

ABSTRACT

CASTRO, VANESSA LOPES. Children's Emotion Understanding is Multidimensional and Contextual. (Under the direction of Dr. Amy G. Halberstadt).

The following body of work addresses several gaps in our knowledge regarding the conceptualization, structural organization, and socialization of emotion understanding in children. In the first manuscript, Castro, Cheng, Halberstadt, and Grühn (in press) identified and organized the skills used in the understanding of emotions in the self, familiar others, and others in general. Castro, Halberstadt, and Garrett-Peters (under review) extended this work in the second manuscript to test the structural organization of emotion understanding skills in middle childhood, and third grade specifically, using a variety of measures that collectively assess diverse emotion understanding skills as directed toward familiar and unfamiliar others. In the final manuscript, Castro, Halberstadt, Lozada, and Craig (2014) examined the development of 8- to 11-year-old children's emotion understanding as directed toward familiar others within the family context, specifically as a function of parents' emotion-related beliefs, behaviors, and skills. Results collectively contribute to our knowledge of emotion understanding development. Emotion understanding is comprised of at least nine unique skill sets that may be directed toward three foci (self, familiar other, generalized other). The degree to which different skills are related and structurally organized seems to vary with age; whereas a two-factor structure appears sufficient for young children aged 3 to 5, third-grade children's emotion understanding is best represented by a three-factor structure. Moreover, parents continue to exert influence over children's emotion understanding development in middle childhood, as children aged 8 to 11 demonstrated greater recognition of parents' emotions when parents believed that children's emotions were

dangerous, parents believed that they should *not* guide children's emotional development, and parents were more accurate at recognizing children's' emotions. Collectively, these results highlight the need to apply developmental science principles to the study of emotion understanding as a way to facilitate greater consideration of the development of emotion understanding as an organized integration of functions across systems and embedded within contexts.

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Children's Emotion Understanding is Multidimensional and Contextual

by
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DEDICATION

I would like to dedicate this dissertation to my parents, Manuela and Victor Castro, who sacrificed everything to provide a better life for me. A vida está preta não mais.

BIOGRAPHY

Vanessa Lopes Castro was born in New Bedford, Massachusetts. She graduated from New Bedford High School in the top 3 of her class in 2004 and went on to attend Northeastern University. She graduated from Northeastern in the spring of 2009 with a Bachelor of Science degree, summa cum laude, in Psychology. She then attended the University of Massachusetts Dartmouth and graduated in the spring of 2011 with a Master of Arts degree in Research Psychology. In the fall of 2011, she enrolled in the doctoral program in Lifespan Developmental Psychology at North Carolina State University. During her doctoral training, Vanessa worked closely with mentor and advisor Dr. Amy Halberstadt in the Family, Affect, Beliefs, and Behaviors Laboratory. She hopes to continue her career in research and academia. Her primary research interests concern the development of emotion understanding, including the promotive and maladaptive factors that contribute to this development across the lifespan, the contexts in which this development is embedded, particularly familiar, everyday contexts, and the socioemotional correlates of emotion understanding across the lifespan, such as psychological well-being and social adjustment.

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TABLE OF CONTENTS

LIST OF TABLES	vii
LIST OF FIGURES	viii
CHAPTER 1: Introduction	1
Emotion Understanding Conceptualization	4
Emotion Understanding Structural Organization	6
Emotion Understanding Socialization	7
Dissertation Outline	10
Summary	15
CHAPTER 2: EUREKA! A Conceptual Model of Emotion Understanding	16
Introduction	17
A Model of Emotion Understanding	19
Measuring Emotion Understanding	27
Conclusion and Future Directions	33
References Cited	38
CHAPTER 3: A Three-Factor Structure of Emotion Understanding in Middle Childhood	58
Introduction	59
Method	63
Results	70
Discussion	74
References Cited	84
CHAPTER 4: Parents' Emotion-Related Beliefs, Behaviours, and Skills Predict Children's Recognition of Emotion	99
Introduction	100
Method	108
Results	114
Discussion	118
References Cited	129
CHAPTER 5: Discussion	147
Conceptualization	147
Structural Organization	149
Socialization	154
Applying a Developmental Science Lens to the Study of Emotion Understanding	157
Limitations	168
Future Directions	171
Final Remarks	178
REFERENCES	180

LIST OF TABLES

CHAPTER 2

Table 1: Measures of Emotion Recognition by Specific Skills and Foci 52

Table 2: Measures of Emotion Knowledge by Specific Skills and Foci 55

CHAPTER 3

Table 1: Descriptive Statistics for Children’s Socioemotional Competence Scales 93

Table 2: Intercorrelations between Children’s Emotion Understanding Measures 94

Table 3: Comparing Model Fit: Different Factor Structures for Children’s Emotion Understanding 95

Table 4: Standardized Factors Loadings for the Emotion Understanding Tasks in the 1-, 2-, 3-, and 4-Factor Models 96

CHAPTER 4

Table 1: Correlations between Emotion-Related Beliefs, Socialization Behaviors, and Emotion Recognition Skills, with Means (and Standard Deviations) on the Diagonal 144

Table 2: Hierarchical Regression Model Predicting Children’s Recognition of Parents’ Emotions 145

LIST OF FIGURES

CHAPTER 2

Figure 1: The EUREKA Model57

CHAPTER 3

Figure 1: Tested Factor Structures of Children’s Emotion Understanding 97

Figure 2: Children’s Emotion Understanding Factors as Predictors of Children’s
Socioemotional Competence 98

CHAPTER 4

Figure 1: Model of Children’s Emotion Recognition as a Function of Parents’
Beliefs about Children’s Emotions, Emotion Socialization Behaviors, and Own
Emotion Recognition Skill146

CHAPTER 1: Introduction

Emotion understanding is a broad umbrella term used to describe the identification, labeling, and attribution of emotion in the self and others (Harris, 1989; Saarni, 2000). The benefits of emotion understanding are far-reaching, as the ability to infer others' thoughts and feelings "distinguishes the most tactful advisors, the most diplomatic officials, the most effective negotiators, the most electable politicians, the most productive salespersons, the most successful teachers, and the most insightful therapists" (Ickes, 1997, p. 2). Thus, it is no surprise that emotion understanding has been identified by social development models as a pillar of socioemotional flourishing (Halberstadt, Denham, & Dunsmore, 2001; Saarni & Harris, 1991; Salovey & Mayer, 1989).

Recent evidence from national intervention programs aimed at bolstering children's physical, social, and cognitive development (e.g., Head Start programs, Bierman et al., 2008; Domitrovich, Cortes, & Greenberg, 2007; Izard et al., 2008; Miller et al., 2006) suggest that early emotion understanding skills promote positive adaptation in a variety of social and cognitive domains. This interpretation is further supported by findings within the broad literature linking children's emotion understanding to social and cognitive functioning. Within the social domain, children's emotion understanding is positively associated with a variety of behaviors that contribute to interpersonal success, including cooperation, assertion, and prosocial behaviors (for review, see Trentacosta & Fine, 2010). Moreover, children with greater emotion understanding tend to experience more positive relationships with others, including peers and teachers (Bosacki & Wilde Astington, 1999; Dunn, 1995; Dunsmore,

Noguchi, Garner, Casey, & Bhullar, 2008; Garner, Jones, & Miner, 1994; Garner & Waajid, 2008; Halberstadt & Hall, 1980; Trentacosta & Izard, 2007). Within the cognitive domain, emotion understanding is related to theory of mind development in young children (Bosacki & Wilde Astington, 1999; Hughes & Dunn, 1998; O'Brien et al., 2011), and has been linked to additional cognitive abilities, including receptive language and vocabulary skills (Garner, 2010), executive control (Denham, Bassett, Brown, Way, & Steed, 2013), and teacher-reported attention in school (Trentacosta & Izard, 2007). These benefits are often maintained over time, with greater emotion understanding in the preschool period (ages 3 to 5) predicting higher levels of social competence, academic adjustment, and academic achievement in the first years of elementary school (Denham et al., 2013; Denham et al., 2012; Denham et al., 2003; Dunn, 1995; Garner & Waajid, 2008; Trentacosta & Izard, 2007).

From this literature we know a great deal about the correlates of children's emotion understanding, including factors that contribute to and are influenced by this skill. We also know that emotion understanding is an adaptive competence for children to possess throughout childhood. Despite this proliferation of research, we do not have basic agreement about a shared definition of emotion understanding. Specifically, the field does not share definitions regarding what skills comprise this broad construct and how these skills are structurally organized. We also do not have much clarity regarding how emotion understanding develops within the family context in children beyond the age of five, including how these skills are socialized by parents in middle childhood, when children may range in age from 7 to 11 years. These gaps in our knowledge constrain the field, as it is

difficult to identify and explain developmental trajectories without knowledge of *what* develops (e.g., specific emotion understanding skills) as integrated across *time* and *space* (Magnusson & Cairns, 1996). The research included in this dissertation thus presents a necessary first step in addressing these gaps in our knowledge about the conceptualization, structural organization, and socialization of emotion understanding in children. To do so, this dissertation applies a developmental science lens to the study of emotion understanding through the unique and collective contributions of three manuscripts.

This dissertation includes five chapters. This first chapter begins with the current introduction, followed by a summary of the literature on children's emotion understanding conceptualization, structural organization, and socialization. Within these three areas, I identify specific gaps in the literature and then outline the unique contribution of each of the three manuscripts in addressing these gaps. I conclude this chapter with a brief summary of how the combined body of work advances our understanding of development through application of developmental science principles. Chapters 2-4 are the full reprints of the manuscripts presented in the introduction. Chapter 5 is an integrative discussion that summarizes the combined body of work, and then integrates the major findings and conclusions within the developmental science framework. Emphasis will be placed on three developmental science perspectives in particular: integrated synthesis, persons-in-context, and reorganized functions. Chapter 5 then continues with a discussion of limitations and suggestions for future directions, and concludes with final remarks.

Emotion Understanding Conceptualization

Theoretical definitions. Theoretical conceptualizations of emotion understanding typically assume a two-factor structure of emotion understanding, with one factor representing skills in recognizing emotional expressions and the second factor composed of the knowledge used to attribute emotions to people in situations (Denham, 1986; Halberstadt et al., 2001; Pons, Harris, & de Rosnay, 2004; Widen, 2013). Empirical conceptualizations support this assumption. From this literature, we know that skills in recognizing and labeling emotional expressions typically emerge at the beginning of early childhood, around 3 years of age, and by the end of early childhood (roughly the age of 6) children are typically able to identify and apply knowledge regarding external situational emotional cues, such as emotional expressions, causes, and consequences, to attribute emotions to others in situations (Denham, 1986; Harris, 1989). These skills are often considered primary in the sense that they set the stage for more sophisticated skill development that occurs in middle childhood between the ages of 7 and 11, including the understanding of mixed and moral emotions and the knowledge that emotions may be hidden or controlled (Denham, 1998; Pons et al., 2004). Recent debates notwithstanding (see Widen, 2013 for discussion of how knowledge of emotions may contribute to recognition), it is generally assumed that skills in recognizing emotional expressions precede the development of knowledge about emotion-eliciting situations, and that these two factors (emotion recognition and emotion knowledge) together comprise the construct of emotion understanding.

Integrating theory with assessment. One limitation in our knowledge of emotion understanding concerns the degree to which theoretical and empirical conceptualizations cohere. That is, the field currently lacks an organized and integrated framework for defining and assessing emotion understanding skills across the lifespan. To illustrate this limitation, measures that claim they assess emotion understanding may assess the entire gamut of understanding skills (all emotion recognition and emotion knowledge skills), or a small subset of skills (such as knowledge about emotional causes), or even a very specific skill (such as knowledge about the cause of shame). Although these measures may be conceptualized broadly as assessing emotion understanding, the degree to which they all assess the same skills is unclear, as is the degree to which any single measure adequately represents the full construct of emotion understanding.

A framework is thus needed so that emotion understanding skills can be cohesively defined and identified within and across measures. A lack of shared language regarding what skills comprise this broad construct and how these skills are assessed in the literature makes it difficult to integrate findings across different domains of research. Additionally, it is challenging to integrate findings across studies that use different measures of emotion understanding, but which nonetheless make interpretations regarding children's understanding of emotions in general. *Thus, a gap exists in our knowledge regarding the specific skills that theoretically and empirically comprise the broad construct of emotion understanding.*

Conceptualizing the focus of understanding. A second related limitation in emotion understanding conceptualizations concerns the focus of understanding—that is whose emotions are being understood. The foci of understanding has been implicitly included in a few previous models of emotion understanding (Denham, 1998; Halberstadt et al., 2001; Labouvie–Vief, DeVoe, & Bulka, 1989; Lane, Quinlan, Schwartz, Walker, & Zeitlin, 1990; Shaver, Schwartz, Kirson, & O'Connor, 1987). However, these theoretical models are limited in making finer discriminations among foci (such as familiar others versus unfamiliar others). Empirical assessments of emotion understanding rarely emphasize the foci of understanding. Whether or not assessments exist that examine different foci (such as a familiar other or even the self), and the degree to which these foci are assessed in different skill sets (such as the recognition of a parents' emotions, or knowledge about what causes us to feel angry), is not known. This limitation challenges our conceptualization of emotion understanding as we cannot know what aspect of emotion is being understood if we do not specify the focus of this understanding. *Thus, a gap exists in our knowledge regarding the foci of emotion understanding, and as integrated into conceptual definitions.*

Emotion Understanding Structural Organization

In addition to a lack of clarity regarding the conceptualization of emotion understanding, there is also uncertainty regarding the overlap among different emotion understanding skills, including relations among different skill sets and the underlying structural organization of these skill sets. As noted briefly above, theoretical models of emotion understanding generally assume a two-factor structure. However, models that

delineate more sophisticated differentiation among skill sets (e.g., Pons et al., 2004) have not been empirically tested using structural analyses. In fact, previous structural work is scarce, as only two studies have empirically tested the factor structure of children's emotion understanding, and these studies were focused on early childhood, with children aged 3 to 5, and used only single measures (Barbosa-Leiker, Strand, Mamey, & Downs, 2014; Bassett, Denham, Mincic, & Graling, 2012). Thus, these studies were limited in the number and types of dimensions tested. This limitation is problematic when attempting to describe emotion understanding skills in older children (i.e., children in middle childhood, between the ages of 7 and 11), who likely demonstrate increasingly sophisticated levels and types of understanding and thus may be expected to differentiate skills more than younger children aged 3 to 5. It is unclear whether a two-factor structure would be sufficient in middle childhood, or whether additional factor structures that allow for more complex skills and differentiated organization better represent emotion understanding at these ages. *Thus, a gap exists in our understanding of how different emotion understanding skills are structurally organized in middle childhood.*

Emotion Understanding Socialization

The family has long been considered a primary context in which children's social and emotional skills develop. Parents are thought to coach or guide children's emotional experience and expression through a variety of socialization pathways, including distal processes such as parents' beliefs, thoughts, and attitudes about their own emotions and their children's emotions (Gottman, Katz, & Hooven, 1996; Katz, Maliken, & Stettler, 2012) and

more proximal processes such as parents' own emotional expressiveness, parents' reactions to children's emotions, and parents' discussion of emotional situations and events (Denham, 2007; Dunsmore & Halberstadt, 1997; Eisenberg, Cumberland, & Spinrad, 1998). These pathways have been targeted by recent interventions aimed at reducing young children's and adolescents' social and emotional behavior problems (e.g., Kehoe, Havighurst, & Harley, 2014; Havighurst, Wilson, Harley, Prior, & Kehoe, 2010).

Although certainly influential, this work has lacked a focus on emotion understanding, both with regard to the inclusion of parental emotion understanding as a facet of socialization, and the examination of this socialization in relation to children's emotion understanding development. Some preliminary research has focused on associations between parent and child emotion expression and experience (e.g., Daly, Abramovitch, & Pliner, 1980; Perlman, Camras, & Pelphey, 2008). However, it is also important to examine how parents' emotion understanding contributes to children's emotion understanding, above and beyond other parental socialization factors, such as emotion-related beliefs and behaviors. Little research has examined the collective contributions of these factors in predicting children's emotional functioning, and more specifically, children's emotion understanding.

Moreover, the emotion understanding literature has focused primarily on identifying correlates of emotion understanding in early childhood between the ages of 3 and 5 (perhaps because of the utility of emotion understanding as an indicator of early school success; e.g., Denham et al., 2012). However, it is equally important to examine these associations in middle childhood between the ages of 7 and 11, as parents continue to retain influence over

children's socioemotional functioning despite growth in children's behavioral autonomy (Freitag, Belsky, Grossmann, Grossmann, & Scheuerer-Englisch, 1996; Wray-Lake, Crouter, & McHale, 2010). This potential mismatch in children's needs and parents' environmental affordances may result in shifts in the direction of socialization effects at this age.

This possibility is echoed by recent findings indicative of a shift in the utility of parental socialization processes that guide or support children's emotional development in middle childhood, with greater guidance predicting less emotional skill in children at this age (Dunsmore, Her, Halberstadt, & Perez-Rivera, 2009). More research is needed to delineate the specificity of these shifts (e.g., shifts in influence for what facets of socialization on what skills in children).

Finally, as noted above, it is important that the field of emotion understanding move to consider the foci of understanding. Given what we know about the role of the familial context in socializing children's emotional development, it is likely that children develop skills in understanding emotions in those individuals with whom they have the most frequent and intimate contact, such as their family. As children age, they accumulate a variety of emotion-related experiences and expectations within the family context, all of which contribute to children's growing emotional repertoires (Klimes-Dougan & Zeman, 2007). Little research has examined the degree to which parental socialization processes relate to children's understanding of emotions within the same familial context. *Thus, a gap exists in our understanding of how children develop emotion understanding within the family context as a function of parental socialization factors in middle childhood.*

Dissertation Outline

The proposed gaps in our knowledge of emotion understanding conceptualization, structural organization, and socialization are addressed in three manuscripts that collectively examine the development of emotion understanding. Data for the manuscript presented in Chapter 2 were collected from several literature searches completed during the second and third year of my doctoral training. The study presented in Chapter 3 included data collected from 203 third-grade children and their mothers participating in a study on maternal socialization of child emotion understanding (NSF1023839). A subset of these families were participating in a larger longitudinal study (NSF-BCS-0126475; BCS-0720660). In Chapter 3, data were collected from 69 parent-child dyads participating in a larger study in three Southeastern cities (NICHD535372). The following section will introduce each manuscript and explain its contribution in addressing the gaps noted above.

1. Castro, V. L., Cheng, Y., Halberstadt, A. G., & Grühn, D. (in press). EUREKA! A Conceptual model of emotion understanding. *Emotion Review*.

This manuscript addresses the gaps in our knowledge regarding the conceptualization of emotion understanding. The manuscript integrates existing conceptual definitions of emotion understanding used across the lifespan into an organized framework that more fully and accurately describes the broad construct of emotion understanding and its specific skills as directed to different foci. In addition, this manuscript categorizes 56 measures of emotion understanding within the presented framework, so as to systematically compare different

conceptual and empirical assessments of emotion understanding skills while also making apparent the gaps in emotion understanding assessment.

The four main findings were as follows: First, the lack of measures spanning skills in *both* emotion recognition and emotion knowledge suggests that the broad conceptual definitions of emotion understanding already existing within the field do not reflect the specificity of actual assessments. Second, nearly one-fourth of the measures reviewed assess only one specific skill, suggesting that interpretations based on these measures alone should be limited to the specific skill under study rather than “emotion understanding” broadly. Third, the skills within emotion recognition and emotion knowledge do not receive equal amounts of attention, with greater methodological attention devoted to skills that are most easily measured (e.g., recognition of prototypical emotions; knowledge about prototypical emotional causes). Lastly, the vast majority of measures assess the understanding of emotions in generalized others (strangers or other individuals unknown to the self), and relatively few measures assess the understanding of emotions in the self or familiar others (such as a parent, child, spouse, coworker). The field is thus dependent on measures that are about unknown and imagined others, and so we have little knowledge about whether this type of emotion understanding is reflective of everyday experiences, such as the understanding of emotions in the self and familiar others.

The findings from this integrative conceptual review contribute to the second and third manuscripts, which respectively explore the relations between different emotion understanding skills spanning both emotion recognition and emotion knowledge in a sample

of third-grade children (Castro, Halberstadt, & Garrett-Peters, under review), and the influence of various socialization factors on 8- to 11-year-old children's development of a less-studied understanding skill that is relevant to everyday experience, children's recognition of parents' emotions (Castro, Halberstadt, Lozada, & Craig, 2014).

2. Castro, V. L., Halberstadt, A. G., & Garrett-Peters, P. (under review). A three-factor structure of emotion understanding in middle childhood. Submitted for publication.

The study presented in this manuscript addresses the gap in our knowledge regarding the structural organization of emotion understanding skills in middle childhood, specifically in third-grade children aged 7 to 9. Extending the first manuscript's proposal to consider the relations among a wide variety of emotion understanding skills, this manuscript tests associations among multiple emotion understanding skills that collectively assess the increasingly sophisticated social cognitive skills of third-grade children. This study employed latent variable modeling to test whether a two-factor structure found previously with 3- to 5-year-old children was supported in a sample of third-grade children, or whether alternative three- and four-factor structures were better fit for the data. The study also explored predictive associations between different emotion understanding skills and mother-reported socioemotional competence using structural equation modeling.

Results indicate that emotion understanding in third-grade children is best represented as a differentiated construct with three factors: *Prototypical Emotion Recognition* (skills in recognizing prototypical expressions of emotion), *Prototypical Emotion Knowledge* (skills in attributing emotion to prototypical emotion-eliciting situations using knowledge about

emotional causes and consequences, as well as knowledge about the management of emotions), and *Advanced Emotion Understanding* (skills in attributing complex emotional states such as mixed or moral emotions to situations, and identifying emotions in interpersonal contexts such as close relationships). Skills within factors were modestly related, with higher associations for skills that share methodological similarities, such as the recognition of prototypical emotional expressions posed by children and adults. The factors also varied in complexity from rather basic skills to complex understanding skills, supporting theoretical and empirical models detailing developmental differentiation of skills. Finally, emotion understanding skills varied in associations with other socioemotional competencies in third-grade children, such that prototypical emotion knowledge was uniquely predictive of children's socioemotional skills and problems.

3. Castro, V. L., Halberstadt, A. G., Lozada, F. T., & Craig, A. B. (2014). Parents' emotion-related beliefs, behaviours, and skills predict children's recognition of emotion. *Infant and Child Development*. Advance online publication. doi:10.1002/icd.1868

This manuscript addresses the gap in our knowledge regarding parents' socialization of children's emotion understanding in middle childhood, specifically in children aged 8 to 11. The previous two manuscripts respectively highlight the importance in distinguishing different emotion understanding skill-foci combinations and including the more complex skill-foci combinations in assessments with children in middle childhood. This manuscript builds on these points by focusing on one specific emotion understanding skill in middle childhood as directed toward one specific focus—children's recognition of parents'

emotions. This study tested the unique and collective contributions of parents' emotion-related beliefs, behaviors, and skills on children's recognition of parents' emotions in middle childhood. Specifically, the study examined whether parents' beliefs about the value, danger, and guidance of children's emotions, parents' emotion labeling and teaching behaviors, and parents' skill in recognizing their own children's emotions predicted children's recognition of their parents' emotions.

Children's recognition of parents' emotions was indeed predicted by parents' emotion-related beliefs, behaviors, and skills; these parental factors collectively accounted for more than one-third of the variance in children's emotion recognition. Parents' beliefs about the danger and guidance of children's emotions, and their own abilities to recognize children's emotions, were uniquely predictive of children's emotion recognition. These results indicate that children were more accurate at recognizing parents' emotions when parents believed that children's emotions are dangerous, parents believed that they should not guide children's emotional development, and parents were more accurate at recognizing children's emotions. Interestingly, the results also indicate that more supportive socialization practices may not relate positively to children's emotional development in the middle years, as parents' beliefs in guiding children's emotional development related negatively to children's recognition skill. Together, the findings point to the continued importance of the family milieu in the development of children's emotion recognition in middle childhood.

