state and the external expression of that state (Thompson 1991). The expression of positive and negative emotion must be regulated, but the greatest pull for the management of emotion occurs in response to negatively valenced emotions (Barrett *et al.* 2001). Some researchers focus on how the emotion is initially expressed (i.e., antecedent-focused emotion regulation) and therefore managed, whereas others focus on the outcomes of an emotion regulation strategy (i.e., a response-focused emotion regulation strategy) in their assessment of skill in this area (see Cole *et al.* 2004; Gross 1998). What is widely accepted, though, is that emotion regulation involves physiological, neurologic, motivational, and behavioral processes. Researchers obviously differ in the extent to which they focus on singular or multidimensional dimensions of the construct. Moreover, emotion regulation, at least aspects of it, is explained by individual differences that are biologically rooted, present very early in life, and stable across time and context, points which are not always addressed in studies on this topic (Eisenberg and Spinrad 2004).

Emotion regulation in early childhood

From birth, young children experience physiological and interpersonal events that elicit extreme intense levels of both negative and positive emotions (Karraker *et al.* 1994). The ability to manage these negative emotional events is an important developmental achievement because the maintenance of positive affect is associated with later cognitive and social competence, and early emotional behavior is thought to be predictive of later affective skills (Cicchetti *et al.* 1991). The entry into toddlerhood marks a particularly challenging time for developing emotion regulation ability because aggression is at its highest level during this period in development (Shaw *et al.* 1994). Thus, early attempts at emotion regulation tend to be aided by parents and other adults. However, sometime during the second year of life, the expectation is that children will come to rely on their own internal resources to manage their emotions (Cicchetti *et al.* 1991; Kopp 1989). For instance, mothers of toddlers are less likely than mothers of infants to eliminate emotional stressors or attempt to soothe their children (Karraker *et al*. 1994). These maternal interventions continue to decrease as children move from toddlerhood to the preschool years (Spinrad *et al.* 2004). During the preschool years, children continue to show improvement in the development of emotion regulation ability and can implement carefully planned strategies (i.e., venting, actively resisting negative overtures from a peer, and seeking the assistance of a supportive adult) for responding to stimuli and situations that evoke negative emotion (Fabes and Eisenberg 1992).

Emotion regulation in school-age and adolescent children

During the middle school years, children become better at turning their attention away from behavioral emotion regulation strategies to those that are more complex and internally based,

such as acceptance, cognitive distraction, and positive reappraisal of the emotion-eliciting event (Harris 1989). As individuals move into the adolescence and early adulthood, they become less focused on emotion-related goals for regulating emotions and more concerned with the acquisition of different skills built around "new" experiences (Carstensen *et al.* 2003).

Difficulty regulating emotional expression is an important predictor of problematic social relationships across the life span regardless of whether emotion regulation is conceptualized as a global ability, if regulation of specific emotions is measured, or whether antecedent-focused or response-focused emotion regulation strategies and behaviors are considered. For example, elementary children who have peer difficulties tend to be characterized as higher than other children in negative arousal and emotional reactivity (Kochenderfer-Ladd 2004), and children rated as being frequently angry at both home and school are more likely than other children to be victimized by peers (Hanish *et al*. 2004). Moreover, adolescent children who are unable to effectively regulate their emotions may be at increased risk for adolescent depression, the inability to seek out others for support, and disengagement (Garber *et al.* 1995; Silk *et al.* 2003). Socially incompetent children may have difficulty controlling the expression of positive emotion as well (Miller and Olson 2000). Importantly, some researchers have hypothesized that emotion regulation is predicated upon the ability to understand emotions (Cicchetti *et al.* 1995).

Linkages Between Emotion Knowledge and Academic and School-related Competence

Though the literature is laden with work linking challenges in the understanding, processing, and regulation of emotion to social and behavioral outcome measures, relatively little research has examined the question of how aspects of emotional competence relates to school outcomes across childhood. This is despite the fact that emotion-related problems are a frequent cause for referral of school children for psychological services (Greenberg *et al.* 1991). Indeed, emotion-related problems in young children represent one of the most challenging issues for educators because of the heightened affect that is often present in the classroom (McCabe *et al.* 2000), and educational researchers have hypothesized that the awareness, appraisal, and understanding of emotions are critical to the creation of a positive classroom climate that encourages effective instructional engagement for students and teachers (Meyer and Turner 2006).

