EXAMINING RELATIONSHIPS AMONG PRE-SERVICE PROFESSIONALS' COURSEWORK, KNOWLEDGE, BELIEFS, AND PRACTICES RELATED TO CHILDREN'S SOCIAL-EMOTIONAL DEVELOPMENT

By

Tamesha N. Harewood

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

Human Development and Family Studies - Doctor of Philosophy

2016

ABSTRACT

EXAMINING RELATIONSHIPS AMONG PRE-SERVICE PROFESSIONALS' COURSEWORK, KNOWLEDGE, BELIEFS, AND PRACTICES RELATED TO CHILDREN'S SOCIAL-EMOTIONAL DEVELOPMENT

By

Tamesha N. Harewood

Children's early social-emotional development is important to their lifelong learning, academic success, and school readiness. With greater focus on high-quality early care experiences and increasing numbers of children enrolled in early education and care settings, the role of early childhood teachers has become more important to children's development. However, many children enter kindergarten lacking social-emotional skills and many early childhood teachers report being unprepared to support children's social-emotional development. Institutions of higher education provide opportunities for teachers to improve their knowledge and skills, and meet standards in the early childhood education field, which expect teachers to have knowledge of children's development and strategies to support children's learning and development across domains. Yet, research has only examined basic links between education and classroom quality, limiting our understanding of what educational experiences contribute to teachers' development of knowledge and skills to work with young children. One current impediment to this line of research is the lack of existing tools to assess teacher knowledge. In the current research, a tool was created to assess pre-service teachers' knowledge of social-emotional development and its psychometric properties tested in Study 1, this tool was then used to answer more substantive questions related to teachers' coursework, knowledge, beliefs, and practices in Study 2. These were cross-sectional studies using a convenience sample of undergraduate students at a Midwestern university in the United States. Participants included 160 students enrolled in courses through a Human Development and Family Studies department. In Study 1, the

Knowledge of Social-Emotional Milestones and Support Strategies (K-SEMS) tool was determined as having two indices (the Knowledge of Social-Emotional Milestones index and the Knowledge of Social-Emotional Support Strategies Index), which were valid and moderately reliable. Study 2 found pre-service teachers who took more domain-specific coursework had more accurate knowledge of preschoolers' social-emotional milestones and strategies, as well as higher endorsements of beliefs about expressing and support emotions in the classroom. Observing a subsample of the larger 160 participants, Study 2 also found pre-service teachers (n = 33) with more accurate knowledge and higher endorsements of instruction/modeling beliefs about emotions more frequently used developmentally supportive social-emotional practices in the classroom. These findings have implications for research, policy, and practice related to the education and development of early childhood teachers.

ACKNOWLEDGMENTS

If God brought you to it, He will bring you through it! This has been my motto and my belief throughout my graduate career, so I would first like to acknowledge God for bringing me through this process and placing the people I needed along the way in my life.

What a process and experience graduate school has been. I have grown in so many ways and have learned many things from many wonderful people. I would like to thank you Claire, my mentor, and cheerleader in so many ways, for your relentless support and for caring so much about my success, and my professional development. You truly are a rare gem, with a beautiful mind. I will forever cherish my time working with you as a student and look forward to working with you as a colleague. Your example of mentorship should be published everywhere, but until it is, I will take the experience with me in my future career and prayer I can be to my students what you were for me, a place of hope and encouragement. Thank you!

To my other committee members – Dr. McNall, Dr. Fitzgerald, and Dr. Brophy-Herb – thank you for your guidance, for your strong and valued feedback, and for not letting me try to examine the whole world in this dissertation. I would also like to thank Dr. Johnson, who has cheered me on and supported me in so many ways. You truly are an awesome person.

To my loving family and friends, I cannot even begin to say how eternally grateful I am to all of you. You have sacrificed so much for me to accomplish this goal.

To my husband Karl, thank you for being my rock and cheerleader. You picked up the slack with our children when I was too tired to be mommy and you made sure we did not lose all of our family time to school work. Thank you for keeping me focused and balanced and not letting me work myself to death. I love you forever.

To my wonderful children, Jordan and Jesse, thank you for coming into our lives when you did. You made me prioritize and manage my time more effectively. I love you both and look forward to spending a lot more time with you my darlings.

To my mom, Margaret Watson, my dad, sisters and brother, my nieces and nephews, I love you and thank you for your continuous prayers, checking in on me, and support from far away. You didn't understand this journey but you always believed I could do it. Telisa, I hope I was a good example for you; I am looking forward to your graduation next.

To Walton and Karlene Phillips, I do not know how I would have done this without your sacrifice. I am forever indebted to you and cannot tell you enough how much I appreciate and love you both. Thank you for your prayers, encouragement, and love. Glenn, thank you for making me even think about pursuing a Ph.D. and for always being there and making me laugh. Tina my dear, you are next. I couldn't have asked for a sweeter more loving sister-in-law. See you on the other side, honey!!

Last but certainly not least; I would like to thank my APOC church family, too many names to mention. I am so blessed to have each of you in my life. Thank you all for your unending love. Thank you to those who sent me care packages, messages of encouragement along the way, hugged me until I couldn't breathe, and definitely for your many thoughtful prayers. I love you all!

To all my other family in Barbados, New York, Maryland, and everywhere, thank you, thank you, thank you!

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

Justification for Current Research

Social-emotional (SE) development in early childhood predicts subsequent school and life success (Boyd, Barnett, Bodrova, Leong, & Gomby, 2005; Cohen, Onunaku, Clothier, & Poppe, 2005; Romano, Babchishin, Pagani, & Kohen, 2010; Shonkoff & Phillips, 2000). Further, children who lack social and emotional skills at school entry may be subjected to peer rejection and experience conflictual or distant relationships with teachers (Berry, 2012; Miller et al., 2005), which can further affect their academic performance and social adjustment (Engle, McElwain, & Lansky, 2011; Howes, 2000; Rhoades, Warren, Domitrovich, & Greenberg, 2011; Trentacosta & Izard, 2007; Vitaro, Boivin, Brendgen, Girard, & Dionne, 2012).

A growing body of child development research and numerous reports demonstrate that the quality of early care and education (ECE) experiences is important for young children's school readiness and later outcomes (Burger, 2010; Mashburn et al., 2008). Early care and education settings provide opportunities for children to receive much-needed support for their social-emotional skills, with both immediate and long-term impacts for their development, well-being, and academic success. More specifically, the most important element in ECE settings is the teacher/care provider and the quality of his or her interactions with children (Baker, 2006; Baker, Clark, Maier, & Viger, 2008; Burchinal, Roberts, Zeisel, Hennon, & Hooper, 2006; Hamre & Pianta, 2001; Howes, 2000; Mitchell-Copeland, Denham, & DeMulder, 1997; Pianta & Stuhlman, 2004; Rimm-Kaufman & Hamre, 2010). When the teacher-child relationship is negative it affects children's social behaviors, with children more likely to be disruptive in class, cooperate less, dislike school, and display aggressive behaviors towards others (Elicker & Fortner-Wood, 1995; Hamre & Pianta, 2001; Howes, 2000; Ladd, Birch, & Buhs, 1999; Ladd &

Burgess, 2001; Pianta & Stuhlman, 2004). But when teachers interact with children in positive ways, these interactions foster children's positive emotional development and build a sense of security that encourages children's active engagement in the social and academic opportunities provided by the classroom (Pianta, La Paro, Payne, Cox, & Bradley, 2002).

Further, research indicates that the developmental needs of children may best be met by teachers with specialized education and training from teacher preparation programs in child development and early childhood education (Burchinal, Cryer, Clifford & Howes, 2002; Howes, 1997). Hence, teachers' abilities to support the social-emotional development of all children, even those with challenging behaviors, are crucial, but may depend in large part on the preparation they receive to provide such support. Essentially, what teachers know and do are fundamental factors in the quality of educational and developmental experiences they provide to young children, and can have long-lasting effects on children's subsequent development. However, the teacher education literature related to development of teachers' knowledge and skills to work with young children is quite sparse, and there is very little understanding about how pre-service teachers' educational experiences contribute to their effective teaching and support in the classroom. Thus, educators of pre-service early childhood teachers in institutions of higher education are left to assume that the education these teachers receive improves their knowledge and skills and adequately prepares them for their future work with young children. However, reports of early care and education professionals feeling unprepared to meet the social-emotional needs of children, especially those with difficult behavior, coupled with the high rates of preschool expulsions (Gilliam, 2005; Hemmeter, Corso, & Cheatham, 2006) suggest a need to more closely examine early childhood teachers' preparation, such as associations between their

educational experiences and educational outcomes, to better understand which educational factors produce effective teachers of young children.

Institutions of higher education provide a context for early childhood teachers not only to gain knowledge, but to learn and practice skills for their future work with children. It is expected that early childhood programs will improve teachers' knowledge of children's development in all domains and equip them with effective teaching strategies to support children's development. In the US, however, there is no single level of education required for early care and education teachers/caregivers. Different levels of formal education, from high school diplomas through masters degrees, as well as non-credit-bearing early childhood certifications (e.g., the CDA), can all be considered acceptable qualifications for individuals working directly with children in early childhood settings, depending upon the specifications of the individual programs and their funding sources. Given this wide range of acceptable levels of training, it is not surprising that debates about the relevance of education to teachers' practices continue to arise. Research in this area has produced mixed findings, with recent meta analyses refuting the effects of education on teacher outcomes (Early et al., 2006; Early et al., 2007), which does not contribute clarity to this debate. Nonetheless, research in this area generally suggests that more formal education -- used in both research and hiring practices as a proxy for knowledge and skills -- is associated with overall classroom quality and linked to better cognitive and social outcomes for children (Arnett, 1989; Bowman, Donovan, Burns, & the Committee on Early Childhood Pedagogy , 2000; Burchinal et al., 2002; Cassidy, Buell, Pugh-Hoese, & Russell, 1995; Howes, 1997; Whitebook, 2003; Whitebook et al., 1989). But what pre-service teachers know about child development, how they obtain this knowledge, and how this knowledge influences their classroom practices remain substantial gaps in the research on early care and education, despite the generally

accepted idea that teachers' knowledge of child development is important (National Association for the Education of Young Children [NAEYC], 2009).

While the examination of the relationship between knowledge and practices is important, it is incomplete without considering the influence of beliefs. Beliefs are defined as concepts individuals hold to be true that are based on personal judgment and evaluation regardless of an evidence-base (Pajares, 1992). Research indicates that teachers' beliefs predict their classroom behaviors and affect their planning and execution of classroom activities and curriculum, and interactions with children (Faulkner-Schneider, 2005; Hur, Buettner, & Jeon, 2013; Stipek & Byler, 1997). Further, earlier researchers suggest that teachers' instructional judgments and classroom decisions are based less on their knowledge and more on their beliefs about a topic or teaching area (Nisbett & Ross, 1980; Shavelson, 1983). However, only a few studies have incorporated both knowledge and beliefs as predictors of teachers' practices. Even fewer have addressed the role of domain-specific beliefs, such as those about early math, literacy, or social-emotional development, related to knowledge and teacher practices. Findings indicate domain-specific beliefs are important because they may influence teacher expectations of and behaviors toward children, thereby determining the teaching strategies used by teachers related to the subject (Schirmer, Casbon, & Twiss, 1997); these findings further support the inclusion of beliefs as an important factors to consider when examining associations between teachers' knowledge and practices. Thus, a goal of the current study was to determine whether an aspect of teachers' educational experiences—college coursework—influences teachers' domain-specific knowledge and beliefs (about the social-emotional domain), whether teachers' domain-specific knowledge is associated with their domain-specific classroom practices, and what role, if any, beliefs play in the relationship between knowledge and practices.

One current barrier in this line of research is the lack of adequate measurement tools to assess teachers' domain-specific knowledge related to social-emotional development. Instruments measuring pre-service teachers' knowledge relevant for their future work performance are limited in the field of early childhood. Thus far, there have been efforts to develop instruments about teachers' knowledge of early literacy, science, technology, and math (Blomeke, Buchholtz, Suhl, & Kaiser, 2014), but no known work to develop a measure appropriate for measuring teachers' knowledge of children's social-emotional development or the teaching practices which support it. There is one measure of adults' knowledge of child development used in research and linked to adults' education, the Knowledge of Infant Development Inventory (KIDI; MacPhee, 1981). However, the relevance of this measures is limited for preschool teachers because although it covers a broad range of knowledge across numerous domains in addition to social-emotional development, it focuses on parenting and the home context, and on children between birth and 2 years old; it does not address the classroom setting or teaching practices, and does not have questions relevant to preschool aged children. Thus, the field of early child education, and specifically teacher preparation, is lacking an adequate measure of pre-service professionals' knowledge of young children's social-emotional development and related classroom practices. Another goal of the current study was to develop an instrument to measure pre-service early childhood teachers' knowledge of preschoolers' social-emotional development and strategies to support SE development. This measure will be used to gather data to address substantive questions about the relations among pre-service teachers' courses, knowledge, beliefs, and skills.

The present study aimed to resolve several limitations in the current scientific literature on the professional development of early childhood educators by (1) developing an instrument to

measure knowledge of children's social-emotional development and strategies to support this development, and (2) testing a theoretical model of relationships among coursework, knowledge, beliefs, and practices.

REFERENCES

REFERENCES

Arnett, J. (1989). Caregivers in day-care centers: Does training matter*? Journal of Applied Developmental Psychology, 10*, 541–552.

Baker, J. A. (2006). Contributions of teacher–child relationships to positive school adjustment during elementary school. *Journal of School Psychology, 44*, 211–229.

Baker, J. A., Clark, T. P., Maier, K. S., & Viger, S. (2008). The differential influence of instructional context on the academic engagement of students with behavior problems. *Teaching and Teacher Education, 24*,1876–1883.

Blomeke, S., Buchholtz, N., Suhl, U., & Kaiser, G. (2014). Resolving the chicken-or-egg causality dilemma: The longitudinal interplay of teacher knowledge and teacher beliefs. *Teaching and Teacher Education, 37*, 130–139.

Boyd, J., Barnett, S., Bodrova, E., Leong, D., & Gomby, D. (2005). Policy report: Promoting children's social emotional development through preschool education. National Institute for Early Education Research (NIEER), New Brunswick: NJ.

Burchinal, M. R., Cryer, D., Clifford, R. M., & Howes, C. (2002). Caregiver training and classroom quality in child care centers. *Applied Developmental Science, 6*, 2–11.

Burchinal, M., Roberts, J. E., Zeisel, S. A., Hennon, E. A., & Hooper, S. (2006). Social risk and protective child, parenting, and child care factors in early elementary school years. *Parenting: Science and Practice, 6*, 79–113.

Burger, K. (2010). How does early childhood care and education affect cognitive development? An international review of the effects of early interventions for children from different social backgrounds. *Early Childhood Research Quarterly, 25*, 140–165. doi:10.1016/j.ecresq.2009.11.001

Cassidy, D., Buell, M., Pugh-Hoese, S., & Russell, S. (1995). The effects of education on child care teachers' beliefs and classroom quality: Year one evaluation of the TEACH early childhood associate degree scholarship program. *Early Childhood Research Quarterly, 10*, 171–183.

Cohen, J., Onunaku, N., Clothier, S., & Poppe, J. (2005, September). Helping young children succeed: Strategies to promote early childhood social and emotional development. Washington, DC: Zero to Three and the National Conference of State Legislatures.

Early, D., Bryant, D., Pianta, R., Clifford, R., Burchinal, M., Ritchie, S., … Barbarin, O. (2006). Are teacher education, major, and credentials related to classroom quality and children's academic gain in pre-kindergarten? *Early Childhood Research Quarterly, 21*, 174–195.

Early, D. M., Maxwell, K. L., Burchinal, M., Alva, S., Bender, R. H., Bryant, D., … Zill, N. (2007). Teachers' education, classroom quality, and young children's academic skills: Results from seven studies of preschool programs. *Child Development, 78*, 558–580.

Elicker, J. & Fortner-Wood, C. (1995). Research in review: Adult–child relationships in early childhood settings. *Young Children, 51*, 69–78.

Engle, J. M., McElwain, N. L., & Lasky, N., (2011). Presence and quality of kindergarten children's friendships: Concurrent and longitudinal associations with child adjustment in the early school years. *Infant and Child Development, 20*, 365–386.

Faulkner-Schneider, L. (2005). *Child care teachers' attitudes, beliefs, and knowledge regarding science and the impact of early childhood learning opportunities*. (Unpublished thesis). Oklahoma State University, Norman: Oklahoma.

Gilliam, W. (2005). Prekindergarteners left behind: Expulsion rates in state prekindergarten systems. New York, NY: The Foundation for Child Development.

Hamre, B. K., & Pianta, R. C. (2001). Early teacher–child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development, 72,* 625–638.

Hemmeter, M. L., Corso, R., & Cheatham, G. (2006). Issues in addressing challenging behaviors in young children: A national survey of early childhood educators. Paper presented at the Conference on Research Innovations in Early Intervention, San Diego, CA.

Howes, C. (1997). Children's experiences in center-based child care as a function of teacher background and adult–child ratio. *Merrill-Palmer Quarterly, 43*, 404–425.

Howes, C. (2000). Social-emotional classroom climate in child care, child–teacher relationships and children's second grade peer relations. *Social Development, 9*, 191–204.

Ladd, G. W., Birch, S. H., & Buhs, E. S. (1999). Children's social and scholastic lives in kindergarten: Related spheres of influence? *Child Development, 70*, 1373–1400.

Ladd, G. W., & Burgess, K. B. (2001). Do relational risks and protective factors moderate the linkages between childhood aggression and early psychological and school adjustment? *Child Development, 72*, 1579–1601.

Mashburn, A., Pianta, R., Hamre, B., Downer, J., Barbarin, O., Bryant, D., … Howes, C. (2008). Measures of classroom quality in prekindergarten and children's development of academic skills. *Child Develoment, 79*, 732-749.

MacPhee, D. (1981). *Knowledge of Infant Development Inventory*. Princeton, NJ: Educational Testing Service.

Miller, A. L., Gouley, K. K., Seifer, R., Zakriski, A., Eguia, M., & Vergnani, M., (2005). Emotion knowledge skills in low-income elementary school children: Associations with social status and peer experiences. *Social Development, 14*, 637–651.

Mitchell-Copeland, J., Denham, S., & DeMulder, E. (1997). Q-Sort assessment of child–teacher attachment relationships and social competence in the preschool. *Early Education and Development, 8*, 27–39.

National Association for the Education of Young Children [NAEYC]. (2009). *Position statement: Developmentally appropriate practice* (3rd ed.). Washington, DC: Author.

Nisbett, R., & Ross, L. (1980). *Human inferences: Strategies and shortcomings of social judgment.* Englewood Cliffs, NJ: Prentice-Hall.

Pajares, M. F. (1992). Teacher beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research, 62*, 307–332.

Pianta, R. C., La Paro, K. M., Payne, C., Cox, M. J., & Bradley, R. (2002). The relation of kindergarten classroom environment to teacher, family, and school characteristics and child outcomes. *Elementary School Journal, 102*, 225–238.

Pianta, R. C., & Stuhlman, M. W. (2004). Conceptualizing risk in relational terms: Associations among the quality of child-adult relationships prior to school entry and children's developmental outcomes in first grade. *Educational and Child Psychology, 21*, 32–45.

Rhoades, B. L., Warren, H. K., Domitrovich, C. E., Greenberg, M. T. (2011). Examining the link between preschool social-emotional competence and first grade academic achievement: The role of attention skills. *Early Childhood Research Quarterly, 26*, 182–191.