Summary

Collectively, these three manuscripts help fill the gaps in the literature on emotion understanding by: (1) providing a coherent framework delineating the skills, foci and measurement possibilities in emotion understanding, (2) empirically demonstrating how the structure of emotion understanding may become more differentiated in third-grade children as compared to young children aged 3 to 5, and (3) delineating the ways in which parents socialize 8- to 11-year-old children's emotion understanding, with a focus on the socialization of children's recognition of parents' emotions in middle childhood. These studies also inform the developmental psychology literature more broadly through the application of developmental science. The first two manuscripts examine emotion understanding from the perspectives that development is a *synthesis of integrated systems*, and that *functions are continually organized and reorganized over time*. The third manuscript utilizes a *persons-in-context* perspective to examine the development of emotion understanding within the family context in middle childhood. These developmental science perspectives allow for a more holistic and accurate representation of emotion understanding development.

CHAPTER 2: EUREKA! A Conceptual Model of Emotion Understanding

The field of emotion understanding is replete with measures, yet lacks an integrated conceptual organizing structure. To identify and organize skills associated with the recognition and knowledge of emotions, and to highlight the focus of emotion understanding as localized in the self, in specific others, and in generalized others, we introduce the conceptual framework of Emotion Understanding in Recognition and Knowledge Abilities (EUREKA). We then categorize 56 existing methods of emotion understanding within this framework to highlight current gaps and future opportunities in assessing emotion understanding across the lifespan. We hope the EUREKA model provides a systematic and integrated framework for conceptualizing and measuring emotion understanding for future research.

EUReKA! A Conceptual Model of Emotion Understanding

Understanding emotion in the self and others serves important socioemotional goals across the lifespan. In children, emotion understanding ability is linked to social skill and prosocial behavior (e.g., Ensor, Spencer, & Hughes, 2011; Mostow, Izard, Fine, & Trentacosta, 2002) and fewer externalizing, aggressive, and oppositional problem behaviors (e.g., Cook, Greenberg, & Kusché, 1994; Denham et al., 2003; Schultz, Izard, & Bear, 2004). In adults, emotion understanding ability is associated with empathy, marital satisfaction, and self-esteem (e.g., Hall, Andrzejewski, & Yopchick, 2009; Koerner & Fitzpatrick, 2002; Pitterman & Nowicki, 2004) and less loneliness and social anxiety (Pitterman & Nowicki, 2004).

Despite the clear utility and value in understanding emotions, the field currently lacks a cohesive description of the specific skills embedded in the overarching concept of emotion understanding. The burgeoning of research which followed earlier models' inclusion of emotion understanding as a pillar of emotional competence (e.g., Halberstadt, Denham, & Dunsmore, 2001; Saarni & Harris, 1991; Salovey & Mayer, 1989) has led to the development of many measures of emotion understanding. Nevertheless, researchers have not often considered how these measures relate to the overarching construct of emotion understanding. Thus, when studies include different measures of emotion understanding, we often do not know the degree to which those measures capture shared or completely different subsets of skills within the larger construct.

This problem is even more pronounced when attempting to integrate definitions of emotion understanding across the lifespan, as different skill sets are highlighted for different age groups. For example, emotion understanding in adults is almost exclusively defined as the abilities to monitor and represent inner states, differentiate emotions in self and others, and understand the social and moral functions of emotions (e.g., Grünh, Lumley, Diehl, & Labouvie-Vief, 2013; Labouvie-Vief, Grünh, & Studer, 2010; Lane, Quinlan, Schwartz, Walker, & Zeitlin, 1990). These abilities are often aggregated into assessments of emotional complexity, with specific components rarely identified. In contrast, child definitions of emotion understanding emphasize the skills of labeling emotional expressions and attributing emotions to prototypical situations, and rarely include assessments of emotional complexity (e.g., Denham, Zoller, & Couchoud, 1994; Pons, Harris, & de Rosnay, 2004; see Cunningham, Kliwer, & Garner, 2009, for an interesting exception). Although these operational differences may reflect developmental differences in understanding emotions, some of the embedded assumptions (e.g., that adults achieve some absolute maximum of emotion understanding and that children lack it) constrain our ability to understand the full scope of emotion understanding. Thus, a comprehensive conceptual structure can help researchers to recognize measurement limitations and can serve to unite the field, both theoretically and empirically.

Providing shared and explicit definitions of the specific skills comprising emotion understanding can also help guide the appropriate use and interpretation of existing measures when relating emotion understanding to various other constructs. Finally, a good organizing

model can guide development of future measures of emotion understanding by identifying skills not readily assessed, as well as those well saturated in the field. We believe this to be a particularly important contribution, as decades of research on emotion understanding present both redundancy and disparity concerning the components being assessed, while leaving potentially vital components of emotion understanding largely unstudied. Thus, the goals of this paper are to introduce the model of Emotion Understanding in Recognition and Knowledge Abilities (EUREKA) as an integrative model of emotion understanding, and to review the extant research within the lens of this model.

A Model of Emotion Understanding

We define emotion understanding broadly as “expertise in the meaning of emotion.” Specifically, we include within the EUREKA model the two higher-order abilities of emotion recognition and emotion knowledge, the specific measurable skills within these two broad abilities which we describe in detail below, and three foci of emotion understanding – how well we understand our own emotions (Self), how well we understand emotions in a specific other, such as a parent, spouse, coworker, or child (Other), and how well we understand emotions in the general population, for example, someone we don’t know (General). Figure 1 depicts the two broad abilities of emotion recognition and emotion knowledge (with corresponding skills embedded) and the three overlapping columns representing the Self, Other, and General foci of emotion understanding.

Before describing the model further, we note three caveats. First, we recognize that identification of “expertise” in most situations will be embedded within a larger cultural

context, as emotions are constructed and construed within cultural models (Barrett, Mesquita, & Gendron, 2011; Halberstadt et al., 2001; Halberstadt & Lozada, 2011). In our model, we consider cultural cues and display rules and norms (see skills below) but we omit the very specific ways that cultures create shared understandings of emotion (e.g., ethno-theories of emotions as illnesses, identities, etc.), which serve to fulfill roles and functions within the culture. These may become relevant in future revisions of our model, but for now it may be understood that the specific instantiations of expertise and relations between them are likely to be culturally-embedded. Second, the EUREKA model makes no claims about the temporal or developmental structure of skills, but rather aims to identify and explicitly define the skill sets that comprise emotion understanding (for developmental considerations, see Barrett et al., 2011; Labouvie-Vief, DeVoe, & Bulka, 1989; Labouvie-Vief et al., 2010; Pons et al., 2004; Widen, 2013). Third, the EUREKA model maintains a level of flexibility, in that the current conceptualization may be revised to include additional skill sets.

Recognition and Knowledge as Broad Understanding Abilities

Previous research has generally acknowledged that a variety of skills are needed to define the overarching construct of emotion understanding; common to most definitions are skills related to the recognition and knowledge of emotion. Skills in labeling emotional expressions and using knowledge about emotions (e.g., emotional cause scripts) to attribute emotions to situations are common to many conceptualizations of emotion understanding, including emotion knowledge (Morgan, Izard, & King, 2010; Pons et al., 2004; Shaver, Schwartz, Kirson, & O'Connor, 1987), affective perspective taking (Denham, 1986, 1998),

emotion understanding (Phillips, MacLean, & Allen, 2002; Saarni, 2000; Saarni & Harris, 1991), or even emotion intelligence (Mayer et al. 1999). Thus, to enhance parsimony and integrate existing definitions, we organize these skills into two broad abilities: emotion recognition and emotion knowledge.

In everyday life, it is apparent that both abilities are necessary to understand emotions. For example, in the context of performing a favor, emotion knowledge provides us with potential and expected emotional reactions (e.g., gratitude emotional script) and emotion recognition enables us to perceptually detect whether a display of gratitude is made (or not), and whether it is posed or genuine. We may also utilize our knowledge of others' emotional expressiveness and experiences to perceptually identify spontaneous emotional displays, thus resulting in a complex amalgamation of emotion knowledge and emotion recognition skills (e.g., Fabes, Eisenberg, Nyman, & Micalieuf, 1991). Although these skills are likely intertwined, correlational analyses (Mayer et al., 1999; Mayer, Salovey, Caruso, & Sitarenios, 2003; Perez Rivera & Dunsmore, 2011; Thingujam, Laukka, & Elfenbein, 2012) and tests of factor structure (Barbosa-Leiker, Strand, Mamey, & Downs, 2014; Bassett, Denham, Mincic, & Graling, 2012) support emotion recognition and emotion knowledge as two distinct but moderately-related components of emotion understanding.

A more difficult question is what to include as the specific skills comprising emotion recognition and emotion knowledge. This is especially challenging as there are many assessments of skills, and yet these assessments are rarely utilized in conjunction with each other, and the associations between skills are still largely uncharted. Based on previous

theory and research (including Denham, 1986; Halberstadt et al., 2001; Labouvie-Vief et al., 2010; Mayer et al., 1999; Pons et al., 2004; Saarni & Harris, 1991), we begin the process of identifying skill sets, and welcome revisions in future iterations of the model.

Emotion recognition skills. In our current conceptualization, emotion recognition utilizes visual and/or auditory cues across a variety of modalities (i.e., face, body, and voice), and is comprised of four skill sets: (1) awareness that an emotion has been expressed, (2) labeling of prototypical expressions, (3) labeling of non-prototypical expressions, and (4) use of contextually-relevant cues in identifying and labeling emotions.

Awareness refers to the detection of emotional information in any given communication (Halberstadt et al., 2001; Saarni, 2000), and likely guides more downstream recognition skills, as acknowledged in other models (e.g., social information processing model; Dodge, 1986). An example of awareness would be a shift in a parent's or spouse's voice, which may signal the availability of emotional information. One then has to determine what the signal means. Awareness can be assessed through tasks that allow individuals to discern whether there is any emotion expressed. For example, including a "neutral" or "no emotion" option as a response to emotions presented in varying intensities, or asking participants to identify when in the flow of an interaction an emotion appears, allows participants to reveal their awareness "thresholds" for emotional communications.

The process of labeling—identifying whether a parent's or spouse's vocal shift signals anger, distress, or careful intonation using a neutral tone of voice to conceal feelings—involves interpreting the signal as conveying specific emotional meaning (e.g.,

Denham, 1986; Pons et al., 2004). We separate labeling of prototypical expression, which is utilized primarily in research studies, from the labeling of non-prototypical expression, which is more ecologically valid given the prevalence of non-prototypical expressions in real life. Non-prototypical expressions include subtle or spontaneous displays of emotion, mixed or suppressed expressions, and authentic or non-authentic expressions.

A fourth skill set involves recognizing emotions within the ongoing flux of a context. Sometimes context may facilitate recognition, in that individuals can utilize relevant contextual cues (such as cultural scripts and situation-specific clues) to detect and identify emotions, but often the context will also require identifying which cues are relevant, which cues are not relevant, and discounting irrelevant information (e.g., Barrett et al., 2011; Halberstadt et al., 2001; Saarni, 2000). For example, cultural learning and shared expressive style may give in-group members an advantage to recognize emotional expressions compared with members of a different culture (e.g., Elfenbein, 2013; Laukka, Neiberg, & Elfenbein, 2014). Additionally, recognition may depend on dynamic contextual cues tied to the situation in which emotions are expressed—these cues may be particularly relevant in identifying ambiguous expressions (Barrett et al., 2011).

Emotion knowledge skills. Emotion knowledge is comprised of five skill sets that incorporate information regarding: (1) internal and external causes of emotions, (2) the qualities of emotions, including the structure, timing, and sequencing of emotion, (3) consequences and functions of emotions, (4) cultural rules and norms, and (5) management

of emotions including the breadth of and most appropriate strategies available for a given situation.

Emotions may be more internally (e.g., desires, beliefs) or externally (e.g., events, social cues) caused; knowledge of causes in general allows us to predict how an individual may feel given that information (e.g., Denham, 1986; Pons et al., 2004; Saarni & Harris, 1991). For example, receiving flowers when sick may elicit feelings of happiness in the receiver; anticipating that the flowers made someone happy may also elicit happiness in the giver. Knowledge regarding the qualities of emotion refers to the understanding that emotions are dynamic properties (Labouvie-Vief et al., 2010; Mayer et al., 1999); thus, emotions may exist independently or simultaneously, at varying intensities, and with some stability or change over time. Knowledge regarding emotion consequences refers to the understanding that emotions serve many functions (e.g., communication, motivation) and contribute to the effects of our actions. Thus, we may use emotions to obtain certain desired results or outcomes (Izard et al., 2011; Tamir, 2009), such as deliberately cultivating feelings of anger to exert dominance when confronting an opponent (Ford & Tamir, 2012).

Knowledge regarding cultural rules and norms includes display rules, base rates, and other information afforded by a culture (broadly defined) that influences the expression, experience, and recognition of emotion (e.g., Halberstadt et al., 2001; Saarni, 2000). For example, we apply display rules regarding death and the celebration of life to determine whether intense displays of negative or positive affect are normative or informative at a funeral. Management refers to regulating emotions; thus, knowledge about management

includes knowing that emotions may be controlled, as well as potential strategies and relative benefits and disadvantages for each strategy (e.g., MacCann & Roberts, 2008; Pons et al., 2004). For example, suppression is a viable method for inhibiting the expression of anger, but we may recognize the advantages of reappraisal when seeking relief from the subjective experience of anger, even before anger has been experienced (Gross, 2001).

It is important to note that each skill set within both emotion recognition and emotion knowledge can vary along dimensions of difficulty and complexity. For example, the labeling of a happy facial expression can vary from easy – recognizing a wide, open-mouthed smile –to difficult – recognizing a faint smile with lips pressed together. Similarly, knowledge about the causes of disappointment can vary from rather simple – failed expectations cause disappointment – to rather complex requiring the integration of several pieces of information—for example, the importance of the goal, likelihood of achieving expectations, and locus of control.

Foci of Understanding

An important and unique feature of the EUREKA model is the explicit differentiation between the three foci of emotion understanding, that is, who is being understood. This has been implicitly included in previous theoretical models (i.e., understanding emotions in self and others; see Denham, 1998; Halberstadt et al., 2001; Labouvie-Vief et al., 1989; Lane et al., 1990; Shaver et al., 1989). Emotion understanding can be applied to the self, specific others, or others in general. The focus on the “Self” refers to the understanding of one’s own emotions. This includes recognizing the emotional states of the self and knowing how the

self emotionally reacts in different contexts: *I can tell when I am mad and I easily get mad when I am around my sibling.* The focus on “Other” involves the understanding of emotion in specific others, or people that the self knows directly or personally. That is, an individual has some specific knowledge and experience about how that known other person shows emotions and may react in different contexts: *My father hardly shows any emotions; though, if he does, you don't want to be around.* The “General” focus involves the understanding of emotion in others in general (people for whom one has no personal information) or the population average. Thus, the general focus incorporates the idea of how people typically display emotions and how people typically react in different contexts: *People frown when they are sad and people are sad when a loved one passes away.*

By explicitly incorporating the foci of emotion understanding, the EUREKA model distinguishes emotion recognition and emotion knowledge depending on the person that is to be emotionally understood. For example, the knowledge of what may cause happiness in one's self; the knowledge of what may cause happiness in one's parent, spouse, coworker, or child; and the knowledge of what may cause or reflect happiness in most people might not be the same. One reason contributing to different knowledge of different foci is that people react differently to the same context: *People are typically happy when receiving gifts; I feel primarily embarrassed, though, from all the attention when I receive a gift; my grandmother feels angry because she thinks gifts are a waste of money.* Similarly, recognizing an emotion in a stranger, in one's parent, spouse, coworker, or child, and in oneself might differ substantially. Although the importance of distinguishing between different foci is obvious

once stated, we know little about the degree to which understanding of others and self are related, or the degree to which we utilize these sources to make inferences about how others react.

The three foci of emotion understanding are visualized by three overlapping columns in the EUREKA model (see Figure 1) to illustrate that we may utilize different foci or knowledge sources to understand emotions. For example, for understanding how a specific other might experience rejection, we may utilize generalized emotion knowledge (General), we may combine this with emotion knowledge about specific others (Other), or with our past experiences (Self), or in any combination of these foci: *I don't know how my daughter feels about breaking up with her first love, but I know how I and my friends felt.* The representation of the foci by three columns is also a simplification. To be more accurate, there should be columns for many specific others, as people experience and express emotions differently. We may even demonstrate preferences for some others: *My classmate is very similar to my brother and I know how my brother feels, so my classmate must feel the same.* We provide these examples to argue that people are able to flexibly incorporate these different knowledge sources, further adding to the complexity in assessing emotion understanding. The degree to which such possibilities exist remains an important empirical question.

Measuring Emotion Understanding

In addition to providing a framework for organizing and interpreting the literature on emotion understanding, another goal for the EUREKA model is to foster awareness of

existing measures and support the development of new measures assessing this rich construct. One way of doing this is to identify and place current measures of emotion understanding within the EUREKA model. This may help researchers to select measures of emotion understanding most appropriate for their goals, and to help the field to detect potential gaps in assessment.

Measure Selection and Coding

We conducted a PsycINFO search of articles published from 2009 to January 2014 to identify both common and novel methods of assessing emotion understanding represented in the recent literature. This approach allowed us to include one instantiation of all the well-established measures of emotion understanding and to identify as many novel measures as possible to diversify our measurement toolbox. Key search terms included: *emotion understanding, emotion recognition, emotion knowledge, emotion awareness, emotion perception, emotion complexity, emotion competence, emotion comprehension, affective competence, affective understanding, affective knowledge, affective perception accuracy, and affective perspective taking.*

We searched for well-established measures that were frequently cited in the literature as well as novel measures that provided unique approaches to studying emotion understanding, particularly with regards to the assessment of unique skill sets or foci. We aimed to include measures used at different ages including measures for use with children, adolescents, and adults. We excluded measures designed for infants because these methods systematically differ from other methods due to the developmental demands of infants, and

we excluded measures designed for atypical samples with existing biological, cognitive, or social impairments (e.g., dementia patients; individuals on the Autism spectrum; substance abusers). We also omitted measures using essentially the same methodology as numerous other measures with only slight variations, retaining either the first publication of a well-established measure or a frequently cited instantiation of that measure. Given that our initial search yielded over 5000 articles, we may have missed measures; however, our careful search process was designed to ensure that most currently available measures are represented, and that all categories of measures have been included.

We found 56 unique methods of measuring emotion understanding. To locate these methods within the structure of the EUREKA model, the first two authors coded each measure for the ability, skill, and focus of the assessment. Discrepancies were resolved by discussion among all authors. Measures were obtained through published articles and by request. Table 1 presents measures assessing emotion recognition ability and Table 2 presents measures assessing emotion knowledge ability; citations represent primary sources. The eleven measures assessing both abilities are listed in a separate section in both tables. To aid organization, emotion recognition measures are grouped into sections by the type of presentation: prototypical static, single-channel measures; static, morphed images; prototypical dynamic, multi-modal stimuli; and naturalistic measurement techniques. Emotion knowledge measures are grouped into either prototypical vignettes or open-ended response measures. These groupings were methodologically based and do not imply conceptual differences.

The columns represent the skills; letters listed as entries indicate the focus as S (self), O (other), and G (general). Given that a measure might assess multiple foci, any combination of the three letters is possible. Because some measures could be expanded to assess specific skill-foci combinations for which the measure has not yet been used, we coded potential scoring as well; thus, we included lower-case letters, s (self-potential), o (other-potential), and g (general-potential), to designate that this measure has the potential to be used for this additional skill-focus. For example, emotion recognition measures utilizing naturalistic methods such as recognition of familiar others' emotions during ongoing interactions (referred to as *in vivo* decoding; e.g., Dunsmore, Her, Halberstadt, & Perez-Rivera, 2009) often include spontaneous expressions of emotion in the Self and Other; such measures may also include prototypical expressions of both Self and Other foci, as well as the use of contextual cues to recognize emotions in the Other. Finally, we report the primary age groups for which the measure or technique was designed.

EUREKA Findings

Our coding of measures within the EUREKA model revealed four major findings. First, as noted, only eleven measures (20%) assess both of the broad abilities of emotion recognition and emotion knowledge. This scarcity of measures including both abilities likely contributes to the lack of comprehensive assessment of emotion understanding in empirical studies. It is important to note that some studies do include measures of emotion understanding spanning both abilities (e.g., Mayer et al., 2003; Perez Rivera & Dunsmore, 2011; Thingujam et al., 2012); these studies are arguably more inclusive in their assessment

of emotion understanding. However, our review of the literature suggests that most studies rely on measures assessing only one broad ability to represent the construct of emotion understanding. The lack of simultaneous measurement of emotion recognition and emotion knowledge within the same study hinders interpretation of findings across studies because emotion understanding then implies different abilities. Thus, we recommend that researchers include both emotion recognition and emotion knowledge measures so as to comprehensively reflect the construct of emotion understanding.

Second, as a field, we seem over-reliant on single-skill assessments within the broad abilities; fully one-quarter (25%) of the measures assess only one specific skill. Although these measures can be combined to collectively reflect a variety of skills, single measures by themselves limit interpretations regarding emotion recognition or emotion knowledge as a unified expertise. Approximately 64% of measures assess two to three skills, and two emotion knowledge measures assess four skills. All available skills are included in only three emotion recognition measures (see Dunsmore et al., 2009; Magill-Evans, Koning, Cameron-Sadava, & Manyk, 1995; Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979) and one emotion knowledge measure (see Lane et al., 1990). All other things being equal (e.g. psychometric properties, time demands), we suggest selecting measures that include multiple skills over single skill assessments.

Third, the skills within the broad abilities do not receive equal amounts of attention. Not surprisingly, skills that receive the most attention are those that are most easily measured. For example, labeling prototypical expressions is included in 82% of emotion

recognition measures; knowledge about causes is included in 88% of emotion knowledge measures. However, other skills receive substantially less attention. For example, labeling expressions in context is included in 36% of emotion recognition measures; knowledge about the qualities of emotion is included in 24% of emotion knowledge measures. The reliance on only a few types of skills leads to a lack of diversity and reduces what we can know about emotion recognition or emotion knowledge, particularly within ecological and cultural contexts.

Fourth, the vast majority (88%) of measures assess emotion understanding with only a General focus. For emotion recognition, the focus is almost entirely General, with 97% measures relying on recognition of emotion for people unknown to the participant, and 6% for Self, 6% for Other. Only 9% of the measures include two foci. The situation with emotion knowledge measures is almost as challenging, with 82% measures assessing knowledge of emotions for people unknown to the participant, and 35% for Self, 9% for Other. Only 26% of the measures include two foci. No measures include all three foci. These findings likely reflect the methodological ease with which measures of generalized others are constructed; it may be easier to establish criterion validity for items assessing the recognition and knowledge of generalized others' emotions than of the self, a parent, spouse, coworker, or child. However, the lack of Self or Other focus constrains what we know about emotion understanding skills in highly important and relevant domains, limits the ecological validity of current emotion understanding measures, and hinders understanding of the development of these skills, as they likely emerge and develop within familiar contexts, such as family or

work settings (Castro, Halberstadt, Lozada, & Craig, 2014; Eisenberg, Cumberland, & Spinrad, 1998; Halberstadt et al., 2001).

Conclusion and Future Directions

The construct of emotion understanding remains relatively unmapped despite the proliferation of research on this rich construct. To summarize our review we emphasize five general points and a final caveat. First, as noted above, the measures used to assess emotion understanding do not often reflect the breadth of conceptual definitions. Given that numerous skill sets comprise expertise in emotion understanding and many measures assess only a subset of the possible skills within these skill sets, measures of emotion understanding often do not match broad conceptual definitions. We hope the specificity in the current review will help future researchers to be more specific in their conceptual definitions of emotion understanding.

Second, future research would benefit greatly from investigating multiple skills of emotion understanding. This may be achieved by creating new measures that include skills within both emotion recognition and knowledge, particularly skills noted in this review as needing more empirical attention. Alternatively, the EUREKA model may serve as a practical guide for the selection of existing measurements that assess a wide variety of skills of interest to researchers. In particular, some measurement methods have adaptability for assessing more skills than originally intended (e.g., Dunsmore et al., 2009; Lane et al., 1990), and/or include assessment of skills less frequently studied (e.g., Fabes et al., 1991; Mayer et al.,

1999). Either option would enhance coherence in the assessment of emotion understanding across studies.