Language competence

In early childhood, studies considering the linkage between emotion knowledge and cognitive outcomes have focused, to a large extent, on language competence as the measure of cognitive competence. For example, a study conducted by Colwell and Hart (2006) demonstrated that emotion knowledge was positively associated with preschoolers' language competence as measured by the Peabody Picture Vocabulary Test. Children's ability to label emotions was assessed with drawings of an adult female expressing happiness, sadness, anger, and fear. Scores on this measure were aggregated with scores on a measure that assessed the children's understanding of the situational determinants of these same emotions using hypothetical vignettes that involved a female child. The authors do not explain why pictures of an adult female were used in the affective labeling task and pictures of a female child were used in the emotion situation knowledge task or discuss how this might have impacted children's emotion knowledge scores.

The link between language competence and emotion knowledge has also been demonstrated in research on European children. Specifically, Cutting and Dunn (1999)

assessed multiple forms of child language, which included measures on the standardized British Picture Vocabulary Scale, a measure of receptive language and children's ability to retell a story from a picture book, and a measure of expressive language. From the narrative assessment, the length and grammatical complexity of the children's sentences were also determined. Affective labeling and knowledge of situational cues of emotion were included as separate components of children's emotion knowledge. As before, receptive vocabulary was positively related to both types of emotion knowledge, as was narrative performance on the story retelling and sentence length and complexity. Interestingly, grammatical complexity was associated only with the more advanced type of emotion knowledge, namely, emotion situation knowledge. In a study of first- and second-grade children, Trentacosta *et al.* (2006) found an association between verbal ability as assessed by the Stanford-Binet vocabulary subtest and children's knowledge of facial expressions and their understanding of prototypical situations related to happiness, sadness, anger, and fear as assessed with the Assessment of Children's Emotion Skills Scales developed by the authors.

Other research involving school-age children has also shown links between emotion knowledge and vocabulary scores. Using a small sample, Bajgar and her colleagues conducted a validation study of a "new" emotion knowledge task called the Levels of Emotional Awareness Scale for Children. Children aged 9 to 12 years were presented 12 evocative interpersonal scenarios that were developed to elicit feelings of anger, fear, happiness, or sadness and asked to provide written responses to the following two questions "How would you feel?" and "How would the other person feel?" Children's performance on the Levels of Emotional Awareness Scale for Children was positively related to their scores on the vocabulary subtest of the Weschler Intelligence Scale for Children-Revised and to another measure of language competence (i.e., the total number of words children used to respond to the emotion scenarios; Bajgar *et al.* 2005).

Some have argued that the linkage between emotion knowledge and language competence is due to the fact that most tasks of emotion understanding require verbal fluency for the children to be successful (Shields *et al*. 2001). Others, however, have suggested that language competence provides an important vehicle for children to label, articulate, and acknowledge their own and others' emotional feelings and experiences so that the specific act of learning to talk about emotions is adaptive and functional (Izard 2009).

Attentional competence

As suggested by attentional control theory, problems understanding emotions might also contribute to children's inability to attend during instructional tasks. Children with higher emotion knowledge scores appear to be better than other children at focusing and sustaining attention in the classroom (Nelson *et al*. 1999). Emotion knowledge at the beginning of the school year also predicts attentional competence at the end of the year for early elementary school children. In a study of first- and second-grade children, (Trentacosta *et al.* 2006) assessed children's emotion knowledge using the Assessment of Children's Emotion Skills Scales, which measures knowledge of facial expressions and children's understanding of prototypical situations related to happiness, sadness, anger, and fear. Children were also asked to nominate classmates who expressed the highest level of happiness, sadness, and anger. Attentional competence was assessed using the teacher-rated cognitive concentration subscale of the Teacher Observation of Classroom Adaptation. Fall measures of emotion knowledge predicted attentional competence assessed later that spring. Children nominated by their peers as being happier than their peers were rated by teachers as being more

attentionally competent than other children. On the other hand, those children with higher sadness and anger nominations were rated as less attentionally competent. Given that these studies are correlational, it is also plausible that attentional control contributes to emotion knowledge. For example, preschoolers' attentional control as assessed by teacher report longitudinally predicts children's knowledge of the prototypical response to emotion-eliciting situations (Schultz *et al*. 2001).

Overall school adaptation

In other work, Izard and his colleagues assessed economically disadvantaged preschoolers' ability to point to the correct emotional expression and their ability to produce a label for nine basic emotions. These two scores were aggregated to reflect a total emotion knowledge score. At 9 years of age, skills in reading, math, and motivation to succeed were evaluated by teachers. Preschoolers' scores on the emotion knowledge composite meaningfully predicted social skills, behavioral dysregulation, and academic competence at age 5 and positively predicted academic competence at age 9, even after controlling for gender, language competence, and temperament (Izard *et al*. 2001). In similar work, Shields and her colleagues assessed the emotion knowledge of Head Start enrolled preschoolers in the Winter months using a composite of emotion situation knowledge and affective perspective taking and correlated it with teachers' ratings of the children's academic skills (i.e., reading readiness, number recognition and counting, language skills, and compliance to classroom rules) at year end. The emotion knowledge composite was positively related to teacher-rated school adjustment and adaptation (Shields *et al*. 2001). However, Miller *et al*. (2006) reported that emotion knowledge was unrelated to teachers' ratings of children's cooperation and self-control in the classroom, after controlling for age and verbal ability.