Rimm-Kaufman, S. E., & Hamre, B. K. (2010). The role of psychological and developmental science in efforts to improve teacher quality. *Teachers College Record, 112*, 2988–3023.

Romano, E., Babchishin, L., Pagani, L., & Kohen, D. (2010). School readiness and later achievement: Replication and extension using a nationwide Canadian survey. *Developmental Psychology, 46*, 995–1007. doi:10.1037/a0018880

Schirmer, B., Casbon, J., & Twiss, L. (1997). Diverse learners in the classroom: Teacher beliefs about learning: What happens when the child doesn't fit the schema? *The Reading Teacher, 50*, 690–692.

Shavelson, R. (1983). Review of research on teachers' pedagogical thoughts, judgments, plans, and decisions. *Elementary School Journal, 83,* 392-413.

Shonkoff, J. P., & Phillips, D. A. (Eds.). (2000). *From neurons to neighborhoods: The science of early childhood development*. Washington, DC: National Academy Press.

Stipek, D., & Byler, P. (1997). Early childhood education teachers: Do they practice what they preach? *Early Childhood Research Quarterly, 12*, 305–325.

Trentacosta, C., & Izard, C. (2007). Kindergarten children's emotion competence as a predictor of their academic competence in first grade. *Emotion, 7*, 77–88.

Vitaro, F., Boivin, M., Brendgen, M., Girard, A., & Dionne, G. (2012). Social experiences in kindergarten and academic achievement in grade 1: A monozygotic twin difference study. *Journal of Educational Psychology, 104,* 366–380.

Whitebook, M. (2003). *Early education quality: Higher teacher qualifications for better learning environments—A review of literature.* Berkeley, CA: Institute of Industrial Relations, University of California.

Whitebook, M., Gomby, D., Bellm, D., Sakai, L., & Kipnis, F. (2009). *Preparing teachers of young children: The current state of knowledge, and a blueprint for the future.* Berkeley, CA: Center for the Study of Child Care Employment.

CHAPTER 2: STUDY 1

Development of the Knowledge of Social-Emotional Milestones and Support Strategies (K-SEMS, Preschool Version) Tool

The last two decades of research have made it clear that children's social-emotional development is important to their school readiness and success (Denham et al., 2013; Eisenberg, Valiente, & Eggum, 2010; McClelland et al., 2007; Raver, 2002). Early care and education settings are perceived as preparation for Kindergarten school-readiness (Hatcher, Nuner, & Paulsel, 2012). These settings provide opportunities for children to receive much-needed support for their social-emotional skills, with both immediate and long-term impacts for their development, well-being, and academic success. Further, the key elements in these settings are the characteristics of the teacher/care provider and the quality of his or her interactions with children (Baker, 2006; Baker, Clark, Maier, & Viger, 2008; Burchinal, Roberts, Zeisel, Hennon, & Hooper, 2006; Hamre & Pianta, 2001; Howes, 2000; Mitchell-Copeland, Denham, & DeMulder, 1997; Pianta & Stuhlman, 2004; Rimm-Kaufman & Hamre, 2010). Studies have shown that negative teacher-child relationships and interactions predict children's poor social behavior such as disruptions in class, lack of cooperation, disliking school, and aggressive behavior towards others (Elicker & Fortner-Wood, 1995; Hamre & Pianta, 2001; Howes, 2000; Ladd, Birch, & Buhs, 1999; Ladd & Burgess, 2001; Pianta & Stuhlman, 2004: Garner, Mahatmya, Moses, & Bolt, 2014). Conversely, teachers who interact with children in positive ways foster constructive social-emotional experiences for children and build a sense of security that encourages children's active engagement in the social and academic opportunities provided within the classroom (NICHD ECCRN, 1999; Pianta, La Paro, Payne, Cox, & Bradley, 2002). But many preschool teachers report feeling unprepared to address children's challenging

behaviors and effectively support their social-emotional development (Hemmeter, Corso, & Cheatham, 2006). Additionally, reports of high rates of preschool expulsions (Gilliam, 2005; Perry, Holland, Darling-Kuira, & Nadiv, 2011) seem to suggest that preschool teachers may be lacking the knowledge, skills, and/or dispositions necessary to support children's social-emotional development, particularly when children exhibit challenging behaviors.

Early Childhood Education and Practices

Federal policy initiatives and national programs requiring pre-K teachers to have bachelor's degrees suggest that one method to improve knowledge and skills is through education. Institutions of higher education provide a context for pre-service teachers to learn and practice such skills. But studies examining the relationships between teacher education and teacher's practices or overall classroom quality have revealed mixed findings, which have contributed to debates about the relevance of formal education to early childhood teachers' effectiveness in the classroom (Burchinal, Cryer, Clifford, & Howes, 2002; Early et al., 2006; Early et al., 2007). In general these studies measure basic associations between education level and classroom quality but do not examine more distinct features of teachers' educational experiences and teachers' educational outcomes (e.g., knowledge or skills). These inconsistent findings should not lead to the assumption that education is not important, but rather, encourage a closer examination of early education programs in institutions of higher education to better understand the variations within students' educational experiences which may explain inconsistencies in the links between education level and quality.

Knowledge of Social-Emotional Development

Professional standards set by influential agencies within the field of Early Care and Education (ECE), such as the National Association for the Education of Young Children

(NAEYC), Administration for Children and Families (ACF), and Division of Early Childhood Council for Exceptional Child (DEC/CEC), indicate that in order to guide children's development and promote learning, early childhood teachers should be knowledgeable about children's typical early development in all domains and have skills to support children's development. This includes knowing about the timing of crucial developmental milestones, as well as strategies, which support the development of these milestones. Social-emotional milestones may be defined as children's age-varying abilities to express and regulate emotions and respond to social interactions with others (Giles, 2015). As children grow older, their abilities to express and regulate emotions and respond to social interactions continue to expand and become more refined. Knowing about social-emotional milestones can inform teachers' expectations of children's behavior, and help teachers decide how to best support children's social-emotional behavior and development. Social-emotional support strategies, defined for this study as approaches taken by adults to support the development of social-emotional skills, may include encouraging children's expression of emotions, managing and redirecting behavior, modeling caring and positive regards for others, labeling one's own and children's emotions, and building positive relationships with children and their families (Kemple & Hartle, 1997). Having such knowledge may better prepare teachers to support children's social-emotional development and manage children's difficult behaviors. It is thus expected that early childhood teachers who lack knowledge of children's typical social-emotional development and the strategies to support this development are less likely to respond appropriately to children's social-emotional needs or use effective practices to promote their development.

With standards in the field communicating the expectation that teachers of young children should have knowledge of child development and strategies to support development in

order to promote children's development and learning across domains (NAEYC, 2009), it is surprising that little research has been conducted examining teachers' child development knowledge and relations between knowledge and practices. Given that early childhood teachers' child development knowledge, let alone knowledge of the social-emotional domain, has not been measured, it is difficult to adequately assess how pre-service early childhood teachers develop skills needed to support children's social-emotional learning and development, or to determine the training and professional development needs these teachers may have.

One current impediment to this line of research is the lack of adequate measurement tools to assess teachers' domain-specific knowledge of development and strategies related to supporting children's social-emotional development. Thus far, there have been efforts to develop instruments about teachers' knowledge of early literacy, science, technology, and math (Blomeke, Buchholtz, Suhl, & Kaiser, 2014), but no published work on measures appropriate for assessing teachers' knowledge of children's social-emotional development or strategies to support it.

Current Measures Related to Knowledge of Social-Emotional Development

Measures of adults' practices of caring for or interacting with young children, which are linked to children's social-emotional development have been created for parents, and are typically specific to the context of parenting. That is, they focus on the context of home rather than school, on responses to one child rather than children in groups, and on the many roles of parents, but not the roles of teachers. Further, these typically cover a whole range of parenting practices and care routines which support children's growth, health, and development across domains, and do not focus largely on the social-emotional domain. Examples of such measures include Caregiver Knowledge of Child Development Inventory (Ertem et al., 2007), Epstein High/Scope Knowledge Scale (1980), and the Knowledge of Infant Development Inventory

(KIDI; MacPhee, 1981). Other measures such as the Coping with Toddlers' Negative Emotion Scale (CTNES) and the Maternal Emotional Styles Questionnaire (MESQ) are more focused on children's social-emotional development and much closer to measuring parental socialization practices or responses to children's emotions, but still do not get at knowledge of social-emotional development. Meanwhile, measures such as the Parental Modernity Scale (Schaefer & Edgerton, 1985), the Parent Opinion Survey (Luster, Rhoades, & Haas, 1989), and the Adolescent Adult Parenting Inventory (Bavolek, 1984), while not specifically designed for teachers, include some practices, and might capture important attitudes and beliefs related to children's development, but do not measure knowledge of development or strategies for supporting development. A measure that is more focused on assessing early childhood teachers' knowledge related to the social-emotional domain is therefore needed.

Developing the Knowledge of Social-Emotional Milestones and Support Strategies Survey (K-SEMS)

As knowledge of child development and support strategies have been indicated as important factors in teachers' classroom decision-making and practices, developing an instrument to measure teachers' knowledge of social-emotional development is central to assessing how early childhood teachers develop skills to effectively support children's social-emotional development and learning. Such a tool could move the early childhood field forward by providing a measure of domain-specific knowledge which could gather data to inform teaching and instruction in early childhood programs at institutions of higher education, identify the achievements and learning needs of students in these programs, inform course development, and be a tool for research focused on the relationships between students' development of knowledge and application of skills. Thus, the aim of the current study is to evaluate the

psychometric properties of a self-report tool, the Knowledge of Social-Emotional Milestones and Support Strategies (K-SEMS) designed to assess pre-service teachers' knowledge of general social-emotional milestones of children 3–5 years old and knowledge of strategies to support children's development in this domain.

Items for the K-SEMS were designed to assess pre-service early childhood teachers' knowledge of children's social-emotional milestones and the strategies that can be used to support this development in children 3–5 years old. The development of items was informed by the early childhood scientific literature on typical development from 3 to 5 years, and evidence based practices, as well as milestone information collected by federal institutions (e.g., the Centers for Disease Control [CDC]), and the recommendations of national associations of early childhood recommendations (CDC,gov; Ertem et al., 2007; Fox & Lentini, 2006; Joseph, Strain, Yates, & Hemmeter, 2010; Kemple & Hartle, 1997; MacPhee, 1981; Squires et al., 2002).

Method

Procedures

Overview. This was a cross sectional study using a convenience sample of undergraduate students at one large university in the Midwestern United States to develop and validate a tool to assess pre-service early childhood teachers' knowledge of preschoolers' social-emotional milestones and support strategies (the K-SEMS). The procedures used to develop and validate the K-SEMS included an item development phase, a validation phase, and a data collection phase, which are described below. These are followed by the analytic procedures used to provide evidence of the reliability (internal and test–retest) and validity (content, concurrent and predictive) of the instrument.

Item development.

Knowledge of milestones. Four to six items were created to capture knowledge of milestones in four broad areas of social-emotional development for children ages 3 to 5 years: self-awareness, self-regulation, relationship skills and social interaction, and social emotional understanding. A total of 25 original items were crafted based on the social-emotional milestones identified for children 2–6 years old (CDC.gov; Squires et al., 2002) and using examples of skills form the California Preschool Learning Foundations publication. Current measures of caregivers' knowledge of child development (e.g., KIDI [MacPhee, 1981], Caregiver Knowledge of Child Development Inventory [Ertem et al., 2007]) were considered to help structure the response options for participants, and inform the structure of questions. Following the answer structure of the KIDI, which assesses knowledge of infant and toddler development across domains, respondents were asked to respond to each item by indicating whether they "agree" (1), disagree, and thus selecting either "younger" (2 – indicating a child develops this skill at a younger age) or "older" (3 – indicating a child develops this skill at an older age) option, or are "not sure" (4), to determine accuracy of knowledge. These were later recoded to indicate the participants' response as 1 (*correct*) or 0 (*incorrect*). Selection of the "not sure" option was coded as incorrect because it suggested that participants attempted the questions but did not have the knowledge to select the correct answer. Higher scores on the Knowledge of Milestones scale indicated pre-service teachers had more accurate knowledge of children's social-emotional milestones.

Knowledge of strategies. Items for the strategies section of the K-SEMS were gathered primarily from research providing evidence-based strategies used to support children's social-emotional development (Joseph et al., 2010; Kemple & Hartle, 1997); websites and projects presenting strategies were also explored (CDC.gov, California Department of Education, and

Virginia's Early Childhood Development Alignment Project). The research emphasized a number of important strategies, but for this study, focus was placed on strategies that could be used while pre-service teachers are interacting with children during free-play and clean-up activities, such as modeling behaviors, labeling emotions, encouraging empathic thinking, and redirecting children's behavior in positive ways. Since no existing instruments specifically measure knowledge of strategies to support social-emotional development, statements were created based on these research-based strategies shown to promote children's social-emotional learning. Ten original statements were created to measure participants' knowledge of support strategies. Respondents were required to indicate whether the statements were true or false; answers were later recoded as correct (1) incorrect (2). Higher scores on the knowledge of strategies scale indicate pre-service teachers have greater knowledge of effective strategies to support children's social-emotional milestones.

Validation procedures. After the initial items and response options were created, nine individuals with expertise in the science of child development and practice of early child education reviewed them for face and content validity. The group of experts included six doctoral students in child development and three professors in the same discipline. The doctoral students all had master's degrees and had direct experience with young children; the professors each had over 15 years of experience in the early childhood field. The reviewers were asked to provide feedback on the clarity, accuracy, and appropriateness of each item for measuring knowledge of social-emotional milestones and strategies to support social-emotional development for 3- to 5-year-old children. Based on the preliminary feedback, three initial items were deleted, leaving 32 items. Ten of those items were reworded for clarity, and another five items received minor edits to improve relevance of examples for the 3-to-5 age group. Two of

the original experts plus six new experts completed the revised 32-item K-SEMS and offered additional feedback. Two additional items were discarded after this process because they were considered controversial—answers were inconsistent—based on experts' answers and feedback. There were therefore a total of 30 items in the final version of the K-SEMS administered in this study.

Data collection procedures. A convenience sample of undergraduate students enrolled in 10 different courses offered through a department of human development and family studies (HDFS) were recruited for this study. Approval to conduct the study was granted by the university's Institution Review Board prior to the distribution of the survey. Courses ranged from lower level courses to upper level courses and included early childhood courses (e.g., Child Growth and Development) and courses not in the early childhood major (e.g., Lifespan Human Development in the Family). An online survey including (a) the 30-item K-SEMS tool which included the knowledge of social-emotional milestones (20 items) and support strategies (10 items) (Appendix A), and (b) background questions such as demographics and experiences with children, were used to gather the data for this study. Surveys were distributed solely online during the fall semester (2014) via course instructors, but due to a low participation rate, a second round of surveys were distributed both in-class and online in the spring semester (2015). Students consented to participate in the study by selecting the "yes" option after reading the online consent form. For the paper-and-pencil option students selected "yes," signed, and dated a paper copy of the consent form. Students also had the option to decline consent by selecting "no" online or on the paper copies, and could choose to withdraw their participation at any time during the study. Students received weekly e-mail reminders with the survey link and the survey closing date via their course instructors. Survey respondents were offered a chance to win 1 of 10

$25 Amazon gift cards as an incentive to participate. Of the students participating in this study, a subsample of students taking three courses in the early childhood major with required field placements were observed for their social-emotional practices during interactions with children. This subsample of participants were observed one time for 1 hour during free play, clean-up, and transition to the next activity by undergraduate research assistants trained to used the observation tool for this study.

Retest. A new survey link was directly e-mailed to participants 6 weeks after initial surveys were completed asking participants to complete the K-SEMS a second time. All participants were sent the e-mail in an effort to gain the needed responses to conduct test–retest analysis. An additional incentive of a chance to win 1 of 5 $15 Amazon gift cards was offered to participants to complete the survey the second time.

Participants

A total of 211 students filled out the initial survey. Fifty-one participant surveys were omitted from analysis because of missing data on all of the K-SEMS items. Thus, data from 160 participants were used to conduct analyses. The majority of participants were White (82%), female (96%), and ranged in ages from 18 to 20 (54%), 21 to 24 (39%), and 25 years and older (7.4%). The median household income while participants were in high school was $100,000–$150,000 per year (see Table 2.1). Students were at various stages in their programs of study, and reported a variety of majors (see Table 2.1).

Observation subsample. Of the 160 participants from the larger sample, 33 were observed using an adapted version of the Teaching Styles Rating Scale (TSRS) described in the measures section. The majority of observation participants were juniors and seniors in college

(81%), white (91%) non-Hispanic (94%), and between the ages of 18 and 24 (94%). All observation

Table 2.1

Characteristics of the Study 1 Participants—Percentages

Characteristics	Survey participants (n = 160) %	Observation participants (n = 33) %
Gender		
Female	95	100
Ethnicity		
Not Hispanic	95	94
Race		
White	82	91
African American/Black	10	3
Asian/Pacific Islander	4	3
Other	4	3
Age		
18–20	54	38
21–24	39	56
25+	7	6
Major		
Early childhood	55	100
Communication	8	
Kinesiology	8	
Nursing/Pre-Nursing	8	
Other	21	
Year in College		
Freshman	13	0
Sophomore	21	9
Junior	34	38
Senior	24	44
Other	7	9
Family Income		
Under 10,000	1	
10,000–49,000	21	16
50,000–99,000	25	26
100,000+	31	23
Would rather not say	22	35

participants were female and were early childhood majors (child development, or elementary education: early childhood track).

Test–retest subsample. Forty-eight participants took the K-SEMS a second time. Twelve of the participants were missing background data. The demographic data from the remaining 36 participants showed these participants were representative of the whole sample based on gender, race, ethnicity, family income, and major. Participants differed significantly on their year in college; a greater percentage of sophomores (36% vs. 21%) and fewer juniors (25% vs. 34%) and seniors (16% vs. 24%) retook the survey.

Measures

Coursework with social-emotional content. Copies of course syllabi were obtained from instructors to determine which courses included social-emotional content; three courses had social-emotional content embedded in them—Child Growth and Development, Interaction Processes with Children in groups, and Curriculum for Early Childhood Programs. In the background section of the survey participants were asked to indicate whether they (1) had not yet taken a course, (2) were taking it currently, or (3) took it in the past for each of the 10 courses in which students were recruited. For each of the courses with social-emotional content, a binary variable was created to indicate whether the student had already taken the course; courses in which students were currently enrolled were coded as 0 because the survey was collected early in the semester, thus students were not expected to have gotten much of the content. A variable was then created to summarize the number of courses students took in the past with social-emotional content. Codes for the coursework variable were as follows: 0 (*took no prior courses with social-emotional content*); 1 (*took 1 course with social-emotional content*); 2 (*took two courses with social-emotional content*); 3 (*took all 3 courses with social-emotional content*).