Third, our analyses of existing measures suggest that both child and adult measures of emotion recognition and emotion knowledge fit well within the conceptual scope of emotion understanding. Certainly emotion understanding skills are complex enough that they likely continue to develop throughout the lifespan, and our review suggests that we can and do measure similar emotion understanding skills at different ages. That is not to say that such skills appear the same at different ages; rather, skills likely demonstrate continuity and discontinuity with age, with changes in complexity of understanding as well. We hope our review will encourage future researchers to think about emotion understanding as a dynamic expertise that develops across the lifespan, as an individual must understand emotions as a young child, as an adolescent, and throughout adulthood.

Fourth, our review highlights the need for more detailed information regarding the structure of emotion understanding skills. Although our selection of abilities and skill sets was theoretically and empirically driven, the degree to which this structure is supported across contexts, and different groups relating to age, ethnicity, and gender, remains an important empirical question. Future research should compare skills within and across the broad abilities of emotion recognition and emotion knowledge. Such information would indicate to what extent emotion understanding skills are, in fact, related, whether there are additional groupings beyond the two broad abilities identified here, and the degree to which relations among skills may differ between groups, such as age groups. For example, there are

good reasons to imagine that emotion recognition and emotion knowledge become more differentiated abilities during childhood and adolescence; such differentiation may peak in middle adulthood and we may expect dedifferentiation of skills in old age (Labouvie-Vief et al., 2010). Having measures or methodologies that span multiple age groups would allow us to test the structure of emotion understanding at different ages in the lifespan. Further, such measures would allow for the test of whether there are different age-related trajectories for different skills within abilities.

Fifth, the EUREKA model points out the large gap in our knowledge about how we understand emotions in the self and specific others. Researchers would likely agree that such understanding constitutes an important component of everyday functioning. Assessing all three foci will allow us to test numerous hypotheses, including whether these three foci of understanding develop in concert with each other, whether individuals of different ages differentiate their understanding of emotions by these three foci, whether such differentiation becomes stronger or weaker over time, and whether understanding emotions in specific others provides a foundation for internal working models about others' emotional behaviors, as has been initially demonstrated by research with maltreated children (Pollak, Cicchetti, Hornung, & Reed, 2000). We expect that individuals do differentiate their understanding of emotions by foci. Through experience, we know that different people's feelings may differ within the same context. Indeed, individuals' descriptions of their own emotional episodes and episodes of the same emotion in general differ in many features (Shaver et al., 1987). We also expect age-related differences in the utility of specific foci in understanding emotions.

The ability to understand specific others' emotions may be particularly important for both very young children who are reliant on known others for many of their needs (Halberstadt & Lozada, 2011), and for older adults who may rely on contextual cues and past experiences to compensate for losses in sensory functions and cognitive abilities (Isaacowitz & Stanley, 2011; Raters, Blanke, & Riediger, 2013). Thus, future research may investigate questions regarding the relation between understanding across different foci. We strongly argue that this is a likely process by which emotions are understood; yet as a field we must first devise measurement methods to capture those processes.

We worked hard to include a full and diverse representation of emotion understanding measures in our review (see Tables 1 and 2). We are hopeful that this work will guide future conceptual and empirical assessments of emotion understanding. However, we have deliberately omitted evaluations of formal assessments of measurement reliability or validity, as doing so would substantially lengthen the manuscript and detract from our main goals to comprehensively describe the rich construct of emotion understanding and to organize and integrate current assessments of emotion understanding in childhood and adulthood. Thus, we do not endorse any specific measures, and, as always, encourage researchers to consider psychometric properties including reliability and validity when selecting measures for use in research. Validation assessments should also include other emotion understanding measures that sample similar skill sets, as well as measures that sample other aspects of the overarching construct of emotion understanding (such as distinct skill-foci combinations). Such considerations are likely to result in the creation and use of measures which more

comprehensively represent the range of emotion understanding skills, as well as contribute to the literature on the structure of emotion understanding skill.

In sum, the EUREKA model attempts to provide a unified conceptual framework for the field of emotion understanding. We hope that the model will generate research in testing the structure of the EUREKA model and its corresponding ideas. It is clear that the field of emotion understanding is in a state of growth and renewal and we hope that our review of existing measures within the EUREKA model will guide future work on emotion understanding.

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Table 1. Measures of Emotion Recognition by Specific Skills and Foci

Measures	Emotion Recognition Skills			
	Awareness	Labeling Prototypical Expressions	Labeling Non-prototypical Expressions	Labeling in Context
<i>Prototypical static, single-channel</i>				
Bowers et al. (1999); FAB ^{bcd}	G	G	G	
Ekman & Friesen (1974); BART ^d		G		
Field & Walden (1982) ^a		SG		
Kusché et al. (1993); KEI ^{ab}		G		
Laukka et al. (2010); VENEC ^d	G	G		g
Matsumoto et al. (2000); JACBART ^d	G	G		g
Nowicki & Duke (1994); DANVA2 ^{abd}		G		
Parker et al. (2013); CARE ^a	G	G	g	
Tuminello & Davidson (2011) ^{ab}	G	G		G
Sauter et al. (2013) ^{ab}	G	G		
Scherer & Scherer (2011); ERI ^d	G	G	g	
<i>Static, Morphed images</i>				
Montagne et al. (2005) ^d	G	G	G	
Montirosso et al. (2010); AFFECT ^{abc}	G	G	G	
Pollak et al. (2009) ^b	G	G	G	

Table 1 Continued

<i>Prototypical dynamic, multi-modal</i>					
Bänziger et al. (2009); MERT ^d		G			
Crane & Gross (2013) ^d	G			G	
Rosenthal et al. (1979); PONS ^d	G	G		g	G
Magill-Evans et al. (1995); CASP ^{abc}	G	G		g	g
Moraitou et al. (2013); EET ^d	G	G			G
Trimboli & Walker (1993); CAST ^d				G	G
<i>Naturalistic</i>					
Buck (1976); CARAT ^d	G			G	
Dunsmore et al. (2009) ^{bd}	SO		so	SO	o
<i>Measures including both EK and ER</i>					
Barbosa-Leiker et al. (2014); EUA ^a			G		
Denham (1986) ^a			G		
Fabes et al. (1991) ^a					og
Kalokerinos et al. (2014) ^d				G	G
Mayer et al. (1999); MEIS ^{cd}	G		G		
Mayer et al. (2002, 2003); MSCEIT ^{bcd}			G		
Morgan et al. (2010); EMT ^a			G		g
Pons et al. (2000, 2004); TEC ^{ab}			G		
Schultz et al. (2004); ACES ^b			G		

Table 1 Continued

Steele et al. (1999); TAT^a

G

Strayer (1980)^a

G

G

Note. Target age groups for each measure are reflected as follows: ^aEarly Childhood; ^bMiddle Childhood; ^cAdolescence; ^dAdulthood. Cells reflect the assessed foci (upper-case) and potential foci (lower-case) in the skill: S,s = self; O,o = other; G,g = general.

Table 2. Measures of Emotion Knowledge by Specific Skills and Foci

Measure	Emotion Knowledge Skills				
	Causes	Quality	Consequences	Rules and Norms	Management
<i>Measures including both EK and ER</i>					
Barbosa-Leiker et al. (2014); EUA ^a	G				
Denham (1986) ^a	G				
Fabes et al. (1991) ^a	og				
Kalokerinos et al. (2014) ^d				g	g
Mayer et al. (1999); MEIS ^{cd}	G	G			G
Mayer et al. (2002, 2003); MSCEIT ^{bcd}	G		G		G
Morgan et al. (2010); EMT ^a	G				
Pons et al. (2000, 2004); TEC ^{ab}	G				G
Schultz et al. (2004); ACES ^b	G				
Steele et al. (1999); TAT ^a	G				
Strayer (1980) ^a	G			G	
<i>Prototypical vignette EK measures</i>					
Burnett et al. (2011) ^{bc}	S	S		sg	
Chow & Berenbaum (2012); PAUSE ^d			S		
Cunningham et al. (2009) ^{bc}	SG	SG			S
Denham et al. (1994) ^a	G				
Harwood & Farrar (2006) ^a	SO				
Jenkins & Ball (2000) ^b			G		
MacCann & Roberts (2008); STEU ^d	G				

Table 2 Continued

Nelson et al. (2013) ^a	G				
Ribordy et al. (1988); ERQ ^a	G				
Ruby & Decety (2004) ^d	SO				
Schmidt-Atzert & Bühner (2002); TEMINT ^d	G			G	
Sidera et al. (2013) – task b ^a				S	S
Sidera et al. (2013) – task c ^a	G			G	G
Urberg & Docherty (1976) ^{ab}	SG			SG	
Zajdel et al. (2013) ^{abc}	G	G			
<hr/> <i>Open-ended EK measures</i>					
Lane et al. (1990); LEAS ^{bcd}	SG	sg	sg	sg	sg
Friend & Davis (1993) ^{ab}	G			G	
Kats-Gold & Priel (2009); KAI-R ^b	SG	G			G
Labouvie-Vief et al. (1989) ^{bcd}	S	s		s	S
Salmon et al. (2013) ^a	S				
Schultz et al. (1989); INSI ^b	G		G		g
Underwood et al. (1992) ^{bc}	Sg		Sg	Sg	
Vitulić (2009) ^{bc}	G	G		G	G

Note. Target age groups for each measure are reflected as follows: ^aEarly Childhood; ^bMiddle Childhood; ^cAdolescence; ^dAdulthood. Cells reflect the assessed foci (upper-case) and potential foci (lower-case) in the skill: S,s = self; O,o = other; G,g = general.

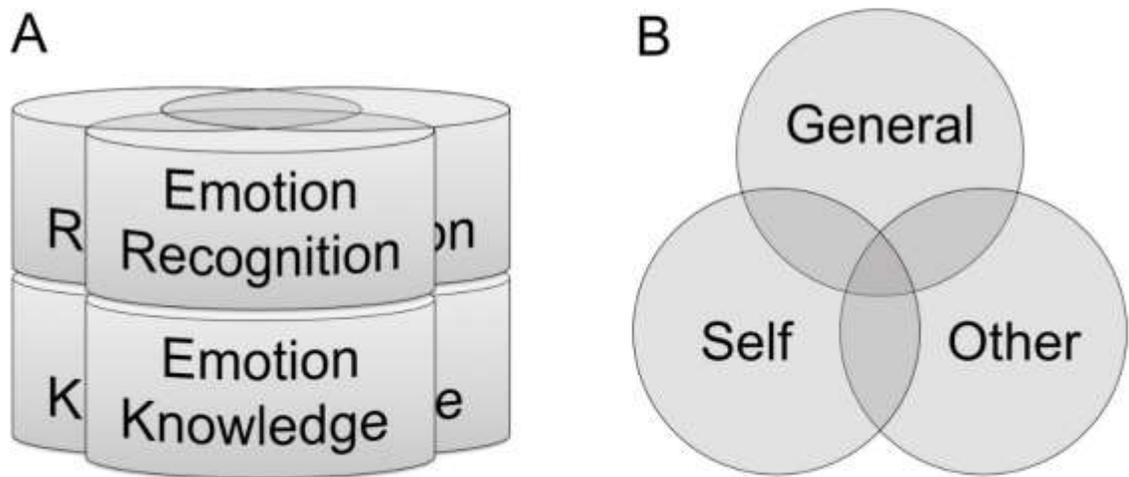


Figure 1. The EUREKA Model

The EUREKA model constitutes emotion understanding as the two broad abilities of emotion recognition and emotion knowledge (A) and the three overlapping columns representing the different foci (B). Abilities and foci are arranged for ease in presentation, and thus do not assume some type of temporal or developmental hierarchy or structure.

CHAPTER 3: A Three-Factor Structure of Emotion Understanding in Middle Childhood

Theoretical conceptualizations of the broad construct of emotion understanding generally imply a two-factor structure comprised of recognition of emotional expressions and understanding emotion-eliciting situations. To empirically test the structure of emotion understanding in middle childhood we provided a variety of measures that could collectively assess the increasingly sophisticated emotional skills of elementary-school-aged children. We then explored the unique predictive value of various facets of emotion understanding to children's socioemotional competence. Participants were 203 third-grade children and their mothers. Children completed five different measures of emotion understanding: two prototypical emotion recognition measures, one in vivo emotion recognition measure, one prototypical emotion knowledge measure, and one contextualized emotion knowledge measure. Mothers completed two questionnaires assessing children's socioemotional skills and problems. Results suggest that: (a) emotion understanding in third-grade children is differentiated into three unique factors: Prototypical Emotion Recognition, Prototypical Emotion Knowledge, and Advanced Emotion Understanding, (b) skills within factors are modestly related, (c) factors vary in complexity, supporting theoretical and empirical models detailing developmental sequencing of skills, and (d) skills in Prototypical Emotion Knowledge are uniquely related to mothers' reports of third-grade children's socioemotional competence. Limitations and implications regarding elementary-school-aged children's social cognitive development are discussed.

A Three-Factor Structure of Emotion Understanding in Middle Childhood

Emotion understanding (EU) is an umbrella term used to capture the many skills associated with the recognition and attribution of emotions in the self and others (Castro, Cheng, Halberstadt, & Grühn, in press; Denham, 1986; Halberstadt, Denham, & Dunsmore, 2001). EU is thought to predict important socioemotional competencies across childhood, including fewer parent- and teacher-reported behavior problems (for meta-analytic review, see Trentacosta & Fine, 2010), greater prosocial adjustment (Ornaghi, Grazzani, Cherubin, Conte, & Piralli, 2014), greater interpersonal success with peers (Heinze, Miller, Seifer, Dickstein, & Locke, 2014; Miller et al., 2005), and various indicators of academic achievement (Denham et al., 2012; Denham et al., 2013).

Despite the importance of EU as a developmental competency, we know little about the structure of this rich construct for elementary-school-aged children. Knowing more about the structure of emotion understanding is important for two reasons. Pragmatically, no one has examined to what extent the multiple measures of EU assess similar or divergent skill sets, challenging our ability to compare across studies. Theoretically, understanding the structure of EU allows us to test developmental trajectories of independent EU skills, as well as associations with other social and cognitive competencies; that is, different skills may cohere differently at older ages, and different skills may be uniquely related to other competencies at older ages.

To begin to address these gaps in the literature, the current study provides an empirical test of the structure of EU, and additionally examines that structure in relation to

third-grade children's other socioemotional competencies. Below we describe the broad construct of EU and how different components of EU may relate to developmental competencies that are important for children's socioemotional adjustment during middle childhood broadly, and third grade specifically.

Theoretical Conceptualizations of Children's Emotion Understanding

Children's EU is thought to be multidimensional, with at least two broad skill sets: *emotion recognition*, the perceptual recognition and labeling of emotional expressions in the self and others, and *emotion knowledge*, the attribution of emotions in the self and others using general emotional scripts as well as culturally-embedded scripts about emotion-eliciting situations (e.g., Castro et al., in press; Denham, 1986; Halberstadt et al., 2001; Pons, Harris, & de Rosnay, 2004; Widen, 2013). The process by which children's EU develops is thought by some theories to be sequential, with skills becoming increasingly complex in both level and quality throughout childhood. For example, basic skills, such as labeling prototypical emotional expressions and knowing about external causes of emotions, emerge in early childhood (ages 3 to 5), whereas more complex skills, such as recognizing mixed emotional expressions, understanding social and moral emotions, and knowing how to manage emotions effectively, develop around the age of eight in middle childhood (e.g., Harris, 1989; Pons et al., 2004; Saarni, 2000).

EU development may thus be considered orthogenetic (Werner, 1957), with abilities in early development beginning as unitary or highly related skills, and becoming increasingly differentiated with age. It is likely that emotion recognition and emotion knowledge skills

continue to differentiate during middle childhood (ages 7 to 11), as children's growing cognitive skills facilitate their abilities to analyze, interpret, and integrate multiple, mixed, and fragmented emotion-related messages (Eccles, 1999; Halberstadt, Parker, & Castro, 2013). Children in middle childhood are also increasingly expected to understand others' emotions in contexts that include multiple, rapidly changing, and fragmented emotion expressions and experiences (Halberstadt et al., 2013; Pons et al., 2004). Together, children's developing skills and the contextual demands they face may spawn more complex and differentiated skills, such as the *in vivo* recognition of emotion in familiar others (e.g., Castro, Halberstadt, Lozada, & Craig, 2014; Ickes, 2011) and knowledge of mixed and moral emotions (e.g., Brown & Dunn, 1996; Pons et al., 2004). Further, children's skills in knowing which emotion regulatory responses to select and apply in social situations, as well as self-awareness about their own skill, may become increasingly sophisticated and differentiated as children learn how to effectively manage their emotions (Eisenberg & Morris, 2002). Thus, testing the multidimensionality of EU during middle childhood may reveal a differentiated pattern of development, adding clarity to our understanding of the development of different EU skills.

To our knowledge, only two studies have tested the structure of children's EU; both report a two-factor structure distinguishing emotion recognition and emotion knowledge as the factors in 3-to-5-year-old children (Barbosa-Leiker, Strand, Mamey, & Downs, 2014; Bassett, Denham, Mincic, & Graling, 2012). Our study expands on these in three ways. First, our sample extends knowledge about EU structure to an older population—third-grade

children. Second, our study includes multiple EU measures that collectively assess a diverse skill set. Previous studies used subscales from a single measure of EU, thus potentially limiting the number and types of dimensions that could emerge. Utilizing multiple measures may be even more important for testing the structure of EU in third grade, so as to assess children's growing capacity for complex understanding of emotions. Third, we include both prototypical and non-prototypical measures of EU. Emotion communication in "real life" is "messy," and often involves quick and truncated expressions, and across a variety of channels (App, McIntosh, Reed, & Hertenstein, 2011; Halberstadt et al., 2013). Yet, most EU measures consist of prototypical, static, and unimodal emotional expressions and vignettes that are largely decontextualized. To better assess the increasingly sophisticated skills of third-grade children, we included an *in vivo* measure of children's accuracy in recognizing parents' emotions during a parent-child discussion of conflict, and also a contextualized measure of children's abilities to differentiate emotion labels and regulation strategies in the context of meaningful relationships and events.

Emotion Understanding and Socioemotional Competence in Middle Childhood

Although the linkages between EU and socioemotional competencies are well-established in early childhood, fewer studies have considered this association in middle childhood. Additionally, the majority of studies have used global measures of EU that fail to differentiate skill sets (for notable exceptions with early childhood samples, see Bassett et al., 2012; Garner & Waajid, 2012; Heinze et al., 2014; Miller et al., 2005). Thus, the

degree to which specific EU skills are relevant for third-grade children's social and emotional adjustment, over and above other skills, remains unknown.

One possibility is that all EU skills are similarly influential in relation to other socioemotional competencies; that is, all EU skills relate positively to all socioemotional skills and negatively to all socioemotional problems throughout childhood. Alternatively, different EU skills may relate differently to the various socioemotional competencies. With age, children may experience unique interpersonal demands that recruit different EU skills. We know that children in middle childhood place increasingly more emphasis on initiating and maintaining peer relationships while also establishing social and emotional independence from parents than children at younger ages (Klimes-Dougan & Zeman, 2007). Interpersonal challenges may require specific skills in understanding others' emotions, including prototypical knowledge about emotional scripts (so as to help identify what may have caused a new friend to appear hurt during an interaction) as well as prototypical knowledge regarding the management of emotion (as in the case of regulating strong emotions that may arise in interpersonal contexts). These emotion knowledge skills are likely important in supporting third-grade children's abilities to maintain positive and harmonious relationships with peers and adults. Interestingly, some evidence suggests that some advanced EU skills in middle childhood may result in over-attunement to peer relationship problems, and may contribute to socioemotional *maladjustment* over time (Hoglund, Lalonde, & Leadbeater, 2008). Thus, children's socioemotional competence may be uniquely predicted by particular

subsets of EU skills (such as prototypical emotion knowledge) in middle childhood that are developmentally relevant.

Our study addresses these possibilities by exploring associations between various facets of EU and children's socioemotional competence in middle childhood. Given that no previous studies have examined the unique predictive value of different EU skills on children's socioemotional competence in middle childhood, and that our study includes a wider variety of EU skills than typically assessed in the literature, we approach these associations in an exploratory fashion.

The Present Study

To test the factor structure of EU in middle childhood, we utilized multiple, mixed-method measures appropriate for third-grade children. We hypothesized that EU would demonstrate multidimensionality in middle childhood but we did not predict a specific multi-factor structure that would best fit the data, as no research exists to formulate such a prediction. Specifically, we tested the two-factor structure identified in early childhood, and included a third factor related to advanced understanding skills, and a fourth factor related to regulation knowledge skills, as suggested by the research noted above (e.g., Castro et al., 2014; Eisenberg & Morris, 2002; Pons et al., 2004). We also tested model fit between one-, two-, three-, and four-factor structures to determine the best fitting model for the data. We then explored the unique predictive value of the resulting factors on mothers' reports of children's socioemotional skills and problems. Again, no a priori hypotheses were made, given the scarcity of studies in this area.

Method

Participants

Participants were 203 third-grade children (117 African American, 82 European American, 4 Biracial; 48.3% female; $M_{\text{age}} = 8.75$ years) and their mothers participating in a larger study in a southeastern city. Families represented a broad spectrum in total household income (ranging from \$800 to \$420,000; $M = \$84,081$), and maternal education level (ranging from 9th grade to college graduate; $M = 14.11$ years, some college education).

Measures

Children's emotion understanding. Children completed five tasks, which provided eight indices of EU (indices indicated in parentheses): Two tasks assessed children's accuracy in recognizing prototypical emotional expressions as posed by children (*child recognition*) and adults (*adult recognition*). A third task assessed children's accuracy in recognizing mothers' emotions during an *in vivo* mother-child discussion of conflict (*in vivo recognition*). A fourth task assessed children's prototypical emotion situation knowledge and distinguished between knowledge about basic mental states (*mental knowledge*), emotion regulation (*regulation knowledge*), and complex emotional states (*complex knowledge*). A fifth task assessed children's abilities to differentiate emotion labels (*differentiation knowledge*) and regulation strategies (*change knowledge*) in the context of meaningful relationships and events.

Prototypical emotion recognition. The Child and Adolescent Recognition of Emotion task (CARE; Parker, Mathis, & Kupersmidt, 2013) is a web-based measure assessing young

children's recognition of other children's prototypically happy, sad, mad, scared, surprise, disgust, and neutral expressions, depicted via the face or body. Children select the description best characterizing the emotion for each of 54 expressions. CARE is scored using a traditional accuracy paradigm, in which responses that match the target criterion receive a value of 1, and incorrect responses not matching criterion receive a value of 0. Responses are averaged across all 54 items to create a mean *child recognition* accuracy score ranging from 0 to 1; higher scores indicate greater accuracy. In our sample, accuracy ranged from 0.42 to 0.90 ($M = 0.69$, $SD = 0.08$). Evidence of construct validity is supported by associations with teacher-reported social skills (Parker et al., 2013). Reliability in our sample was low ($\alpha = .41$), but consistent with the literature (Parker et al., 2013; for discussion regarding why nonverbal measures of emotion recognition often have low reliability, see Hall & Bernieri, 2001).

The Increasingly Clear Emotions task (ICE) is a computer-based task that assesses recognition of adults' dynamic facial expressions of emotion in multiple rounds in which the expressions unfold from the very initial forming of the expression to the full facial expression. Expressions were drawn from video-recordings of 20 different adults balanced by ethnicity (African American and European American) and gender (male and female). Video-recordings included 12 expressions chosen from the Extended Cohn-Kanade AU-Coded Facial Expression Database (Lucey et al., 2010) and 8 expressions acquired by the authors. Five emotions (anger, fear, happiness, sadness, surprise) are fully represented within gender and ethnicity. To establish prototypicality of the facial expressions, all 20 facial expressions

were correctly identified by at least 80% of a sample of 20 adult raters (10 African Americans, 10 European Americans, balanced across gender).