Intelligence and achievement test scores

Among preschoolers, an association between emotion knowledge scores and performance on intelligence quotient (IQ) tests has also been found among normally developing, maltreated, and children at environmental risk because of low socioeconomic status (SES) and maternal education (Garner and Waajid 2008; Pears and Fisher 2005; Sullivan *et al*. 2008), and toddlers' IQ scores positively predict emotion knowledge 2 years later (Bennett *et al*. 2005). Oddly, emotion knowledge is not associated with young children's perceptions of their school ability, at least in the early elementary years (Donelan-McCall and Dunn 1997), but emotion understanding may make children more sensitive to teacher criticism about their performance and behavior (Cutting and Dunn 2002). Although not specified in the work itself, these findings lend themselves to an interpretation consistent with the motivational theories proposed by Linnenbrink (2006), Pekrun (2006), and even the differential emotions theory of Izard (2009), who propose that emotion can impact the amount of interest and attention that is devoted to an academic task and that certain emotions become activated at the anticipation of certain academic-related experiences, such as test taking. This may work well when the emotions are positive and not so well when the activated emotions are negative, though some types of negative emotions (e.g., anxiety and frustration) can be transformed into interest or motivate a student to put more effort into the learning tasks, whereas other types of negative affect (e.g., anger and sadness) may lead to abandonment of the task altogether (Efklides 2006).

Considerably less is known about the specific role of emotional competence in predicting school-age children's IQ and achievement test scores. However, consistent with

the findings reported above, Farmer and his colleagues assessed kindergarteners' emotion situation knowledge using the Emotion Recognition Questionnaire developed by Ribordy *et al*. 1988) and found that it, along with performance on the Weschler Intelligence Scale for Children-Revised, predicted third-grade academic grades (Farmer *et al.* 2002). In another study, Collins and Nowicki (2001) administered the Diagnostic Analysis of Nonverbal Accuracy (DANVA; Nowicki and Duke 1994) to low- and middle-income African American children averaging 10 years of age and investigated whether their scores were associated with children's achievement scores on the Iowa Basic Skills. The DANVA assesses children's ability to understand emotions via facial expressions, postures, gestures, and tones of voice as well as the ability to send these emotional signals to others. Interestingly, children's ability to express affect and understand others' affect as assessed with the DANVA was positively associated with academic achievement, but not IQ.

A significant body of research has explored the link between emotion and cognition in populations at risk for poor learning outcomes. For example, children diagnosed with attention-deficit hyperactivity disorder (ADHD) and other learning disabilities have more difficulty understanding emotions overall and anger in particular than other children (Norvilitis *et al*. 2000; Singh *et al*. 1998). In other research, the emotion knowledge of children and adults varying in levels and etiologies of mental disability was evaluated using photographs of emotional expressions normed and standardized by Ekman and Friesen (1975) and compared with that of nondisabled matched controls. Results indicated that children with mental disability were less proficient in the understanding of emotions and that those children with milder levels of disability were more accurate at recognizing emotions than those with a more moderate form of the disability (McAlpine *et al*. 1992). Finally, children varying in the presence of symptoms associated with the presence of learning disabilities (i.e., achievement scores below grade level, but average or above average intelligence) listened to stories designed to elicit feelings of happiness, loneliness, shame, pride, and guilt and were then asked to identify emotions from pictures devoid of facial cues. Children with more severe learning disabilities performed less well than other children on both the listening and visual emotion knowledge tasks and were less knowledgeable of emotional display rules (Bauminger *et al*. 2005).

Affective intervention programs

Indirect evidence for the link between emotion knowledge and school outcomes can also be gleaned from research on intervention programs. Preschool children's participation in an emotion-based intervention program is associated with increases in emotion knowledge, emotion regulation skills, and social competence and decreased expression of negative emotions in preschool (Domitrovich *et al.* 2007; Izard *et al.* 2004; Izard *et al*. 2008). School-age children's participation in emotion-based intervention programs has also been associated with increased cognitive performance, improved classroom climate, and decreased behavior problems (Cook *et al.* 1994; Domitrovich *et al*. 2007; Greenberg and Kusche 1998; Linares, *et al*. 2005). These programs have been successful when offered as small focused programs and when implemented in large urban public schools (Linares *et al*. 2005).