Classroom practices that support social-emotional development. Observation data were collected from a subsample of participants using an adapted version of the Teach Styles Rating Scale (TSRS; Domitrovich, Cortes, & Greenberg, 2000). This tool was designed to assess teachers' teaching styles across three domains: Positive Discipline, Classroom Management, and Positive Emotional Climate (Domitrovich et al., 2000). It was chosen because it captures teachers' interaction practices with children in both the social and emotional child development areas. This meant it could be used to provide predictive validity of the K-SEMS measure, which is designed to capture pre-service teachers' knowledge covering both the social and emotional child development areas. The Classroom Management domain (3 items) from the original tool was removed because it was not appropriate for observing the sample for this study, i.e., pre-service teachers in a classroom being supervised by a lead teacher who was responsible for managing the classroom. One item under the Positive Discipline domain (negative behavior management) was also removed because it was believed the positive behavior management item in this domain would capture this information. Three items were then added to the tool to create a dimension to measure positive social climate and one item was added to the Positive Emotion Climate domain. Participants were rated by observers on their use of practices on a scale of 1 (almost never) to 5 (almost always). Exploratory factor analyses conducted in Mplus on the adapted version of the TSRS for this study produced three subscales: Positive and Proactive Behavior Management includes three items ($\alpha = .74$), Social-Emotional Guidance includes 3 items ($\alpha = .69$), and Encouraging the Use of Social-Emotional Skills includes three items ($\alpha = .83$). Average scores were calculated for each subscale. When there were no opportunities to observe participants using a practice this was coded not observed and identified as missing data. Higher scores on the adapted TSRS indicated more frequent use of social-emotional practices.

Analyses and Results

In order to examine the psychometric properties of the K-SEMS, Exploratory Factor Analyses (EFA) were conducted to first determine what conceptually meaningful latent factors might be extracted, and evaluate construct validity (DeVon et al., 2007). Internal and external consistencies of the extracted factors were measured using Cronbach's alpha analyses and Pearson's product moment correlations for test–retest. Cronbach's alphas estimated at a .70 or higher indicate strong internal reliability and construct validity. Other measures of validity—concurrent and predictive validity—were calculated using the person's correlation analyses.

Exploratory Factory Analyses

EFAs of the knowledge of social-emotional milestones items (20) and support strategies items (10) were conducted separately. Version 6 of Mplus was used to conduct analyses of the 160 cases since the data for the K-SEMS were categorically coded as correct (1) or incorrect (0) and Mplus computes a polychoric correlation matrix for categorical data (Muthén & Muthén, 2010). Seven single responses were missing on different items from different participants, and were therefore coded as missing; Mplus uses all cases that have at least partial data. If, however a case is missing values on all the variables in the analyses, Mplus excludes it from the model. The EFAs were estimated using the weighted least square estimator (WLSMV), which is considered a strong estimation method for factor analysis with categorical data (Brown, 2006). An oblique rotation was chosen because it was assumed that the factors would be correlated (Costello & Osborne, 2005).

Fit criteria. To evaluate model fit, the chi-square test of goodness-of-fit was used. For this test, the null hypothesis is that the model is a good fit for the data; thus, a p value greater than .05 is considered an indicator of good model fit (Raykov & Marcoulides, 2011). The root –

mean square error of approximation (RMSEA) was also used to evaluate fit. Values below .05 on the RMSEA usually indicate close fit (Browne & Cudeck, 1992), but a .06 cutoff is also suggested (Yu & Muthén, 2002). Other fit indices including the Comparative Fit Index (CFI) and the Tucker Lewis Index (TLI) can also be used to determine fit—closer to 1 or 1 indicates the considered model is a better fit for the data than other models (Raykov & Marcoulides, 2011).

Model selection. The Kaiser-Guttmann criterion (eigenvalues > 1.0) was initially used to gain an idea of the number of possible factors in each of the K-SEMS scales, however, using this criterion is often shown to overestimate the appropriate number of factors (Gorsuch, 1983). Eigenvalues were also used to calculate the percentage of variance accounted for, once the number of factors that best fit the model were determined. Cattell's (1966) scree test, which is a graphical representation of the eigenvalues, was then used as a more objective method for determining the number of factors in the K-SEMS and the number of factors to rotate. Following this, each model, starting from the one-factor solution, was examined, and the first model that fit the data according to the fit criteria was selected. The models were then evaluated for interpretability of loadings. Selection of the final factor structure for the two main subscales of the K-SEMS—knowledge of milestones and knowledge of strategies—was based on the ability of the models to produce subscales that (a) had salient factor loadings > .30, (b) indicated three or more items for retention on a subscale, and (c) exhibited conceptual clarity.

Knowledge of preschoolers' social-emotional milestones. The Kaiser-Guttmann criterion revealed eight factors with eigenvalues greater than 1.0, using the 20 items for this section of the K-SEMS, but these were not interpretable. Examining the scree test showed the 4-factor solution as the most promising factor solution for the initial EFA. Exploring the fit indices in each model from the 1-factor solution to the 4-factor solution indicated the 4-factor solution

was the best fit for the data. Two items (2 and 12) in the 4-factor solution did not load on to any of the four factors and while this solution was indicated as best explaining the data, the 3-factor solution made more conceptual sense related to age-based social-emotional milestones. Deleting items 2 and 12, the remaining18 items were therefore analyzed using a forced 3-factor solution. The 3-factor solution revealed three items (items 1, 6, and 18) with loadings < .30 on all three factors. Removing those items produced a 3-factor solution with good model fit (χ^2 = 72.55, p = .19, df = 63, RMSEA = .03; *CFI/TLI* = .94/.91) and factors that were interpretable, and was therefore chosen as the final model. The three eigenvalues accounted for approximately half of the original variance. Because there were 15 observed variables each with a variance of 1, there were 15 units of variance, hence the share of the three eigenvalues is (3.259 + 2.220 + 1.870)/15 = 49% (Raykov & Marcoulides, 2011). Conceptually, the three factors extracted measured (1) knowledge of 3-year-olds social-emotional milestones, (2) knowledge of 4-year-olds social-emotional milestones, and (3) knowledge of 5-year-old social-emotional milestones (see Table 2.2 for final factor loadings), and were thus labeled in this manner. Although items were crafted around age-based milestones, there was an expectation that the items would load based on the four social-emotional development areas focused on for this study (i.e., self-awareness, self-regulation, relationship skills and social interaction, and social emotional understanding). Nonetheless, items did not load in this manner, and even though the three factors were conceptually identified as knowledge of 3-, 4- and 5-year-olds' milestones, the loadings were not clean and distinct. Some probing of loadings seemed to suggest that loadings were not a result of underlying latent variables, but could be reflecting participants' choices of associated response options of agree, younger, and older.

Table 2.2

Factor Loadings for Knowledge of Social-Emotional Milestone Items (15 Items)

Component	Knowledge of 3-year-olds (1)	Knowledge of 4-year-olds (2)	Knowledge of 5-year-olds (3)
4. At around the age of 4 years old, children typically begin to assert their independence, test limits and say "No" a lot. (Younger)	**.84**	.20	.00
8. The average 4-year-old is able to manage transitions in the classroom routine, such as moving from playtime to cleanup without resisting or throwing a tantrum. (Younger)	**.37**	.08	.03
10. At around 3 years old, children typically begin to notice and respond to other people's moods and feelings. (Younger)	**.66**	.04	.06
11. At around 4 years old, typical children may cling to parents/teachers in new situations. (Younger)	**.61**	.00	.54
13. At around 6 years old, children typically begin to show a strong sense of self through assertiveness and directing others. (Younger)	**.79**	–.04	–.22
20. Most 5-year-old children typically play "next to," rather than "with," others. (Younger)	**.66**	.42	.03
7. The average 3-year-old understands that another child might be mad because he/she couldn't finish a hard task he/she was trying to do. (Older)	.19	**.44**	.17
14. On average, children begin to compare their abilities to those of others around the age of three (3). (Older)	–.04	**.49**	.03
15. A typical 3-year-old may explain the reason for a behavioral rule (e.g., "We walk inside so we don't bump into other people"). (Older)	–.05	**.52**	–.00
16. A typical 3-year-old child may suggest taking turns riding the tricycle on the playground. (Older)	.00	**.51**	.26
17. Typical 4-year-old children may coordinate simple sequences of pretend play by communicating to another child "I'll be the mommy, you can be the baby." (Agree)	–.32	**.55**	–.00
21. On average, children around 3 years old are motivated to please their friends. (Older)	–.14	**.42**	.02
3. Children around 5 years old could generate an explanation for another child's emotions. (Agree)	–.09	–.11	**.32**
5. At around 3 years old children are able to regulate their impulses with little adult guidance. (Older)	–.01	.13	**.94**
9. Children around 5 years old may come to the defense of a friend who is teased by a peer. (Agree)	.01	–.12	**.39**

Note: N = 160

Knowledge of social-emotional support strategies. A separate EFA was conducted for the knowledge of strategies section of the K-SEMS and revealed a one-factor solution, which was confirmed by the scree test. This one factor accounted for 29% of the variance and model fit indices indicated that one factor best explained the data ($\chi^2 = 29.42$ $p > .05$, $df = 27$, RMSEA =. 02, CFI/TLI = .96/.95). The 29% of variance accounted for is low and could mean that a one-factor solution was not the best fit for the data, however these were the only output produced. One item (item 1) loaded < .10 and was eliminated from the final model (see Table 2.3 for factor loadings). Items two and five were retained in the model because they were conceptually important to the factor. This one-factor solution conceptually measured support strategies for preschoolers' social-emotional development and was thus named.

Validity. Content validity and two types of criterion validity were tested to establish the validity of the K-SEMS, including concurrent and predictive validity.

Content validity. Content validity was established by conducting independent samples t-test to examine differences in knowledge scores between participants in an early childhood major and those in other majors. Results showed significant mean differences in the scores on the Knowledge of 3-year-olds' Milestones subscale of participants in an early childhood major (M = .49, SD = .25) compared to those in other majors (M =.33, SD = .25). Significant differences were also found in the mean scores on the Knowledge of Support Strategies scale of participants in an early childhood major (M = .85, SD = .16) compared to those in other majors (M = .69, SD = .16). Results indicate this knowledge measure has appropriate content relative to the population for which it is intended.

Table 2.3

Factor Loadings for Knowledge of Support Strategy Items (9 Items)

Component	**Support Strategies for Preschoolers' Social-Emotional Development**
2. Drawing children's attention to others' feelings (e.g., "Look at her face. Can you tell how she feels?") can help them develop empathy.	.28
3. Children learn most from other children, so it's important to point out what other children are doing right and wrong in the classroom.	.45
4. It is best to ignore children who are acting out in the classroom; most children just act out to get attention, and it's best not to reward that behavior by giving them attention.	.39
5. Establishing warm, close relationships with children who exhibit challenging or negative behaviors will help them develop self-control.	.17
6. Allowing children to play together freely may allow conflicts to occur between children, but that is a way for them to learn problem-solving and negotiation skills	.43
7. Giving children specific words to say to each other during social conflicts will hinder their abilities to develop their own skills for negotiation and managing conflicts.	.43
8. Labeling children's emotions helps children to identify and understand emotions	.36
9. Labeling your own negative emotions for children could scare children.	.72
10. Teachers should not express negative emotions in the classroom because it creates a negative atmosphere that harms children's abilities to learn.	.76

Note: N = 160

Concurrent validity. Concurrent validity was established by correlating factors on the K-SEMS with courses including social-emotional content using the Pearson's correlation method Participants' knowledge of 3-year-olds' social-emotional milestones was significantly and positively correlated with the number of courses participants took which included social-emotional content ($r = .36$, $p < .01$), suggesting a positive association between knowledge of 3-year-olds' milestones and courses with social-emotional content. Participants' knowledge of 4-year-olds' social-emotional milestones significantly but negatively correlated with relevant coursework ($r = –.28$, $p < .01$), suggesting associations between more courses with social-

emotional content and less accurate knowledge of 4-year-olds' social-emotional milestones. Knowledge of 5-year-olds' social-emotional milestones was not significantly correlated with coursework ($r = .14$, *ns*). Knowledge of support strategies was positively and significantly correlated with coursework ($r = .28$, $p < .01$), suggesting a positive association between participants' knowledge of support strategies and courses taken with social-emotional content.

Predictive validity. Predictive validity was established by correlating participants' scores on both knowledge scales with their scores on observed classroom practices for supporting social-emotional development (see Table 2.4), which included three sub-scales: (1) positive and proactive behavior management, (2) Encouraging the Use of Social-Emotional Skills, and (3) Social-Emotional Guidance. Knowledge of 3-year-olds' Social-Emotional Milestones correlated only with the Positive and Proactive Behavior Management subscale on the adapted TSRS ($r = .38$, $p < .05$), but not the other two subscales. The Knowledge of Support Strategies scale was positively correlated with the Positive and Proactive Behavior Management subscale ($r = .36$, $p < .05$) and encouraging the use of social-emotional skills subscale on the TPRS ($r = .38$, $p < .05$); the association between knowledge of support strategies and the social-emotional guidance subscale on the TSRS was not significant.

Table 2.4

Correlations Between K-SEMS and TSRS Subscales

TSRS Subscales	K-SEMS Subscales			
	Knowledge of 3-Year-Olds	Knowledge of 4-Year-Olds	Knowledge of 5-Year-Olds	Knowledge of Support Strategies
Positive and Proactive Behavior management	.38*	–.30	.07	.36*
Social-emotional Guidance	.15	–.29	–.35	.31
Encouraging the Use of Social-emotional Skills	.08	–.18	–.13	.38*
N	29	29	29	30

*$p < .05$

Reliability. Two estimators of reliability were used to examine the reliability of the K-SEMS. First, internal consistency was used to determine how well the items in the revealed K-SEMS factors fit together and second, test–retest was used to determine the stability of the K-SEMS factors (DeVon et al., 2007).

Internal consistency. Internal consistency for each of the K-SEMS factors was calculated using Cronbach's alpha in SPSS 22.0. Cronbach's alphas for the factors were Factor 1 (Knowledge of 3-year old social-emotional development, 6 items) .61; Factor 2 (Knowledge of 4-year old social-emotional milestones, 6 items) .50; and Factor 3 (Knowledge of 5-year old social-emotional milestones, 3 items) .39. For the Knowledge of Social-Emotional Support Strategies, the Cronbach's alpha (9 items) was .51. Based on internal consistency, Factor 1 on the Knowledge of Milestones scale (Knowledge of 3-year-olds) was the most robust of all factors, but still did not meet the .70 criteria for acceptable reliability recommended for new scales (DeVellis, 2003). This indicates that these factors should be interpreted with caution and that the items in these factors may not consistently measure pre-service professionals' knowledge of social-emotional milestones and support strategies.

Test–retest. This form of reliability measures the stability in a test given at two time points and was established by correlating participants' responses on the knowledge of milestones and strategies instruments at time-1 with their time-2 responses. Using the Pearson correlation the test–retest reliability for knowledge of 3-year-olds factor was significant at the .10 level ($r = .26$, $p = .07$), the knowledge of 4-year-olds factor was significant ($r = .58$, $p < .01$) and the knowledge of 5-year-olds factor was not significant ($r = .12$, $p = .41$). The test –retest correlation coefficient for Knowledge of Support Strategies between Time 1 and Time 2 was strong and statistically significant ($r = .72$, $p < .01$).

Discussion

The aim of this study was to evaluate the psychometric properties of a tool developed to measure pre-service early childhood teachers' knowledge of children's social-emotional milestones and strategies to support children in this domain using a sample of undergraduate students enrolled in courses through an HDFS department at one university.

Knowledge of Social-Emotional Milestones Scale

The three factors identified on the Knowledge of Social-Emotional Milestones scale were indicative of a general knowledge of preschoolers' age-based social-emotional milestones. However, it was expected that items on the Knowledge of Social-Emotional Milestones scale would have loaded based on the four social-emotional areas initially used to developed items—self-awareness, self-regulation, relationship skills and social interaction, and social emotional understanding—to create a multidimensional construct of knowledge of social-emotional milestones. Based on the extracted factors, however, it appeared as though items with correct responses identified as "agree," "younger, or "older" were loading onto each other to create a multi-dimensional construct based on age and thus identified as Knowledge of 3-Year-Olds, Knowledge of 4-Year-Olds, and Knowledge of 5-Year-Olds. Because of the response options included in the Knowledge of Social Emotional Milestones section, the item loadings were untidy, and some items could have loaded onto multiple factors and still be conceptualized as fitting for that factor. For example, "A typical 3-year-old may explain the reason for a behavioral rule"—answer, Older—could have loaded onto knowledge of 4- or 5-year-olds. It could be that the factors extracted are not producing age-based constructs but rather are artifacts of the responses even though the underlying construct is unidimensional (Spector, Katwyk, Brannick, & Chen, 1997). Treating the K-SEMS as a scale rather than an index may have been

inappropriate for this tool. While a scale and an index are both composite measures of variables, they have different properties and account for composite scores in different ways. A scale is a measure based on intensity of a concept such as attitudes or emotions and assigns numerical values to a concept based on a range of response-related intensities to provide an interpretation of the relative intensity of items on a scale (Babbie, 2001). It is comprised of several items having an empirical or a logical structure among them. The most commonly known and used scale is the Likert scale which may include responses such as strongly agree, agree, disagree, strongly disagree. On the other hand, an index is a measure that accumulates values from a variety of items and represents more of a general dimension (Babbie, 2001). Studies should be cognizant of these differences in order to appropriately design and analyze new instruments.

Based on these differences, the Knowledge of Social-Emotional Milestones and Strategies may be considered an index rather than a scale. Results using all 20 items initially included on the Knowledge of Milestones sub-scale to calculate an index score and then estimate internal consistency show the Knowledge of Milestones index is not a good index or measure of pre-service teachers' knowledge of social-emotional milestones ($\alpha = .44$). Further, there were no significant associations between overall Knowledge of Milestones index and coursework, or observed practices. However, correlations of all items showed the items which had loaded as the Knowledge of 3-Year-Olds factor in the earlier factor analysis were the only items significantly correlated with each other, suggesting these six items (4, 8, 10, 11, 13, and 20) as a more concise and adequate index of Knowledge of Social-Emotional Milestones. Based on reliability and validity analyses of these six items previously identified as the Knowledge of 3-Year-Olds Social-Emotional Milestones, this more concise index of Knowledge of Milestones was

determined as the most valid and reliable for measuring teacher's knowledge of social-emotional milestones.

Improving the reliability and validity of the Knowledge of Social-Emotional Milestones scale. The subscales of the Knowledge of Social-Emotional Milestones scale had poor to moderate internal reliability ranging from .39 to .61 and only the Knowledge of 4-year-old subscale was stable from Time1 to Time2 (r =.58, p < .01), bringing into question the ability of this scale to consistently measure pre-service ECEPs' knowledge of milestones. The moderate reliability on all factors may be due to a number of reasons. First, the value of alpha is significantly reduced when items are not correlated, and many of the items in Factor 2 (Knowledge of 4-year-olds) and 3 (Knowledge of 5-Year-olds) were not correlated, thus producing lower alphas than Factor 1 (Knowledge of 3-Year-olds) (DeVon et al., 2007). Second, the number of items included in each subscale may not have been adequate to reach the desired alpha level. It was not surprising that the Cronbach's alpha for Factor 3 (knowledge of 5-year-olds social-emotional milestones), which included three items, would have lower reliability than the other factors, which included six items, since calculations of internal consistency are sensitive to the number of items included in a factor (DeVellis, 2003). Thus, adding items may help to improve the reliability of the subscales. Although not used for this study, the Spearman-Brown Prophesy Formula can be used to determine the number of items that are needed to improve reliability to a desired level (DeVellis, 2003) and should be considered in future studies.

Along with increasing the number of items included in each of the subscales, the next phase in developing this instrument should consider other knowledge of social-emotional development, such as sequences of development and learning processes. For this study, only milestones of development were included as knowledge of social-emotional development.

However, items should be crafted to assess teachers' knowledge of children's social-emotional sequences of developmental and different learning processes. Combined, these different components of knowledge of development could produce a better quality tool that provides a comprehensive assessment of pre-service early childhood teachers' knowledge, and highlight areas where teachers may need additional professional development.