Children viewed four rounds of facial expressions: these began with early stages of facial expressions and continued to moderately intense expressions. Accuracy was calculated for each expression within each round; scores were then averaged across rounds to create a total *adult recognition* accuracy score; higher scores indicate greater accuracy in recognizing emotions posed by adults. In our sample, accuracy ranged from 0.33 to 0.76 ($M = 0.58$, $SD = 0.07$). Reliability for the ICE task, based on Cronbach's alpha ($\alpha = .65$), was relatively high compared to other measures of nonverbal emotion recognition (Hall & Bernieri, 2001).

In vivo emotion recognition. Mother-child pairs talked for seven minutes about an issue involving conflict between them (e.g., homework, chores, bedtime, as per Gunlicks-Stoessel & Powers 2008; Welsh & Dickson, 2005). Facial and upper-body images of each participant were video-recorded. Fifteen 10-second videoclips taken from the beginning of the discussion were then presented to participants following the conflict discussion. Children and mothers independently identified what they were feeling during each videoclip, and then each participant independently reviewed the videoclips again to identify what the other was feeling. Answers were selected from the emotion categories of Happy, Curious, Anxious, Irritated, Sad, Disgust, each of which included three descriptors (e.g., for *Happy*, pleased, proud, and happy were included; for *Anxious*, worried, afraid, and anxious were included) or No Emotion. Participants could also write in an emotion that was not included; no participant included a term that indicated a distinct, separate emotion.

In vivo recognition accuracy was based on agreement between the self-reported experience of the mother and the child's judgment as to what the mother was feeling. Items received 1 point for complete agreement (e.g., mother reported feeling "happy" and child said mother was feeling "happy"), no points for complete disagreement (e.g., mother reported feeling "happy" and child said mother was feeling "sad"), and 0.5 points for mismatched responses of the same valence (e.g., mother reported feeling "irritated" and child said mother was feeling "anxious"). Points were averaged across all items for each child to create a total *in vivo* recognition score. In our sample, recognition accuracy ranged from 0.00 to 0.70 ($M = 0.27$, $SD = 0.14$). Evidence of construct validity for this type of paradigm in elementary-school-aged children is provided by two studies (Castro et al., 2014; Dunsmore, Her, Halberstadt, & Perez-Rivera, 2009).

Prototypical emotion knowledge. Children completed the Test of Emotion Comprehension (TEC; Pons et al., 2004), which assesses prototypical emotion situation knowledge. Children are asked to identify emotional outcomes of schematically depicted characters in nine vignettes that require increasingly sophisticated emotion knowledge. Because our study included an age group whose skills are typically representative of the end-range of TEC assessment, greater variability existed for the more complex vignettes, and from these we created three indices of increasing complexity: *Mental Knowledge* (composite of desires and beliefs vignettes; range: 0 to 2, $M = 1.64$, $SD = 0.53$), *Regulation Knowledge* (composite of masking and regulation vignettes; range: 0 to 2, $M = 1.62$, $SD = 0.54$), and *Complex Knowledge* (composite of mixed and moral emotion awareness vignettes; range: 0

to 3, $M = 1.98$, $SD = 0.88$). Reliability is not usually reported for the TEC, due to the small number of items per knowledge component, but several studies provide evidence supporting construct validity (e.g., Pons & Harris, 2005; Pons et al, 2004; von Salisch, Haenel, & Freund, 2013).

Contextual emotion knowledge. To assess more contextually-relevant aspects of emotion knowledge, children engaged in discussions of three vignettes designed to elicit emotional responses (Halberstadt, MacCormack, & Shull, 2012; adapted from Bajgar, Ciarrochi, Lane, & Deane, 2005; Cunningham, Kliewer, & Garner, 2009). Vignettes include being in a restaurant with one's mother while black smoke comes out of the kitchen, forgetting to bring one's lunch to school and getting caught taking someone else's, and being tripped in an athletic competition which was won by one's friend. Children are asked what they and the other person would feel in the situation, and, if they wanted to change their own feelings, what they could do. Responses were video-recorded, transcribed, and coded for complexity of understanding by a mixed-ethnicity team of coders. Coders rated on Likert scales ($kappas > 0.90$) the children's ability to identify and differentiate emotions in themselves and others (*Differentiation*; range: 0.00 to 2.50, $M = 1.15$, $SD = 0.53$), and to identify a variety of strategies that might be used to change or control emotions (*Change Knowledge*; range: 0.00 to 4.17, $M = 1.31$, $SD = 0.80$).

Children's socioemotional competence. Mothers completed two questionnaires measuring their perceptions of children's social and emotional skills and problems. See Table

1 for individual scale descriptive statistics, including scale range, mean, and standard deviation.

Social Skills Rating System (Parent version, SSRS; Gresham & Elliott, 1990) measures four domains of social skills: *Cooperation* (10 items; “How often child volunteers to help family members with tasks;” $\alpha = 0.77$), *Assertion* (10 items; “How often child joins group activities without being told to;” $\alpha = 0.75$), *Self-control* (11 items; “How often child responds appropriately when hit or pushed by other children;” $\alpha = 0.84$), and *Responsibility* (10 items; “How often child appropriately questions household rules that may be unfair;” $\alpha = 0.64$). The SSRS also assesses three domains of social problems: *Internalizing* (6 items; “How often child appears lonely;” $\alpha = 0.70$), *Externalizing* (6 items; “How often child threatens or bullies others;” $\alpha = 0.80$), and *Hyperactivity* (6 items; “How often child fidgets or moves excessively;” $\alpha = 0.79$). Mothers reported the frequency for each behavior by responding to each item on a 3-point Likert scale (0 = never, 1 = sometimes, and 2 = very often). Responses were averaged for each domain. The SSRS has demonstrated evidence of reliability and construct validity (e.g., Burchinal, Roberts, Zeisel, & Rowley, 2008; Gresham & Elliott, 1990).

Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997) measures parents’ reports of children’s abilities to regulate their own emotions and their emotional reactivity. Two domains are assessed: *Emotion Regulation* (8 items; “Responds positively to neutral or friendly overtures by peers;” $\alpha = 0.68$), and *Emotional Lability* (15 items; “Exhibits wide mood swings;” $\alpha = 0.86$). Mothers rate the frequency for each behavior using a 4-point Likert

scale ranging from 1 (Never) to 4 (Almost Always). Responses are averaged across items within each domain to create two composite scores corresponding to socioemotional skill (Regulation) and problems (Lability). The ERC has demonstrated good reliability (Kim & Cicchetti, 2010), and strong convergence with other social competence measures (Shields & Cicchetti, 1997; Kim & Cicchetti, 2010).

Procedure

Maternal consent and child assent were obtained for each family. Prior to the lab visit, mothers were mailed the socioemotional competence questionnaires and completed them before coming to the lab. At the lab visit, children completed the TEC with a research assistant, participated in a dyadic task with their mothers (not relevant to this study) and completed the CARE and ICE tasks. Following another task not relevant to EU and a snack, children participated in the contextualized knowledge interview and then joined their mothers for the conflict discussion and subsequent *in vivo* recognition task.

Results

All variables demonstrated univariate and bivariate normality. Bivariate correlations, shown in Table 2, were examined to assess the degree to which skills were related across EU measures. The results suggest that there are relatively distinct skill sets, as not all indices were significantly correlated, and that similar skills demonstrated greater coherence (e.g., prototypical emotion recognition of child and adult expressions) than divergent skills (e.g., emotion differentiation knowledge and *in vivo* emotion recognition).

Emotion Understanding Structural Analyses

We assessed whether three- and four-factor structures fit our data better than the two-factor structure reported with young children (Barbosa-Leiker et al., 2014; Bassett et al., 2012) and an alternative one-factor model, using latent variable modeling (see Figure 1). All models were estimated using AMOS 22.0. Latent variable variances were constrained so that path estimates for all indicators could be estimated. Missing data occurred an average of 4.37% across measures, and were addressed by maximum likelihood imputation. Model fit was determined using chi-square statistic (χ^2), Comparative Fit Index (CFI), Tucker-Lewin Index (TLI), Root Mean Square Error of Approximation (RMSEA), and 90% confidence interval around RMSEA (90% CI). A nonsignificant χ^2 value, $CFI \geq .95$, $TLI \geq .90$, and $RMSEA \leq .08$ indicate good model fit to the data (Hu & Bentler, 1999; Schreiber, Nora, Stage, Barlow, & King, 2006). Models were nested by constraining covariances among factors, and thus statistically compared using χ^2 difference test. Model fit and comparison statistics are presented in Table 3.

We first tested whether a two-factor structure of EU fit the data. The two-factor model failed to demonstrate adequate model fit. Instead, the three-factor model demonstrated good fit to the data, as did the four-factor model structure. Next, we compared the least constrained four-factor model against the more constrained but parsimonious one-, two-, and three-factor models by examining the χ^2 difference between the unconstrained (four-factor) model and alternative models. The one-factor model failed to demonstrate adequate model fit, and did not differ significantly from the two-factor model. The comparison between the

four-factor model and the one- and two-factor models revealed significant differences in χ^2 , indicating that the one- and two-factor models had significantly worse fit to the data than the four-factor model. Similarly, comparisons between the three-factor model and the two- and one-factor models revealed that the more constrained models (two- and one-factor models) demonstrated significantly worse fit to the data than the three-factor model. A final comparison between the four-factor model and the three-factor model revealed no significant difference in χ^2 ; thus, we interpret the more parsimonious three-factor model as the best fitting model (Byrne, 2010). Altogether, these results indicate that the three-factor model structure was the more parsimonious best-fitting model to explain third-grade children's EU as measured by our variety of EU tasks.

Table 4 presents the standardized regression coefficients for each manifest variable in the one-, two-, three-, and four-factor models. In the three-factor model, the covariance between the Prototypical Emotion Recognition and Advanced Emotion Understanding latent factors was moderate, $r = .45, p = .020$. However, the covariance between Prototypical Emotion Recognition and Prototypical Emotion Knowledge latent factors was not significant, $r = .23, p = .076$, and the covariance between Prototypical Emotion Knowledge and Advanced Emotion Understanding latent factors was also not significant, $r = .27, p = .102$. These results suggest that EU in third-grade children is well represented by three distinct factors.

Exploratory Associations with Maternal Reports of Socioemotional Competence

Bivariate correlations between the socioemotional competence scales were first conducted to determine the existence of potential latent variables as assessed by mothers' responses on the SSRS and ERC. Overall, scales relating to socioemotional skills were moderately associated ($M = .52, ps < .01$), as were scales relating to socioemotional problems ($M = .57, ps < .001$). Intercorrelations between skills and problems were lower ($M = -.35, ps < .05$). Thus, we continued with analyses modeling socioemotional skills and problems as two independent latent factors.

Structural equation modeling was used to explore the unique predictive value of children's EU factors on children's socioemotional skills and problems (see Figure 2). We examined the structural path coefficients from each of the three EU factors to the socioemotional skills and problems latent variables using AMOS 22.0. Models were run separately for skills and problems. Missing data ($M = 4.37\%$) were again estimated using maximum likelihood imputation.

Both models fit the data adequately (Byrne, 2010), and all manifest variables loaded significantly onto respective latent variables ($ps > .01$). As shown in Figure 2, children's Prototypical Emotion Knowledge was both a significant positive predictor of socioemotional skills and significant negative predictor of socioemotional problems. However, children's Prototypical Emotion Recognition was unrelated to children's socioemotional skills ($\beta = .01, p = .971$) and problems ($\beta = -.23, p = .162$), as was children's Advanced Emotion Understanding unrelated to children's socioemotional skills ($\beta = .04, p = .839$) and problems

($\beta = .19, p = .296$). These exploratory analyses suggest that third-grade children's prototypical emotion knowledge skills are uniquely associated with children's socioemotional competence, over and above the effects of children's prototypical emotion recognition and advanced emotion understanding skills.

Discussion

A two-factor structure of EU identified in early childhood (Barbosa-Leiker et al., 2014; Bassett et al., 2012) appears insufficient for third-grade children. When a greater diversity of measures assessing a wider variety of EU skills was used than previously, three- and four-factor structures of EU provided significantly better model fit for the data compared to alternative two- and one-factor structures, supporting theoretical postulations regarding school-aged children's increasingly complex and differentiated understanding of emotions (e.g., Harris, 1989; Pons et al., 2004; Saarni, 2000). As there were no significant differences between the three- and four-factor models, we interpret the more parsimonious three-factor model as the best fitting model for the data (Byrne, 2010). The findings suggest that EU skills may continue to differentiate across childhood.

Multiple Dimensions of Emotion Understanding in Middle Childhood

Overall, our results suggest that EU in middle childhood is an overarching construct of relatively distinct skills that are modestly related at best. Although we observed coherence among similar skills that were measured using similar methods (e.g., labeling of prototypical emotional expressions as posed by children and adults), little coherence was observed among the more differentiated, contextualized skills (e.g., *in vivo* emotion recognition and emotion

differentiation knowledge). These results suggest that EU skills may be a more complex collection of skills than previously considered, and certainly highlight the need for research to include a greater variety of EU measures that collectively assess the broad construct of EU, particularly with children over 5-years old.

Three factors of emotion understanding. We found evidence to support three distinct factors of EU in middle childhood, specifically in third-grade children. The first factor, Prototypical Emotion Recognition, includes children's skills in recognizing child and adult prototypical expressions of emotions as displayed by the face and body. Such skills are thought to develop during early childhood (Denham, 1986; Harris, 1989; Pons et al., 2004), and recent theoretical frameworks distinguish the recognition of prototypical emotional expressions from the more advanced skill of recognizing non-prototypical emotional expressions (Castro et al., in press).

The second factor, Prototypical Emotion Knowledge, consists of knowledge regarding others' mental states, including the ability to differentiate emotional states across and within situations and to use beliefs and desires to attribute emotions during prototypical emotion-eliciting situations; and knowledge regarding the management of emotions, including the ability to differentiate and select appropriate strategies for a given emotion-eliciting situation. Notably, this factor includes skills sampled from two methods using two very different techniques to assess children's prototypical and contextualized emotion knowledge, further supporting the structural coherence underlying these types of knowledge. These skills typically emerge during early childhood, and become increasingly more

sophisticated as children move through school (Harris, 1989; Pons et al., 2004; Saarni, 2000). The separation of these skills as empirically distinct from emotion recognition in our sample of third-grade children replicates findings with younger children (Barbosa-Leiker et al., 2014; Bassett et al., 2012). That the covariance between factors in our sample is reduced also suggests increased differentiation of these skills with age.

The third factor, Advanced Emotion Understanding, arguably consists of the most complex and integrated skills assessed in the present study. This factor included children's skills in recognizing their parents' emotions during an ongoing discussion of conflict (*in vivo* recognition) and the identification of mixed and moral emotions in emotional situations. Again, this factor crosses diverse methods, and includes children's judgments following engagement about conflictual situations with their mothers as well as children's interviewed responses to emotionally-relevant vignettes. Both skill sets are highly relevant for children in middle childhood (Castro et al., 2014; Halberstadt et al., 2013; Harris, 1989; Pons et al., 2004). These skills may also be the most difficult to measure, as they likely consist of a complex amalgamation of recognition and knowledge; in order to accurately recognize expressions in a familiar other (such as a parent, peer, or teacher) we may rely not only on our perceptual skills (emotion recognition) but also on our accumulated knowledge regarding how and why this known person typically experiences emotions in a given situation (emotion knowledge). Thus, these skills are not just general knowledge forms but knowledge embedded in and tailored to unique relationships. For example, in order to understand that one's behaviors may disappoint another person (such as in the case of stealing a cookie from

the cookie jar prior to eating dinner, despite parental rules), a child must predict how the other person will feel and react by differentiating his/her emotions from the emotions of the other person as well as using knowledge about the situation to attribute emotion. Both of these processes are interpersonally relevant; for example, a child must care about the parent's appraisals in order to correctly differentiate and attribute emotion in the cookie jar context.

Moving beyond two factors. On the one hand, our results are surprising given that research with younger children identified a two-factor structure of EU corresponding to skills in emotion recognition and emotion knowledge (Barbosa-Leiker et al., 2014; Bassett et al., 2012). However, these studies did not include multiple measures assessing a variety of EU skills (as we did) and thus were more limited in the number and types of dimensions possible. Moreover, it is likely that older children demonstrate more dimensionality, and continued differentiation of skills, as skills become more sophisticated both in terms of level (e.g., accuracy) and quality (e.g., complexity) of understanding (Harris, 1989, Pons et al., 2004). Researchers have argued that skill in recognizing prototypical emotional expressions sets the foundation for more sophisticated understanding skills, including knowledge about emotional scripts (Bassett et al., 2012; Denham, 1986; Pons et al., 2004). Our study demonstrates that these skills are differentiated at least by third grade, although we cannot yet ascertain at what point during the transition from early to middle childhood this differentiation occurs. In order to disentangle effects relating to emergence and differentiation of skills, longitudinal work is needed spanning a larger age range (i.e., children aged 5 to 11).

Our results also illustrate the complexity with which children in middle childhood understand others' emotions; third-grade children demonstrate skills in recognizing prototypical expressions, knowledge about prototypical emotion-eliciting situations, and advanced understanding of emotions in interpersonal contexts. Moreover, our results illustrate the possibility that EU continues to differentiate with age, given that the four-factor structure did not differ significantly from the parsimonious three-factor structure. This finding invites testing as to whether knowledge about emotion regulation will differentiate into a fourth factor during adolescence. Knowledge regarding the management of emotions, including appropriate strategies for a given situation and relative benefits and costs for engaging in different strategies, may allow adolescents to successfully transition from a period marked by emotional "storm and stress" (Arnett, 1999) to a period of emotional stability. We are especially excited at this possibility, and believe that this is a promising area for social development research.

Prototypical Emotion Knowledge as Unique Predictor of Socioemotional Competence

Our exploratory analyses relating the three EU factors with maternal reports of children's socioemotional skills and problems suggest that third-grade children's prototypical knowledge regarding emotion-eliciting situations may be more relevant for children's socioemotional skills and problems than either prototypical emotion recognition or advanced understanding skills. This may reflect a match between prototypical emotion knowledge and the socioemotional demands placed on third-grade children. As children enter school, they experience a greater diversity in both the number and types of social interactions they

encounter. As they get older, children also place more emphasis on successfully navigating these interactions (Klimes-Dougan & Zeman, 2007). Thus, being able to differentiate between various emotions another child may feel, to understand how one's beliefs and desires may contribute to emotions, and to know about regulatory strategies may very well be integral to successfully interacting with others at this age. Parents and other family members may also be expecting greater independence and levels of competence in their children, and children who are able to understand how beliefs and desires of others influence their emotions, and who can also identify strategies for regulating their own emotions, may better succeed in maintaining cooperative and harmonious relationships in which they also achieve having their own needs met.

So why did skills in prototypical emotion recognition and advanced emotion understanding not predict children's socioemotional competence? One possibility is that social skills in third grade rely less on prototypical emotion recognition skills, because prototypical expressions likely do not encompass the majority of expressions that third-grade children observe in daily life. We might expect then that more complex recognition and understanding skills would be predictive of third-grade children's socioemotional competence and not these comparatively "basic" skills. However, our results did not support this expectation, as advanced EU skills failed to predict children's social skills and problems. There is some evidence that more complex understanding of emotion is not always beneficial to children's socioemotional functioning; children may become too sensitive to emotional problems and issues and this sensitivity may interfere with their ability to behave

appropriately (Hoglund et al., 2008). Additionally, knowing too much about what others are feeling may not be advantageous to harmonious social relationships (Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979). Thus, it may be that too much EU may be neither advantageous nor problematic at this age, when children may not yet match their EU skills with pragmatic interpersonal skills and parents do not yet expect their children to have mastered these more complex emotional skills.

Limitations and Strengths

As with any study, we note some limitations. The *in vivo* recognition measure, though similar to methods used widely in the marital literature (e.g., Gottman & Porterfield, 1981), is a relatively novel method with children and their families (e.g., Castro et al., 2014; Dunsmore et al., 2009). The dynamic emotion recognition measure with adults' increasingly clear emotions is similar to methods used with children (e.g., Pollak, Messner, Kistler, & Cohn, 2009), but it, along with the contextualized emotion knowledge measure, will require further validation. The new measures are also a notable strength, providing depth and novelty within a field that is saturated by methodological commonalities.

Another limitation concerns issues of reliability, as some EU measures demonstrate low reliability (i.e., CARE) whereas other methodologies preclude the calculation of reliability estimates altogether (i.e., TEC, *in vivo* decoding). It is important to note, however, that the field of emotion understanding has long dealt with issues of reliability, perhaps due to the fact that emotions are abstract entities and thus measures approximate the assessment of this abstractness. In fact, it has been argued that hundreds of items must be included within

a given measure in order to achieve adequate reliability in this domain (Hall & Bernieri, 2001). To do so would not be reasonable for research with children, whose cognitive and social capacities likely preclude such lengthy inventories. It is also important to note that three of the five EU measures used in the present study have demonstrated good construct validity in predicting other socioemotional competencies (e.g., Castro et al. 2014; Parker et al., 2014; von Salisch et al., 2013). Thus, we argue that issues of reliability should always be discussed alongside assessments of validity; only then may a balanced picture regarding the utility of a given measure be observed.

In addition, estimates from latent variable and structural equation modeling are sample-specific, and, thus, limit generalizability to other samples using other measures of EU. However, our study extends previous findings and provides useful information for researchers wishing to conceptualize and assess EU beyond early childhood. Our results suggest that theoretical conceptualizations regarding developmental sequencing (e.g., Harris, 1989; Pons et al., 2004) and increased differentiation (Werner, 1957) of skills are supported in middle childhood; third-grade children appear to have greater complexity in understanding emotions that is best differentiated into three factors corresponding to prototypical emotion recognition (a relatively simple skill), prototypical emotion knowledge (often considered a simple skill but more complex than prototypical recognition), and complex understanding in recognizing familiar others' emotions and appraising emotions to situations using reflective knowledge. It appears then that children's skills in third grade may not be simply "more of

the same, just better,” but may also reflect differentiation and integration of various skills which are utilized more efficiently and in response to changing interpersonal demands.

Our study also demonstrates distinct strengths. First, our study provides a comprehensive assessment of EU in middle childhood and third grade more specifically, including both prototypical and innovative, contextualized measures of EU. Collectively these measures provide information regarding children’s abilities to identify and label prototypical facial and body expressions of emotion in children and adults; identify prototypical emotional causes, consequences, and regulation strategies; identify and label emotions in familiar others during a real-life interaction; and identify a variety of emotions and regulation strategies that may be experienced by the self (or a known other) in meaningful interpersonal contexts. The latter two abilities are particularly important contributions to the field, as these likely mirror the ways in which emotions are understood by third-grade children in “real life”, thus answering recent calls for greater consideration of context and interpersonal dynamics in the study of emotion (Boiger & Mesquita, 2012; Halberstadt et al., 2013).

Second, our study is the first to empirically test the structure of EU skills in children in middle childhood. The results suggest that continued attention should be allocated to the construct itself, as it appears that there are multiple facets of EU. Moreover, in consort with previous studies of younger children, our findings suggest that the structure of EU is dynamic; skills may become more differentiated with age, contributing to potential lifespan changes in the structure of this construct. That a four-factor structure might also be supported

in our sample suggests additional differentiation may develop over time; thus consideration of the EU structure at later points in the lifespan would be a fruitful avenue for future research.

Third, our study is the first to examine the unique predictive value of different facets of EU on socioemotional competencies in middle childhood. Such results may be lost when researchers rely on single measures of EU. Our study thus extends the literature with young children (Bassett et al., 2012; Garner & Waajid, 2012; Heinze et al., 2014; Miller et al., 2005) by suggesting that children's prototypical emotion knowledge may be uniquely related to their social and emotional competencies in third grade.