Recall that the global emotion knowledge construct includes the understanding of the causes and consequences of emotion, its relational context, the expected bodily sensations and facial expressions for emotions, the rules for displaying emotions in the presence of others, and the available repertoire of actions to enhance or reduce emotion (Barrett *et al.* 2001). Many researchers studying this topic work from a social contextual approach, investigating the role of emotion knowledge in the development of positive social

interactions and relationships. In general, this research has shown that children who do not develop a higher-level emotion understanding are at risk for responding inappropriately in social situations (e.g., Denham 1986). Few studies have used the perspectives of the educational and psychological theories reviewed earlier in this paper to examine relations between emotion knowledge and school-related outcomes in children. For that reason, other than the social aspects linking emotion understanding, we do not fully understand the reasons for the linkages between aspects of emotion knowledge and children's learning outcomes. Attention to these other theoretical approaches offers the opportunity to better understand how emotion knowledge or the lack of it impacts children's learning in the classroom.

Emotional Intelligence and Linkages to Academic Outcomes

As already noted, there is some overlap between emotion knowledge and EI in that they both focus on the appraisal of emotions from facial, situational, and behavioral cues and the ability to regulate emotions through the implementation of strategies aimed at managing the experience and expression of emotion. Scores on global measures of EI have been unrelated to intelligence test scores in college-age students, but positively related to grade point average (GPA) and other indices of school success for both high school and college-age students (Marquez *et al*. 2006; Schutte *et al*. 1998). However, general mental ability as assessed with standardized measures of intelligence explains more variance in GPA than EI (Song *et al*. 2010), at least for Chinese students. Performance on EI measures correlates with the quality of children's processing of emotion-related information (Austin 2005). Current views of EI also incorporate the notion that emotional skills are an important prerequisite for the creation of a democratic classroom and school environment (Elias *et al*. 2003). In related work, classroom management theory posits that classrooms conducive to learning are emotionally regulated (Emmer and Stough 2001) and encourage positive teacher–student interactions and collaborative peer relationships (Boekaerts 1993).

In considering these findings, it is important to point out that there has been some disagreement about the extent to which EI overlaps conceptually with emotion knowledge (Izard 2001), although higher EI is associated with the ability to identify facial expressions of emotions (Ciarrochi *et al*. 2001). In addition, there have been questions about the specificity of the scoring methods for EI and the adequacy of the psychometric properties of the measures (Izard 2001; Roberts *et al*. 2001).

Emotion Regulation: Linkages to School-related Developmental Outcomes

Most studies that focus on the role of emotions in the classroom have been concerned with the construct of emotion regulation. School entry introduces new standards for the suppression of aggressive and destructive impulses, cooperating with peers and adults outside of the family, and asserting one's own needs without violating the rights of others (Pianta *et al*. 1995). Although most children experience negative affect in the school environment, these negative experiences place some children at significant risk for school refusal (Higa *et al*. 2002).

Emotion regulation skills have been identified as being important to the ability to focus selective attention and to apply the mental processes necessary for learning (Blair 2002). Indeed, experiencing frequent negative emotions in school is thought to narrow thoughts

and critical thinking (Reschly *et al*. 2008). Further, children who are well regulated emotionally may be better able than other children to elicit behavior from others that promotes learning and more likely to be perceived by their teachers as attentive and cognitively advanced (Eisenberg *et al*. 2005). Negative emotionality, which includes mood swings, angry reactivity, and dysregulated emotions as evaluated by Shields and Cicchetti's (1997) Emotion Regulation Checklist (ERC), is associated with higher levels of observed inattentive behavior and hyperactive behavior and lower levels of academic and attentional competence (Bulotsky-Shearer and Fantuzzo 2004; Keogh and Burstein 1988). In addition, Head Start children observed to be high in displays of mild negative emotion, anger, and sadness are rated by teachers to be low in teacher-rated classroom adjustment (Miller *et al*. 2004).

Children high in emotional intensity also tend to be less engaged than other children during a structured mother-child joint planning task (Perez and Gauvain 2005), skills that are important for learning, especially in the early years of grade school. Additionally, kindergarteners who are rated by their teachers as expressing high levels of intense negative emotions in the classroom are more likely than other children to be rated by their third grade teachers as having significant school performance problems that include having poor study skills and being unable to complete tests and follow instructions (Nelson *et al*. 1999). Emotion regulation problems in the early years are also predictive of early school dropout (Ensmiger and Slusarick 1992; Rose *et al*. 1989).