Poor test–retest stability could have occurred due to four reasons identified by Kelly and McGrath (1988). First, it is possible participants knowledge could have increased during the 6-week lag between tests, thus, affecting differences in responses from Time 1 to Time 2. Second, it is possible participant responses could have been influenced by the time of day or test administration (paper-pencil at Time 1 and online at Time 2). Participants may have felt more pressured and rushed taking the test in class as opposed to more relaxed taking the survey at their leisure online. Thirdly, fatigue could have played a role in how participants read items and therefore responded. Lastly, it is possible that the instability of the test may have been due to inherent unreliability of the measurement. Future studies therefore need to consider many factors when conducting this form of reliability and careful acknowledgment should be given to time1 and time2 confounding factors to help explain differences.

Finally, the quality of the items may need to be improved to better measure knowledge. Items could be improved by using broader constructs of social-emotional skills instead of specific examples, which despite the best efforts to craft, can lead to misinterpretation by participants and affect reliability.

Knowledge of Support Strategies Scale

The items on this scale produced a unidimensional factor, and two items with factor loadings < .30 were retained, which may have affected the reliability of this factor. Removing

items with low loadings are suggested because these items may not be important to the factor (Rahn, 2015). However, examination of the Cronbach's alpha results showed that removing these items did not change the alpha level. Even thought this scale had only moderate internal consistency estimated at $\alpha = .51$, the stability of the test from Time 1 to Time 2 was $r = .72$, $p < .01$, indicating strong stability. However, the true/false answer format for the knowledge of support strategies statements could have made it easier for participants' to select consistent responses at Time 1 and Time 2. This format gave respondents a 50/50 chance to select the correct answer, which limited the amount of variance in answers, and may have resulted in participants' answering some items correctly by chance. But since responses were highly consistent from Time 1 to Time 2 and there was a 6-week lag between tests, it is possible that those who responded correctly did have more accurate knowledge of strategies. A better question and answer format may eliminate these ambiguities and provide a better way to capture teachers' knowledge of strategies to support social-emotional development.

Limitations and Recommendations

The sample of participants used for this study were all from the same university, were homogenous in terms of gender and race, and came from middle-income families, thus limiting the generalizability of the findings.

Many other unmeasured factors could have played a role in the associations between the scores on the K-SEMS and the scores used to establish validity. That is, the positive associations between participants' scores on the K-SEMS, coursework taken, and observed practices could be explained by associations with variables not collected for this study. For example, factors such as IQ and GPA may have been important to consider since there is a possibility that participants with higher IQs or GPAs may have answered questions more accurately due to intelligence, and

having performed better in courses related to the content of the study. Also, work or personal experience with children in the preschool years may also be factors related to participants' knowledge of social-emotional development, the courses they do or do not take, and the ways they interact with children to support their development. It is possible that some participants responded to questions on the K-SEMS based on their own implicit theories of social-emotional development rather than on research-based knowledge they receive through courses (Gebel & Schrier, 2002; Kuzborska, 2011). It is further possible these beliefs could have affected the ratings observed participants received during their interactions with children, and thus the relations between knowledge and practices. It is also possible that participants may believe they already have knowledge of children's social-emotional development and may forego taking courses with social-emotional content, or may attend less to that particular content, which may affect the accuracy of their answers on the K-SEMS (Cunningham, Zibulsky, & Callahan, 2009). Future studies should consider each of these factors and their potential relationships to coursework, knowledge, and practices in order to assess psychometric properties of a knowledge tool.

Many of the items on the K-SEMS referred to a gender as part of the example (e.g., "Look at her face…") and could have unconsciously influenced responses on items, especially if participants implicitly were accounting for differences that may exist between girls and boys social-emotional development. Revisions to items and the addition of items should ensure items are balanced by making references to both genders and making sure items account for differences related to gender.

Only 35 items were developed for the K-SEMS. A large pool of potential items, which can be reduced based on expert feedback as well as participant responses, should be developed in

the early stages of instrument development (Netemeyer et al., 2003). Having a larger pool of items may help to better capture the intended construct and may permit similar questions to be asked in multiple ways and formats to allow a more thorough evaluation from experts and participant. The K-SEMS was not pilot-tested with student respondents, only with experts, prior to distribution of the survey. This is a critical stage of instrument development and may have contributed to the poor to moderate reliability and validity of the K-SEMS. Future development of this tool should include a more thorough pilot testing stage.

The response options to questions may not have been the most appropriate to assess knowledge on either of the K-SEMS scales. If a participant selected "younger" or "older" on an item it did not suggest the participant knew exactly at what age a social-emotional skill appears, just that they have enough knowledge to know it does not appear at the age associated with the question, leaving the researcher to assume these participants have accurate knowledge of social-emotional milestones. Future studies could consider using vignette-type questions and responses reflecting a correct action, a partially correct action, and an inappropriate action to better assess pre-service teachers' content and practical knowledge of social-emotional development. This would alleviate some of the problems incurred from true or false responses and from response options including a younger-older option, which led the researcher to make many assumptions about participants' actual knowledge. Future studies might consider the use of open-ended questions at the item-development phase to design appropriate items for a final measure. Allowing for open-ended responses on the strategies scale could offer valuable insight into what strategies pre-service teachers are being taught through coursework or are learning while working with children.

Only two components of child development knowledge were measured—knowledge of milestones and support strategies—limiting the thoroughness of the measure to assess knowledge of development. Other components such as sequences of skill development and learning processes should be included in future development of this instrument. Further, a number of other strategies were not represented in this scale but are recommended as best practices to promote children' social-emotional development. These include modeling positive social behavior, role playing, encouraging children in their social-emotional efforts, setting up the environment to support social-emotional development, providing materials to promote social-emotional skills, and developing activities to promote, support and encourage children's social-emotional development (Fox & Lentini, 2006; Joseph et al., 2010; Kemple & Hartle, 1997). The reason for this omission of strategies was that many of the students in field placements are not the ones making decisions about what is done in the classroom (materials, design of space and environment) as they are under the direction of the lead teachers, and it was thought that the strategies developed should be aligned with what students were allowed to do in the classroom. Thus, it was assumed that there would be a lot of missing data on the knowledge of strategies subscale, or that they would not be valid for this population, if the strategies did not take into account the role of the participants in the classroom. However, including these other variables may have provided a more thorough test of knowledge related to support strategies, particularly if this measure were to be used with a broader population of pre-service and in-service early childhood professionals. These other strategies should therefore be included in the next phase of measure development especially if this instrument will be used to assess the knowledge of in-service teachers.

Conclusion

The K-SEMS was designed to capture pre-service teachers' knowledge of preschoolers' social-emotional milestones and support strategies. After careful review of factors and further research related to scales and indices, it was determined that the K-SEMS should be treated as an index rather than a scale. Further, the most robust factor on the Knowledge of Social-Emotional Milestones sub-scale (Knowledge of 3-Year-Old Milestones) and the Knowledge of Support Strategies sub-scale should be used as an index and compose the final measure of pre-service teachers' knowledge prior to any further modifications and testing of the measure. Caution should be taken in interpreting this index as a thorough measure of preschoolers' social-emotional milestones and support strategies. Additional items should be crafted and tested for both sections of the index a more diverse sample should be surveyed and observed to make this tool more adequate for the early childhood population.

Despite the need to revise and enhance this instrument, these results indicate the importance of domain-specific measures of knowledge to understand the professional development needs of pre-service and in-service teachers of young children. Only one factor of this instrument was sufficiently reliable and valid to be considered for further development, but the process taken and the limitations outlined provide useful information to guide the development of a better quality tool. This study provided an instrument designed to capture preschool teachers' actual knowledge of social-emotional milestones and strategies to support social-emotional development. This instrument can serve as an important support for early childhood programs' curricula development, course enhancements, and professional development for pre-service teachers. Opportunities to take courses with relevant content, plus more and better learning opportunities, can help teachers with their competence in supporting

children's development in all domains and produce effective teachers of young children. Enhancing teachers' knowledge of social-emotional skills and support strategies could significantly affect children's social-emotional development and thus their school readiness.

APPENDIX

Appendix

Knowledge of Children's Social-Emotional Milestones and Support Strategies (K-SEMS)

Instructions (Please read carefully before starting):
This questionnaire asks you about children's social and emotional development. Each of the following statements asks you about the average age at which typically developing children can do something. If you think the age is correct, check "Agree." If you don't agree, then decide whether a Younger or Older child could do it. If you aren't sure of the age, check "Not Sure."

1. A typical 5-year-old may have the self-awareness to recognize he/she is currently able to do something he/she wasn't able to do when he/she was younger, such as riding a bike.
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

2. By age 4, children are able to verbally label their own feelings of anger and frustration by saying "I'm mad" or "I'm upset."
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

3. Children around 5 years old could generate an explanation for another child's emotions (e.g., Jessica is sad because she wanted to play with the doll and someone else took it).
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

4. At around the age of 4 years old, children begin to assert their independence, test limits, and say "No" a lot.
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

5. At around 3 years old, children are able to regulate their impulses with little adult guidance.
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

6. At around 4 years old, preschoolers consistently play with one or two special buddies, especially those of the same sex.
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

7. Most 3-year-olds understand that another child might be mad because he/she couldn't finish a hard task he/she was trying to do.
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

8. Most 4-year-olds are able to manage transitions in the classroom routine, such as moving from playtime to cleanup without resisting or throwing a tantrum.
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

9. Children at around 5 years old may come to the defense of a friend who is teased by a peer.
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

10. Around 3 years old children begin to notice and respond to other people's moods and feelings.
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

11. Around 4 years old, children may cling to parents/teachers in new situations.
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

12. Children around 4 years old understand basic moral reasoning about good and bad.
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

13. Around 6 years old children begin to show a strong sense of self through assertiveness and directing others.
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

14. Children begin to compare their abilities to those of others around the age of 3.
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

15. A typical 3-year-old may explain the reason for a behavioral rule (e.g., "We walk inside so we don't bump into other people").
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

16. A 3-year-old child may suggest taking turns riding the tricycle on the playground.
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

17. Typical 4-year-old children may coordinate simple sequences of pretend play by communicating to another child "I'll be the mommy, you can be the baby."
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

18. Children around 5 years old may negotiate with each other, seeking adult assistance when needed.
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

19. Most 5-year-old children typically play *next to*, rather than *with*, others.
   (A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

20. Children around 3 years old are motivated to please their friends.

(A) Agree _____ (B) Younger____ (C) Older____ (D) Not Sure _____

The next section is about the things that support preschool-aged children's social skills. In this section, please read the following statements and respond by selecting true or false.

Research suggests that…

1. When young children are upset and acting out, you should use that moment as an opportunity to explain the best way to handle their emotions.
    a. True
    b. False
2. Drawing children's attention to others' feelings (e.g., "Look at her face. Can you tell how she feels?") can help them develop empathy.
    a. True
    b. False
3. Children learn most from other children, so it's important to point out what other children are doing right and wrong in the classroom.
    a. True
    b. False
4. It is best to ignore children who are acting out in the classroom; most children just act out to get attention, and it's best not to reward that behavior by giving them attention.
    a. True
    b. False
5. Establishing warm, close relationships with children who exhibit challenging or negative behaviors will help them develop self-control.
    a. True
    b. False
6. Allowing children to play together freely may allow conflicts to occur between children, but that is a way for them to learn problem-solving and negotiation skills.
    a. True
    b. False
7. Giving children specific words to say to each other during social conflicts will hinder their abilities to develop their own skills for negotiation and managing conflicts.
    a. True
    b. False
8. Labeling children's emotions helps children to identify and understand emotions.
    a. True
    b. False
9. Labeling your own negative emotions for children could scare children.
    a. True
    b. False

10. Teachers should not express negative emotions in the classroom because it creates a negative atmosphere that harms children's abilities to learn.
    a. True
    b. False

REFERENCES

REFERENCES

Babbie, E. (2001). *The practice of social research* (9th ed.). Belmont, CA: Wadsworth Thomson.

Baker, J. A. (2006). Contributions of teacher–child relationships to positive school adjustment during elementary school. *Journal of School Psychology, 44*, 211–229.

Baker, J. A., Clark, T. P., Maier, K. S., & Viger, S. (2008). The differential influence of instructional context on the academic engagement of students with behavior problems. *Teaching and Teacher Education, 24*, 1876–1883.

Bavolek, S. J. (1984). *Adult-adolescent parenting inventory* (AAPI). Park City, UT: Family Development Resources, Inc.

Blomeke, S., Buchholtz, N., Suhl, U., & Kaiser, G. (2014). Resolving the chicken-or-egg causality dilemma: The longitudinal interplay of teacher knowledge and teacher beliefs. *Teaching and Teacher Education, 37*, 130–139. Brown, T. A. (2006). *Confirmatory Factor Analysis for Applied Research*. New York, NY: Guilford.

Browne, M. W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods and Research, 21*, 230–258.

Burchinal, M. R., Cryer, D., Clifford, R. M., & Howes, C. (2002). Caregiver training and classroom quality in child care centers. *Applied Developmental Science, 6*, 2–11.

Burchinal, M., Roberts, J. E., Zeisel, S. A., Hennon, E. A., & Hooper, S. (2006). Social risk and protective child, parenting, and child care factors in early elementary school years. *Parenting: Science and Practice, 6*, 79–113.

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research, 1*, 245–276.

Costello, A. B., & Osborne, J. W. (2005). Exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research, and Evaluation, 10*, 1–9.

Cunningham, A. E., Zibulsky, J., & Callahan, M. D. (2009). Starting small: Building preschool teacher knowledge that supports early literacy development. *Reading & Writing, 22*, 487–510.

Denham, S. A., Kalb, S., Way, E., Warren-Khot, H., Rhoades, B. L., & Bassett, H. H. (2013). Social and emotional information processing in preschoolers: indicator of early school success? *Early Child Development and Care, 183*, 667–688. doi:10.1080/03004430.2012.682728

DeVellis, R. F. (2003). *Scale development: Theory and application* (2nd ed.). Thousand Oaks, CA: Sage.

DeVon, H. A., Block, M. E., Moyle-Wright, P., Ernst, D. M., Hayden, S. J., … Kostas-Polston, E. (2007). A psychometric toolbox for testing validity and reliability. *Journal of Nursing scholarship, 39*, 155–164.

Domitrovich, C., Cortes, R. C., & Greenberg, M. T. (2000). *Head Start Competence Scale technical report*. Unpublished manuscript, Pennsylvania State University.

Early, D., Bryant, D., Pianta, R., Clifford, R., Burchinal, M., Ritchie, S., … Barbarin, O. (2006). Are teacher education, major, and credentials related to classroom quality and children's academic gain in pre-kindergarten? *Early Childhood Research Quarterly, 21*, 174–195.

Early, D. M., Maxwell, K. L., Burchinal, M., Alva, S., Bender, R. H., Bryant, D., … Zill, N. (2007). Teachers' education, classroom quality, and young children's academic skills: Results from seven studies of preschool programs. *Child Development, 78*, 558–580.

Eisenberg, N., Valiente, C., & Eggum, N. D. (2010). Self-regulation and school readiness. *Early Education and Development, 21*, 681–698. doi:10.1080/10409289.2010.497451

Elicker, J. & Fortner-Wood, C. (1995). Research in review: Adult–child relationships in early childhood settings. *Young Children, 51*, 69–78.

Ertem, I.O., Atay, G., Dogan, D.G., Bayhan, A., Bingoler, B.E., Goc, C.G., Ozbas, S., Haznedaroglu, D. & Isikli, S. (2007). Mother's knowledge of young child development in a developing country. *Child: Care Health and Development, 33,* 728-737.

Fox, L., & Lentini, R. (2006). "You've got it!" Teaching social and emotional skills. *Beyond the Journal: Young Children on the Web*, November, 1–7.

Garner, P. W., Mahatmya, D., Moses, L. K., & Bolt, E. N. (2014) Associations of preschool type and teacher–child relational quality with young children's social-emotional competence. *Early Education and Development, 25*, 399–420. doi: 10.1080/10409289.2013.801706

Gebel, A., & Schrier, L. L. (2002). Spanish language teachers' beliefs and practices about reading in a second language. In J. H. Sullivan (Ed.), *Literacy and the second language learner* (pp. 85–109). Charlotte, NC: Information Age Publishing.

Giles, G. (2015). What are developmental milestones in children? Table, definitions and examples. Retrieved from http://study.com/academy/lesson/what-are-developmental-milestones-in-children-table-definition-examples.html#lesson

Gilliam, W. (2005). *Prekindergarteners left behind: Expulsion rates in state prekindergarten systems*. New York, NY: The Foundation for Child Development.

Gorsuch, R. L. (1983). *Factor analysis*. Hillsdale, NJ: Erlbaum.

Hamre, B. K., & Pianta, R. C. (2001). Early teacher–child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development, 72,* 625–638.

Hatcher, B., Nuner, J., & Paulsel, J. (2012). Kindergarten readiness and preschools: Teachers' and parents' beliefs within and across programs. *Early Childhood Research and Practice, 14*.

Hemmeter, M. L., Corso, R., & Cheatham, G. (2006). Issues in addressing challenging behaviors in young children: A national survey of early childhood educators. Paper presented at the Conference on Research Innovations in Early Intervention, San Diego, CA.

Howes, C. (2000). Social-emotional classroom climate in child care, child–teacher relationships and children's second grade peer relations. *Social Development, 9*, 191–204.

Joseph, G., Strain, P., Yates, T., & Hemmeter, M. L. (2010). Social emotional teaching strategies: Presenter's script, module 2. Retrieved from http://csefel.vanderbilt.edu/modules/module2/script.pdf

Kelly, J. R., & McGrath, J. E. (1988). *On time and method.* Newbury Park, CA: Sage.

Kemple, K., & Hartle, L. (1997). Getting along: How teachers can support children's peer relationships. *Early Childhood Education Journal, 24*, 139–146.

Kuzborska, I. (2011). Links between teachers' beliefs and practices and research on reading. *Reading in a Foreign Language, 23*, 102–128.

Ladd, G. W., Birch, S. H., & Buhs, E. S. (1999). Children's social and scholastic lives in kindergarten: Related spheres of influence? *Child Development, 70*, 1373–1400.

Luster, T., Rhoades, K., & Haas, B. (1989). The relation between parental values and parenting behavior: A test of the Kohn hypothesis. *Journal of Marriage and the Family, 51,* 139-147.

MacPhee, D. (1981). *Knowledge of Infant Development Inventory*. Princeton, NJ: Educational Testing Service.

McClelland, M. M., Cameron, C. E., Connor, C. M., Faris, C. L., Jewkes, A. M., & Morrison, F. J. (2007). Links between behavioral regulation and preschoolers' literacy, vocabulary, and math skills. *Developmental Psychology, 43,* 947–959. doi:10.1037/0012–1649.43.4.947

Mitchell-Copeland, J., Denham, S., & DeMulder, E. (1997). Q-Sort assessment of child–teacher attachment relationships and social competence in the preschool. *Early Education and Development, 8*, 27–39.

Muthén, B. O., & Muthén, L. K. (2010). *Mplus user's guide: Statistical analysis with latent variables.* Los Angeles, CA: Muthén & Muthén.

National Association for the Education of Young Children [NAEYC]. (2009). *Position statement: Developmentally appropriate practice* (3rd ed.). Washington, DC: Author.

NICHD Early Child Care Research Network [NICHD ECCRN]. (1999). Child outcomes when child care center classes meet recommended standards for quality. *American Journal of Public Health, 89,*1072-1077.

Perry, D., Holland, C., Darling-Kuria, N., & Nadiv, S. (2011). Challenging behavior and expulsion from child care: The role of mental health consultation. *Zero to Three, 32,* 4–11.

