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Attachment Predicts College Students’ Knowledge, Attitudes, and Skills for Working with Infants, Toddlers, and Families

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Abstract

Research Findings: Adults’ attitudes about attachment relationships are central to how they perceive and respond to children. However, little is known about how attachment styles are related to teachers’ attitudes toward and interactions with infants and toddlers. From a survey of 207 students taking early childhood (EC) courses at 4 U.S. universities, we report relations among students’ attachment styles and their (a) career goals, (b) attitudes about caring for and educating infants and young children,

and (c) interaction skills for responding in developmentally supportive ways. Overall, attachment security was positively associated with career goals focused on working with younger children, knowledge about infant/toddler development, attitudes that acknowledge the importance of adult support in children's development, and developmentally supportive interaction skills. Students who scored high on attachment fearfulness minimized the importance of adults in children's lives, minimized the importance of the early years for later learning, and endorsed strict and controlling forms of child guidance.

Practice or Policy: A conceptual mediation model linking a path from attachment to caregiving skill through knowledge and attitudes is articulated. We propose a person-centered pedagogy for infant/toddler professional preparation that provides opportunities for reflection on one's own attachment and its effects on work with young children.

Researchers are truly in the infancy of understanding the motivations of individuals who enter the early care and education workforce, the characteristics of those best suited to being teachers in early care and education settings, or how to optimize training and educational experiences to best prepare individuals for this important role. Early childhood (EC) and elementary teachers' implicit attitudes are associated with pedagogy and classroom practices (e.g., Cassidy & Lawrence, 2000; Charlesworth et al., 1993; Pajares, 1992). Here we understand teacher attitudes to include beliefs and values that "house the evaluative, comparative, and judgmental functions of beliefs and replace predisposition with an imperative to action" (Pajares, 1992, p. 314). Brownlee and colleagues have described the belief systems of toddler teachers¹ and their association with Squires's (2004) key affective, cognitive, and executive functions of teaching (Berthelsen & Brownlee, 2005, 2007; Brownlee & Berthelsen, 2006, 2009; Brownlee, Berthelsen, & Boulton-Lewis, 2004; McMullen & Dixon, 2006). Other research has connected infant teachers' mind-mindedness, or the attribution of mental states and processes to children's behavior, to observed teaching practices, specifically to increased sensitivity and stimulation levels (Degotardi

1. We choose to use the term teacher here for infant and toddler professionals working in the classroom, and we use the term as inclusive of the terms educator, caregiver, and child care provider.

& Davis, 2008; Degotardi & Sweller, 2012; Susman-Stillman, Pleuss, & Englund, 2013). These limited associations between attitudes and teacher practices have not been fully examined for teachers of infants and toddlers, particularly for future teachers. Furthermore, given that the teacher role is fundamentally relationship based in EC (Margetts, 2005), teachers' own attachment styles may influence their attitudes and classroom practices as well as the quality of their relationships with children. Because teacher-child relationships are a crucial determinant of quality in infant and toddler care (Raikes & Edwards, 2009), teachers' attachment styles and attitudes may have particular relevance for pedagogy and practice.

Following this line of thinking, some researchers have used attachment theory as a framework to investigate teacher characteristics that promote the social and emotional well-being of the children in their care (e.g., Ahnert, Piquart, & Lamb, 2006; Belsky & Rovine, 1988). This work has focused on teacher sensitivity and child attachment rather than on teachers' attachment styles. Berlin (2012) reviewed research on the role of sensitive, supportive care in promoting child well-being and recommended that hiring interviews for infant/toddler teachers include questions about applicants' attachment-related values and states of mind and that attachment-based training be instituted to help teachers understand how their own attachment security influences their work with children. However, to date there is no empirical evidence linking current or future teachers' attachment security to their attitudes, beliefs, or behaviors related to educating and caring for infants and toddlers. We address this gap by investigating relations among university students' attachment styles (for both EC majors and those in classes with childhood development content); their expectations regarding future professional roles; and their knowledge, attitudes, and skills related to working with infants and toddlers.