On the whole, very little attention has been paid to the exploration of possible linkages between emotion regulation and indicators of school progress and success for grade school children. This is despite the fact that school is the most common context of negative emotions for school-age children (Larson and Asmussen 1991) and that the aspects of emotion regulation that are important to school competence in the early years may be different from those needed in middle and high school. In addition, once children enter school, they must learn to manage a new set of emotions, including reactions of guilt, shame, pride, embarrassment, and boredom that are in direct relation to school performance (Thompson 1991). There is also the emotional control that is required when children are required to monitor the learning activities associated with homework (Xu 2008) and other tasks that require completion outside the confines of the classroom environment.

What is also known is that school-age children (ages 7–10 years) who report that they frequently experience positive emotions in the school environment use more adaptive cognitive and emotion-focused coping strategies (e.g., self-reliance and problems solving) and, in turn, report feeling that school work is relevant to their future aspirations and goals (Reschly *et al*. 2008). The ability to delay gratification, another measure of emotion self-regulation, is also associated with success in the early school years (Alexander *et al*. 1993). Emotion regulation is associated with academic performance and mathematics achievement and early literacy skills for kindergarteners, even after controlling for cognitive, attentional, and social factors, and IQ (Graziano *et al*. 2007; Ramsden and Hubbard 2002; Walcott and Landau 2004). In one study, Gumora and Arsenio (2002) evaluated children's perceptions of their negative affect associated with academic tasks and of their overall mood and their conceptions of their academic competency. Teachers also reported on their perceptions of the children's moods and information about the children's grades, and achievements test scores were also collected. Findings revealed that it was the children who reported experiencing high levels of affect when engaged in academic tasks who had the lowest GPAs.

Recent research has also suggested that the processing demands associated with some forms of emotion regulation may actually reduce the regulatory resources that are available for the successful completion of cognitive tasks (Baumeister *et al*. 1998). However,

although experiencing sadness seems to detract from children's ability to recall educationally relevant material, implementing disengagement as an emotion regulation strategy rather than actively working through these feelings may work best when children are faced with time constraints associated with academic assignments (Rice *et al*. 2007).

In other work, a global measure of self-regulation that includes assessment of emotional, attentional, and behavioral components is a strong predictor of preschool and kindergarten children's math and literacy skills (Blair and Razza 2007; Howse *et al*. 2003). The efficiency with which preschoolers deploy and distribute their attentional resources is also correlated with task behavior (Blair 2003), and effortful control, a measure of attentional regulation, is associated with children's task persistence (Valiente *et al*. 2003). However, for school-age children, scores on these same measures of self-regulation are associated with literacy scores, but not math achievement (Liew *et al*. 2008). This inconsistency across subjects is especially important as children from different ethnic minority and economic backgrounds respond with more negative emotion to mathematics than to other subjects (Stevens *et al*. 2006). Preschool children's behavioral self-regulation has also been found to predict school developmental outcomes in adolescence and adulthood (Ayduk *et al*. 2000; Shoda *et al*. 1990). Behavioral self-regulation (i.e., delay of gratification) may even mediate the association between family income and cognitive competence in school-age children (Evans and Rosenbaum 2008). However, whether this same pattern of findings emerges when a more precise measure of emotion regulation is included is not known.

As already noted, negative affect may signal to some students that more effort is needed for success and to less successful learners that the learning activity should be abandoned because it is too difficult (Efklides 2006). Thus, emotion regulation may operate as a component of resilience, such that maintaining positive emotion and experiencing moderate levels of negative emotion may encourage a student to persist in the learning task. Nevertheless, no one theory can account for the findings linking emotion regulation ability to children's learning outcomes. Based on the available data, it appears that integrating motivational and attentional control theories with Izard's differential emotions theory may provide the most reasonable explanation of how emotion regulation operates to predict learning. This means that the theories may work better in concert rather than in isolation to explain the detailed emotion regulatory processes that positively or negatively impact children's learning in school.

Integrating Children's and Teachers' Emotions into the Classroom

Because children's classroom emotion expression also impacts their relationship with teachers, which in turn can influence their school performance, it is important that we understand more about how child and teacher emotion intersect in the classroom. A central topic in research on emotions focuses on the socialization of emotional competence. Extensive research across a range of studies and laboratories has shown that high levels of positive parental emotion are associated with children's knowledge of and regulation of emotion (Calkins and Hill 2007). On the other hand, parental negative emotion generally predicts low levels of child emotional competence. Talk about emotions also provides the opportunity for parents to probe their children for information about the causes and consequences of their feelings. For instance, parents use emotion-based language to clarify children's emotional states, to intensify their awareness of their own and others' emotions, and to teach their children how to respond appropriately to emotion-related experiences (see Eisenberg *et al*. 1998; Thompson and Meyer 2007).