Pianta, R. C., La Paro, K. M., Payne, C., Cox, M. J., & Bradley, R. (2002). The relation of kindergarten classroom environment to teacher, family, and school characteristics and child outcomes. *Elementary School Journal, 102*, 225–238.

Pianta, R. C., & Stuhlman, M. W. (2004). Conceptualizing risk in relational terms: Associations among the quality of child–adult relationships prior to school entry and children's developmental outcomes in first grade. *Educational and Child Psychology, 21*, 32–45.

Rahn, M. (2015). Factor analysis: A short introduction. Retrieved from http://www.theanalysisfactor.com/factor-analysis-1-introduction/

Raver, C. C., & Knitzer, J. (2002). *Ready to enter: What research tells policymakers about strategies to promote social and emotional school readiness among three- and four-year-old children (Promoting the Emotional Well-being of Children and Families Policy Paper No.3*). New York, NY: National Center for Children in Poverty.

Raykov, T., & Marcoulides, G. A. (2011). *Introduction to psychometric theory*. New York, NY: Routledge.

Rimm-Kaufman, S. E., & Hamre, B. K. (2010). The role of psychological and developmental science in efforts to improve teacher quality. *Teachers College Record, 112*, 2988–3023.

Schaefer, E. S., & Edgerton, M. (1985). Parent and child correlates of parental modernity. In I. E. Sigel (Ed.), *Parental belief systems: The psychological consequences for children* (pp. 287-318). Hillsdale, NJ: Lawrence Erlbaum Associates.

Spector, P., Katwyk, P., Brannick, M, & Chen, P. (1997). When two factors don't reflect two constructs: How items characteristics can produce artifactual factors. *Journal of Management, 32,* 659–677.

Squires, J., Bricker, D., & Twombly, E., Yockelson, S., Davis, M.S., & Kim, Y. (2002). *Ages & Stages Questionnaires®: Social-Emotional (ASQ: SE): A parent-completed, child-monitoring system for social-emotional behaviors.* Baltimore, MD: Paul H. Brookes Publishing Co.

Yu, C. Y., & Muthén, B. (2002). *Evaluation of model fit indices for latent variable models with categorical and continuous outcomes* (Technical report). Los Angeles, CA: University of California at Los Angeles, Graduate School of Education & Information Studies.

CHAPTER 3: STUDY 2

A Heuristic Model of Pre-service Early Childhood Teacher Preparation to Support Children's Social-Emotional Development

Public awareness of the value of high quality early childhood education has grown stronger in the last decade, especially as greater attention is being placed on children's school readiness. Research is quite clear that there is a link between social-emotional development and school readiness, specifically, early social-emotional development predicts later school and life success (Boyd, Barnett, Bodrova, Leong, & Gomby, 2005; Cohen, Onunaku, Clothier, & Poppe, 2005; Romano, Babchishin, Pagani, & Kohen, 2010; Shonkoff & Phillips, 2000). Social-emotional development includes the child's abilities to identify and understand his or her own feelings and the feeling of others, manage emotions, regulate behavior, and establish and sustain relationships (National Scientific Council on the Developing Child, 2005). Failure to promote young children's social-emotional development can lead to significant deficits in social skills, school readiness, academic success, as well as internalizing and externalizing problems during adolescence, juvenile delinquency, and increased risk of drug abuse and imprisonment (Bornstein, Hahn, & Haynes, 2010; Dishion, French, & Patterson, 1995).

With increasing numbers of children 0–5 years old being enrolled in early childhood programs for longer hours, the role of teachers in the development of young children is becoming even more important (U.S. Department of Education, National Center for Education Statistics, 2015). Teachers' interactions with and the supports they provide to children are indicated as vital to children's social-emotional development, and teachers are expected to share with parents the responsibility of supporting young children's social-emotional development. Further, early childhood teachers are expected to be familiar with knowledge of child development and

practices to promote children's development as part of their work with children (NAEYC, 2009; Allen & Kelly, 2015). However, high rates of preschool expulsions seem to suggest teachers may be lacking the knowledge and skills needed to promote social-emotional development (Gilliam, 2005; Perry, Holland, Darling-Kuira, & Nadiv, 2011). Systems of learning such as degrees obtained in institutions of higher education provide a context for early childhood teachers to learn about child development and best practices for working with children, and help them translate their knowledge into practice (Allen & Kelly, 2015). Early childhood teachers' abilities to support the social-emotional development of all children, including those with challenging behaviors, may depend in large part on the educational preparation they receive. But, research indicating social-emotional development as one of the least focused on domains in higher education early childhood programs suggests pre-service teachers may not receive adequate professional development in this area of child development (Allen & Kelly, 2015; Andrews, Buettner, Hur, & Jeon, 2015). Further, many teachers of young children and graduates of early childhood programs report feeling unprepared to address children's challenging behaviors and effectively support their social-emotional development (Hemmeter, Corso, & Cheatham, 2006; Hemmeter, Santos, & Ostrosky, 2008; National Survey of Early Care and Education Project Team, 2013). Findings regarding the impacts of variation in early childhood teacher education have been mixed. Although, in general, studies show that teachers with higher levels of education have more child development knowledge, better interactions with children, better classroom quality, and their students have better academic achievements and social outcomes than those of teachers with less or general education (Arnett, 1989; Bowman, Donovan, Burns, & the Committee on Early Childhood Pedagogy, 2000 Burchinal, Cryer, Clifford, & Howes, 2002; Goble, Horm, Atanasov, Williamson, & Young Choi, 2015; Howes, 1997; Pianta et al., 2005;

Whitebook, 2003), research has not examined links between knowledge and practices despite standards in the field suggesting teachers of young children should have knowledge of child development and the strategies which support it in order to guide children's learning and development (NAEYC, 2009). Further, very little research has gone beyond examining basic associations between levels of formal education (e.g. associate's degree, bachelor's degree) and teacher or classroom outcomes, limiting our understanding of teachers' educational experiences that contribute to their development of relevant knowledge and skills to support children's development. Further, because education level is often used as a proxy for knowledge, there is an assumption that the more content knowledge teachers gain the more prepared they are to meet the needs of children in their care. However, this has not been explicitly tested and it is not clear from the existing literature what domain-specific knowledge early childhood teachers have and how this knowledge is related to their practices.

While early childhood teachers' knowledge of child development may be an important factor accounting for teachers' practices, it is not the only factor that may explain teacher practices related to children's social-emotional development. Teachers' beliefs play a vital role in what teachers do and how they interact with children in the classroom. The influence of teachers' beliefs on practices has been well documented, and studies suggest that teachers' classroom decisions are influenced by their beliefs about students and learning (Faulkner-Schneider, 2005; Stipek & Byler, 1997). Hence, domain-specific beliefs may be important to examine because they may determine the teaching strategies used by teachers related to the subject (Schirmer, Casbon, & Twiss, 1997). For this study, what teachers believe about emotions and their place in the classroom may be another significant factor related to the practices they use to support children's SE development.

To go beyond the basic link between teachers' education levels and classroom practices, the current study focuses on (1) the relationship between coursework and early childhood teachers' knowledge and beliefs related to social-emotional development, (2) relationships between teachers' knowledge of children's social-emotional age-based milestones and support strategies, and their classroom practices, and (3) the role of teachers' beliefs in the relationship between knowledge and practice.

Below is a review of the literature examining basic associations between education and teacher practices showing mixed findings for the effects of education on early childhood teacher practices, and calling for a closer look at teachers' education to understand teachers' development of knowledge and practices. This is followed by a review of literature on teacher education studies in the elementary through high school field showing mediating and moderating factors, which may play a role in teachers' classroom practices, and a proposed theoretical model that may explain how these factors are related.

Links Between Teacher Education and Classroom Practices

In the Unites States there is no single level of education required for early care and education teachers/caregivers. Different levels of formal education such as master's degrees, bachelor's degrees, associate degrees, high school diplomas, and early childhood certifications are all acceptable qualifications for individuals working directly with children in early childhood settings (Morgan, 2003). Hence, research has primarily focused on comparing the influences of these different education levels on teacher outcomes. Findings from such research have been mixed, but the majority of the research shows that preschool teachers' formal education and specialized training predict their knowledge, classroom quality and influence children's learning and development (Arnett, 1989; Burchinal et al., 2002; Cassidy, Buell, Pugh-Hoese, & Russell,

1995; Clarke-Stewart & Gruber, 1984; Goble et al., 2015; Howes, Whitebook, & Phillips, 1992; Pianta et al., 2005; Snider & Fu, 1990). For example, Pianta and colleagues found evidence indicating teachers with bachelor's degree, specifically in early childhood education or child development, had classrooms with more positive emotional climates and better provision for learning than teachers holding other BA degrees. Similarly, Burchinal and colleagues found that teachers with BA/BS degrees in early childhood were rated substantially higher on global measures of classroom quality (including the ECERS and ITERS) and teacher sensitivity (Arnett Caregiver Interaction Scale [CIS]) than teachers with either a CDA/Associates degree, vocational courses only, or no training. Furthermore, children with higher receptive language scores had teachers with more formal (specialized) education (e.g., BA/BS in early childhood) compared to children of teachers in the other three education categories (Burchinal et al., 2002).

Other recent research, however, did not find completely consistent results to those previously presented. For instance, Early and colleagues (2007) reanalyzed data from seven large studies of early care and education examining the relationship between teachers' level of education and classroom quality. Results showed null findings from four of the seven studies reviewed. The remaining three studies showed conflicting results, where two of the studies found that teachers with BAs or higher had higher classroom quality, while the other study indicated lower classroom quality for teachers with BAs or higher compared to those with less training. Similarly, when examining teachers' years of education, level of education, degree status, and degree content (e.g., majoring in early childhood versus majoring in other topics), no significant associations were found related to measures of quality (Early et al., 2006). In another study, the associations between teacher education and classroom quality disappeared once adult/child ratio and teachers' wages were taken into account (Phillipsen, Burchinal, Howes, & Cryer, 1997)

indicating that these structural features which are associated with teacher education were the actual predictors of classroom quality, rather than teacher education itself.

The moderate literature on early childhood teacher education provides an elementary understanding of the link between formal education and teacher practices. However, mixed findings suggest the need to go beyond this basic relationship to better understand specific aspects of teachers' preparation (e.g., coursework) that contribute to the development of knowledge, and thus influence their practices.

Coursework, Knowledge, and Beliefs

There is little empirical evidence in the field of early care and education linking pre-service teachers' coursework to their knowledge, despite broad associations between degrees in early childhood and teacher practices. A closer look at the relations between coursework—a fundamental aspect of teachers' educational experiences—and knowledge and beliefs, which are expected to have an effect on teachers' practices is therefore needed to understand how teachers develop knowledge and skills to teach young children. The limited research on coursework and knowledge converges on the idea the coursework does not always improve teachers' knowledge (Floden & Meniketti, 2005; Koh & Neuman, 2009; Neuman & Cunningham, 2009). Research by Floden and Meniketti suggested that coursework in specific subject matter is significant for teachers' knowledge but is not always effective in developing all pre-service teachers' knowledge in the subject matter. Furthermore, although coursework provides teachers with breadth of knowledge, they may lack depth in understanding concepts related to teaching the subject matter (Shulman, 1987; Whitebook, Gomby, Bellm, Sakai, & Kipnis, 2009). This suggests that coursework enhances teachers' knowledge about a subject (e.g., children's social and emotional development), but does not necessarily guide teachers in how to apply the

knowledge to practice in their classrooms in order to teach it to children. On the other hand, studies of pre-service and in-service populations show that teachers' coursework alone in early literacy development does not improve their knowledge of early literacy (Koh & Neuman, 2009; Neuman & Cunningham, 2009). However, coursework plus coaching leads to improved knowledge of early literacy, suggesting coaching is a vital component for improving knowledge (Koh & Neuman, 2009; Neuman & Cunningham, 2009). Coaching provides one-on-one support to teachers and often enhances teachers' knowledge of strategies to support children's learning in a focused area (Joyce & Showers, 2002). Research shows that teachers who receive coaching make sustained changes to their teaching practices compared to teachers who receive other types of professional development, for example, workshop-style training or formal coursework (Joyce & Showers, 2002; Neuman & Wright, 2010). It is therefore likely that coursework which includes field placements with coaching from lead teachers may have a greater effect on teachers' knowledge of strategies to support children's development than courses without field placements that include coaching. Because education is a developmental process we need to not only understand how the different aspects of education influence teacher development, i.e., their knowledge of developmental milestones and support strategies, their beliefs, and ultimately their practices, but also how these developmental components influence each other and interact to influence teacher, classroom, and child outcomes.

Knowledge of Child Development

Early childhood education has been viewed as a "practical application of the scientific field of child development" (Spodek, 1987, p. 206). Leaders in the science and practice of early child development and education indicate that teachers' knowledge of child development is, or should be, central to their practice and pedagogy in the classroom. For example, NAEYC's

(2009) position statement on *Developmentally Appropriate Practice in Early Childhood Programs Serving Children from Birth Through Age 8* states, "Teachers who are knowledgeable about child development and learning are able to make broad predictions about what children of a particular age group typically will be like, what they typically will and will not be capable of, and what strategies and approaches will most likely promote their optimal learning and development" (p. 9). These standards in the field set the expectation that future professionals will know about and understand children's development across domains in order to promote children's development and learning, and serve as guidelines for many early care and education programs and courses in institutes of higher education. These views and standards are redolent of the idea that knowledge of child development—including milestones of development—predicts teachers' classroom practices; further, that a lack of such knowledge may lead to inappropriate expectations and the use of ineffective strategies to support children's development (Qi & Kaiser, 2003). Yet very few studies have examined associations between teachers' knowledge about children's development and their practices, and even fewer about knowledge of children's social-emotional development.

As reviewed above, extant literature does suggests that more formal education—often used as a proxy for knowledge—is associated with overall classroom quality and linked to better cognitive and social outcomes for children (Arnett, 1989; Bowman et al., 2000 Cassidy et al., 1995; Early et al., 2006; Whitebook, 2003; Whitebook et al., 1989). But what early childhood teachers know about child development and whether their knowledge of child development influences their classroom practices remains a gap in the research on early care and education, despite the idea that knowledge of child development is important for the field of practice. Research on teacher education for the elementary and high school (K–12) age range shows that

teachers who are more knowledgeable about a subject matter are better able to engage students with the subject matter, and better able to evaluate and use instructional materials related to that subject matter (Cai, 2005; Cunningham, 1998; Fernández, 1997; Gess-Newsome & Lederman, 1995; Ma, 1999; Sanders, Borko, & Lockard, 1993; Sowder, Phillip, Armstrong, & Schappelle, 1998; Wilkins, 2002). Further, drawing from studies of parents' child development knowledge, there is evidence supporting the expectation that greater knowledge of children's normative development predicts parenting behaviors (Haung, Caughy, Genevro, & Miller, 2005; Stevens, 1984). Findings from the K–12 and parenting research linking knowledge to practices suggest that understanding children's normative social-emotional development is likely an important component of the knowledge early childhood teachers need to guide the practices they use to support children's development in this domain. While having more formal education (e.g., a BA degree) does imply and has been shown to predict greater knowledge of child development (Goble et al., 2015), it does not provide evidence for the depth of, or domain-specificity of, knowledge a teacher may gain while obtaining their degree. Further, the focus given to different domains in many higher education programs is generally unequal, with social-emotional development being one of the areas receiving less attention, and often taught as part of much broader courses on development across domains, rather than a domain-specific course (Andrews, Buettner, Hur, & Jeon, 2015). This lack of focus on the social-emotional domain, despite having and early childhood degree, may be the reason teachers report feeling unprepared to support children's social-emotional needs. Given the general idea that knowledge influences practices, we hypothesize that early childhood teachers with more accurate knowledge of children's SE milestones and strategies which support social-emotional development will more often use

practices to support children's social-emotional development than those with less accurate knowledge.

Beliefs About Child Development

While knowledge may be an important factor guiding pre-service teachers' practice, it is not the only factor that accounts for teachers' practices. Beliefs—described as "a proposition which may be consciously or unconsciously held, is evaluative in that it is accepted as true by the individual, and is therefore imbued with emotive commitment; further, it serves as a guide to thought and behavior" (Borg, 2001, p. 186)—may also explain teacher practices. It has been suggested that teachers approach teaching on impulse and intuition, relying very little on their professional education, and that teaching is really about common sense and practice, and less about professional knowledge (O'Brien & Stewart, 1990) such as knowledge of children's development. It is expected that teachers will bring their beliefs to their learning and practice, which in some cases may contradict the research-based knowledge they receive from institutions of higher education, but nonetheless shape their classroom practices (Davis & Wilson, 1999; Gebel & Schrier, 2002; Johnson, 1992; Kuzborska, 2011; Richardson, Anders, Tidwell, & Lloyd, 1991). Research shows that teachers' decisions to use specific teaching practices in the classroom may reflect their beliefs about what is important for children to learn (Faulkner-Schneider, 2005; La Paro, Siepak, & Scott-Little, 2009; Stipek & Byler, 1997). For example, Faulkner-Schneider (2005) found that teachers with more positive beliefs and attitudes about science and science teaching more frequently provided different types of science activities. Also, early childhood teachers who believed that early child education should be about teaching children basic skills tended to place emphasis on teaching numbers, letters, and days of the week; teachers who believed children learn best through child-centered practices tended to place more

emphasis on following children's lead by being more responsive, respectful, accepting, and nurturing (Stipek & Byler, 1997). Some studies, however, failed to find relationships between beliefs and practices or found incongruences between beliefs and practices (e.g., McClintic & Petty, 2015; Wen, Elicker, & McMullen, 2011; Wilcox-Herzog, 2002). These null findings and incongruences may be a result of teachers' self-reporting beliefs that are based on their educational knowledge rather than deep rooted beliefs (Green, 1971). Thus, when observed in the classroom teachers may demonstrate deep-rooted beliefs about teaching which may contradict their self-reported beliefs. If teachers' beliefs are not addressed during their preparation this may have strong implications for what teachers do in the classroom, especially if the beliefs are contrary to recommended practices. Because beliefs can have serious implications for teachers' decision-making and behaviors toward children, understanding how knowledge and beliefs interact to influence practices can benefit early childhood programs seeking to better prepare their students for their future work with young children (Monroe, 2005; Silverman, 2007). This information may provide support for the need for pre-service teachers to examine their own deep-rooted beliefs, which may be misaligned with current evidence-based practices (Thomas, 2014).