Attachment, attitudes, and behaviors

To explore how EC teachers' attachment styles may relate to their attitudes and behaviors regarding infants and toddlers, we drew on literature describing adult attachment styles. Adult attachment has been conceptualized as a caregiving behavioral system regulated by

internal working models of self and others that organize thoughts and feelings about relationships (Ainsworth, 1979; Bowlby, 1969; George & Solomon, 1999; Main, Kaplan, & Cassidy, 1985; Sroufe & Waters, 1977). Four primary styles have been identified: (a) secure or autonomous, (b) insecure-entangled or preoccupied, (c) insecure-avoidant or dismissing, and (d) disoriented-disorganized or fearful. These internal working models guide attitudes and beliefs about relationships, including parents' appraisals of and responses to children's behavior (e.g., Bretherton, 1990; Crowell & Feldman, 1991; Steele, Steele, & Fonagy, 1996).

Attachment security benefits parents in many ways. Secure mothers are able to appraise a child's behavior amid relevant contextual cues; regulate their own emotional responses to the child's behavior; and respond in a way that meets the child's needs with sensitivity, warmth, and affection (Crowell & Feldman, 1991; De Wolff & van Ijzendoorn, 1997; DeOliveira, Moran, & Pederson, 2005) without being overly intrusive, negative, detached, rejecting, or controlling (Adam, Gunnar, & Tanaka, 2004; Ainsworth, Blehar, Waters, & Wall, 1978; Bretherton, 1990; Main & Goldwyn, 1984; Mills-Koonce et al., 2011; Roskam, Meunier, & Stievenart, 2011; Whipple, Bernier, & Mageau, 2011). Secure parents can be present in the moment with children and respond to them relatively unencumbered by ghosts from past attachment relationships (Fraiberg, 1980). In turn, their children tend to be more secure, socially competent, and autonomous compared to children with insecure parents (e.g., Grossman, Fremmer-Bombik, Rudolph, & Grossman, 1988; Pearson, Cohn, Cowan, & Pape Cowan, 1994; Stevenson-Hinde & Shouldice, 1995; van Ijzendoorn, 1995).

In contrast, insecure individuals adopt strategies for coping with unmet security needs (Main, Goldwyn, & Hesse, 2002). Dismissing individuals deactivate the attachment system by minimizing the importance of attachment needs for themselves and others and are less nurturing and more controlling than secure parents (George & Solomon, 1999). Preoccupied individuals hyperactivate the attachment system, resulting in overprotective and intrusive behaviors (George & Solomon, 1999). As parents, they can be angry and intrusive (Adam et al., 2004). Fearful individuals are more prone to feeling fear and anxiety during interactions with their infants and to withdrawing emotionally from children as a coping strategy. Moreover, fearful adults can

exhibit confusing and contradictory caregiving behaviors, such as approaching the infant but then turning away from the infant's cues for closeness, or intrusive behaviors that reflect misalignments in affective communication (Lyons-Ruth & Spielman, 2004). Parents with insecure attachment styles report more parenting stress, more negative parental attitudes, and lower parenting self-efficacy (Kohlhoff & Barnett, 2013; Trillingsgaard, Elklit, Shevlin, & Maimburg, 2011).

Although adult attachment consistently predicts parenting behaviors, especially during the infant and toddler period, much less is known about how attachment styles of EC professionals may influence their thoughts and feelings toward, and interactions with, young children. However, research with young adults is instructive for considering how attachment affects professionals. For example, women with insecure attachment styles less accurately identify infant emotions, make more negative attributions about a distressed infant, report more irritation in response to infant crying, and are less likely to respond with empathy than secure women (Leerkes & Siepak, 2006; Riem, Bakermans-Kranenburg, van Ijzendoorn, Out, & Rombouts, 2012). Insecure college students hold more negative models of parenting and parent-child relationships, expect to be easily aggravated by children, endorse stricter disciplinary practices, and are less confident in their ability to relate to children (Rholes, Simpson, Blakely, Lanigan, & Allen, 1997).