In sum, EU, at least in third grade, appears to be a multidimensional construct. Our results support theories that propose multiple, developmentally-oriented components of understanding (e.g., Harris, 1989; Pons et al., 2004). Moreover, our results extend empirical considerations to include the degree of coherence among different skill sets as well as potential discontinuity in development of EU skills. We hope that these findings will facilitate greater exploration of the latent construct of EU across the lifespan.

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Table 1. Descriptive Statistics for Children's Socioemotional Competence Scales

Measure	N	Range	<i>M</i>	<i>SD</i>
SSRS				
Cooperation ^a	193	0.30-2.00	1.24	0.32
Assertion ^a	193	0.60-2.00	1.59	0.30
Self-control ^a	193	0.27-2.00	1.35	0.35
Responsibility ^a	193	0.50-2.00	1.36	0.29
Internalizing ^b	192	0.00-1.67	0.52	0.37
Externalizing ^b	192	0.00-2.00	0.54	0.40
Hyperactivity ^b	192	0.00-2.00	0.63	0.44
ERC				
Emotion Regulation ^a	195	2.13-4.00	3.33	0.39
Emotional Lability ^b	195	1.00-3.20	1.67	0.39

^a Socioemotional skill.

^b Socioemotional problem.

Table 2. Intercorrelations between Children's Emotion Understanding Measures

Measure	Prototypical Emotion Recognition		<i>In Vivo</i> Emotion Recognition	Prototypical Emotion Knowledge			Contextualized Emotion Knowledge	
	Child	Adult	<i>In Vivo</i>	Mental	Regulation	Complex	Differ	Change
Child Recognition ^a	--	.30***	.09	.10	.02	.05	.05	.09
Adult Recognition ^b		--	.15*	.25***	.10	.12†	.02	.07
<i>In Vivo</i> Recognition			--	.08	.08	.19*	-.06	.05
Mental Knowledge ^c				--	.12†	.05	.10	.16*
Regulation Knowledge ^c					--	.07	.01	.19*
Complex Knowledge ^c						--	.07	.10
Differentiation Know ^d							--	.37***
Change Knowledge ^d								--

Note: Differ = Differentiation. Know = Knowledge.

^a Index from CARE.

^b Index from ICE.

^c Index from TEC.

^d Index from contextual interview.

† $p < .10$. * $p < .05$. *** $p < .001$.

Table 3. Comparing Model Fit: Different Factor Structures for Children's Emotion Understanding

Model	<i>df</i>	Fit indices					Model comparison		
		χ^2	CFI	TLI	RMSEA	90% CI	$\Delta\chi^2$	Δdf	Comparison
1-factor	20	39.25**	.65	.34	.07	.36-.10	11.29**	1	2 vs. 1
2-factor	19	27.96†	.84	.69	.05	.00-.08	9.81**	2	3 vs. 2
3-factor	17	18.15	.98	.96	.02	.00-.07	21.00***	3	3 vs. 1
4-factor	14	16.14	.96	.90	.03	.00-.08	2.01	3	4 vs. 3
							11.82*	5	4 vs. 2
							23.11**	6	4 vs. 1

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4. Standardized Factors Loadings for the Emotion Understanding Tasks in the 1-, 2-, 3-, and 4-Factor Models

Model	Emotion Understanding Indicators							
	CARE	ICE	Mental	Differ	Regulation	Change	<i>In Vivo</i>	Complex
1-factor	.35***	.51***	.42***	.25*	.25*	.38***	.26*	.25*
2-factor	.45**	.66**	.30**	.47***	.25**	.68***	.14	.20*
3-factor ^a	.42**	.69***	.25**	.46***	.24*	.78***	.45**	.42**
4-factor	.41**	.72***	.28*	.40**	.22*	.90**	.46**	.42**

Note: ^aBest fitting model for the data.

Differ = Differentiation

* $p < .05$. ** $p < .01$. *** $p < .001$.

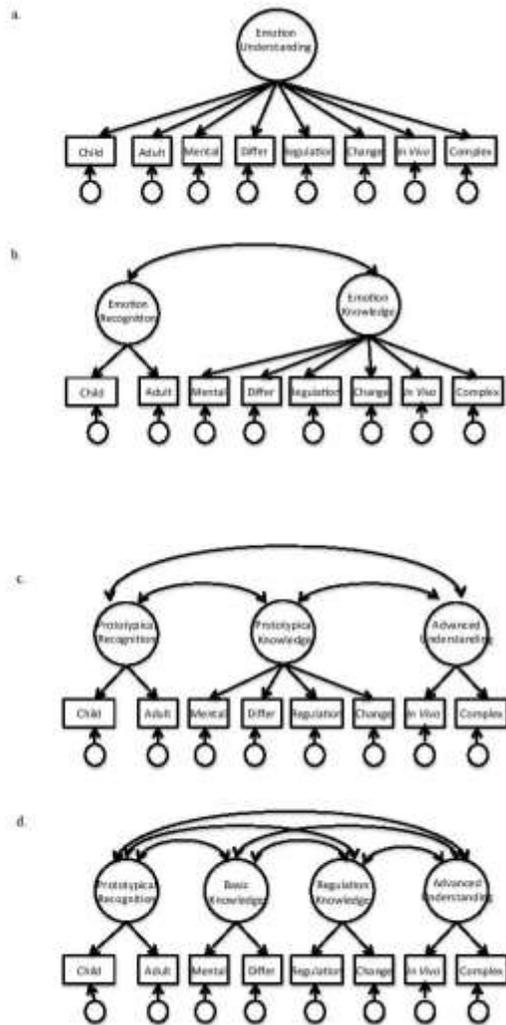
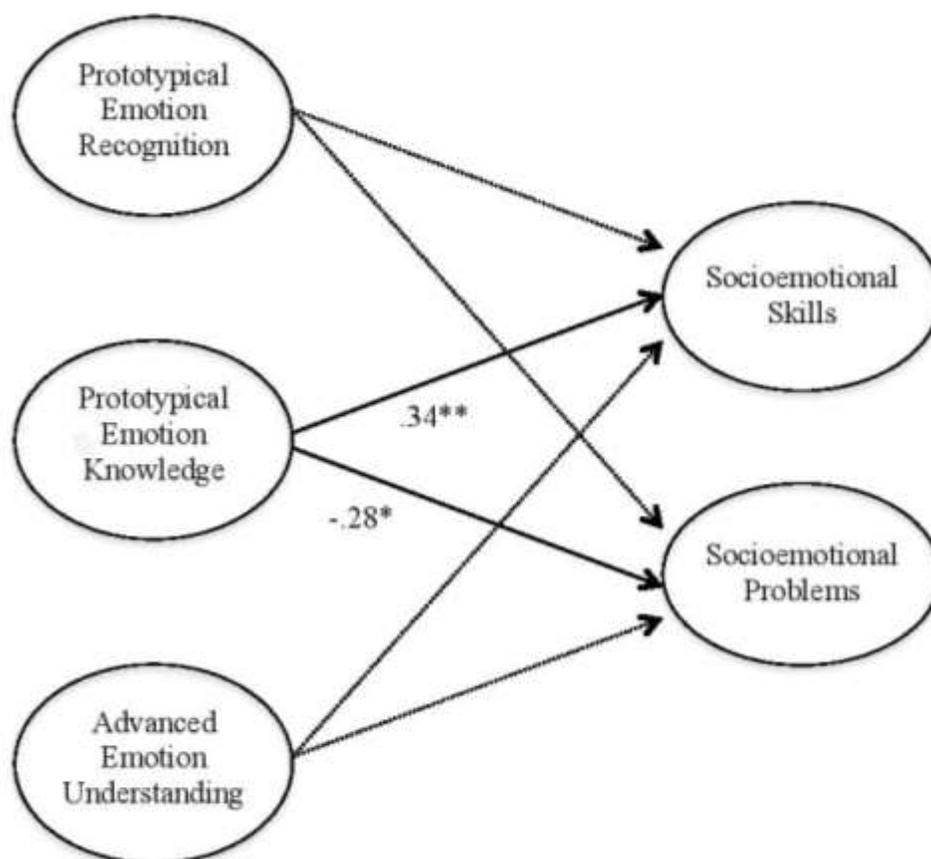


Figure 1. Tested Factor Structures of Children’s Emotion Understanding

Latent variable modeling of children’s emotion understanding as (a) one, (b) two, (c), three, and (d) four factors.



* $p < .05$. ** $p < .01$.

Figure 2. Children's Emotion Understanding Factors as Predictors of Children's Socioemotional Competence

Structural equation model of children's emotion understanding predicting mothers' reports of children's socioemotional skills ($\chi^2 = 66.65$, $p = .231$, CFI = .98, TLI = .97, RMSEA = .03, 90% CI: .00-.05), and problems ($\chi^2 = 55.24$, $p = .220$, CFI = .98, TLI = .97, RMSEA = .03, 90% CI: .00-.06). To simplify presentation, indicators for latent variables and residuals are omitted here, as are covariances between emotion understanding factors. Dashed lines indicate non-significant paths. Solid lines indicate significant paths, and include the standardized regression coefficient.

CHAPTER 4: Parents' Emotion-Related Beliefs, Behaviours, and Skills Predict Children's Recognition of Emotion

Children who are able to recognize others' emotions are successful in a variety of socioemotional domains, yet we know little about how school-aged children's abilities develop, particularly in the family context. We hypothesized that children develop emotion recognition skill as a function of parents' own emotion-related beliefs, behaviors, and skills. We examined parents' beliefs about the value of emotion and guidance of children's emotion, parents' emotion labeling and teaching behaviors, and parents' skill in recognizing children's emotions in relation to their school-aged children's emotion recognition skills. Sixty-nine parent-child dyads completed questionnaires, participated in dyadic laboratory tasks, and identified their own emotions and emotions felt by the other participant from videotaped segments. Regression analyses indicate that parents' beliefs, behaviors, and skills together account for 37% of the variance in child emotion recognition ability, even after controlling for parent and child expressive clarity. The findings suggest the importance of the family milieu in the development of children's emotion recognition skill in middle childhood, and add to accumulating evidence suggesting important age-related shifts in the relation between parental emotion socialization and child emotional development.

Parents' Emotion-Related Beliefs, Behaviours, and Skills Predict Children's Recognition of Emotion

Children who understand and recognize others' emotions are successful in a variety of socioemotional domains (for reviews, see Halberstadt, Denham, & Dunsmore, 2001; Halberstadt, Parker, & Castro, 2013; Trentacosta & Fine, 2010). For example, children's emotion understanding is associated with fewer parent- and teacher-reported internalizing and externalizing behaviors (e.g., Cook, Greenberg, & Kusché, 1994; Morgan, Izard, & King, 2009), greater parent-reported cooperation, assertion, and self-control (Mostow, Izard, Fine, & Trentacosta, 2002), greater teacher-reported social competence (Rothman & Nowicki, 2004), and greater displays of prosocial behaviors in the laboratory (Ensor, Spencer, & Hughes, 2011). Further, the specific skill of emotion recognition accuracy is associated with being liked by peers (Dunsmore, Noguchi, Garner, Casey, Bhullar, 2008; Miller et al., 2005), behaving less aggressively in school settings (Denham et al., 2002; Schultz, Izard, & Bear, 2004), and a number of factors associated with educational success (e.g., Denham et al., 2012; Garner & Waajid, 2008; Halberstadt & Hall, 1980).

Although the advantages of understanding and recognizing emotions are clear, we know little about how these abilities develop throughout childhood, particularly within the family context despite the number of emotion socialization researchers who have argued for the importance of the family milieu at this time in children's emotional development (e.g., Eisenberg, Cumberland, & Spinrad, 1998; Gottman, Katz, & Hooven, 1996; Lunkenheimer, Shields, & Cortina, 2007). Middle childhood is specifically interesting because of the

intriguing socialization paradox at this age, with parents retaining influence regarding children's socioemotional competence (Freitag, Belsky, Grossmann, Grossmann, & Scheuerer-Englisch, 1996), and children simultaneously developing greater behavioral autonomy (Wray-Lake, Crouter, & McHale, 2010). Children at this age also demonstrate cognitive and social advancements that contribute to greater understanding of emotions and social interactions (Eccles, 1999). Moreover, context may be especially important for older children's emotion recognition skill, as children and parents share a history of emotion-related experiences and expectations, all of which are relevant to children's growing emotional repertoires (Klimes-Dougan & Zeman, 2005). Thus, we chose to examine the influence of parental emotion socialization on children's emotion recognition skill during middle childhood.

We propose a socialization model in Figure 1 with the three likely domains by which parents contribute to children's developing emotion recognition skill within the family: (1) parents' beliefs about children's emotion; (2) their behaviors with regard to children's emotions; and (3) their own emotion recognition skill. In the present study, we test the degree to which these three domains relate to children's emotion recognition skill within the family context, and specifically within the parent-child dyad, following recent calls for more dynamic and real-life measurement of emotional processes (e.g., Boiger & Mesquita, 2012; Halberstadt et al., 2013; Krumhuber, Kappas, & Manstead, 2013). Below we discuss why these parent variables are important to children's emotion recognition skill, followed by a description of the complexity in assessing children's emotion recognition skill.

Parents' Emotion-Related Beliefs

Recent theory and evidence suggest that parents' beliefs about emotion guide a number of parents' emotion-related socialization behaviors (e.g., Dunsmore & Halberstadt; 1997; Eisenberg et al., 1998). In particular, meta-emotion theory suggests that parents who view emotions as valuable and an opportunity for intimacy engage in behaviors that are instructive, responsive, and encouraging of children's emotions, and parents who view emotions as problematic or dangerous tend to deny, ignore, or minimize children's emotions (Gottman et al., 1996). Parents' emotion-related beliefs may also sufficiently infuse family environments so that they directly predict children's skill, for example, coping with emotionally intense events (Halberstadt, Thompson, Parker, & Dunsmore, 2008), feeling socially competent with peers (Wong, Diener, & Isabella, 2008), and recognizing others' emotions (Dunsmore, Her, Halberstadt, & Perez-Rivera, 2009; Perez-Rivera & Dunsmore, 2011). We focus on the two most relevant belief sets: the value/danger of emotions and the guidance of emotion socialization.

Emotions as valuable and emotions as problematic or dangerous. The belief that emotions are valuable suggests some awareness and acceptance of emotions. Parents who believe in the value of emotion believe that children benefit from the experience and expression of both positive and negative emotions, and that these emotions provide opportunities for children to learn and develop (Gottman et al., 1996; Parker et al., 2012; Stelter & Halberstadt, 2011). Such parents are likely to engage in emotion coaching behaviors (Gottman et al., 1996; Lunkenheimer et al., 2007), and we may expect then that

parents who value both positive and negative emotions will create environments that are more emotionally expressive, sensitive to, and accepting of children's emotion as compared to parents who do not value emotion; such beliefs may thus provide children with opportunities to learn how to express and identify their own and others' emotions.

In contrast, parents who believe that emotions can be problematic or dangerous for children when experienced frequently or intensely may hide or mask their own emotions in attempts to shield children from observing their emotional experiences (Dunsmore et al., 2009; Halberstadt, Thompson et al., 2008). Although this might initially decrease opportunities for children to learn about emotions, over time a shift may occur as children work harder at knowing what their parents are feeling and thinking because of the subtlety with which emotions are being expressed. This pattern has been found in the family expressiveness literature, in which a positive relation between parents' expressiveness and children's emotion recognition skill is evidenced in very young children (Camras et al., 1990), but begins to shift for children in elementary school, with an increasingly negative relation over time (see Halberstadt & Eaton, 2002 for a meta-analysis). The shift indicates that children growing up with parents who are less expressive become more skilled at recognizing others' emotional expressions compared to children who grow up in more expressive homes. Thus, in the case of parents' beliefs, when parents believe that emotions are problematic or dangerous, they may subsequently mask their emotions, and children may have to work especially hard at knowing what their parents are feeling and thinking due to the subtlety with which emotions are expressed. This affective climate may thus foster more

accurate emotion recognition skill for older children as they become attuned to their parents' unique beliefs and ways of expressing emotion over time.¹

We also note related findings in middle childhood for children in nonnormative, challenging environments, such as potentially abusive homes. Children in such situations work harder to identify expressions of anger, and thus, eventually become more skilled than children in less challenging environments (Masten et al., 2008; Pollak, Cicchetti, Hornung, & Reed, 2000; Pollak, Messner, Kistler, & Cohn, 2009). Although such environments may also contribute to perceptual biases (for recent meta-analysis see Luke & Banerjee, 2013), it appears that some degree of environmental challenge may inadvertently stimulate children's emotional development and promote adaptation to that environment.

Guidance of children's emotions. Parents who believe they are responsible for helping children learn about emotions emphasize their own agency in children's emotional development (Denham & Kochanoff, 2002; Dunsmore & Karn, 2001, 2004). Thus, parents who believe that guidance is important may provide more explicit instruction regarding the causes, consequences, and nature of emotions compared to parents who believe that guidance is less important; indeed, the belief in parental guidance predicts greater emotion labeling and knowledge in young children aged 4 to 6 (Dunsmore & Karn, 2001, 2004). However, as children become older, parental guidance may predict *less* skill in children's recognition of parents' emotions (Dunsmore et al., 2009), perhaps because such guidance interferes with children's recognition of parents' emotions or alternatively parents are responding proactively when they see their children falling behind in skill by this age. Thus, by middle

childhood, parents' beliefs in the importance of guiding children may either disrupt children's development of skill or reflect parents' concerns when their children have not sufficiently developed these skills.

Parents' Emotion-Related Behaviors

In addition to parents' beliefs about emotion, parents' active acknowledgement and instruction regarding children's emotions may also predict children's development of emotion recognition skill. We included the two types of instructive behaviors found in previous research that are most likely to relate to children's emotion recognition skill: labeling and teaching.

Labeling is defined as occurring when a parent explicitly identifies what the child or another person is feeling (Denham & Kochanoff, 2002; Havighurst, Wilson, Harley, Prior, & Kehoe, 2010), and is related to enhanced emotion regulation skills (Eisenberg et al., 2001), lower amounts of internalizing behaviors in the classroom (Denham, Mitch-Copeland, Strandberg, Auerbach, & Blair, 1997), and greater overall social competence with peers (Denham et al., 1997). Teaching is defined as occurring when a parent explicitly points out the causes and consequences of an emotional experience (Dunn & Brown, 1994; Gottman et al., 1996; Parke, 1994), and is related to greater emotion understanding in children (Garner, Jones, Gaddy, & Rennie, 1997; Havighurst et al., 2010), lower levels of parent- and teacher-reported internalizing and externalizing behaviors (Sales & Fivush, 2005; Havighurst et al., 2010) and children's academic adjustment (Gottman et al., 1996). Thus, we predicted that

both labeling and teaching behaviors would relate positively to children's skill in recognizing parents' emotions.

Parents' Emotion-Related Skill

The literature on children's understanding and recognition of emotion has focused on emotion-related beliefs and socialization behaviors, yet parents' own emotion recognition skill may also predict children's skill, through both direct and indirect associations with parents' beliefs and behaviors. Passive gene-environment correlations suggest that parents' own emotion recognition abilities contribute to the affective climate of the family, thus influencing the context in which children develop emotion recognition skill (Rutter, 2006). Additionally, there is some evidence to suggest that parents' own emotion-related skills influence children's emotion-related skills (e.g., Daly, Abramovitch, & Pliner, 1980; Perlman, Camras, & Pelphrey, 2008); however, these findings have often focused on parents' skills in regulating or expressing emotion and not parents' skills in recognizing emotion, particularly their skill in recognizing children's emotions. It is possible that parents who have greater emotion recognition accuracy are more likely to have the skills needed to accurately respond to children, and thus, guide children's emotion understanding more effectively.

Children's Emotion Recognition Skill

Most studies examining emotion recognition within family contexts are directed toward children in the preschool years (e.g., Camras et al., 1990; Garner et al., 1997; Havighurst et al., 2010) and, as such, use fairly simplistic measures of emotion recognition in order to be developmentally appropriate. As children's emotion-related skills continue to

develop throughout elementary school (e.g., Larsen, To, & Fireman, 2007; Pons, Harris, & de Rosnay, 2004; Vitulić, 2009), it is important to utilize measures that adequately capture the increasing complexity of elementary school-aged children's skills. Further, increased interest in ecological measurement is directing attention away from still poses of emotions, and highlights the importance, particularly for older children and adults, of measuring real-time emotion recognition within interpersonal contexts (Boiger & Mesquita, 2012; Halberstadt et al., 2013). To address these issues, we chose to study children's skill in recognizing parents' emotions more dynamically, as such skill is more representative of real-life emotional transactions within parent-child relationships than standardized, still posed measures of general emotion recognition.

The Present Study

To date, no study has included parents' emotion-related beliefs, behaviors, and skills together when predicting children's emotion recognition. Thus, in this study, we tested whether parents' beliefs about children's emotions, emotion-related socialization behaviors, and emotion recognition abilities would be associated with children's emotion recognition. We included the three factors in one regression model to assess each factor's unique contributions in explaining children's emotion recognition skill. We hypothesized that children's accuracy in recognizing parents' emotions would be positively related to parents' beliefs about the value and danger of emotions, and negatively related to parents' belief that parents should guide children's socioemotional development. Second, we predicted that children's accuracy in recognizing parents' emotions would be positively associated with

parents' use of labeling and teaching behaviors. Third, we predicted that parents' recognition of children's emotions would relate positively to children's recognition of parents' emotions.

Method

Parents' beliefs about children's emotions were measured using a self-report questionnaire. Parents' emotion socialization behaviors were observed during a board game designed to evoke emotion-related conversation. Emotion recognition for both parents and children were measured using an *in vivo* interaction task. To control for the potential confound between parent-child sending and receiving abilities, we included a measure of both parents' and children's expressive clarity assessed by a group of naïve coders.

Participants

Participants were 69 parent-child dyads. Parents ranged from 28 to 53 years of age ($M_{age} = 39.15$, $SD = 4.94$; 79% mothers). Children ranged from 8 to 11 years of age ($M_{age} = 9.57$, $SD = 0.71$; 52% daughters). Family ethnicities were African American ($n = 34$), European American ($n = 5$), and Lumbee American Indian ($n = 30$). Parents' education levels were as follows: 22 with a high school degree, 25 with a college degree, and 22 with a graduate degree or some post-college education. Family income ranged from \$8,500 to \$180,000 ($M_{income} = \$75,404$). Most families included two parents in the home ($n = 51$), with other family structures also represented (single parent, $n = 7$; divorced, $n = 8$; separated, $n = 3$). The parent-child dyads were participating in a larger study conducted in three small Southeastern cities (see Stelter & Halberstadt, 2011) and parents were recruited to participate in game playing and conversations with their children in a university setting through

announcements and flyers posted in the community, invitations passed to parents during recreational sports practices, and emails via online web listings, university alumni organizations, and directories of participation in previous research studies. The families appear to represent their communities well, and in comparison to data for the counties in which they live, indicate a (relatively) low-risk sample.

Procedure

Following informed consent by parents and assent by children, parents completed a questionnaire assessing parental beliefs about children's emotions while children were interviewed by a researcher for another task not relevant to this study. Parent-child dyads then engaged in two activities which were video-recorded, with one camera recording each participant. The first activity was a game involving emotion-related conversation, and the second was a problem-solving discussion that was subsequently used as stimuli for the self- and other-rating measure of emotion recognition. Following the session, parent-child dyads were thanked and compensated for their time. A racially diverse team of research assistants assisted with all data collection.