Theoretical Framework

The purpose of the current research was to investigate relationships among coursework, knowledge, beliefs, and practices. Little is known about the factors beyond the broad construct of education—typically measured as degree level—that influence teachers' development of knowledge and practices (Whitebook et al., 2009). Research, however shows that education level influences knowledge (Goble et al., 2015) and standards in the field expect that knowledge of child development influences teacher practices (NAEYC, 2009). Also, there are numerous

studies showing that beliefs are important to, and often predict, teacher practices, but have not examined interactions between knowledge and beliefs, nor related this relationship to practices (Pajares, 1992; Stipek & Byler, 1997; Wilkins, 2008). Thus, we hypothesized that content-specific coursework—an aspect of education—would influence early childhood teachers' knowledge of child development and support strategies as well as their beliefs. Also, that early childhood teachers' knowledge of child development and support strategies would directly and positively influence the use of practices (NAEYC, 2009; Wilkins, 2008), but this might depend on their beliefs. Figure 3.1 represents the conceptual model that guided the development of this study and led to the following research questions:

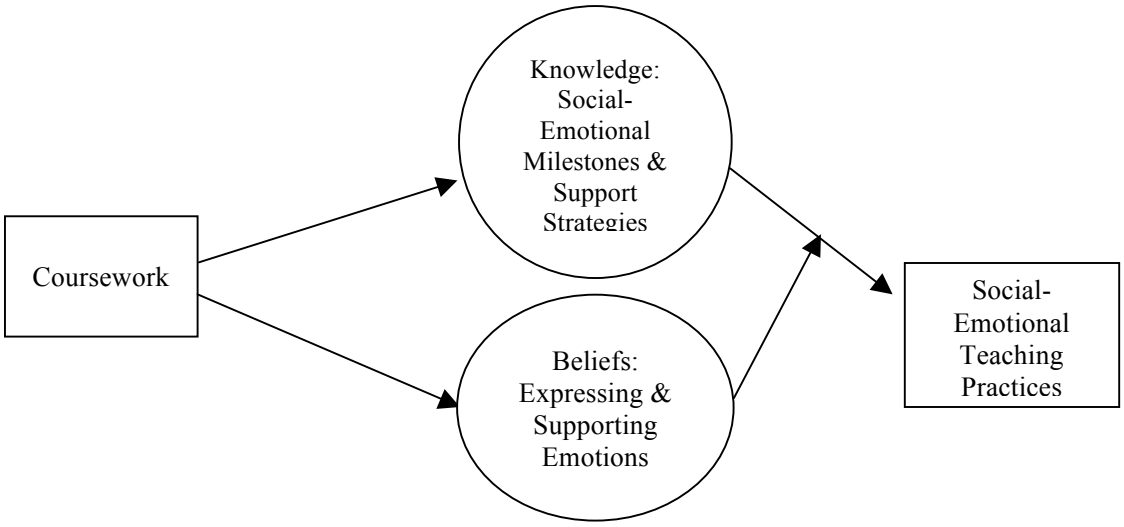

Figure 3.1. Conceptual model.

1. What is the relationship between early childhood teachers' prior coursework containing social-emotional content and (a) knowledge of children's SE milestones, (b) knowledge of strategies to support SE development, and (c) beliefs about supporting and expressing emotions?

2. Do early childhood teachers' beliefs about expressing and supporting emotions in the classroom moderate the relationships between early childhood teachers' knowledge of children's social-emotional milestones and strategies to support social-emotional development and their use of social-emotional practices in the classroom?

Methods

Overview

This is a cross-sectional study employing both self-report and observation methods, using a convenience sample of college students at one large public university, including those majoring in Early Childhood Education (ECE) and other majors.

Procedures

The university's IRB and the research board of the universities' Child Development Laboratories (CDLs) approved this study. Students were recruited from 10 courses offered through the Human Development and Family Studies Department (HDFS). These courses ranged from lower to upper level courses and included courses both in an out of the early childhood major (e.g., Child Growth and Development and Lifespan Human Development in Family). The researcher visited each of the 10 college courses from which students were recruited prior to distribution of the survey. Data were collected over the two semesters of the 2014/2015 academic year. A survey was distributed both online and in paper-and-pencil formats to collect data on students' educational and demographic backgrounds, knowledge of social-emotional developmental milestones and strategies to support social-emotional development, and beliefs about expressing and supporting emotions in the classroom context. Survey items used to gather background information on participating students included current enrollment in courses, prior

courses taken, prior and current work and field experiences with children, year in college, major, and basic demographic data (e.g., gender, age, family income, race, and ethnicity).

Observations were also conducted with a subsample of the participants who were taking courses with field placements at the university's child development laboratories. The three courses, which each included supervised field work, in which participants were observed included Interactions with Children, Curriculum in Early Childhood Education, and Student Teaching in Early Childhood Education. Observations allowed the researcher to gather data on pre-service teachers' practices without participant response bias, which may occur through self-report measures, and may have inflated associations. All participants were entered into a drawing to win 1 of 10 $25 gift cards from Amazon.

Participants

Survey participants. The participants in this study were undergraduate students enrolled in one or more of 10 courses through a Human Development and Family Studies department in one large public university in the Midwest. Survey participants (n = 160) ranged in age, year in college, majors, and family income. The majority of survey respondents were female (95%), White (82%), and non-Hispanic (95%). Approximately half (55%) of students were majoring in either early child education or child development; other common majors included kinesiology, nursing, and communications and participants were at various stages in the education (see Table 3.1).

Observation participants. The participants observed on classroom practices (n = 33) were a subsample of the survey participants for this study who were taking courses with supervised field placements in preschool classrooms. Observation participants were mostly juniors and seniors in college (81%), white (91%), non-Hispanic (94%), and between the ages of

18 and 24 (94%). All observation participants were female and were early childhood majors (child development or early child education).

Table 3.1

Characteristics of the Study 2 Participants—Percentages

Characteristics	Survey participants (n = 160) %	Observation participants (n = 33) %
Race		
White	82	91
African American/Black	10	3
Asian/Pacific Islander	4	3
Other	4	3
Age		
18–20	54	38
21–24	39	56
25+	7	6
Major		
Early childhood	55	100
Communications	8	
Kinesiology	8	
Nursing/Pre-Nursing	8	
Other	21	
Year in College		
Freshman	13	0
Sophomore	21	9
Junior	34	38
Senior	24	44
Other	7	9
Family Income		
Under 10,000	1	
10,000–49,000	21	16
50,000–99,000	25	26
100,000+	31	23
Would rather not say	22	35

Note: Extracted from Harewood, 2015

Measures

Knowledge of social-emotional milestones and support strategies. Knowledge of social-emotional milestones and support strategies was measured using the Knowledge of Social-

Emotional Milestone Index and the Knowledge of Support Strategies Index (K-SEMS, preK version; Harewood, 2015). The Knowledge of Social-Emotional Milestones index consists of six items and the Knowledge of Social-Emotional Support Strategies consists of nine items. These indices were determined in a previous study as valid (e.g., face and content validity were established via experts and predictive validity established via associations with observed social-emotional teacher practices) and moderately reliable (e.g., Cronbach's alphas for the two indices were .61 and .51 respectively and test–retest and correlations of items were moderate to good) Responses on the indices were coded as 1 (correct) or 0 (incorrect) and scores for knowledge on both indices were calculated by averaging the scores across items, resulting in scores on a 0–1 scale, with scores closer to 1 indicating more accurate knowledge. An example item on the Knowledge of Social-Emotional Milestones Index is, "Children begin to compare their abilities to those of others around the age of 3." An example item on the Knowledge of Support Strategies index is "Giving children specific words to say to each other during social conflicts will hinder their abilities to develop their own skills for negotiation and managing conflicts."

Teacher beliefs about emotions in the classroom. The Teacher Beliefs About Emotions (TBAE; Hyson & Lee, 1996; Appendix B) survey was used to measure participants' beliefs about expressing and supporting emotions in the classroom. The TBAE consists of 23 Likert-scale items in 6 subscales ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The six subscales include bonds (beliefs concerning adult-child connections [e.g., *People are better teachers if they aren't emotionally involved with the children*]), expressiveness (beliefs in adults' expression of emotions around children [e.g., *It's good for a teacher to let children know when she is feeling angry*]), instruction/modeling (beliefs in using direct instruction and demonstration to help illustrate to children appropriate emotion expression [e.g., *I think it's better for children*

to figure out how to express their feelings on their own, instead of having the teacher show them how]), Talk/Label (beliefs in helping children identify and discuss their current emotion states [e.g., *When children are upset or angry about something, it's not the best time to talk about their feelings*]), protect (beliefs in shielding children from upsetting emotions [e.g., *If a class pet died, I would not tell the children because they might become too upset*]), and display/control (beliefs in children's ability to regulate and exhibit emotions in a socially acceptable manner [e.g., *It's important for teachers to teach children socially acceptable ways of expressing their feelings*]). Item responses in each subscale are averaged with higher scores reflecting higher endorsement of the statements in a specific belief area. Higher scores on all subscales except the Protect subscale were considered better. For this study, a total average score was calculated by averaging the average scores on each subscale. In the original study in which this instrument was developed, alphas for subscales ranged from .41 to .62. Cronbach's alphas for this study were similar to those of the original study ranging from .42 to .67.

Teacher practices to support preschoolers' social-emotional development.

Observations of pre-service early childhood teachers in the classroom context were conducted using an adapted version of the Teacher Styles Rating Scale (TSRS; Domitrovich, Cortes, & Greenberg, 2001). The original instrument was developed as a complementary tool to the CLASS and included nine total items, three items in each subscale (Positive Discipline, Classroom Management, Positive Emotional Climate). For this study, five items from the original scale were retained and four items were added. Two of the four added items were taken from an adapted version of the TSRS and the remaining two items were taken from the CSEFEL Teaching Practices Inventory (2006). These added items aligned with the teaching skills taught in the HDFS coursework, which are modeled and reinforced by master teachers in participants'

field placements; thus, the modifications were made to provide more curricular validity to the observational measure. Three of these added items were expected to create a subscale for social climate and one item was added to the positive emotions subscale.

Observer training and reliability. Three undergraduate research assistants (URAs) were trained by the researcher to use the observation instrument through live observations at the CDLs. Inter-observer agreement was assessed using percentage of agreement within one scale point. During the training period, randomly selected early childhood teachers in preschool-aged classrooms were rated independently and simultaneously by all three URAs and assessed for inter-observer agreement. Training continued until all URAs reached 90% agreement within one scale point on a minimum of 5 teachers.

RAs observed each participant one time during their field placement and rated pre-service teachers for SE teaching practices during free play, clean-up, and transition. Observations lasted for 1 hour, beginning when children were dismissed to free play and ending when all children finished cleaning up. These three contexts were selected for observation because these are often child-directed activities that allow pre-service teachers to interact freely with children, potentially eliciting a broader range of teacher behavior relevant to the observation instrument than would a more teacher directed activity. At the end of the hour, the URA rated how often pre-service teachers used the SE practices on a scale of 1 (never) to 5 (always) using notes taken during observation to help support their ratings.

Subscales of observed skills. Since the original version of the instrument was adapted, we tested the items using confirmatory factor analysis (CFA) to determine if the theoretical structure of the adapted instrument would hold. Results from the CFA revealed that the nine items in the adapted TSRS for this study did not load well together in the proposed three factor

model ($\chi^2 = p < .001$; RMSEA = .39; CFI/TLI = .70/.57). Thus, an exploratory factor analysis (EFA) was conducted to identify a factor solution that best fit the data and item loadings. Using a varimax rotation, we examined the eigenvalues and the scree test, which suggested a 2-factor model. When the 1- and 2-factor solutions were examined, test statistics did not show good fit for either, thus, the 3-factor solution was examined. Chi-square test statistic, and RMSEA indicated the 3-factor solution was the best fit for the data ($\chi^2 = .92$, RMSEA < .001) and accounted for 89% of the variance (6.049 + 1.106 + .885) / 9 = .89). The EFA revealed slight differences in the items that loaded together in this 3-factor solution compared with the proposed 3-factor model analyzed for the CFA. Thus, factors were renamed to reflect the items in each factor. Factor 1, Positive and Proactive Behavior Management, included three items (α = .74) positive behavior management, classroom awareness, and social awareness. Factor 2, Social-Emotional Guidance, included three items (α = .69) including identifies and labels emotions, identifies and corrects misbehavior, models emotion expression. Factor 3, Encouraging the Use of Social-Emotional Skills (α = .83), included three items: emotion regulation, emotion expression, and social problem-solving. Average scores across items in each factor were used in analyses. Higher scores indicated pre-service teachers used practices more frequently.

Courses with social-emotional content. Background questions on the survey required participants to indicate whether they (1) had not yet taken a course, (2) were taking it currently, or (3) took it in the past for each of the 10 courses from which students were recruited. Instructors provided copies of course syllabi, which were used to determine the courses with social-emotional content. Based on the weekly topics and assignments listed in course syllabi, three courses had social-emotional content embedded in them – Child Growth and Development, Interaction Processes with Children in Groups, Curriculum for Early Childhood Programs. For

each of these three courses, binary variables were created to indicate participants had either already taken the course or they had not; courses in which students were currently enrolled were coded as 0 because surveys were collected early in each semester, thus students were not expected to have gained much of the content. A variable was then created indicating the number of prior courses students took with social-emotional content. Codes for the coursework variable were: 0 (*took no prior courses with social-emotional content*); 1 (*took 1 course with social-emotional content*); 2 (*took two courses with social-emotional content*); 3 (*took all 3 courses with social-emotional content*).

Preliminary Analyses

Means and standard deviations of study variables are reported in Table 3.2 for the 160 survey participants as well as for the 33 observation participants. Correlations were conducted to determine associations among study variables. Age and year in college significantly correlated with predictor or outcome variables for the larger sample and were included in regression models using the larger sample (see Table 3.3). In the observation subsample, neither age nor year in college correlated with the predictor or outcome variables (see Table 3.4), hence, these variables were not included in the regression analyses for the subsample.

Table 3.2

Means and Standard Deviations of Study Variables

Variables	Survey Sample			Observation Subsample		
	N	*M (SD)*	*Min–Max*	*N*	*M (SD)*	*Min–Max*
TBAE: Bonds	156	3.87 (.65)	2.25–5.00	33	4.19 (.57)	2.75–5.00
TBAE: Expressiveness	154	3.14 (.63)	1.50–4.50	33	3.39 (.62)	22.00–4.50
TBAE: Instruction and Modeling	156	3.72 (.78)	1.67–5.00	33	4.08 (.62)	3.00–5.00
TBAE: Talk/Label	156	3.83 (.57)	2.67–5.00	33	4.18 (.49)	3.33–5.00
TBAE: Protect	158	2.25 (.62)	1.00–4.00	33	1.79 (.49)	1.00–2.67
TBAE: Display/Control	158	3.92 (.64)	2.33–5.00	33	4.30 (.50)	3.33–5.00
TBAE: Total	151	3.46 (.36)	2.36–4.38	33	3.66 (.29)	3.04–4.28
Positive and Proactive Behavior Management				32	3.79 (.79)	2.00–5.00
SE Guidance				30	3.58 (.77)	1.67–4.67
Encouraging Use of SE Skills				31	2.97 (.95)	1.00–4.67
Knowledge of SE Milestones	160	.41 (.26)	0.00–1.00	30	.52 (.23)	.00–.83
Knowledge of Support Strategies	161	.78 (.18)	.22–1.00	31	.87 (.13)	.56–1.00
Age Range	129	1.64 (.95)	1–5	32	1.75 (.80)	1–5
Year in College	128	2.87 (1.14)	0–5	32	3.53 (.80)	2–5
No. of prior courses with social-emotional content	140	1.08 (1.19)	0–3	33	2.15 (.94)	0–3
N (listwise)	106			25		

Table 3.3

Correlations Among Study Variables for the Entire Sample (n = 160)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Bonds	1										
2. Expressiveness	.44**	1									
3. Instruction/ modeling	.42**	.21*	1								
4. Talk/label	.57**	.36**	.59**	1							
5. Protect	–.41**	–.23**	–.36**	–.48**	1						
6. Display/ control	.59**	.25**	.47**	.65**	–.57**	1					
7. TBAE: Total Ave	.78**	.60**	.74**	.81**	–.32**	.71**	1				
8. Age	.24**	.12	.07	.12	.00	.17	.21**	1			
9. Year in college	.30**	.17	.27**	.29**	–.26**	.34**	.32**	.53**	1		
10. Knowledge of SE Milestones	.35**	.20*	.31**	.41**	–.32**	.41**	.42**	.31**	.20**	1	
11. Knowledge of SE strategies	.40**	.24**	.37**	.45**	–.27**	.37**	.47**	.16	.27**	.47**	1
12. Courses with SE content	.49**	.40**	.46**	.51**	–.37**	.43**	.60**	.37**	.58**	.42**	.48**

Notes: TBAE = Teachers' Beliefs About Emotions; SE = Social-Emotional
*$p < .05$; **$p < .01$.

Table 3.4

Correlations Among Study Variables for Subsample (n = 33)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Bonds	1												
2. Expressiveness	.49**	1											
3. Instruction/ Modeling	.27	.04	1										
4. Talk/Label	.56**	.13	.43*	1									
5. Protect	–.42*	–.19	–.29	–.44*	1								
6. Display/Control	.54**	.25	.43*	.73**	–.58*	1							
7. Total: TBAE Ave	.78**	.58**	.62**	.74**	–.31	.74**	1						
8. Age Range	.19	–.10	.00	–.09	–.01	.03	.01	1					
9. Year in College	.16	–.11	.12	.03	–.16	.25	.09	.76**	1				
10. PPBM	.01	.13	.18	.07	–.01	.13	.16	.11	.32	1			
11. SEG	.17	–.04	–.07	.00	.02	.11	.06	.26	.43*	.42*	1		
12. EUSES	.05	–.07	.25	.18	–.06	.10	.14	.13	.19	.61**	.53**	1	
13. K-SEM	.00	.14	.43*	.33	–.18	.39*	.34	.08	.19	.38*	–.13	.11	1
14. K-SES	.02	–.06	.07	.10	.26	–.21	.05	–.01	.04	.36*	.19	.38*	.18

Notes: PPBM = Positive and Proactive Behavior Management; SEG = Social-Emotional Guidance; EUSES = Encouraging the Use of Social-Emotional Skills; K-SEM = Index of Knowledge of Social-Emotional Milestones; K-SES = Index of Knowledge of Social-Emotional Support Strategies

*p < .05; **p < .01.

Results

Relationships Between Coursework and Knowledge and Beliefs

What is the relationship between courses with SE content and pre-service teachers' (a) knowledge of SE milestones, (b) knowledge of SE support strategies (c) beliefs about expressing and supporting emotions?

Multiple regression analyses were conducted to examine the influence of coursework on knowledge and beliefs using the larger sample (n = 160). Results showed that domain-specific coursework predicted both domain-specific knowledge and beliefs.

Relationships between coursework and knowledge. Multiple regressions showed participants' prior coursework with SE content predicted knowledge of social-emotional milestones ($\beta = .38$, $p < .001$; effect size = .34) as well as their knowledge of support strategies ($\beta = .41$, $p < .001$; effect size = .35) even when accounting for year in college and age. Results indicate that participants who took more courses with social-emotional content had more accurate knowledge about children's social-emotional milestones and more accurate knowledge of strategies to support children's social-emotional development. Coursework also explained a significant portion of the variance in the Knowledge of Milestones scores ($R^2 = .21$, $F(3, 106) = 9.46$, $p < .001$) and the Knowledge of Support Strategies scores ($R^2 = .23$, $F(3, 112) = 11.29$, $p < .001$). Students who took all courses with SE content were all in an early childhood major.

Comparisons of average knowledge scores based on number of prior courses taken. Post hoc analyses showed significant differences between the knowledge of milestones scores for students who took all three courses with social-emotional content and those who did not take any of these courses. There were no differences between scores for those who had taken only one or two courses and those who had not taken any courses. The mean scores on the knowledge of

milestones scale for students who took courses with SE content ranged between .32 for those who took one course to .65 for those who took three courses and compared to .37 for students who took no courses with SE content.

Mean scores on the knowledge of support strategies index were generally higher than scores on the social-emotional milestones index. There were significant differences between the knowledge of support strategies scores of participants who took two or more social-emotional content-courses scoring between .88 and .90 compared to scores of .72 for those who did not take courses with social-emotional content.