Attachment and preparation of EC professionals

The attachment-related patterns and associations described in the previous section may be similar for EC teachers and for students preparing to enter that field. Although parents are children's primary attachment figures, children spend a substantial amount of time with their EC teachers, who can also contribute to their security needs (Kuhl, 2011; Meltzoff, Kuhl, Movellan, & Sejnowski, 2009; Pianta, 1992; Siegel, 1999; Sroufe, Egeland, Carlson, & Collins, 2005). Child care is a context that elicits attachment-related challenges such as transitions from one setting, teacher, or major activity to another (McMullen & Dixon, 2006) as well as the need to share teachers' attentions with other children. For instance, one study found that 91% of children who spent more than 12 months with a high-ability

teacher were securely attached compared to only 50% of those who had been with their teachers 5 to 8 months (Raikes, 1993). Group size was also linked with attachment in a study of Israeli children: 72% of children in classrooms with a 1:3 or better adult:child ratio were securely attached compared to only 57% of children in classrooms with worse ratios (Berlin, 2012).

It follows that it is worthwhile to apply attachment theory to research on the childrearing-related feelings and ideas of current and future EC professionals. Teachers' attachment styles may influence their attitudes and behaviors toward young children in ways similar to those of parents (Edwards & Raikes, 2002; Honig, 2002). In fact, the attachment theory framework has already led to useful insights beyond the parent-child relationship. First, there is evidence that professionals' attachment plays a role in other child- and family-related practices: In home visiting, providers' attachment security predicts better program implementation, higher home visitor self-efficacy, and greater family engagement and trust (Burrell et al., 2009; McFarlane et al., 2010). Second, there is evidence that attachment style is associated with EC career intentions. Horppu and Ikonen-Varila (2004) found that secure EC education students were more likely than dismissing students to report that working with younger (as opposed to older) children was their first career choice.

Third, there is evidence that children benefit when their teachers have secure working models of relationships. Stability of care and teacher sensitivity are associated with children's secure attachment relationships with nonparental caregivers (Ahnert et al., 2006; De Schipper, Tavecchio, & van Ijzendoorn, 2008; Elicker, Fortner-Wood, & Noppe, 1999; Raikes, 1993). Fourth, children who have secure relationships with their teachers demonstrate greater social competence, including prosocial behavior, and less hostile aggression and withdrawal (Howes, Matheson, & Hamilton, 1994; Howes, Rodning, Galluzzo, & Myers, 1988). For these reasons, knowledge about teachers' attachment styles in relation to their attitudes about and interactions with young children could inform preparation programs for infant/toddler professionals and in-service training. Yet there is only sparse knowledge about the role of undergraduate students' own attachment styles in forming their career expectations, their ideas about the nature of children, and their thoughts about best practices in child care.

America's universities train many EC professionals (Honig & Hiralal, 1998; Hyson, Horm, & Winton, 2012). In higher education settings, students' attachment styles likely influence their (a) decisions to enter the early care and education field, as they do for elementary and secondary teachers (Riley, 2009; Wright & Sherman, 1963); (b) attitudes and approaches toward coursework and practicum experiences that include relationships with children and families; and (c) ability to acquire knowledge and skills about, and change attitudes toward, children and families (Ambrose, Bridges, DiPietro, Lovett, & Normán, 2010). Yet there is limited research on these associations and no comprehensive models for addressing the effects of these psychosocial factors on students' learning and career paths related to early care and education. Horm, Hyson, and Winton (2013) proposed a model of education and career development for EC professionals that focuses primarily on essential content in students' program of study rather than on the underlying psychosocial characteristics that may influence choice of major and subsequent learning. However, they pointed out the need for further research specifically on the education of infant/toddler teachers in order to create a model for effective education and training of these future professionals, and the need to consider learner characteristics in such models.

The current study and introduction to the research questions

A group of child development scholars across multiple universities have collaborated to address the gap in research that undermines the development of a comprehensive model of effective education for future infant/toddler teachers.² The group first used a rigorous vetting process to articulate a set of competencies based on empirical evidence and professional standards (i.e., Zero-to-Three Core competencies; competencies of the Council for Exceptional Children's Division for Early Childhood). Group members each nominated up to five competencies with justification and evidence statements, and content analysis was conducted to integrate and align the competencies. Nine competency dimensions, which each included specific knowledge, attitudes, and skills that EC teachers need to work effectively with infants,