Measures

Parents' beliefs about children's emotions. Five subscales of the Parents' Beliefs About Children's Emotions Questionnaire (PBACE; Halberstadt, Dunsmore, Parker, Beale, Thompson, & Bryant, 2008) were of particular interest for this study.² The Value dimension contains three subscales: Positive Emotions are Valuable ("It is important for children to express their happiness when they feel it," 10 items, $\alpha = .80$), Negative Emotions are

Valuable (“The experience of anger can be a useful motivation for action,” 12 items, $\alpha = .79$), and Emotions are Dangerous (“Children who feel emotions strongly are likely to face a lot of trouble in life,” 13 items, $\alpha = .78$). The Guidance dimension contains two subscales: Parents Guide (“It’s a parent’s job to teach children about happiness,” 9 items, $\alpha = .76$) and Children are Capable (“Children can figure out how to express their feelings on their own,” 8 items, $\alpha = .84$). Because the two scales regarding the value of positive and negative emotion were conceptually and empirically related, $r(67) = .29$, $p = .014$, we created a combined Emotions are Valuable scale (22 items; $\alpha = .81$). Because the two Guidance scales were also conceptually and empirically related, $r(67) = -.37$, $p = .002$, we reverse-scored the Children are Capable scale and created a combined Parents Should Guide scale (17 items; $\alpha = .84$). For all items, parents rated their level of agreement with each item using a 6-point Likert-type scale from strongly disagree (1) to strongly agree (6). Evidence of construct validity has been demonstrated by associations with parents’ socialization behaviors such as parents’ discussions of emotional events and emotional expression (Dunsmore et al., 2009; Halberstadt, Thompson et al., 2008; Perez Rivera & Dunsmore, 2011) and with children’s emotional coping and feelings of security (Halberstadt, Thompson et al., 2008; Stelter & Halberstadt, 2011).

Parents’ socialization behaviors. Parents and children were video-recorded while playing a board game designed to evoke emotion-related conversation for approximately 15 minutes. The game, LifeStories®, encourages families to talk about life experiences (e.g., “Describe a good time you had with your family,” and “Describe one of your favorite

childhood toys or games”) and is played much like other board games where players roll dice, move a specified number of spaces on the board, and select cards from specific decks. Players were able to select cards from three decks designed to elicit discussion, including six cards which were added to elicit discussions more specific to emotion (e.g., “Tell about a time the other player made you feel angry”). Additionally, players could select from a fourth deck of cards twice in the game as an alternative to answering other card questions or if they were unable to come up with an example experience with which to respond.

Coding of parents’ behaviors. The transcribed conversations were coded for frequency of emotion-related socialization behaviors by three-person multi-ethnic teams, with each coder assigned to two-thirds of the game conversation, so that all conversations were coded twice. Coders were trained until they reached reliabilities at or exceeding kappa of .80, with interim reliabilities calculated to assess for any observer drift, and final reliability assessed for one-third of all transcripts. Disagreements were resolved by coder consensus (manuals available from the authors).

Labeling was defined as instances in which the parent labeled or named either her/his emotional experience or that of their child. For example, when a parent said, “I felt sad when I went to the parent-teacher conference,” the emotion “sad” was considered a label; $M_{kappa} = .84$. Teaching was defined as instances during which the parent discussed the causes and/or consequences of emotion by providing a rationale (e.g., “I’m irritated because I have to keep calling you”); $M_{kappa} = .97$. Coding for both labeling and teaching behaviors occurred only when the parent explicitly provided an emotion label.

Parent and child emotion recognition. Parent-child dyads engaged in a 7-minute problem-solving discussion of an ongoing situation which they agreed was conflictual (e.g., homework, bedtime, sibling relationships), following Gunslicks-Stoessel and Powers (2008) and Welsh and Dickson (2005). Dyads were instructed to discuss a second topic if they succeeded in resolving the first.

Immediately following the discussion, research assistants selected the middle three minutes and identified 18 ten-second video clips that would then be judged by the parent and the child separately. Parents and children were taken to separate rooms to first watch their own video clips and then to watch the video clips of the other. After each video clip, participants circled the emotions they felt during that video clip on a provided answer sheet. Emotions were clustered into six emotion categories: Happy (consisting of happy, pleased, proud), Curious (curious, interested, surprised), Anxious (anxious, worried, afraid), Mad (irritated, frustrated, mad), Sad (sad, hurt), and None. Participants were allowed to select multiple emotion categories, although this was a rare event (4.03% of ratings). After completing the task for oneself, the dyad members switched rooms and judged the other person's video clips, using the same rating procedure. Thus, each participant reported their own feelings (or lack of feeling) during each video clip, and what the other dyad member was feeling (or not feeling) during the same video clip. Although the conflict discussion task was designed to elicit emotionally arousing dialogue, parents and children were able to engage in relatively calm and pleasant discussions that did not reflect highly intense, negative affect. They did report a range of emotions, thus the task seemed to invite variability in

responses. Specifically, parents reported the following frequencies in feeling Happy (20%), Curious (35%), Anxious (8%), Mad (20%), Sad (1%), and No emotion (16%); and children reported the following frequencies in feeling Happy (26%), Curious (21%), Anxious (11%), Mad (14%), Sad (7%), and No emotion (20%).

Emotion recognition scores were then calculated for parents and children based on agreement between what the individual self-reported during the video clip and what the other person judged that individual to be feeling. Scores were determined using an accuracy scoring paradigm. Participants received full credit for agreement and partial credit of .5 when answers did not match but were at least of shared valence (e.g., if the mother reported that she felt “sad”, and the child reported that her mother felt “angry”), following Denham (1986) and Dunsmore and Smallen (2001). Partial credit was also awarded if multiple emotion categories were selected and at least one matched what the partner reported or vice versa (e.g., if the child judged her mother to be “happy” and “curious”, and the mother reported feeling “curious”). Mean emotion recognition scores for parents and children were calculated by averaging values across all 18 clips, resulting in potential scores ranging from 0 (no agreement) to 1 (perfect agreement). Identifying emotions of others *in vivo* is generally thought to be a challenging task for adults and children alike, and our task was no different, with mean score accuracy in our sample consistent with other measures of accuracy between familiar others (e.g., Ickes, 2011).

Parent and child expressive clarity. Because interpersonal perception accuracy in dyadic paradigms is always necessarily confounded by the sending skill of the partner, an

individuals' accuracy may be because they are more accurate in recognizing their partner's emotions *or* because their partner is more expressive and thus more easily decoded (Hall, Rosip, LeBeau, Horgan, & Carter, 2006; Noller, 2001; Snodgrass, Hecht, & Ploutz-Snyder, 1998). To control for this potential confound, an objective rating of expressive clarity was obtained for each parent and child. Ten naïve observers viewed the same stimuli presented to parents and children and completed the same emotion recognition task. Expressive clarity was calculated as a ratio value, with the numerator representing the highest number of observers that agreed upon a judgment, and the denominator representing the total number of observers for that clip. Thus, if the ten observers agreed upon a judgment (e.g., anger) then the message rated high on clarity and received a 10/10 score or a value of 1.0. If instead only six raters agreed on a judgment, then the message would receive a score of 6/10 with a value of .60. Expressive clarity was averaged across clips within each participant. Greater values indicate greater expressive clarity. This method of calculating expressive clarity is consistent with previous coding schemes used in the affective sensitivity literature (cf., Noller, 2001). Because we cannot know exactly what the participants were feeling, as this is dependent upon their knowing what they are feeling and being willing to report it, this type of measure is considered the next best option, as it provides a clean measure of expressive ability.

Results

Preliminary Analyses

Parents' value and guidance beliefs demonstrated normal distributions. However, as expected of count data, the distribution of parents' labeling behaviors was skewed and

leptokurtic. Because a square root transformation did not substantially alter normality, and because all assumptions for linear regression were met (Cohen, Cohen, West, & Aiken, 2003), we retained the untransformed data in the regression analyses. An examination of outliers revealed an extreme (3+ SDs) multivariate outlier on the dependent variable of children's emotion recognition. To maintain the integrity of the distribution and reduce unwarranted outlier influence, this extreme outlying value was replaced with a child emotion recognition value of +2 SDs (Field, 2009). This replacement did not alter any of the independent-dependent variable associations. Means and standard deviations for emotion-related beliefs, socialization behaviors, expressive clarity (parent and child), and emotion recognition skill (parent and child) are reported in Table 1 along the diagonal.

Because our sample contained participants from three different ethnicities and two genders, we examined potential effects of ethnicity and gender on children's emotion recognition. Ethnicity, parent gender, and child gender were all initially entered into the first step of the model detailed below.³ Ethnicity was not related to children's emotion recognition ($p = .710$) and remained a nonsignificant predictor at all steps when entered into the regression models below. Neither parent nor child gender were related to children's emotion recognition ($ps = .967$ and $.938$, respectively), and remained nonsignificant predictors at all model steps. To enhance parsimony, ethnicity, parent gender, and child gender were omitted from the analyses described below.⁴

To ensure that our model was not influenced by additional family-level characteristics, we also examined the potential effects of parent marital status, number of

parents at home, and parents' education on children's emotion recognition. Results from a one-way ANOVA with marital status as a between-subjects factor revealed no significant differences in children's emotion recognition between families with parents who were married, single, divorced, or separated, nor were there significant differences for analyses with one- versus two-parent homes. To test the effect of parent education on children's emotion recognition, education was entered into the first step of the regression model described below. Parent education was not related to children's emotion recognition in the initial model step ($p = .882$) and remained nonsignificant at subsequent steps. Moreover, the addition of education into the regression model did not alter the significance or direction of any of the predictors. Thus, parent marital status, number of parents in the home, and parent education were also omitted from the analyses detailed below.

Intracorrelations reported in Table 1 indicate that the beliefs that Emotions are Valuable, Emotions are Dangerous, and Parents Should Guide were unrelated. The two socialization behaviors were moderately positively correlated, suggesting that the more parents engaged in labeling the more likely they were to also engage in teaching. The belief that Parents Should Guide, the socialization behavior of labeling, and parents' skill in recognizing children's emotions, were significantly correlated with children's recognition of parents' emotions.

Parents' Beliefs, Behaviors, and Skills in Relation to Children's Emotion Recognition

To test the collective influence of parents' beliefs, behaviors, and emotion recognition skill on children's emotion recognition skill, we conducted a hierarchical regression model in

which each group of predictors (beliefs, behaviors, and skills) was regressed onto children's recognition of parents' emotions. In the first step, parent expressive clarity was entered to control for the potential confound that some parents may be easier to judge than others. In the second step, we entered the beliefs that Emotions are Valuable, Emotions are Dangerous, and Parents Should Guide, and in the third step we entered labeling and teaching. In the fourth step, we entered parents' skill in recognizing children's emotions and child expressive clarity as a control for the potential confound that some children may be easier to judge than others. Each step was assessed for statistical significance; within each step, individual variables were evaluated.

The overall model was significant, $F(8,48) = 3.50$, $p = .003$, $R^2\Delta = .10$. Parent expressive clarity was not significantly related to children's recognition of parents' emotions, $\beta = -.05$, $t(56) = -.34$, $p = .736$, and remained nonsignificant at subsequent steps. The addition of the beliefs that Emotions are Valuable, Emotions are Dangerous, and Parents Should Guide in the second model step resulted in a significant change, $F(4,52) = 3.97$, $p = .007$, $R^2\Delta = .23$. The beliefs that Emotions are Dangerous and Parents Should Guide were uniquely related to children's recognition of parents' emotions, over and above parent expressive clarity, $\beta_s = .28$ and $-.32$, $t_s(56) = 2.23$ and -2.51 , $p_s = .030$ and $.015$, respectively. These results remained significant at subsequent steps. The belief that Emotions are Valuable was not significantly related to children's recognition of parents' emotions, $\beta = .09$, $t(56) = .67$, $p = .506$, and remained nonsignificant at subsequent steps.

The addition of labeling and teaching in the third model step failed to result in a significant change, though the model step remained significant, $F(6,50) = 3.12$, $p = .011$, $R^2\Delta = .04$. Neither behavior was related to children's emotion recognition, $\beta_s = .22$ and $-.03$, $t_s(56) = 1.48$ and $-.19$, $p_s = .146$ and $.853$, respectively. These factors remained nonsignificant in the fourth step.

The addition of parents' emotion recognition skill and child expressive clarity (as a control for some children being easier to judge than others) in the fourth and final step resulted in a significant change, $F(8,48) = 3.50$, $p = .003$, $R^2\Delta = .10$. Parents' own emotion recognition was significantly positively related to children's emotion recognition, over and above parent and child expressive clarity, the beliefs that Emotions are Valuable, Emotions are Dangerous, and Parents Should Guide, and parents' labeling and teaching behaviors, $\beta = .35$, $t(56) = 2.70$, $p = .010$. Child expressive clarity was not significantly related to children's recognition of parents' emotions, $\beta = -.08$, $t(56) = -.64$, $p = .526$.

After controlling for parent and child expressive clarity, parents' beliefs that Emotions are Valuable, Emotions are Dangerous, and Parents Should Guide, parents' labeling and teaching behaviors, and parents' own emotion recognition skill together accounted for 36.9% of the variance in children's emotion recognition.

Discussion

The present study sought to examine whether parents' beliefs about children's emotions, emotion-related socialization behaviors, and emotion recognition skill predict children's emotion recognition. As predicted, the belief that parents should guide children's

emotion was negatively correlated with children's emotion recognition skill, and parents' labeling socialization behavior and emotion recognition skill were both positively correlated with children's emotion recognition skill. In the regression model including all three parent socialization domains, the significant effects for parents' beliefs about guidance and parents' recognition skill persisted, and the parental belief that emotions are problematic or dangerous also emerged as significantly positively related to children's emotion recognition. Together these factors explained one-third of the variance in children's emotion recognition skill. These results illustrate the importance of parental socialization in the development of children's emotion recognition skill, and specifically within the family.

The negative relation between parents' belief in the guidance of children's emotional development and children's emotion recognition is consistent with previous findings (Dunsmore et al., 2009), suggesting a shift by third grade in the utility of parents' guidance of socioemotional development, and children's skill in recognizing their parents' emotions. It may be that by third grade, parents who believe they are responsible for children's emotional development provide "too much" emotion socialization; parents may be guiding children in a manner that limits children's involvement in their own development. Further support for this interpretation could be garnered if parents' guidance beliefs related positively with parents' teaching and labeling behaviors and if these latter variables also related negatively to children's emotion recognition. However, parents' beliefs in the guidance of children's emotional development were unrelated to their labeling and teaching behaviors; moreover, teaching was unrelated to children's emotion recognition, and labeling was positively

correlated with children's emotion recognition. Thus, we endorse a more bidirectional interpretation: parents may come to believe they are responsible for guiding their children's understanding of emotion *because* their children are not yet skilled at recognizing others' emotions. In this case, parents' belief in guidance may be a consequence of children's emotion recognition skill rather than a cause. Given the consistency of this finding across two different paradigms and samples (see also Dunsmore et al., 2009), and recent interest in "helicopter parenting" (e.g., Schiffrin et al., 2013) it may be useful to invest in longitudinal studies that utilize cross-lagged designs to better identify whether parents' beliefs about guidance at this age lead to over-scaffolding of children or indicate sensitive responsiveness to children who may need additional guidance.

It may also be useful to explore these relations over time with children of varying competence. The mean scores of the parent-child dyads in our study suggest average competence with regards to emotion recognition, at least in comparison with other studies of close dyads (see Ickes, 2011). Further, our sampling methods assumed some modicum of skill within the families recruited (e.g., parents who were able to provide sport participation for children, participate in religious, community, and other organized activities on a regular basis, and/or were active members of alumni organizations). It will be interesting to examine whether the patterns presented here are replicated in at-risk parent-child dyads.

We also found a positive relation between parents' belief that emotions are problematic or dangerous and children's emotion recognition. In previous research, children have demonstrated both perceptual biases and perceptual sensitivity for specific emotions in

highly challenging circumstances such as maltreatment (e.g., Masten et al., 2008; Pollak et al., 2000; Pollak et al., 2009; for a recent meta-analysis see Luke & Banerjee, 2013). Those findings highlight two important points regarding children's emotional development: (1) children adapt to environmental demands, and (2) the degree and direction to which children adapt to challenging environments is influenced by the level of challenge, thus resulting in environmental adaptation that is multidimensional and multidirectional.

Our findings suggest that this phenomenon of children's environmental adaptation may be more widespread, and may also occur in response to normative variation in parental beliefs. Parents who believe that emotions are problematic or dangerous are less emotionally expressive overall, thus providing children with little information regarding the expression of emotion (Dunsmore et al., 2009). Although initially associated with emotion recognition deficits, this affective climate may lead children to develop superior emotion recognition abilities over time, as greater attention to microexpressions of emotion are required to determine how their parents are really feeling within familial interactions. Our results with third-grade children add to accumulating evidence of curvilinear age-related patterns between parental emotion socialization and children's emotion-related skills (e.g., Halberstadt & Eaton, 2002; Morris, Silk, Steinberg, Myers, & Robinson, 2007); parental behaviors that inhibit children's emotion recognition skill in the preschool years may actually work to support skill during elementary school and beyond. Whether such gains in perceptual sensitivity later result in over-attunement to parents' emotions remains an empirical question. Given the importance of these effects, longitudinal research is needed to determine the age

and contexts in which such developmental shifts occur, with attention to the possibility of dynamic and bidirectional relations between parent and child factors over time.

Parents' skill in recognizing children's emotions was also uniquely related to children's recognition of parents' emotions; to our knowledge, this is the first study to assess the role of parents' skill as a contributor to children's skill. It makes sense that parents need at least a certain modicum of skill before helping their children acquire the same abilities; otherwise, it would be very difficult to accurately teach children how to recognize others' emotions. Indeed, parents' teaching behaviors were moderately positively related to their emotion recognition skill, which may also explain why the instructive skills did not emerge as separate, unique contributors to children's emotion recognition skill. That parents' emotion recognition skill is associated with children's emotion recognition skill has implications for fostering improved communication and affective understanding in the parent-child relationship; family interventions may want to develop parents' recognition and understanding of children's emotions as well as developing children's skills directly.

Neither parents' labeling nor teaching behaviors were uniquely related to children's emotion recognition in the regression model, despite a significant moderate correlation between labeling and children's emotion recognition. As noted above, parents' teaching behaviors were moderately correlated with parents' emotion recognition skill. It is possible that such skills are more directly related to children's emotional development at this particular developmental period of middle childhood; such a possibility may have dampened the unique contributions of parents' teaching and labeling behaviors in our model.

Additionally, as can be seen from Table 1, our lack of relations are not due to ceiling or floor effects in the frequency of parents' labeling and teaching behaviors. It is possible that these behaviors provide children with information regarding emotional scripts (knowledge about situations and general responses to those situations) rather than either the motivational lens to know more information by looking and listening or the perceptual knowledge itself garnered from the nonverbal cues. Thus, further research exploring the difference between knowledge of general emotion scripts and more perceptual tasks of identifying facial expressions and voice tone in relation to teaching and labeling may be warranted.

The development of emotion recognition is often studied in very young children, yet this skill continues to develop throughout childhood; children's understanding of emotion becomes more complex and integrated as children mature cognitively and gain experience and expertise in social interactions (Halberstadt et al., 2013). Our results point to the utility in not only studying emotion recognition skills in ages beyond early childhood but also in studying the ways in which parents' adapt their socialization strategies to meet such changes in child skill. We hope that our results serve as a call for parents to continue to think about emotional intelligence in the middle years of childhood.

Limitations and Strengths

Although large for this type of dyadic emotion recognition paradigm (e.g., Dunsmore et al., 2009; Noller & Gallois, 1986), our sample is still relatively small and sample size may decrease detection of subtle effects. Given that some of our nonsignificant findings included relatively moderate sized *Beta* coefficients (i.e., labeling behaviors), it is possible that a

larger sample would find such effects to be significant. However, small sample size does not preclude interpretation, as the relations we found together accounted for 37% of the variance. This finding is both robust and compelling. The fact that these factors together contribute such a large amount of variance in explaining children's emotion recognition supports the model put forth by Eisenberg and colleagues (1998) that multiple parental factors contribute to children's emotional development.

We note that the recorded conflict discussions may not have elicited strong levels of emotional expression in either parents or children. However, many communications between parents and children may initially occur at low expressive levels, and recognizing these low-intensity emotions before intense emotions are felt may be important for maintaining family harmony.

Further, because of the spontaneous nature of expressions within the conflict discussions, the emotion recognition task was likely more difficult for parents and children to complete compared to more traditional measures of general emotion recognition skill (e.g., Naab & Russell, 2007). However, rather than excluding spontaneous expressions as valuable measures of emotion recognition, we think this highlights the difficulty in judging the expressions that predominate in everyday life and the importance of including such expressions. Our measure of emotion recognition utilizing parents' and children's spontaneous expressions was appropriate given that our interests were in emotional development within the family context.

With regard to our measurement of parental socialization behaviors, the board game task used in the current study was designed to elicit emotion-related discussion in relation to shared life experiences between parent-child dyads and thus, may not reflect parents' typical or complex emotion socialization behaviors. Specifically, parents may not directly use emotion words or terms to teach children about the causes and consequences of emotion in daily interactions, but instead may respond to a child's emotion expression with a combination of nonverbal behaviors and general statements of inquiry. Similarly, children likely learn about parents' emotion expression through nonverbal displays of emotion during interaction (e.g., smiling, crying, tone of voice) and/or statements that lack emotion words. It is also possible, however, that the game invited parents who would not normally use labeling or teaching behaviors to do so, thus obscuring differences in teaching and labeling between parents who more naturally weave these behaviors in their day-to-day interactions from those who only do so in laboratory settings. This may also be a problem for other types of parent-child interactions in the laboratory, and so it is important to note the asset of board games' ecological validity and enjoyable nature, which increases likelihood of accessing parents' emotion-related information.

That parents' beliefs and behaviors are not significantly related suggests that the assumption in meta-emotion theory of the confluence of beliefs to behaviors is not always warranted. Rather, the associations between beliefs and behaviors may be complex and dependent upon the specific beliefs and specific behaviors. The pattern of parents' beliefs and/or behaviors not always predicting children's outcomes has been noted in other studies

as well (e.g., Halberstadt, Thompson, et al., 2008; Perez-Rivera & Dunsmore, 2011; Stelter & Halberstadt, 2011). It is necessary to consider the context in these relations, as beliefs may be more predictive of behaviors in contexts that are emotionally intense and arousing (Halberstadt, Thompson, et al., 2008; Stelter & Halberstadt, 2011). Also, it may be that beliefs and behaviors are more convergent when children are younger, but that parents' behaviors may become more constrained as children move into middle childhood and parents also struggle with children's increased need for autonomy. Clearly these results highlight a complexity that will have to be further unpacked in future research.

Our model does not account for additional parental factors that likely contribute to children's emotion recognition development, including neurophysiological markers. For example, our model does not account for the extent to which parents' and children's emotion recognition skills are genetically encoded, yet our model does consider some of this variance in the relation between parent emotion recognition skill and child emotion recognition skill. However, future studies should aim not only to replicate our model but also to identify additional biological, cognitive, and social factors within the family milieu that influence and guide children's emotional development.

This study design also demonstrates distinctive strengths. Our sample includes two American minority groups not often included in emotion research, thus answering a call for more research with diverse participants (cf. Hall & Maramba, 2001; Hartman et al., 2013; Sue, 1999). Our research utilized mixed methods, including both questionnaire data and observations of parent-child interactions. Another strength is the ecological validity of the

tasks; for example, the conflict discussions allow for the unfolding of real emotional expressions over real time. This type of paradigm may be particularly ideal for measuring emotion recognition in older children who are increasingly confronted with rapidly changing and fragmented emotions occurring simultaneously, and who must apply their knowledge to situations that are flooded with changing mixtures of both relevant and irrelevant information.

It may be argued that our emotion recognition task, because of its ecological validity, reflects an idiosyncratic skill specific to the parent-child relationship. Although this paradigm required children to recognize the skill of only one communicator, other contextualized studies utilizing both general and specific emotion recognition tasks indicate that parental socialization beliefs predict children's specific recognition skill beyond children's general recognition skill (Dunsmore et al., 2009). It is likely that parents' emotion-related beliefs, behaviors, and skills influence children's internal working models regarding their own emotional behaviors and expectations they have of others' emotions (Dunsmore & Halberstadt, 1997; Halberstadt & Lozada, 2011). Thus, we believe that our findings would generalize to children's general emotion recognition abilities, although this interpretation has not been empirically tested and remains a worthwhile avenue for future research.

It is also important to stress that our results reflect a pattern of associations between parent emotion-related beliefs, behaviors, and skill and children's emotion recognition in a relatively low-risk, normative sample of parent-child dyads. As briefly noted above, we do not yet know whether the patterns observed would generalize to families in which children

are at socioeconomic or emotional risk. Such work is an important next step in better delineating the ways in which children develop emotional skills within the family context.