Relationships between coursework and beliefs. Participants who took more courses with social-emotional content reported higher endorsements of beliefs about expressing and supporting emotions. Results related to each of the beliefs subscales on the TBAE scale showed that coursework had a significant and positive effect on all belief areas: Bonds ($\beta = .52$, $p < .001$; effect size = .37); Expressiveness ($\beta = .40$; $p < .01$; effect size = .34); Instruction/Modeling ($\beta = .38$, $p < .001$; effect size = .32); Talk/Label ($\beta = .37$, $p < .001$; effect size = .31); Display/Control ($\beta = .30$, $p < .01$; effect size = .25); and Total Beliefs about Expressing and Supporting Emotions ($\beta = .59$, $p < .001$; effect size = .47). The only exception was in the Protect belief area, where coursework was negatively related to this subscale: Protect ($\beta = –.29$ $p < .001$; effect size = .24). These results suggest that participants with more social-emotional coursework believed emotions should be expressed and supported in the classroom and children should not be protected from experiencing or expressing emotions.

Moderation Effects of Beliefs on the Relationships Between Knowledge and Practices

Do early childhood teachers' beliefs about expressing and supporting emotions in the classroom moderate the relationships between early childhood teachers' knowledge of children's

SE milestones and strategies to support SE development and their use of SE practices in the classroom?

Basic regressions were conducted in SPSS using the subsample of participants (n = 33) to test the effects of pre-service teachers' knowledge and beliefs on each of the three outcomes (Positive and Proactive Behavior Management, Social-Emotional Guidance, and Encouraging the use of Social-Emotional Skills). Independent variables (knowledge of milestones, knowledge of support strategies, and beliefs) were centered and the knowledge by beliefs interaction terms were computed for knowledge of milestones and total beliefs, as well as knowledge of milestones and each belief subscale (Aiken & West, 1991). This process was repeated for knowledge of support strategies. The two independent variables and the interactions for each model were entered into a regression model sequentially.

Positive and proactive behavior management.

Knowledge of milestones. There were no main effects for knowledge of milestones, or any of the beliefs subscales on positive and proactive behavior management practices. There was a significant interaction between teachers' knowledge of milestones and instruction/modeling beliefs related to positive and proactive behavior management practices ($\beta = .35$, $p = .05$; effect size = .50). the interaction between knowledge of milestones and instruction /modeling beliefs accounted for a significant portion of the variance in positive and proactive behavior management practices ($R^2 = .26$, $F(2, 26) = 2.94$, $p = .05$). As seen in Figure 3.2, results show participants with higher endorsements of instruction/modeling beliefs and more accurate social-emotional knowledge of milestones used developmentally appropriate positive and proactive behavior management practices more frequently. Conversely, participants with higher endorsements of instruction/modeling beliefs and less accurate social-emotional knowledge of

milestones used developmentally appropriate positive and proactive behavior management practices less frequently.

Other models including two-way interactions between knowledge of support strategies and beliefs were not significant related to positive and proactive behavior management practices.

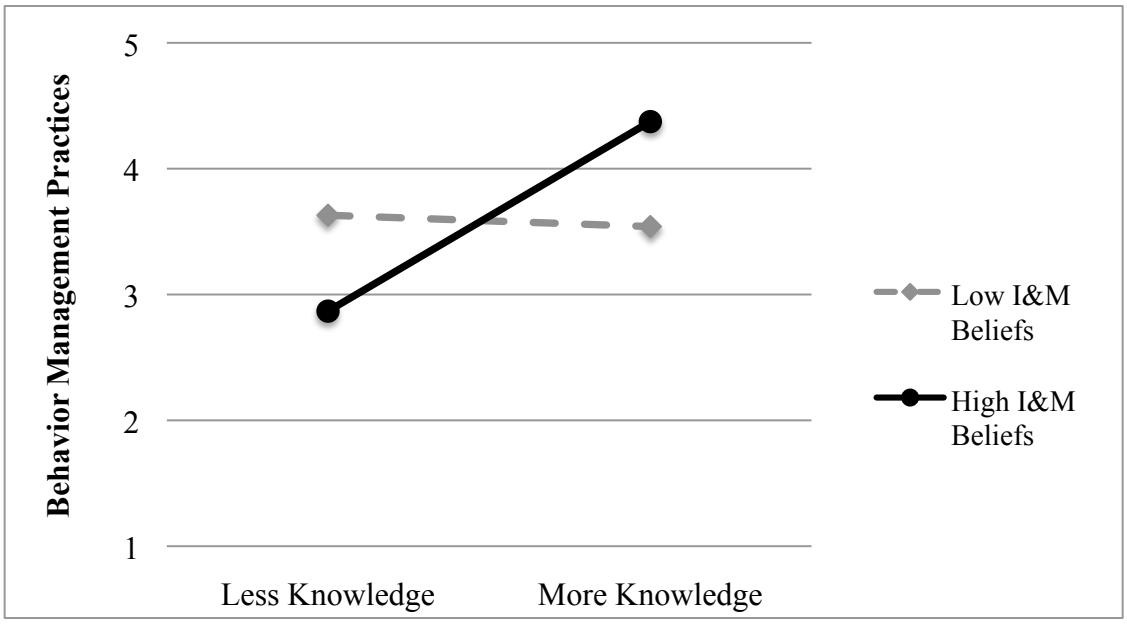

Figure 3.2. Instruction/modeling beliefs moderated the relationship between knowledge of milestones and behavior management practices.

Encouraging the use of social-emotional skills.

Knowledge of support strategies. There was a main effect for knowledge of support strategies on practices encouraging the use of social-emotional skills (β = .38, p = .05; effect size = .35), but not for any of the beliefs subscales. There was a significant interaction between teachers' knowledge of support strategies and instruction/modeling beliefs related to practices encouraging the use of social-emotional skills (β = .38, p = .05; effect size = .37). the interaction between knowledge of milestones and instruction /modeling beliefs accounted for a significant portion of the variance in practices encouraging the use of social-emotional skills (R^2 = .31, F(2, 26) = 3.69, p < .05). Results in Figure 3.3 show that participants with higher endorsements of

instruction/modeling beliefs and more accurate knowledge of strategies to support social-emotional development used practices encouraging the use of social-emotional skills more frequently than those with less accurate knowledge and higher endorsements of instruction/modeling beliefs.

Other models including two-way interactions between knowledge of milestones and beliefs were not significant related to practices encouraging the use of social-emotional skills.

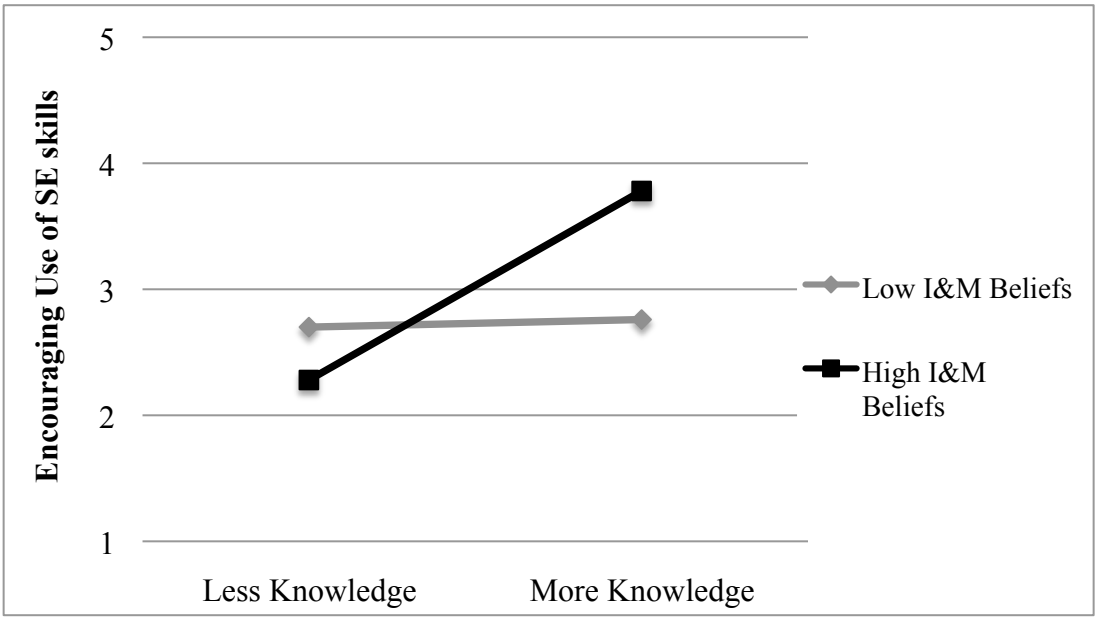

Figure 3.3. Instruction/modeling beliefs moderated the relationship between knowledge of support strategies and practices encouraging the use of social-emotional skills.

Social-emotional guidance. None of the tested models related to social-emotional guidance practices were significant.

Discussion

The current study used a sample of undergraduate students at one university to identify relationships between coursework, knowledge, beliefs, and practices. Results revealed that taking courses with domain-specific content is an important factor related to pre-service teachers' development of domain-specific knowledge and beliefs. Using a smaller sample (n = 33), results

showed that domain specific knowledge is an important factor in pre-service teachers use of domain specific practices, Further, together domain-specific knowledge and beliefs are significant factors related to pre-service teachers use of domain-specific practices.

Relationships Among Coursework, Knowledge, and Beliefs

The findings from this study are consistent with studies broadly defining education as degree level which imply that educational experiences are important to the development of teachers' knowledge and skills (Goble et al., 2015). Also, taking courses with domain specific content contributes to domain specific knowledge (Floden & Meniketti, 2005) as well as beliefs. This study showed that participants' who took HDFS courses with social-emotional content had more accurate knowledge and significantly higher endorsements of beliefs about expressing and supporting emotions than participants who did not take these courses. These findings align with research indicating that education predicts greater child development knowledge (Goble et al., 2015). Also, consistent with work by Floden and Meniketti, these findings suggest that taking courses with domain specific content contributes to pre-service teachers' to domain-specific child development knowledge and beliefs.

Post hoc analyses for differences in knowledge for those who took domain-related coursework showed that although participants who took courses with SE content had higher scores on the knowledge of milestones scale compared to those who did not take these courses, these scores only differed significantly when students took cumulative courses with embedded social-emotional content and these students only had a 65% accuracy on the knowledge of milestones scale. When students took only one course with embedded social-emotional content their scores did not differ significantly from students who did not take any courses with social-emotional content. It could be that since SE content was embedded in courses, that focus on SE

development and/or age-based milestones were underemphasized (Allen & Kelly, 2015; Andrews, Buettner, Hur, & Jeon , 2015) leaving participants to make educated guesses on some of the knowledge items. Further, when social-emotional content is embedded in other courses students would have to take multiple courses in order to gain a depth of knowledge on social-emotional development. Embedding social-emotional content in other courses could therefore leave students feeling unprepared to meet the social-emotional needs of children (Hemmeter et al., 2006; National Survey of Early Care and Education Project Team, 2013. A stand-alone course in SE development may provide pre-service teachers with more thorough and concentrated knowledge of SE development. Future studies should test the effects of a stand-alone SE course on pre-service teachers' SE knowledge. Also, studies should compare the effects of a stand-alone course and courses with SE content embedded in them on student's knowledge of children's social-emotional development. Alternatively, not all courses with social-emotional content had a field placement which allowed students to receive coaching from highly qualified lead teachers. Thus, it is possible that when students took courses having both social-emotional content and field placements their knowledge was more accurate (Joyce & Showers, 2002; Koh & Neuman, 2009; Neuman & Cunningham, 2009; Neuman & Wright, 2010).

Relationships Among Knowledge, Beliefs, and Practices

Main effects of knowledge on practices. When pre-service teachers had more accurate knowledge of social-emotional support strategies they more frequently used social-emotional practices in the classroom. This finding validates standards in the field indicating teachers' should have knowledge of strategies, which guide their developmentally appropriate practices to support children's learning and development (NAEYC, 2009). Specifically this study found that pre-service teachers' knowledge of strategies to support social-emotional development affected

their application of practices encouraging the use of social-emotional skills. It could be that pre-service teachers with more accurate knowledge of strategies are more confident in how to encourage children to use their skills and thus more often responded to children in situations requiring emotional regulation or problem solving, and that those who had less accurate knowledge may have avoided such situations.

Beliefs moderated relationships between knowledge and practices. When pre-service teachers had more accurate knowledge of child development and support strategies, but less endorsements of beliefs about expressing and supporting emotions, they used SE practices less frequently than when they had more accurate knowledge and high endorsements of beliefs. These findings support research indicating beliefs are important to teachers' decision-making and help to explain teachers' practices (Faulkner-Schneider, 2005; Hur, Buettner, & Jeon, 2013; La Paro, Siepak, & Scott-Little, 2009; Pajares, 1992; Stipek & Byler, 1997). Figures 3.2 and 3.3 show that the accuracy of pre-service teachers' knowledge of child development and support strategies interacted with their beliefs about expressing and supporting emotions to predict their use of emotionally supportive practices. While not specifically testing change, the results in this study imply that solely addressing knowledge is not a complete path to educating pre-service teachers of young children. While knowledge is necessary, it is not sufficient. If pre-service teachers come into programs of early childhood with beliefs that are not developmentally supportive for children, and only their knowledge, not beliefs, is influenced by their educational experiences, we may not be helping them to change their practice. Tatto and Coupland (2003) assert that while college courses are often used as the primary context for changes in beliefs, it is premature to think that simply teaching students content knowledge (e.g., theories and empirical research) on a specific topic will effectively influence their beliefs (Tatto & Coupland, 2003).

Instead, college students' beliefs about a specific subject matter are more likely to align with the content knowledge provided in the preparation program if there are opportunities for self- or peer-mediated reflection on existing beliefs (Thomas, 2014). Self-reflective assignments could help teachers identify biases or misconceptions gained through their upbringing and societal experiences and if not change their beliefs at least help them to be aware that they have biases that are not aligned with recommended practices for working with children (Thomas, 2014).

Similar to other research (McClintic & Petty, 2015; Wen et al., 2011; Wilcox-Herzog, 2002), beliefs themselves did not predict practices in this study when knowledge was accounted for in the model. These findings may be linked to the idea that teachers' self-reported beliefs are based on their knowledge of a subject (Green, 1971), thus, making beliefs appear insignificant once the relationship between knowledge and practices was accounted for. Pre- and post- term studies could be used to examine changes in pre-service teachers' domain-specific knowledge and beliefs and consider the effects of other educational factors such as the programs' goals, and instructors' beliefs to see how these might be related to such changes. Also, future studies should conduct path analyses from coursework to knowledge and beliefs and then to practices to better understand these relationships.

While this study provides initial associations between domain-specific coursework and one component of child development knowledge, future studies should include other aspects of pre-service teachers' education such as field experiences. This study calls attention to the need for researchers to conduct more domain-specific studies to further understand what aspects of pre-service teachers' educational experiences produce effective teachers of young children and inform policy and practice. Although not included in this study, other components of child

development knowledge should be included in future research to provide a more complete understanding of teachers' development of knowledge and skills.

Limitations

This study was conducted using a small sample of pre-service early childhood teachers at one university in the Midwest. Participants were mostly white, middleclass females, thus, generalization of results are limited in terms of educational context, race, gender, and socioeconomic status.

Surveys and observations were completed on average 6 weeks apart; students' interim exposure to coursework and field experiences could have influenced changes in knowledge of milestones and support strategies, as well as their interactions with children in the classroom. Future studies should lessen the time between survey completion and observations to minimize the effects of coursework exposure.

This study was based on the assumption that students would be able to recall information and respond to questions based on their knowledge of the specific topic gained through their coursework. Thus, results may not reflect an accurate association between knowledge and practices or beliefs and practices; instead, associations between concurrent knowledge and practices might be stronger than reflected in the current results.

The instrument used in this study to measure knowledge of SE milestones included only six items that minimally covered preschoolers' social-emotional milestones, thus caution should be taken in generalizing this as a thorough measure of social-emotional milestones. Further, the reliabilities for the two Knowledge of Social-Emotional indices were not strong, which suggests these indices may not consistently measure pre-service teachers' knowledge of social-emotional development and strategies, making it difficult to replicate this study.

Some potential relationships were not explored in this study but could be of interest in future studies. Participants' characteristics which may be related to associations between knowledge, beliefs, and practices—such as IQ, GPA, and previous experiences working with preschool-aged children—were not included as potential influences of participants' knowledge and beliefs, but may have influenced their responses on the K-SEMS and the beliefs measures. That is, participants could have answered more accurately because they were more intelligent, they performed better in college, they have experiences working with children of this age group from which they are basing their knowledge, beliefs, and practices. Also, participants' field experiences and support from lead teachers may be important factors associated with relationships among knowledge, beliefs, and practices. Including these variables in future studies could provide a better understanding of the relationships among knowledge, beliefs, and practices.

Conclusions

This study contributes to the early childhood education literature by examining questions about the links between pre-services teachers' coursework, knowledge, and practices, links that so far has only been implied or expected, but not explicitly tested. The findings from this study indicate moderate effects of prior coursework on pre-service teachers' knowledge and beliefs, and moderate effects of prior knowledge and beliefs on observed practices. This current study contributes to the existing literature by providing evidence for the importance of professional development as a way to enhance teachers' knowledge about child development and strategies to support development.

This study provides evidence that pre-service teachers' knowledge and beliefs affect what they do in the classroom to support children's development, and that coursework is an important

factor affecting teachers' domain-specific beliefs, not just their knowledge of development. Thus, it may benefit higher education programs to include reflective assignments in courses as a way to help teachers become aware of their own beliefs, including any biases they may hold about child development, therefore becoming more able to address them explicitly. Results from this study indicate the need for further research examining relationships between educational experiences and educational outcomes in order to inform practices in early childhood teacher preparation programs, and to inform policy related to the baseline educational requirements for teachers of young children. Knowledge of developmental milestones, in addition to other components of knowledge, should be associated with child outcomes to determine what knowledge is most essential to teachers' effectiveness in the classroom.

APPENDIX

Appendix

Teacher Beliefs About Emotions

For each sentence, circle the number that describes HOW TRUE it is for you.

	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree
1. People are better teachers if they aren't emotionally involved with the children.	1	2	3	4	5
2. It's good to hug and touch children affectionately throughout the day.	1	2	3	4	5
3. Teachers avoid being physically affectionate or "huggy" with the children	1	2	3	4	5
4. Children need to feel emotionally close to their teachers.	1	2	3	4	5
5. It's good for a teacher to let children know when she is feeling angry.	1	2	3	4	5
6. Teachers should "let their feelings out" in the classroom.	1	2	3	4	5
7. Teachers should try hard no to show when they are upset with children's behavior.	1	2	3	4	5
8. Teachers should constantly show the children how much they love them	1	2	3	4	5
9. When a child is angry because another child won't share a toy, the teacher should tell the child exactly what words she/he could use to express her/his feelings.	1	2	3	4	5
10. Teachers should avoid showing children how to express their feelings.	1	2	3	4	5
11. I think it's better for children to figure out how to express their feelings on their own, instead of having the teacher show them how.	1	2	3	4	5
12. When a child is upset about something, teachers should try to put into words how he or she is feeling.	1	2	3	4	5
13. Teachers should often label the children's feelings for them, (e.g., "You seem worried about our trip to	1	2	3	4	5

the swimming pool").					
14. When children are upset or angry about something, it's not the best time to talk about their feelings.	1	2	3	4	5
15. I believe that some teachers spend too much time talking to children about their feelings.	1	2	3	4	5
16. Teachers should spend a lot of time talking to children about why they feel the way they do.	1	2	3	4	5
17. Children ages 3–5 years are too young for me to discuss the causes of their feelings with them.	1	2	3	4	5
18. Teachers should not read children stories that might make them sad or worried.	1	2	3	4	5
19. Children should be taken to funerals and other family events, even if they might feel sad or upset as a result.	1	2	3	4	5
20. If a class pet died, I would not tell the children because they might become too upset.	1	2	3	4	5
21. Children ages 3–5 years are really not ready to control the way they express their feelings.	1	2	3	4	5
22. Children ages 3–5 years are really too young to display their feelings in "socially acceptable" ways.	1	2	3	4	5
23. It's important for teachers to teach children socially acceptable ways of expressing their feelings.	1	2	3	4	5

THANK YOU SO MUCH FOR COMPLETING THIS QUESTIONNAIRE.