Unfortunately, the idea of teachers as agents of emotion socialization has received limited research attention despite the fact that researchers and policy makers have long called for a greater examination of the role of teachers in the socialization of social emotional competence (e.g., Eisenberg *et al*. 1981). Still, emotion as a theme in research on teaching and teachers is almost nonexistent (Nias 1996), although new evidence on the topic is beginning to emerge (Schutz and Zembylas 2009). This is an important oversight because the school is an environment where the arousal of strong emotions occurs (Hargreaves 2000). Indeed, teachers cite student behavioral and emotional dysregulation among the major reasons for job stress and burnout (Byrne 1994; Friedman 1995). Although younger teachers have the greatest propensity for burnout and teachers who understand their students' emotions may experience fewer feelings of burnout (Chang 2009), preservice teachers report that they receive very little training about how to develop social emotional skills in students (Brophy 1988) or how to mange their own internal feelings and external displays of emotion (Meyer 2009).

Like parents, teachers experience a range of emotions in response to their students' performance and behavior, including worry, disappointment, hope, enthusiasm, and pride, among others (Hargreaves 2000), but the emotion of frustration is the number one negative emotion reported by teachers (Sutton 2007). Teachers can also be distracted and become emotionally overwhelmed by personal concerns and aspects of teaching that go beyond the classroom. Learning to attend to these emotions is critical because the inability to control one's physiological and behavioral arousal can interfere with the quality of the teaching that occurs in the classroom. Many teachers recognize the importance of attending to student emotion as a critical component of their instructional role (Ahn 2005; McCaughtry and Rovegno 2003; Schwartz and Davis 2006; Sutton 2004), and they use their understanding of emotion to make curricular decisions and to inform their pedagogical styles and practices. A small qualitative study has also demonstrated that competent teachers attend to their own emotions as well as those of their students (Zembylas 2007).

Positive teacher emotions are associated with the use of effective teaching strategies, whereas high levels of negative teacher emotion appear to impact teachers' motivation to teach and students' ability to learn (Pekrun *et al*. 2002; Sutton and Wheatley 2003). When asked, elementary and secondary students report that their teachers often yell and vent when they are angry (Lewis 2001), but most preschool teachers are rated as overwhelmingly warm and engaging (Hyson and Lee 1996). This is important because students who have high levels of teacher warmth directed at them display higher levels of prosocial and sympathetic behavior in the preschool classroom (Kienbaum 2001), which may allow for greater opportunities for children to learn from peers and teachers. Children are also more likely to be on task and exert more effort into their academic tasks when they have a classroom teacher who displays high levels of positive affect (Davis 2003). There may be neurological reasons for this as positive emotion seems to boost the functioning of the part of the brain where the working memory is located (Perlstein *et al*. 2002).

Teachers also talk about emotions. Much of the work on this topic though focuses on the ways in which teachers describe the feelings they experience when teaching or talking about the relationships they have developed with particular students. In general, teachers talk of experiencing positive emotions when they perceive their students as making optimal academic progress and discuss negative emotions in relation to classroom management problems or other issues that interfere with their ability to teach well, such as poor relationships with parents and colleagues, student inattention, and/or student disengagement (Lasky 2000; Nias 1996; Sutton and Wheatley 2003). However, almost nothing is known

about how teachers talk about their own emotions or about students' emotions, although some research has indicated that teachers talk infrequently with students about their feelings (Hyson *et al*. 1990). At the same time, we do know that negative teacher emotions tend to elicit negative emotions from students (Thomas and Montgomery 1998), which could interfere with children's motivation and ability to focus on classroom tasks. Moreover, teachers' expression of negative emotion does not improve their mood (Totterdell and Parkinson 1999). However, teachers who express their negative feelings in a calm way and explain why they feel that way are more likely to be perceived positively by students in the later grades (McPherson *et al.* 2003).

Work on teachers' classroom management skills is also relevant to research on teachers' emotions. Teachers tend to agree on the importance of maintaining order and creating a manageable classroom environment, even when they differ in instructional goals and teaching styles (Evertson and Weade 1989). Teachers' ability to create a positive emotional climate in the classroom is thought to be critically important to the learning that occurs in schools. In accordance with motivational theories of emotion, teachers may have an easier time creating a classroom environment conducive to learning when the majority of children in their classes are emotionally competent and affectively positive (Jennings and Greenberg 2008; Stuhlman and Pianta 2002). Still, some teachers are keenly aware of the importance of students' emotions and their own emotions for learning, whereas others show a lack of attention to both and work instead to make the classroom affectively neutral (Bullogh 2009; Lewis 2001). There are also differences in how teachers perceive their roles in the classroom, with some teachers perceiving themselves more as the classroom leader and clear authority and others conceptualizing their role as one of a facilitator and mentor who guide children's learning (Good and Brophy 1986). There are also individual differences in the extent to which teachers express and allow emotions to be expressed in the classroom, with many teachers having difficulty regulating their classroom affect (Sutton 2007). There should also be some recognition of the fact that teacher emotions influence and are influenced by the emotional climate of the school as well as the principals, teachers, and parents with whom they interact (Hargreaves 2000; Zembylas 2007).