In sum, our findings suggest that children develop understanding and recognition of emotion in relation to parents' beliefs about children's emotions, emotion socialization behaviors, and emotion recognition skill. Because children's emotion recognition appears strongly linked with enhanced socioemotional functioning (Denham et al., 2012; Dunsmore et al., 2008; Ensor et al., 2011; Garner & Waajid, 2008; Rothman & Nowicki, 2004), identifying parental factors predictive of children's emotion understanding may help inform parenting programs designed to remediate children's emotion understanding.

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Footnotes

¹ It may seem initially that the beliefs that emotions are valuable and emotions are problematic or dangerous are two bipolar ends of one dimension; however, in previous research (and foreshadowing current findings), these beliefs tend to be uncorrelated, and have both similar and different trajectories with various parental behaviors, which also suggests independence (e.g., Halberstadt, Thompson et al., 2008).

² The PBACE questionnaire subscales were derived from factor analyses with 1108 mothers and fathers from three ethnicities (African American, European American, and Lumbee American Indian) following focus groups with those same ethnicities to identify items that resonated broadly for parents (Parker et al., 2012; Stelter & Halberstadt, 2011). Thus, the PBACE was developed from responses with a diverse sample. Moreover, the PBACE was developed using a series of factor analyses that utilized methods designed to extract independent factors. Oblique rotations were applied, thus allowing for some covariance among factors, as was observed in this study among the two Value subscales and Guidance subscales.

³ Mean scores for children's recognition skill by ethnicity, parent gender, and child gender are as follows: African American (.34), European American (.32), Lumbee American Indian (.35); Mother (.34), Father (.34); Girl (.34), Boy (.34). Although these scores may appear low, they are representative of scores derived from similar paradigms (i.e., empathic accuracy between spouses; Ickes, 2011).

⁴ We did not hypothesize relations between ethnicity or gender and children's emotion recognition, as we had no conceptual reasons to do so and the extant research on gender effects for children is somewhat mixed (for reviews, see Halberstadt et al., 2013; Hall & Gunnery, 2013). The small sample size may have precluded identifying these effects; however, demographic effects were not robust enough to even be noted as trends.

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Table 1. Correlations between Emotion-related Beliefs, Socialization Behaviors, and Emotion Recognition Skills, with Means (and Standard Deviations) on the Diagonal

Variable	Parent Emotion-Related Beliefs			Parent Socialization Behaviors		Parent/Child Expressive Clarity		Parent/Child Emotion Recognition	
	1	2	3	4	5	6	7	8	9
1. Value	5.04(.43)	-.04	-.11	.14	.17	-.34**	.11	.21†	.19
2. Danger		2.96(.78)	-.17	-.07	-.08	.18	.24†	-.01	.11
3. Guide			4.79(.61)	-.16	-.07	-.06	-.03	-.03	-.24*
4. Label				5.68(4.50)	.54***	-.12	-.11	.18	.34**
5. Teach					2.03(1.54)	-.08	.03	.38***	.16
6. Parent EC						.62(.07)	.40**	-.06	-.01
7. Child EC							.58(.09)	.11	-.02
8. Parent ER								.34(.14)	.28*
9. Child ER									.34(.15)

Note: EC = Expressive Clarity. ER = Emotion Recognition.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2. Hierarchical Regression Model Predicting Children's Recognition of Parents' Emotions

Predictor variables	R^2	B	SE (B)	β
Step 1	.00			
Parent Expressive Clarity		-.09	.26	-.05
Step 2	.23**			
Parent Expressive Clarity		-.16	.25	-.08
Emotions are Valuable		.03	.25	.09
Emotions are Dangerous		.05	.02	.28*
Parents Should Guide		-.07	.03	-.32*
Step 3	.27*			
Parent Expressive Clarity		-.10	.25	-.05
Emotions are Valuable		.03	.04	.08
Emotions are Dangerous		.05	.02	.28*
Parents Should Guide		-.06	.03	-.28*
Parent Labeling		.01	.00	.22
Parent Teaching		-.00	.01	-.03
Step 4	.37**			
Parent Expressive Clarity		-.03	.26	-.02
Emotions are Valuable		.01	.04	.02
Emotions are Dangerous		.04	.02	.26*
Parents Should Guide		-.07	.03	-.32*
Parent Labeling		.01	.00	.22
Parent Teaching		-.01	.01	-.14
Child Expressive Clarity		-.12	.20	-.08
Parent Emotion Recognition		.34	.13	.35*

Note: Parent and Child Expressive Clarity serve as controls for the potential confounds that some children and parents may be easier to judge than others.

* $p < .05$. ** $p < .01$.

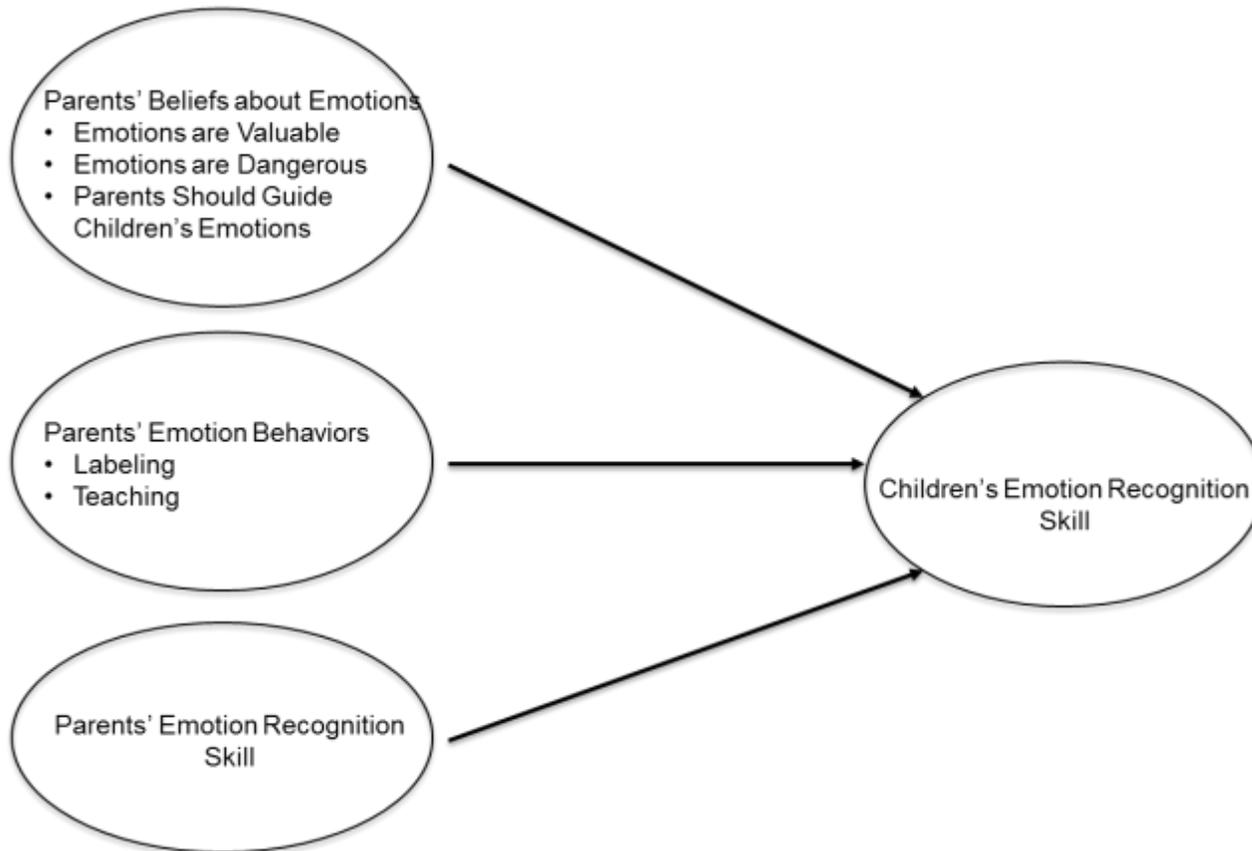


Figure 1. Model of Children's Emotion Recognition as a Function of Parents' Beliefs about Children's Emotions, Emotion Socialization Behaviors, and Own Emotion Recognition Skill

CHAPTER 5: Discussion

This dissertation presents findings regarding the development of emotion understanding, including theoretical and empirical assessments of emotion understanding conceptualization, structural organization, and socialization. In this chapter, I summarize the main conclusions from each of the three manuscripts that comprise the present dissertation. I then reflect on the combined body of work from developmental science perspectives so as to present general conclusions regarding the organized and integrated synthesis of emotion understanding development as embedded within contexts. Following these general conclusions, I note some limitations of the present dissertation. I then suggest some future directions as derived from the combined body of work, and conclude with final remarks.

Conceptualization: Moving Toward an Integrated Emotion Understanding Framework

The primary aim of the manuscript presented in Chapter 2 was to propose an integrated framework that conceptualizes the broad construct of emotion understanding across the lifespan with regard to the specific skills used in the understanding of emotions in the self, specific others, and generalized others. As noted in Chapter 1, emotion understanding as a broad construct remains relatively unmapped, with inconsistencies in the language used in reference to this construct and in the fundamental operational definitions of the skills that comprise this construct, including consideration regarding the foci of understanding. To address these gaps, Castro, Cheng, Halberstadt and Grünh (in press) presented the Emotion Understanding in Recognition and Knowledge Assessment (EUREKA) Model in Chapter 2.

The EUREKA Model defines emotion understanding broadly as “expertise in the meaning of emotion” and delineates nine specific skill sets, roughly corresponding to skills in recognizing emotional expressions and knowing about emotion-eliciting situations. Identification of the specific skills involved in understanding emotions across the lifespan is important, as no shared language exists to discuss these skills at different ages and in reference to different measures. Moreover, identification of these skills as directed toward different foci—including understanding our own emotions, understanding emotions in someone we know, and understanding emotions in the general population, including those we don’t know personally— is a major contribution to the literature as no theoretical models explicitly specify the focus of understanding despite the fact that emotions are understood in specific targets in real life. The EUREKA model thus identifies a variety of unique skill-foci combinations from which emotion understanding may be assessed.

A secondary aim was to categorize measures of emotion understanding using the EUREKA framework so as to highlight areas of commonality and difference across measures, and to identify specific gaps in emotion understanding assessment. The systematic comparison of emotion understanding measures provides an important guide for researchers looking to use existing measures; 56 measures of emotion understanding, spanning the entire lifespan, were identified and categorized using the EUREKA framework.

Results from this categorization revealed that empirical conceptualizations of emotion understanding lag significantly behind theoretical conceptualizations; most measures failed to assess a broad range of emotion understanding skills, and yet, theoretical definitions of

emotion understanding often imply a broad range of skills. Importantly, the results also highlighted the large gap in the literature regarding assessment of emotion understanding as directed toward the self and specific others. The field is largely dependent on measures that are about unknown and imagined others, and so we have little knowledge about whether this type of emotion understanding is reflective of everyday experiences. This limitation poses a potential paradox, as understanding of emotions likely occurs most often in situations involving the self and familiar others, and yet, empirically we do not have a strong sense of how these specific skills develop. The fact that the field appears to rely so heavily upon measures that assess the understanding of generalized others' emotions suggests that a shift is needed in the conceptualization of emotion understanding to include the focus of understanding as an integral component of conceptualization.

Structural Organization: Multiple Dimensions of Understanding in Middle Childhood

The manuscript presented in Chapter 3 builds upon the conceptual knowledge developed in Chapter 2 in order to examine the structural organization of different emotion understanding skills in middle childhood. Examining the structure of skills at different ages is important for learning more about the development of emotion understanding, as different skills may relate differently at different ages. In the two studies examining the structural organization of emotion understanding skills in children using confirmatory factor analyses (Barbosa-Leiker et al., 2014; Bassett et al., 2012), a two-factor structure was identified. However, because these studies included only young children aged 3 to 5, and used only components from a single measure of emotion understanding, it was unclear whether

additional factor structures indicative of advanced multidimensionality would be supported in samples with older children and/or by using a greater variety of emotion understanding measures. These gaps were addressed by the study presented in Chapter 3.

Castro, Halberstadt, and Garrett-Peters (under review) employed a mixed-methods design to test the dimensionality of children's emotion understanding in middle childhood, specifically in third-grade children. Children completed five measures of emotion understanding that collectively assessed the identification and labeling of prototypical facial and bodily expressions of emotion in unfamiliar children and adults, the identification of prototypical emotional causes, consequences, and regulation strategies as related to unfamiliar others, the identification and labeling of familiar others' emotional expressions during an interpersonal interaction, and the identification of emotions and regulation strategies that may be experienced by the self or a familiar other in an interpersonal context. Latent variable modeling was used to test whether the two-factor structure identified in early childhood fit the data better than alternative four-, three-, and one-factor structures.

Results supported a multidimensional structure of emotion understanding in third-grade children: the three- and four-factor structures provided significantly better fit to the data than the one- and two-factor structures. These findings suggest that emotion understanding in third grade is better represented by advanced organization of skills than more simplistic structures. Moreover, because the three- and four-factor structures were not significantly different from each other, the more parsimonious three-factor structure was then retained as the best fitting structure for the data. This factor structure revealed the following

organization of skills: (1) prototypical emotion recognition skills, such as the recognition of basic, discrete emotions in generalized others, (2) prototypical emotion knowledge skills, including knowledge about emotional causes, consequences, and regulation, and (3) advanced understanding skills associated with the understanding of complex emotions and emotions embedded within meaningful interpersonal relationships, such as the parent-child dyad. Interestingly, these results, in association with the other two studies finding a simpler structure in younger children, support developmental models of emotion understanding that differentiate basic skills in recognizing and labeling prototypical emotional expressions and knowing emotional scripts, from more advanced skills in understanding mixed and moral emotions within close relationships (e.g., Pons et al., 2004).

Several possibilities may explain the finding that emotion understanding is multidimensional in middle childhood. First, emotion understanding measures used throughout childhood may hold a large amount of error variance, and associations among measures may be underestimated. A second possibility is that children's emotion understanding skills become increasingly differentiated with age, and we would expect performance on tasks to be less associated in middle childhood than in early childhood. A third related possibility is that children's emotion understanding is a highly dynamic skill; thus, even in middle childhood, great variability exists among children's performance on one task, and so their performance may or may not relate to performance on other emotion understanding tasks. Additional research is needed to disentangle these possibilities,

particularly research employing mixed-methods longitudinal designs that model within-person structural changes and variability.

In addition to mapping the organization among different emotion understanding skills, this study also examined the predictive value of this structure on children's socioemotional competence. Few studies have tested the relations between different emotion understanding skills and different socioemotional competencies in middle childhood (for notable exceptions with young children aged 3 to 5, see Bassett et al., 2012; Garner & Waajid, 2012; Heinze, Miller, Seifer, Dickstein, & Locke, 2014; Miller et al., 2005). Such analyses are necessary to observe whether differential associations exist for different skill sets at different ages. The study tested the unique predictive associations between the three-factor structure of emotion understanding and mother-reported socioemotional skills and problems using structural equation modeling. Examination of factor path coefficients revealed that third-grade children's prototypical emotion knowledge was significantly and uniquely related to children's socioemotional skills and problems; no other predictive paths were significant. These findings indicate that third-grade children demonstrated more socioemotional skills and less socioemotional problems when they possessed greater prototypical knowledge of emotional causes, consequences, and regulation strategies. This knowledge appeared to be more important to children's socioemotional competence than skills in either prototypical emotion recognition or advanced emotion understanding.

These findings may reflect the social cognitive demands of third-grade children, who increasingly emphasize initiating and maintaining peer relationships, while also establishing

social and emotional independence from parents than children at younger ages (Klimes-Dugan & Zeman, 2007). These interpersonal demands likely require prototypical emotion knowledge, including basic skills in attributing emotions to situations (such as identifying why a new friend appears offended by something during an interaction) as well as knowledge regarding the regulation of strong emotions that likely arise in these interpersonal contexts (such as in the context of parent-child conflict over children's demands for more autonomy).

It is not surprising that prototypical emotion recognition skills were unrelated to children's socioemotional competence at this age; these skills may be less relevant to third-grade children who may have more experience (and interest) in recognizing non-prototypical emotional displays than younger children. Moreover, third-grade children may rely more on their knowledge of emotions, rather than on their recognition of emotional cues, to attribute emotions to others, as such knowledge may be used in absence of visual or auditory cues (e.g., emotional faces, vocal expressions, and body expressions). Thus, prototypical emotion recognition skills may be less predictive of children's socioemotional competence in third grade than prototypical emotion knowledge skills.

In contrast, it is surprising that advanced emotion understanding skills failed to predict children's socioemotional competence. This pathway was expected to be significant, given that many of the advanced skills assessed in the study typically develop during middle childhood, specifically between the ages of 8 and 11 (Pons et al., 2004; Ickes, 2011). However, knowing too much about others' feelings may not always be adaptive (Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979). Some evidence suggests that advanced emotion

understanding skills in middle childhood may result in over-attunement to peer relationship problems, thus contributing to children's socioemotional maladjustment over time (Hoglund, Lalonde, & Leadbeater, 2008). Thus, the lack of findings may reflect developmental process. That is, this study may have failed to find significant predictive associations between third-graders' advanced emotion understanding skills and socioemotional competence because such skills may not yet bestow consistent benefits for children at this age. Although the path between advanced emotion understanding skills and children's socioemotional problems was not significant ($p = .296$), the regression coefficient ($\beta = .19$) suggests a maladaptive effect. It is possible that in future studies using measures with less error variance and a greater sample size, this path may become significant. Moreover, studies with older children (i.e., children aged 9 to 11) and adolescents (aged 12 to 18) may reveal additional patterns, as children and adolescents master various other social and cognitive competencies that will enable them to more effectively apply advanced emotion understanding skills. More research is needed to confirm the possibility of curvilinear associations between emotion understanding skills and socioemotional competencies over time, with samples inclusive of adolescents as well as younger and older children.

Socialization: How Children Understand Emotions within the Family Context

The study presented in Chapter 4 extends the findings from Chapters 2 and 3 to address the gap in our knowledge regarding 8- to 11-year-old children's understanding of emotion in familiar others as embedded within the family context.

To do so, Castro, Halberstadt, Lozada, and Craig (2014) bridged the emotion understanding and emotion socialization literatures to test a multifaceted model of parents' emotion socialization of children's emotion recognition in middle childhood. Specifically, three domains of parental socialization were assessed—parents' beliefs about the value, danger, and guidance of children's emotions, parents' emotion-related labeling and teaching behaviors, and parents' own skills in recognizing children's emotions—in relation to children's recognition of parents' emotions in a sample of children aged 8 to 11. This study thus contributed an examination of the development of emotion understanding skills in older children within the family context by assessing a skill highly relevant to the family context (children's recognition of parents' emotions) and as predicted by a variety of parental socialization factors.

The full model accounted for approximately one-third of the variance in children's emotion recognition, suggesting that parents continue to retain influence in socializing children's emotions in middle childhood. Moreover, individual results revealed a complex pattern of socialization: children's accuracy at recognizing parents' emotions related positively to parents' beliefs that children's emotions are dangerous, parents' beliefs that they should *not* guide children's emotional development, and parents' accuracy at recognizing children's emotions. These results highlight the unique predictive value of parents' beliefs about children's emotions and their own emotion recognition skills in predicting children's emotion recognition in middle childhood.

Importantly, the findings also highlight the dynamic nature of the parental socialization pathway over time; that is, what appears to be beneficial to children at one age is not adaptive at others ages. For example, parents' emotion labeling and teaching behaviors were not significantly related to children's emotion recognition in the full model, perhaps because such behaviors are typically supportive of basic emotional skill development in young children aged 3 to 5 (Eisenberg et al., 1998) and may not be as useful in cultivating more advanced skills in older children. It is an assumption that these behaviors will continue to be influential as children age; however, this assumption appears unsupported in Chapter 4. Moreover, whereas most studies with young children suggest a positive association between supportive socialization strategies and children's emotional functioning (e.g., Fabes, Poulin, Eisenberg, & Madden-Derdich, 2002), the results presented in Chapter 4 suggest the reverse association, with greater support (as indicated by parents' beliefs in the guidance of children's emotional development) predicting lower levels of emotion recognition accuracy in third-grade children. These results are consistent with a small but growing body of literature indicative of age-related shifts in the utility of supportive emotion socialization processes (e.g., Dunsmore et al., 2009).

Although the mechanisms driving these effects are difficult to ascertain given that the data are cross-sectional, I note two possible explanations. First, "more may not always be better," and parents may over socialize children in ways that inhibit their emotional growth. For example, parents may provide unneeded guidance to children, and this guidance may subsequently be perceived negatively by children. This interpretation is consistent with

theoretical accounts of the impact of stage-environment fit on children's socioemotional functioning within families (Eccles et al., 1993). Second, parents may increase their socialization efforts in *response* to children's poor emotional skill; that is, parents may demonstrate sensitivity in their socialization approaches by adapting to children's changing skill levels. If parents perceive children's skills to be poor, they may increase their engagement in supportive socialization processes as a means of promoting children's emotional development. Such an interpretation may also be viewed from a stage-environment fit perspective, as we would expect children to demonstrate more positive adaptations *if* children are experiencing socioemotional difficulties *and* parents are able to provide guidance to meet these difficulties. Longitudinal assessments are needed in order to test the validity of these interpretations, though clearly both possibilities are plausible. It is likely that important moderators, such as parental sensitivity and children's perceptions regarding their own emotional needs and parents' abilities to meet these needs, predict the direction of these pathways.

Applying a Developmental Science Lens to the Study of Emotion Understanding

The combined body of work in this dissertation applies developmental science principles to the examination of emotion understanding development in ways that contribute to our understanding of *developing individuals as a whole*. In this section, I focus on three developmental science principles, synthesis of integrated systems, persons-in-context, and reorganization of systems, to illustrate how the combined body of work extends our thinking

regarding development as an organized synthesis of social, emotional, and cognitive functions as embedded within various contexts.

An individual develops and functions as an integrated organism. The first principle of developmental science considers the totality of development; that is, individuals develop as a *synthesis of maturational, cultural, and experiential functions that are fused together* in ontogeny (Magnusson & Cairns, 1996). This fusion implies that functions cannot be separated, nor can their individual contributions on development be completely isolated. In most developmental research, functions are separated both theoretically as dictated by sub-disciplines within developmental psychology (e.g., social functions, cognitive functions), and empirically through use of measures that achieve validity in part by demonstrating that they assess one function and not another (e.g., convergent and discriminant validity). However, developmental science suggests that such practices provide incomplete assessments of development. Instead, interpretations regarding one developmental function such as emotion understanding must also reflect the integrated contributions from other functions embedded within social, cognitive, and cultural systems. Thus, developmental science challenges researchers to consider the whole individual even when studying one specific component of functioning.

Previous research in emotion understanding has focused primarily on identifying maturational functions. From this literature, we know that the labeling of prototypical emotional expressions tends to develop in early childhood between the ages of 3 and 5 (Denham, 1986), and that by the end of early childhood, at 6-years of age, children

demonstrate knowledge regarding prototypical emotional causes and consequences (Denham, 1986; Pons et al., 2004). More advanced skills, such as the knowledge about the management of emotions, tends to develop in middle childhood between the ages of 7 and 9, and the most sophisticated skills surrounding the identification and knowledge of mixed and moral emotions emerge later between the ages of 8 and 11 (Harris, 1989; Pons et al., 2004). Thus, research generally supports a maturational trajectory, whereby skills increase in quantity and quality.

Maturational changes in emotional functions may be complemented by maturational changes in other functions. For example, it has long been argued that the ability to understand others' emotions is dependent upon theory of mind; that is, our ability to take the mental perspectives of other people should contribute to our ability to infer other people's mental states, including their emotions. Indeed, this set of skills has been referred to in the literature as *mental mind reading* and *affective perspective taking*; these labels serve to illustrate the integrative synthesis of social and cognitive functions implied in emotion understanding. Research generally supports this assumption, as most children demonstrate competencies in both theory of mind and basic emotion understanding by the age of six, and a minority of children by the age of four (Harris, Johnson, Hutton, Andrews, & Cooke, 1989), although the direction of effects are constrained by reliance on concurrent rather than longitudinal methodologies (for recent longitudinal study, see O'Brien et al., 2011). Certainly, the field can agree that skills in theory of mind relate to skills in understanding emotions in others.