REFERENCES

REFERENCES

Aiken, L. S., & West, S. G. (1991). Multiple regression: Testing and interpreting interactions. Newbury Park: Sage.

Allen, L. R., & Kelly, B. B. (2015). *Transforming the workforce for children birth through age 8: A unifying foundation.* Washington, DC: National Academies Press.

Andrews, D., Buettner, C., Hur, E., & Jeon, L. (2015). What are we teaching the teachers? Child development curricula in US higher education. Paper symposium presented at the Society for Research in Child Development Biennial Conference, Philadelphia, PA.

Arnett, J. (1989). Caregivers in day-care centers: Does training matter*? Journal of Applied Developmental Psychology, 10*, 541–552.

Bornstein, M., Hahn, C., & Haynes, O. M. (2010). Social competence, externalizing, and internalizing behavioral adjustment from early childhood through early adolescence: Developmental cascades. *Development and Psychopathology, 22*, 717–735.

Bowman, B., Donovan, M., Burns, S., & the Committee on Early Childhood Pedagogy of the National Research Council. (2000). *Eager to learn: Educating our preschoolers*. Washington, DC: National Academy Press.

Borg, M. (2001). Key concepts in ELT. ELT Journal, 55, 186–188.

Boyd, J., Barnett, S., Bodrova, E., Leong, D., & Gomby, D. (2005). Policy report: Promoting children's social emotional development through preschool education. National Institute for Early Education Research (NIEER) New Brunswick: NJ.

Burchinal, M. R., Cryer, D., Clifford, R. M., & Howes, C. (2002). Caregiver training and classroom quality in child care centers. *Applied Developmental Science, 6*, 2–11.

Cai, J. (2005). U.S. and Chinese teachers' constructing, knowing, and evaluating representations to teach mathematics. *Mathematical Thinking and Learning: An International Journal, 7*, 135–169.

Cassidy, D., Buell, M., Pugh-Hoese, S., & Russell, S. (1995). The effects of education on child care teachers' beliefs and classroom quality: Year one evaluation of the TEACH early childhood associate degree scholarship program. *Early Childhood Research Quarterly, 10*, 171–183.

Clarke-Stewart, K. A., & Gruber, C. (1984). Day care forms and features. In R. C. Ainslie (Ed.), *The child and the day care setting* (pp. 35–62). New York, NY: Praeger Special Studies.

Cohen, J., Onunaku, N., Clothier, S., & Poppe, J. (2005, September). Helping young children succeed: Strategies to promote early childhood social and emotional development. Washington, DC: Zero to Three and the National Conference of State Legislatures.

CSEFEL Inventory of practices for promoting children's social and emotional competence. (2006). Available from: www.vanderbilt.edu/csefel. Center on the Social and Emotional Foundations for Early Learning (CSEFEL).

Cunningham, C. M. (1998). The effect of teachers' sociological understanding of science (SUS) on curricular innovation. *Research in Science Education, 28*, 243–257.

Davis, M. M., & Wilson, E. K. (1999). A Title 1 teacher's beliefs, decision-making, and instruction at the third and seventh grade levels. *Reading Research and Instruction*, *38*, 290–299.

Dishion, T. J., French, D. C., & Patterson, G. R. (1995). The development and ecology of antisocial behavior. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology* (Vol. 2, pp. 421–471). New York, NY: John Wiley & Sons.

Domitrovich, C., Cortes, R. C., & Greenberg, M. T. (2001). *Head Start Competence Scale technical report*. Unpublished manuscript, Pennsylvania State University.

Early, D., Bryant, D., Pianta, R., Clifford, R., Burchinal, M., Ritchie, S., … Barbarin, O. (2006). Are teacher education, major, and credentials related to classroom quality and children's academic gain in pre-kindergarten? *Early Childhood Research Quarterly 21,* 174–195.

Early, D. M., Maxwell, K. L., Burchinal, M., Alva, S., Bender, R. H., Bryant, D., … Zill, N. (2007). Teachers' education, classroom quality, and young children's academic skills: Results from seven studies of preschool programs. *Child Development, 78*, 558–580.

Faulkner-Schneider, L. (2005). *Child care teachers' attitudes, beliefs, and knowledge regarding science and the impact of early childhood learning opportunities*. (Unpublished thesis). Oklahoma State University, Norman Oklahoma.

Fernández, E. (1997). The "standards-like" role of teachers' mathematical knowledge in responding to unanticipated student observations. Paper presented at the annual meetings of the American Educational Research Association, Chicago, IL.

Floden, R., & Meniketti, M. (2005). Research on the effects of coursework in the arts and sciences and in the foundations of education. In M. Cochran-Smith & K. M. Zeichner (Eds.), *Studying teacher education* (pp. 261–308). Mahwah, NJ: Erlbaum.

Gebel, A., & Schrier, L. L. (2002). Spanish language teachers' beliefs and practices about reading in a second language. In J. H. Sullivan (Ed.), *Literacy and the second language learner* (pp. 85–109). Charlotte, NC: Information Age Publishing.

Gess-Newsome, J. & Lederman, N. G. (1995). Biology teachers' perceptions of subject matter structure and its relationship to classroom practice. *Journal of Research in Science Teaching, 32*, 301–325.

Gilliam, W. (2005). *Prekindergarteners left behind: Expulsion rates in state prekindergarten systems*. New York, NY: The Foundation for Child Development.

Goble, C. B., Horm, D. M., Atanasov, A. M., Williamson, A. C., & Young Choi, J. (2015). Knowledge and beliefs of early childhood education students at different levels of professional preparation. *Journal of Early Childhood Teacher Education, 36*, 211–231. doi: 10.1080/10901027.2015.1062831

Green, T. E. (1971). *The activities of teaching.* New York, NY: McGraw-Hill.

Haung, K., Caughy, M., Genevro, J., & Miller, T. (2005). Maternal knowledge of child development and quality of parenting among White, African-American and Hispanic mothers. *Applied Developmental Psychology, 26*, 149–170.

Hemmeter, M. L., Corso, R., & Cheatham, G. (2006). Issues in addressing challenging behaviors in young children: A national survey of early childhood educators. Paper presented at the Conference on Research Innovations in Early Intervention, San Diego, CA.

Hemmeter, M., Santos, R., & Ostrosky, M. (2008). Preparing early childhood educators to address young children's social-emotional development and challenging behavior: A survey of higher education programs in nine states. *Journal of Early Intervention, 30*, 321–340.

Howes, C. (1997). Children's experiences in center-based child care as a function of teacher background and adult–child ratio. *Merrill-Palmer Quarterly, 43*, 404–425.

Howes, C., Whitebook, M., & Phillips, D. A. (1992), Thresholds of Quality: Implications for the Social Development of Children in Center-based Child Care. *Child Development, 63*, 449–460.

Johnson, K. E. (1992). The relationship between teachers' beliefs and practices during literacy instruction for non-native speakers of English. *Journal of Reading Behavior*, *24*, 83–108.

Joyce, B., & Showers, B. (2002). *Student achievement through staff development* (3rd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.

Koh, S., & Neuman, S. B. (2009). The impact of professional development on family child care: A practice-based approach. *Early Education and Development, 20*, 537–562.

Kuzborska, I. (2011). Links between teachers' beliefs and practices and research on reading. *Reading in a Foreign Language, 23*, 102–128.

La Paro, K., Siepak, K., & Scott-Little, C. (2009). Assessing beliefs of preservice early childhood education teachers using Q-sort methodology. *Journal of Early Childhood Teacher Education, 30,* 22-36. doi: 10.1080/10901020802667805

Ma, L. (1999). *Knowing and teaching elementary mathematics: Teachers' understanding of fundamental mathematics in China and the United States.* Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

McClintic, S., & Petty, K. (2015). Exploring early childhood teachers' beliefs and practices about preschool outdoor play: A qualitative study. *Journal of Early Childhood Teacher Education, 36*, 24–43. doi: 10.1080/10901027.2014.997844

Monroe, C. R. (2005). Why are "bad boys" always Black? Causes of disproportionality in school discipline and recommendations for change. *The Clearing House, 79*, 45–50.

Morgan, G. G. (2003). Staffing. In D. Cryer & R. M. Clifford (Eds.), *Childhood education and care in the USA* (pp. 58–72). Baltimore, MA: Brookes Publishing.

National Association for the Education of Young Children [NAEYC]. (2009). *Position statement: Developmentally appropriate practice* (3rd ed.). Washington, DC: Author.

National Scientific Council on the Developing Child. (2005). Excessive stress disrupts the architecture of the developing brain (Working Paper no. 3). Retrieved from http://developingchild.harvard.edu/wp-content/uploads/2005/05/Stress_Disrupts_Architecture_Developing_Brain-1.pdf

National Survey of Early Care and Education Project Team. (2013). Number and characteristics of early care and education (ECE) teachers and caregivers: Initial findings from the National Survey of Early Care and Education (NSECE) (OPRE Report #2013-38). Washington DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services.

Neuman, S. B., & Cunningham, L. (2009). The impact of professional development and coaching on early language and literacy practices. *American Educational Research Journal, 46*, 532–566.

Neuman, S., & Wright, T. (2010). Promoting language and literacy development for early childhood educators. *The Elementary School Journal, 111*, 63–86.

O'Brien, D., & Stewart, R. (1990) Preservices teachers' perspectives on why every teacher is not a teacher of reading: A qualitative analysis. *Journal of Reading Behavior, 22,* 101-129.

Pajares, M. F. (1992). Teacher beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research, 62*, 307–332.

Perry, D., Holland, C., Darling-Kuria, N., & Nadiv, S. (2011). Challenging behavior and expulsion from child care: The role of mental health consultation. *Zero to Three, 32,* 4–11.

Phillipsen, L. C., Burchinal, M. R., Howes, C., & Cryer, D. (1997). The prediction of process quality from structural features of child care. *Early Childhood Research Quarterly, 12*, 281–303.

Pianta, R., Howes, C., Burchinal, M., Bryant, D., Clifford, R., Early, D., & Barbarin, O. (2005). Features of prekindergarten programs, classrooms, and teachers: Do they predict observed classroom quality and teacher–child interactions? *Applied Developmental Science, 9*, 144–159.

Qi, C. H., & Kaiser, A. P. (2003). Behavior problems of preschool children from low-income families: Review of the literature. *Topics in Early Childhood Special Education, 23*, 188–216.

Richardson, V., Anders, P., Tidwell, D., & Lloyd, C. (1991). The relationship between teachers' beliefs and practices in reading comprehension instruction. *American Educational Research Journal*, *28*, 559–586.

Romano, E., Babchishin, L., Pagani, L., & Kohen, D. (2010). School readiness and later achievement: Replication and extension using a nationwide Canadian survey. *Developmental Psychology, 46*, 995–1007. doi:10.1037/a0018880

Sanders, L. R., Borko, H., & Lockard, J. D. (1993). Secondary science teachers' knowledge base when teaching science courses in and out of their area of certification. *Journal of Research in Science Teaching, 30*, 723–736.

Schirmer, B., Casbon, J., & Twiss, L. (1997). Diverse learners in the classroom: Teacher beliefs about learning: What happens when the child doesn't fit the schema? *The Reading Teacher, 50*, 690–692.

Shonkoff, J. P., & Phillips, D. A. (Eds.). (2000). *From neurons to neighborhoods: The science of early childhood development*. Washington, DC: National Academy Press.

Shulman, L. (1987). Knowledge and Teaching: Foundations of the new reform. *Harvard Educational Review*, *57*, 1–21.

Silverman, J. C. (2007). Epistemological beliefs and attitudes toward inclusion in pre-service teachers. *Teacher Education and Special Education, 30*, 42–51

Snider, M., & Fu, V. (1990). The effects of specialized education and job experience on early childhood teacher's knowledge of developmentally appropriate practice. *Early Childhood Research Quarterly, 5*, 69–78.

Sowder, J. T., Phillip, R. A., Armstrong, B. E., & Schappelle, B. P. (1998). *Middle-grade teachers' mathematical knowledge and its relationship to instruction.* Albany, NY: State University of New York Press.

Spodek, B. (1987). Thought processes underlying preschool teachers' classroom decisions. *Early Child Care and Education, 28*, 197–208.

Stevens, J. (1984). Child development knowledge and parenting skills. *Family Relations, 33*, 237–244.

Stipek, D., & Byler, P. (1997). Early childhood education teachers: Do they practice what they preach? *Early Childhood Research Quarterly, 12*, 305–325.

Tatto, M., & Coupland, D. (2003). *Teacher education and teachers' beliefs: Theoretical and measurement concerns.* Greenwich, CT: Information Age Publishing.

Thomas, C. (2014). Considering the impact of pre-service teachers' beliefs on future practice. *Intervention in School and Clinic, 49*, 230–236. doi: 10.1177/1053451213509490

U.S. Department of Education, National Center for Education Statistics. (2015). *The Condition of Education 2015* (NCES 2015-144), Preprimary Enrollment.

Wen, X., Elicker, J., & McMullen, M. (2011). Early childhood teachers' curriculum beliefs: Are they consistent with observed classroom practices? *Early Education and Development, 22*, 945–969.

Whitebook, M. (2003). *Early education quality: Higher teacher qualifications for better learning environments—A review of literature.* Berkeley, CA: Institute of Industrial Relations, University of California.

Whitebook, M., Gomby, D., Bellm, D., Sakai, L., & Kipnis, F. (2009). *Preparing teachers of young children: The current state of knowledge, and a blueprint for the future.* Berkeley, CA: Center for the Study of Child Care Employment.

Wilcox-Herzog, A. (2002). Is there a link between teachers' beliefs and behaviors? *Early Education & Development, 13*, 81–106.

Wilkins, J. L. M. (2002). The impact of teachers' content knowledge and attitudes on instructional beliefs and practices. *Proceedings of the Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, 24*, 10.

Wilkins, J. L. M. (2008). The relationship among elementary teachers' content knowledge, attitudes, beliefs, and practices. *Journal of Math Teacher Education, 11,* 139-164. doi: 10.1007/s10857-007-9068-2

CHAPTER 4: INTEGRATIVE CONCLUSION

The goals of this study were to (1) develop and validate an adequate tool to assess pre-service ECEPs knowledge of SE milestones and support strategies and (2) to build a heuristic model of ECEP preparation.

High-quality care and education has been a component of early education reform over the past few years, fueling debates over the baseline educational requirements for early childhood teachers working with young children. Thus far, these debates have been based on mixed findings related to the effect of education on classroom quality and children's outcomes. However, as the shift to professionalize the early childhood field accelerates, researchers are being petitioned to go deeper and examine different aspects of the education process that may produce skilled and effective teachers of young children (Whitebook & Ryan, 2011). Acknowledging the petition, this study set out to answer questions regarding how coursework influences for early childhood teachers' development of knowledge and beliefs and how this knowledge influences ECEPs' classroom practices. But the lack of existing tools to assess for early childhood teachers' knowledge of child development was an impediment to answering these questions. Thus, an assessment tool (K-SEMS, preK version) was developed to fill this gap and help answer these substantive questions about the relations between coursework, knowledge, beliefs, and practices. The standards set out by NAYEC suggest that knowledge of children's general development and milestones alone is not enough, and that for early childhood teachers should also have knowledge of strategies to support children's development. Thus the K-SEMS includes two indices—the Knowledge of Social-Emotional Milestones Index and Knowledge of Social-Emotional Support Strategies Index. Given the importance of social-emotional development to children's school readiness and lifelong success, the importance of early

childhood teachers' role in this development, and lack of professional preparation dedicated specifically to this area, I focused the tool on assessing the social-emotional domain.

Having established Knowledge of Social-Emotional Milestones and Support Strategies indices that are sufficiently reliable and valid for assessing pre-service early childhood teachers' knowledge in study 1, these were then used to test substantive questions to build a heuristic model of student preparation in study 2. Results from this study showed that when pre-service teachers took courses with domain-specific content, they had more accurate knowledge of children's social-emotional milestones and strategies to support children in this domain, as well as higher endorsements of expressing and supporting emotions. Further, early childhood teachers with more accurate knowledge on both indices, frequently used higher quality social-emotional practices when interacting with children in the classroom, especially when pre-service teachers had both more accurate knowledge and higher endorsements of beliefs about emotion-instruction and modeling. While the moderate reliability of the Knowledge of Social-Emotional Milestones and Support Strategies indices might be questioned, the resultant findings provide an initial step in understanding the educational process and how coursework influences knowledge, and knowledge influences practices, elucidating the crucial role of beliefs in the relationship between knowledge and practice. This research provides evidence that taking courses in an early childhood program at an institution of higher education can influence pre-service teachers' knowledge of child development and equip them with strategies to support children's development. Further, these results help to build an initial model that can be tested in other institutions of higher education preparation programs.

Results from the development of the Knowledge of Social-Emotional Milestones and Support Strategies indices, however, indicate the need to revise the tool to improve reliability.

The next development phase should consider improving the quality of questions, increasing the number of items, and including items that cover a broader range of social-emotional skills and age range. Further, the Knowledge of Social-Emotional Milestones and Support Strategies indices only addressed knowledge of milestones and support strategies; however, there are other components of research-based child development knowledge that could be included, such as sequences of development and learning processes. Adding these knowledge components could enhance the tool as a more thorough assessment of knowledge of social-emotional development. This could provide even more insight into the relationship between early childhood teachers' coursework, knowledge, and practices.

Implications for Practice, Research and Policy, and Future Considerations

This study extends existing research indicating that education, broadly defined as a degree level, influences teachers' classroom practices, by taking a closer look at education and examining the influence of courses taken on early childhood teachers' knowledge and beliefs, and linking those educational outcomes to classroom practices. It moves the field forward by examining coursework relevant to particular content and resultant learning, rather than simply years of education and major. Further, the development of a tool to assess early childhood teachers' knowledge could support the field to test and advance the initial heuristic model developed in this study.

As the field of early care and education becomes more professionalized there will be a need for more tools to assess general knowledge of child development as well as domain-specific knowledge to ensure institutions of higher education are preparing skilled and effective teachers of young children. The Knowledge of Social-Emotional Milestones and Support Strategies indices provide a start to future development of other tools. Revised and enhanced, it could

provide educators in early childhood programs with a pre-post assessment of their student's knowledge. This information can then be used to revise course syllabi and guide consequent course content. Additionally, because this research shows that domain-specific course content affects early childhood teachers' domain-specific knowledge and practices, programs of early childhood may consider having stand-alone courses to cover each of the main child development domains. Moving beyond elementary research of teacher education will inform the debates over baseline degree requirements for teachers of young children, thus future studies should examine the individual and combined aspects of education (coursework, field experiences, and reflective practices), and link them to early childhood teachers' competencies, classroom practices, and child outcomes, in order to determine the most effective professional preparation for this important workforce.

REFERENCES

REFERENCES

Whitebook, M., & Ryan, S. (2011). *Degrees in context: Asking the right questions about preparing skilled and effective teachers of young children* (NIEER Policy Brief, Issue 22). New Brunswick, NJ: National Institute for Early Education Research.