Interestingly, students are highly attuned to their teachers' emotional expressions (Thomas and Montgomery 1998), and teachers' expression of emotions can either positively influence students' comprehension and understanding of the subject matter or detract from their learning (Hargreaves 2000; Rosiek 2003). Even in the preschool years, children show an understanding that they should control the expression of emotion in the presence of adults (Cole 1986). This undoubtedly carries over to the formal school environment. For example, as children grow older, their reactions to anger evoked by a teacher are different from those that are in response to anger caused by a peer. Students report feeling more intense negative emotion in response to teacher anger than to peer anger (Klingman and Zeidner 1993). At the same time, emotional reactions that are considered adaptive or regulated in response to a peer may be viewed as inappropriate when responding to a teacher. Klingman and Zeidner (1993) also found differences in how boys and girls respond to the negative emotions of their teachers. Specifically, adolescent boys respond to teacher anger with externalized emotions (e.g., anger) and aggressive acts that include slamming doors and creating classroom disturbances, whereas girls tend to express more internalized emotions such as sadness. Teachers tend to react less negatively to the expression of internalized emotions such as sadness, an emotion that is expressed more by girls than boys, than to anger, which is expressed more frequently by boys (Keenan and Shaw 1997). Differences in the ways that boys' and girls' expression of emotions may

explain why teachers express more negativity in response to behavior of boys than girls and why they are more likely to have negative relationships with boys than with girls (Mantzicopoulos and Neuharth-Pritchett 2003; Stuhlman and Pianta 2002).

There is also evidence that the quality of teachers' relationships with all students deteriorate as children move into the later grade school years (Feldlaufer *et al.*. 1988), which has been found to be correlated with lower scores on self- and teacher-ratings of social and emotional competence (Murray and Greenberg 2000). Teachers' emotion-related responses to school-age children are especially significant because they appear to forecast student risk for school dropout as early as eighth grade (Rumberger 1995). Thus, training that is specifically aimed at helping teachers learn to deal appropriately with anger and other negative emotions expressed in the classroom may diminish the anger that they both experience and direct toward their students, which may improve the emotional climate of the classroom as well as the quality of the individual student–teacher relationships and subsequent learning that occurs in schools (Alvarez 2007). Training teachers to work with children who have difficulty understanding and regulating emotions should be a priority because they are often called on to aid children in appraising the emotions of others and to help them dampen or intensify their emotional expressions to meet the demands of the school environment.

Conclusions

In sum, two components of emotional competence have been proposed to explain school-related outcomes in children and youth, namely, emotion knowledge and emotion regulation. Despite the fact that investigations linking children's as well as teachers' emotional competence and behavior to children's learning are on the rise, there is a need for continued research in this area and there are still major gaps in how the research has been applied in real-world classrooms.

Recommendations for Future Research Linking Children's Emotional Competence to Learning

- Much of the research demonstrating these associations has focused on young children. Researchers should pay more attention to the association between emotional competence and school performance in grade school children. The quality and strength of the associations may change developmentally, and different types of emotion knowledge or emotion regulation strategies may be more or less important at grade school than at earlier developmental periods.
- Relatedly, much of the work that does include children at different points in development is cross-sectional. More longitudinal work is needed as emotional competence may be associated with certain preschool academic outcomes and not with grade school outcomes or the reasons for similar linkages across different time points might be different. It is also important to document whether the associations between emotional competence and school-related outcome variables persist into adolescence, a developmental period when knowledge of emotions and emotion regulation ability are more developed.
- As some researchers have hypothesized that emotion knowledge may increase children's ability to regulate emotions (Wranick *et al.* 2007), a consideration of the interplay between emotion knowledge and emotion regulation in predicting school-

related outcomes must also be explored, as should the potential mediating effects linking these three constructs.