Moreover, although we often distinguish cognitive and emotion processes in research, these are highly interrelated in reality. For example, awareness, as defined by the EUReKA Model in Chapter 2, is an emotion understanding skill used to identify whether a communicated message is emotional in nature (Castro, Cheng, Halberstadt, & Grühn, in press). Awareness thus involves attending to relevant emotional cues while disregarding irrelevant cues, and processing relevant cues as emotionally meaningful (Buck, 1976; Halberstadt et al., 2001); these processes are perceptual (and thus cognitive) in nature. Recent evidence suggests that perceptual qualities at the level of the perceiver are important for the process of recognizing emotions (Castro & Boone, in press). Thus, emotion understanding and perception are likely integrated functions. Awareness fuses both cognitive and emotional processes across a variety of internal (within-person) and external (outside-person) systems. Interpretations regarding awareness of emotions should therefore reference this synthesis.

Emotion understanding is also integrated with cultural functions. The EUReKA model delineates two specific emotion understanding skill sets that are embedded within culture: knowledge regarding cultural rules and norms, and the labeling of emotional expressions in context (Castro et al., in press). Cultures provide information regarding how emotions should be experienced and expressed (i.e., display rules, Saarni, 2000); these display rules then influence how emotions are understood within a given situation (Halberstadt et al., 2001). For example, American children are aware of the need to conceal their negative emotions (i.e., anger, sadness, and pain) when in the presence of peers, and not when in the presence of family members (Zeman & Garber, 1996). However, the opposite

pattern is often observed in non-Western cultures: in Japan, it is less appropriate to display anger and other intense negative emotions toward family members than toward people outside of the family (Matsumoto, 1990; Safdar et al., 2009). In addition, research on children from three cultures (Brahman, Tamang, and the United States) suggests that children's emotional responses to interpersonal situations are guided by cultural display rules (Cole, Bruschi, & Tamang, 2002). These findings highlight the integration of broad cultural rules regarding the expression of emotion with contextual rules regarding the value of such expression in more proximal cultures (such as family or peer contexts).

Culture is also relevant to emotion recognition skills, which require knowledge of contextual cues, including cues afforded by cultural learning. For example, shared cultural knowledge regarding emotional expressiveness may contribute to in-group advantages in emotion recognition (Elfenbein, 2013; Laukka, Neiberg, & Elfenbein, 2014). These advantages may reflect the recognition of actual differences in the expression of emotion, such as in the activation of different facial muscles for the same expressions (e.g., cultural dialects, Elfenbein, Beaupré, Lévesque, & Hess, 2007). Emotions may thus be recognized and understood within specific cultural frameworks that give meaning to emotional experiences and expressions.

In addition to maturational and cultural functions, emotion understanding development also includes the integration of experiential functions. Emotions are understood in reference to a particular foci (Castro et al., in press); in real life, foci likely include the self and familiar others. Emotion understanding not only develops within specific contexts (such

as the family), and in direction to specific others (such as parents), but interactions may involve understanding one's own emotions in relation to specific others' emotions. Such knowledge may be considered experiential to the extent that we accumulate greater understanding of emotions by enacting our understanding across time and space. Indeed, third-grade children's skills in recognizing parents' emotions during an interaction are positively related to parents' skills in recognizing children's emotions during the same interaction (Castro et al., 2014). This result suggests that emotion understanding skills may develop from transactional experiences between parents and children. Moreover, children likely use knowledge regarding how they feel to attribute emotions to others. Recent findings suggest that young children (aged 3 to 6) do attribute their own feelings to others, even when demonstrating competence in taking others' mental perspectives (Harris, de Rosnay, & Ronfard, 2014). Thus, children may use their own experiential knowledge to guide their understanding of emotions in general, and as directed toward specific others. In adulthood, experiences may serve to shift the within-person dynamic organization of emotion (Perunovic, Heller, & Rafaeli, 2007), further illustrating the ways in which experiential and emotional functions are integrated over time.

These maturational, cultural, and experiential functions define emotion understanding as an integrated synthesis across developmental systems. Future studies should include explicit discussion regarding the synthesis of additional functions, as such discussions will unite the developmental psychology literatures in biological, cognitive, and socioemotional systems, thus promoting translational research.

An individual develops as a person in context(s). A second principle noted by developmental science concerns the idea that development occurs within environmental contexts; thus, an examination of any developmental function requires the consideration of the individual person within context. These contextual influences may be stable or unstable over time, and at any single point in time an individual may be situated within a variety of contexts. To summarize:

The individual is an active, purposeful part of an integrated, complex, and dynamic person-environment (PE) system.... Consequently, *it is not possible to understand how social systems function without knowledge of individual functioning, just as individual functioning and development cannot be understood without knowledge of the environment* [emphasis added] (Magnusson & Stattin, 2006, p. 401).

It is important to note that this perspective does not stand in contrast to the integrated systems perspective presented above; rather, the persons-in-context perspective specifies this integration with regard to distal and proximal environmental systems. In this way, context is always fused with individual development, and thus cannot be separated from individual functioning.

The persons-in-context perspective is easily illustrated with regard to emotion understanding development. Emotion understanding is not isolated from the immediate context in which this understanding (i.e., emotional communication) is embedded, and also is not isolated from more distal contexts, including macrosystem contexts such as culture. For example, children understand emotions within the family context (Dunsmore & Halberstadt,

1997; Eisenberg et al., 1998); thus, children understand emotions that are experienced and expressed by members of the family system and develop this understanding in part as a function of factors within the family system including parents' emotion-related beliefs and behaviors and parents' own emotion understanding skills (Castro et al., 2014). In this way, the family may be considered the proximal environment in which children's emotional functions develop (Bronfenbrenner, 1979). In addition, we know that children's emotion understanding is also embedded within a broader cultural context (Castro et al., in press), and that this context influences children's developing skills (Saarni, 2000; Zeman & Garber, 1996). Individual development is thus situated within multiple levels of environmental systems and consideration of one system necessitates consideration of others.

However, it is incomplete to describe the persons-in-context perspective as only representing the influence of environmental systems on individual functioning. That is, persons-in-context may also describe the *mutually reciprocal transactions between individuals and environments* (Sameroff, 2009). Bidirectional person-environment effects have been emphasized within the emotion socialization literature for several decades (i.e., Bell, 1968). Yet, most research in emotion understanding development has neglected this perspective when interpreting socialization functions, perhaps due to the constraints of cross-sectional research designs. The persons-in-context perspective indicates that it is important to consider the ways in which children influence parents' socialization processes, and how these transactions then contribute to changes in children's emotion understanding. Evidence of shifts in the utility of supportive socialization processes for elementary-school-aged

children's emotion understanding (e.g., Castro et al., 2014; Dunsmore et al., 2009) points to the importance in examining transactions from children to parents.

Developmental functions may be reorganized in response to changes across systems. A third principle of developmental science emphasizes that *systems are continually reorganized over time, and in response to changes at various levels in and across systems* (Magnusson & Cairns, 1996). Thus, changes in social and cognitive functions may have important implications regarding the structure of emotion understanding.

For example, the few studies that have examined the structure of children's emotion understanding indicate that a two-factor structure is sufficient in early childhood (Barbosa-Leiker et al., 2014; Bassett et al., 2012). This factor structure may reflect a match between maturation (i.e., the emotion understanding skills that young children possess) and the demands of children's social environments. Parents of young children may expect children to have basic skills in identifying and labeling emotional expressions and knowing about emotional causes and consequences; these expectations may result in parents creating opportunities for children to practice these skills. In return, children may engage in those skills that they deem relevant for their given context—thereby meeting parents' expectations.

However, it may be inaccurate to assume that a two-factor structure that works with young children would demonstrate maintenance over time, because children continue to experience maturational changes alongside changes in their social environment. Thus, emotional functions may be reorganized as an adaptive response to changes both within and across systems. That is, children's emotion understanding skills may be reorganized over

time, and in relation to changes in cognitive and social functions. This appears to be supported by research with third-grade children, which found that a three-factor solution fit the data significantly better than two- and one-factor structures (Castro et al., under review). The assessment of a wider range of emotion understanding skills may have contributed to these findings, as the inclusion of diverse skill sets likely results in greater differentiation than coherence.

It is important to note that this study assessed skills relevant to third-grade children, such as knowledge regarding emotional regulation strategies and emotional hiding, complex and mixed emotional states, and emotions embedded within dynamic, interpersonal contexts (Castro et al., under review). These skills are not only more complex than those assessed in structural analyses with young children (perhaps demonstrating maturational advances in emotion understanding), but may also reflect adaptations to advances in children's social and cognitive systems. For example, as children move from early childhood to middle childhood, they experience gains in important cognitive skills that contribute to emotion understanding, including cognitive flexibility, goal setting, and information processing skills (Anderson, 2002). These cognitive skills may facilitate children's abilities to analyze, interpret, and integrate emotions in ways that appropriately match their environmental demands; that is, children in middle childhood are expected to understand emotional messages that are communicated using multiple, mixed, and fragmented cues (Halberstadt, Parker, & Castro, 2013; Pons et al., 2004). Therefore, changes in contextual demands and changes in children's cognitive skills may act together to influence children's emotion understanding in ways that

promote systematic reorganization of skills through increased differentiation and integration. Continued reorganization is also possible, given that a four-factor structure of emotion understanding also demonstrated adequate fit in third-grade children (Castro et al., under review).

These findings suggest an additional point—that *interactions among systems may also be reorganized over time* (Magnusson & Cairns, 1996). Consider the example of parental socialization of emotion. Often research in this domain includes examination of the interaction between two systems (i.e., parents' contributions to child functioning). The influence of one system on the other may shift over time, and this shift may have consequences to the developing individual. For example, socialization processes that appear to promote emotional adaptations in early childhood may actually inhibit emotional development in older children (Castro et al., 2014). As discussed briefly above, this finding may reflect parents' responses to children's emotional difficulties; such an interpretation is suggestive of bidirectional or transactional effects. However, it is also possible that this finding reflects a mismatch between children's emotional functioning and parents' socialization strategies. As children age, they desire more emotional and behavioral autonomy, and if these needs are not met by parents this could result in negative emotional outcomes in children. The parental socialization system may thus be reorganized to accompany changes in the child system (i.e., advancements in cognitive and social functions). More research is needed to identify specific factors within and across systems that contribute to this reorganization over time.

Summarizing the gains from developmental science perspectives. The application of developmental science to emotion understanding research presents several interesting points. First, emotion understanding development is a function of multiple coordinated systems that are integrated, fused, and reorganized over time. Second, this synthesis includes reciprocal transactions across levels within and without the individual. Research must thus attempt to conceptualize and assess emotion understanding as an integrated synthesis; otherwise, developmental representations will remain incomplete. The results presented in this dissertation are a first attempt in presenting such an integrated analysis: Emotion understanding is a skill that not only changes in level with age, as has been demonstrated by previous research, but, based on my own work in conjunction with the work from early childhood (Barbosa-Leiker et al., 2014; Bassett et al., 2012), seems to demonstrate reorganization of systems (Castro et al., under review; Castro et al., 2014), and to be well-embedded within distal and proximal contexts (Castro et al., in press; Castro et al., 2014). Application of developmental science principles may thus advance the field of emotion understanding, and the emotion literature more broadly.

Limitations

The conceptual model presented in Chapter 2 serves as a starting point for examinations regarding how emotion understanding is conceptualized across the lifespan, both theoretically and empirically. Thus, the EUREKA model likely does not account for *all* emotion understanding skills that are developmentally relevant; indeed, the model does not specify developmental functions at all. Instead, the model serves to stimulate the field by

explicitly considering the different skills that comprise the broad construct of emotion understanding, considering whether these skills are sufficiently assessed in the literature, and considering whether such assessments then adequately reflect the broad construct of emotion understanding. In this way, the EUREKA Model maintains a degree of flexibility, in that future research can and should aim to verify the skills sets identified in the review, and if applicable, extend these conceptualizations to identify additional skill sets as directed toward various foci.

In addition, the EUREKA Model is somewhat simplified with regard to the presentation of different foci; the self, specific others, and general others are represented as three individual columns in the model. Yet, in reality, there may be several columns for specific others, such as a column for one's brother, spouse, best friend, supervisor, etc. This model thus serves as an illustrative tool that may be further specified in future iterations of the model.

The conceptualization presented in Chapter 2 provides a map from which structural relations among different skills may be tested. This structural organization was examined partially in Chapter 3. However, the measures included in this study did not capture the full spectrum of skills as delineated by the EUREKA Model. Thus, it is still not clear what type of structure might emerge if all nine skill sets are assessed. Moreover, it is possible that structures vary not only by the skills assessed, but by specific skill-foci combinations. The findings presented in Chapter 3 make a compelling case that emotion understanding is at least multidimensional in middle childhood, and the study assessed a greater variety of skills,

as directed toward a greater variety of foci, than typically measured. Whether this three-factor structure is specific to the measures under study and/or the age group under study remains unclear. Indeed, this is a known limitation of structural modeling statistical techniques. Given that only three studies in total have tested the structural organization of emotion understanding skills, the field is in need of more research in this area. Perhaps the EUREKA Model will serve as a tool in facilitating such research, as skill sets are cohesively identified and located within existing measures of emotion understanding.

It is also important to note that some of the emotion understanding measures presented in Chapter 3 failed to demonstrate adequate reliability (i.e., $\alpha s < 0.60$). Although low reliability estimates are a normative characteristic of emotion understanding measures (see Hall & Bernieri, 2001), such estimates may limit the interpretation of structural analyses. Indeed, some factor loadings were below traditional thresholds (i.e., $< .30$), perhaps reflecting the overall lack of significant correlations observed among emotion understanding indices. However, such thresholds are considered guidelines rather than explicit rules (Byrne, 2010). To the extent that low reliability estimates reflect error in the measurement model, it may be argued that structural results based on these emotion understanding measures are unreliable and thus unlikely to be generalized across studies. However, two important considerations must be made. First, the measures used in the study are representative of those used in the literature broadly. Thus, the literature is reliant upon interpretations based on such measures despite low reliability estimates. Second, the structural analyses confirmed theoretical models that distinguish skills in recognizing emotional expressions from

knowledge about emotions (e.g., Denham, 1986), and also confirmed developmental models that differentiate basic and advanced components of emotion knowledge (e.g., Pons et al., 2004). Thus, the structural results are supported by the literature.

The studies presented in Chapters 3 and 4 include only cross-sectional data, and thus are limited in explaining developmental processes underlying emotion understanding. Instead, these studies provide descriptive information. It is worth noting that these studies did assess multiple developmental systems (children and parents), and such assessment is considered adequate by developmental science standards. However, the field should strive for exceptionality, not adequacy. The studies presented in this dissertation were limited in considering multiple levels of influence *within* children, including the engagement between biological and social systems as observed through functions such as temperament, attachment, and reactivity. The studies were also limited in assessing multiple contexts at the broad environmental level, including cultural values about emotion and cultural values regarding parents' roles in children's emotional development. Future research would benefit from the application of developmental science to better examine how emotion understanding develops as a function of organized and integrated systems as embedded within a variety of contexts. Translational research that includes a multidisciplinary approach may prove particularly useful in these endeavors.

Future Directions

The combined body of work addressed some unresolved questions regarding the conceptualization, structural organization, and socialization of emotion understanding. In

doing so, several directions for future research have already been noted in previous chapters and in earlier sections of the present chapter. Below, I explore some additional areas for future research.

The results presented in this dissertation highlight how little we know about emotion understanding development in everyday life. For example, research is limited in assessing the understanding of familiar others' emotions. Some primary questions stemming from this gap in the literature concern the types of skills employed in everyday life: What skills do individuals use to understand emotions in real life? What do these skills look like, and do existing measures of emotion understanding adequately tap into these types of skills? To begin to address these questions, researchers should aim to develop ecologically informed approaches to study emotion understanding in and out of the laboratory. Such an approach might involve first identifying emotion understanding skills as they occur in real life and as directed toward real targets at a variety of ages. Studies could employ experience sampling research designs to collect descriptive data on the types of emotion understanding skills children and adults report using in everyday life, the foci of this understanding, the perceived importance of these skills, and the perceived efficacy of these skills. A similar approach has recently been employed by aging researchers (e.g., Raters, Blanke, & Riediger, 2013), but has not yet been adopted by researchers in child and adolescent emotion understanding development.

Information regarding everyday emotion understanding will be useful in providing an accurate depiction of emotion understanding skill development across the lifespan. For

example, findings may reveal interesting patterns of skill use across the lifespan. Targets may become increasingly more familiar as individuals age, as would be consistent with aging theories that emphasize age-related increases in social network selectivity (e.g., English & Carstensen, 2014; Wrzus, Hänel, Wagner, & Neyer, 2013). These patterns may be examined in future studies.

Descriptive information is only the first step in answering questions regarding everyday emotion understanding. The descriptive information gathered from experience sampling designs may then be used to create stimuli for use in the laboratory setting. For example, it may be relevant to create tasks that depict children spontaneously interacting with their peers, as such interactions likely comprise the types of skills children use in real life contexts (such as at school). Developmental research in the field of emotion has largely neglected this possibility, as children are administered de-contextualized tasks that often (although not always) involve the understanding of unfamiliar or imagined others' emotions. In older adulthood, it may be similarly important to design stimuli that include familiar others expressing and experiencing emotion, as such stimuli will likely elicit higher levels of performance through selective engagement processes (Hess, 2014). The clear advantage of such an approach is that stimuli will be reflective of the types of skills employed in real life, thus illustrating direct application of the persons-in-context developmental science perspective. However, it is important to note that such research should also include a variety of outcome-oriented measures to determine the unique predictive variance associated with ecologically informed measures; that is, it is important to demonstrate that these measures are

better at predicting emotional well-being, psychosocial adjustment, and other competencies than traditional, de-contextualized measures of emotion understanding.

It is also important that future research consider individuals' perceptions of their own emotion understanding skills, including perceptions about the importance and efficacy of these skills. These perceptions may reflect motivational processes that impact the development of emotion understanding. For example, individuals may develop more accurate understanding for those skills they deem most important; indeed, research with older adults seems to suggest that motivational appraisals are important to the maintenance of social, cognitive, and emotional skills in old age (Hess, 2014). For children and adolescents, perceptions regarding the importance of skills may similarly impact development. We may expect importance to shift across childhood and adolescence, as young children may be more motivated to understand emotions in family members than in peers, but adolescents may be more motivated to understand emotions in peers than in family members. Moreover, perceptions regarding efficacy may also impact skill development, as individuals may engage more resources in cultivating weak emotion understanding skills as a means to establish or maintain interpersonal harmony. The extent to which individuals are aware of their own skill levels, and are able to evaluate such skills as important or not, is likely dependent upon advanced metacognitive skills involved in self-reflection and self-evaluation. Thus, research would benefit from the consideration of how cognitive functions involving metacognition and motivation promote the development of emotion understanding skills across the lifespan.

Such research would include the synthesis of cognitive and socioemotional functions, thus furthering the quality of research through the use of developmental science principles.

A related area of inquiry involves the degree to which the understanding of emotions generalizes across foci; that is, how does emotion understanding in one focus influence understanding in another? As noted briefly above, children do use information about their own emotions to attribute emotions to others (Harris et al., 2014). However, the opposite pattern of influence is also likely. Individuals from collectivistic cultures may use knowledge of other people's emotions to attribute emotions to themselves, given the cultural emphasis on interdependence and connectedness (Markus & Kitayama, 1991). In contrast, individuals from individualistic cultures may be more likely to use internal cues, including facial feedback, to understand their own emotions as compared to individuals from collectivistic cultures (Levenson, Ekman, Heider, & Friesen, 1992). Research may build upon these findings to examine how emotion understanding may generalize across foci as a function of integrated emotional and cultural processes.

In addition to conceptualizing emotion understanding development using ecological methods, it is important that future research continue to consider the structural organization of emotion understanding skills. The results with third-grade children presented in this dissertation (Castro et al., under review) support a three-dimensional structure of emotion understanding. The finding that a four-factor solution also fit the data significantly better than alternative two- and one-factor structures implies that emotion understanding skills may continue to differentiate with age. This structure differed from the three-factor structure in

the separation of knowledge regarding emotion regulation into a fourth factor. Knowledge regarding the regulation of emotions may be increasingly more salient and relevant as children age, due to maturational changes in children's actual emotion regulation skills (Eisenberg & Morris, 2002), and changes to environmental contexts (e.g., transition from primary to secondary education system). Thus, it is possible that the four-factor structure will demonstrate significantly better fit to the data than a three-factor structure in adolescence, as maturational and contextual changes may place constraints on the emotional system that promote reorganization of skills. Future research should explore this hypothesis by including samples with older children and adolescents.

The findings presented in this dissertation also highlight the need for future research to consider bidirectional socialization effects. Findings with school-aged children suggest that socialization processes supportive of emotion understanding development in young children may not be supportive in older children (Castro et al., 2014; Dunsmore et al., 2009). These results imply the possibility of transactional pathways between parents and children. Longitudinal assessments that include the same measures over time are thus needed to better identify these pathways and more importantly, to identify the direction of transactions. Such research could for example employ cross-lagged models to test for the effect of parental socialization processes over time in predicting changes in children's emotion understanding, while also testing for the effect of children's emotion understanding over time in predicting changes in parental socialization. Studies may thus include the same socialization and

emotion understanding measures across multiple time points to better identify transactional effects.

However, it is not sufficient to simply maintain measurement continuity, because the *meaning* of particular socialization processes (including supportive responses), likely shifts with child age. Thus, these lines of research should also include qualitative assessments that allow for developmental adaptations. For example, behaviors may be coded with schemes that account for children's perceived needs for socialization and children's actual emotional skill levels. Given the possibility of transactional effects, it is also important to examine children's perceptions regarding parents' socialization efforts. Some research suggests that children's perceptions regarding parents' autonomy support and involvement impacts children's competence at school (Grolnick, Ryan, & Deci, 1991); these perceptions may similarly impact children's emotional functions.

Lastly, a unique area for future research involves the examination of parental socialization factors as integrated rather than independent factors. Parents likely engage in a variety of processes that overlap and cohere and are thus not entirely isolated from each other. Future research should examine the ways in which parents engage in a collection of socialization processes, rather than modeling processes as independent factors. Such research would thus involve a person-centered approach rather than a variable-centered approach; person-centered approaches are considered the gold standard by developmental science as they allow for the examination of the whole individual rather than a focus on an isolated variable. There are some preliminary findings in this area with young children and parental

emotional expressiveness. For example, Nelson and colleagues (2012) used cluster analysis to create parental expressiveness profiles; this approach thus allows the independent and simultaneous examination of positive and negative expressiveness dimensions. The results provide a clearer and more precise description of the family affective climate. Future research may extend these findings to include additional socialization factors, such as beliefs about emotions and emotion-related skills, to create multi-faceted parental socialization profiles. Longitudinal studies may then determine which profiles appear the most adaptive for children's socioemotional development at different ages. Following the transactional effects noted above, it may also be useful to identify factors that predict change in these socialization profiles, including internal factors (e.g., parental stress and depression) and external factors (e.g., child emotional difficulties). Such an approach is again consistent with developmental science principles that emphasize the need to assess development as an integrated synthesis of functions across systems.

Final Remarks

The field of emotion understanding is in a period of flux. Although general maturational trajectories have been mapped out, the integration of maturational functions with experiential (e.g., everyday emotion understanding experiences, as embedded within everyday contexts) and cultural (e.g., broad cultural frameworks; familial processes) functions requires further attention. This dissertation presents a first step in advancing the emotion literature by applying developmental science to the study of emotion understanding conceptualization, structural organization, and socialization. Future research in this domain

would benefit from the continued application of principles that emphasize the integrated, contextual, and organized nature of emotion understanding development.

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