- Some children come to school with deficits in the areas of emotion knowledge and emotion regulation that contribute to issues in the classroom, which in turn, could impact school performance. We need to know more about how interactions with peers and teachers provide a unique forum for learning about or expanding one's knowledge and regulation of emotions.
- Although many affective intervention programs have been developed and evaluated, whether participation in interventions aimed at increasing attentional skills may also result in improvements in emotion regulation ability and other aspects of emotional competence contributes to children's cognitive abilities should also be investigated (Rueda *et al*. 2004).
- Focusing on more discrete aspects of school performance (e.g., attention to instructions, planning, reading ability, and math ability) rather than on global constructs such as school adjustment or academic achievement or overall grades may also prove useful in understanding more about the mechanisms that link emotional competence to academic performance and the direction of effects.
- More subdomains of emotional competence should also be investigated. Different methodological techniques are needed to assess these skills. Line drawings and photographs are frequently used to measure of emotion knowledge. Emotions are dynamic and fluid and are expressed at varying levels of intensity, and the use of static stimuli may impact children's performance on emotion knowledge measures. For instance, differences in emotional knowledge between children with high and low IQ scores all but disappear when computerized pictures depicting basic emotions at varying intensity levels are used as stimuli (Montirosso *et al.* 2010). Further, emotions are conveyed through multiple modes that include facial, situational, vocal, and behavioral cues, and it is important to know whether and how and if these various modes for receiving emotional information may differentially impact children's school-related outcomes.
- The development of emotion knowledge and emotion regulation measures that are appropriate for use with children diagnosed with specific learning problems is also needed as most of the available measures, especially for emotion knowledge, were developed for use with children who are developing normally. Similarly, the types of measures of academic competence also need to be expanded to include behavioral observations, grades, direct assessments, and samples of specific school assignments across a variety of subject domains for a variety of populations.

Recommendations for Future Research Linking Teachers' Emotions to Children's Learning

As already noted, teachers also bring their cultural differences to school with them. Some teachers are able to adjust their attitudes about emotions and teaching styles to the culture and context of the students they teach. For example, a style of expressing intense verbal and facial displays of negative emotion may indicate concern and warmth to ethnic minority children enrolled in low-income urban schools (Gordon 1998), but may mean something else to children enrolled in affluent suburban schools. Teachers who work in urban schools tend to believe that expressions of high levels of positive and negative affect contribute to a classroom that is characterized by mutual respect and increased on-task behavior (Monroe, and Obidah 2004). Conceptions of emotional competence also vary across teachers,

communities, and schools. Korean teachers are more accepting of young children's emotional outbursts and dysregulation than US teachers (Hyson and Lee 1996). When researchers examine the within group variability of US teachers, they report that minority group teachers may be less sensitive to the individual differences of emotional expressions and the emotional aspects of temperament than Caucasian teachers (Franyo and Hyson 1999).

- Understanding the extent to which teachers' judgments about and reactions to student emotions reflect their own emotional competencies, beliefs, and/or style of emotional expression rather than the behaviors and skills of the students themselves is also important if we are to effect positive change in the way they are trained to deal with the social emotional learning of their students (see Canivez and Bordenkircher 2002).
- We also need to know more about how teacher training, experience, and classroom size impact teachers' affect in the classroom and their responsiveness and reactions to student emotion.
- A greater understanding of the strategies that teachers use to manage the daily negative emotion that they obviously experience when delivering disappointing feedback to students and balance that with the positive emotion that they experience when other students in the same classroom perform well is also needed. This balancing act has consequences both for teachers and students.
- Teachers observe children in a variety of academic and social situations that include dances, romantic encounters, and collaborative learning situations that parents cannot always witness in the home environment. Convincing teachers to implement research-based techniques for handling emotion in the schools may provide us with more objective and accurate information about the emotions of students in schools.
- Attention should also be directed at learning more about the emotion socialization behaviors of office workers, school social workers, and counselors who also spend significant time interacting with and observing students.
- Lastly, research on teacher emotions has focused on the emotion self-regulatory aspect of the emotional competence construct. Knowledge of emotions is also foundational to teaching, as teachers must correctly appraise student emotions to make sound instructional decisions and to interact with students successfully (Meyer 2009).

In short, the work in this area is in its infancy. The majority of the studies reviewed in this article are correlational, and therefore, we do not know if there is a causal relation between emotional competence and academic performance. Clearly, more refined methods are needed to examine this question more fully. The research reviewed here also suggests that a focus on developing interventions aimed at providing teachers with training about understanding and regulating their own and their students' emotions would also prove especially useful as they may be the first to witness the effects of emotional incompetence on children's learning. Also problematic is that much of the work reviewed above is not well linked to theory. Finally, although the goal of this paper differed from that of a statistical meta-analysis and that unpublished articles and dissertations were not solicited for inclusion, the studies reviewed are of varying quality, and thus, comparison among the studies is difficult. In some cases, muddled constructs of emotion knowledge and emotion regulation were used, which often rendered the work difficult to evaluate. It is for future research to continue to refine these constructs and the methods used to assess them. A more complete understanding of the cognitive processes involved in linking emotional competence to children's learning in school will also be dependent on an integrated approach that takes into account both educational and developmental perspectives.

Acknowledgment The author would like to thank Lesley Smith and Lisa Gring-Pemble for comments on an earlier version of this article.

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