2. This group is called the Collaborative for Understanding the Pedagogy of Infant/Toddler Development.

toddlers, and their families, were articulated and then reviewed and critiqued by the group members. Next we began to develop measures to assess these competencies and the factors that may influence them. As a starting point, the group concentrated on three competency dimensions that are at the center of the current study: understanding and supporting relationships, understanding and supporting learning, and guidance of infant/toddler behavior. There is substantial evidence and professional guidelines underpinning these competences. For example, evidence for the importance of understanding and supporting relationships comes from attachment research described previously (Kuhl, 2011; Meltzoff et al., 2009; Pianta, 1992; Siegel, 1999; Sroufe et al., 2005). Furthermore, child development knowledge based on developmental science is critical to preparing teachers to support children's learning and development (Copple & Bredekamp, 2009; Horm et al., 2013; Pianta, Hitz, & West, 2010). Evidence that these competencies are necessary for developmentally supportive practices with young children is based on associations between adults' knowledge, attitudes, and behaviors within each dimension and children's positive development (e.g., Hamre, Hatfield, Pianta, & Jamil, 2014).

Though the robust body of research on attachment provides the grounding for informed hypotheses regarding its effects on EC professionals, we understand little about whether attachment affects EC teachers', or preservice teachers', attitudes or practices. We hypothesize, however, that EC education students' attachment impacts their tendencies to endorse supportive caregiving practices that demonstrate warmth and sensitivity, avoid over- or undercontrolling the child's behavior, and identify appropriate developmental expectations for children. Furthermore, attachment insecurity may limit students' abilities to gain knowledge and skills for working with young children, particularly if they are unaware of its effects on their learning and behavior. Understanding how adult attachment influences EC-related attitudes and skills may help university instructors better understand their students and help students better understand their own attitudes and responses toward children. The current study examines associations between adult attachment styles and the knowledge, attitudes, and skills that college students in child development courses have related to the development, care, and education of infants and toddlers. Specifically, we ask the following questions:

- (1) How is attachment style associated with the career goals of students in child development courses?
- (2) How is attachment style associated with child development students' knowledge and attitudes about infants, toddlers, and young children?
- (3) Do attitudes mediate effects of attachment and knowledge on child development students' skills for working with infants and toddlers in developmentally supportive ways?

Method

Participants

The participants were 207 college students enrolled in child/human development and early education courses at four U.S. universities. The majority were juniors or seniors (68%), were female (92.7%), were between 18 and 23 years old (89.4%), and had been born in the United States (95.4%). The majority identified as White (68%), with 11% Black or African American, 12% Asian or Pacific Islander, 2% Native American, and 7% other; 8% of respondents identified as Hispanic/Latino. Respondents were not asked about income, but they did report on how they were paying for their education by indicating all non-mutually exclusive categories: 67% received support from family, 34% worked, 49% had scholarships or grants, 47% had loans, and 8% participated in work study indicating income eligibility.

Procedures

Students received an e-mail (in Spring 2014) inviting them to participate in a study of their attitudes, knowledge, and skills related to infant and toddler care and education. Students willing to participate clicked on a hyperlink to open a consent form, then another to open the survey on the Qualtrics website. The survey took about 45 min to complete and consisted of five sections: (a) background information, including demographics (age, race/ethnicity, country of origin, financial support for school), courses taken, and career aspirations (major,

career goals after college); (b) attachment style; (c) knowledge of child development; (d) attitudes regarding early child development, care, and education aligned with the three competency dimensions; and (e) a set of 12 vignettes designed to assess students' likelihood of choosing developmentally supportive responses to realistic situations in infant/toddler care and education.

Measures

Table 1 presents psychometric properties of the measures of attachment styles, knowledge, and attitudes, including the number of items in each measure, descriptive and psychometric information pertaining to the current sample, sample items, and sources. **Table 2** provides examples of the vignettes used to assess students' skills for responding to infants and toddlers in developmentally supportive ways. The measurement of each concept is described next.

Career goals

We asked students about their majors, career goals, and the populations with whom they wanted to work. For career goals, we listed 23 different human services careers that were common goals for those in child development courses (e.g., child care provider, elementary teacher, social worker, medical doctor, clinical psychologist). We let students choose all that applied and write in other career options. To identify those with a career goal involving work with young children, we selected those who identified the following careers: child care center director, child care provider, child life specialist, child psychologist, early child educator, early interventionist, home visitor, and preschool center director. We also asked respondents to rate the degree to which they wanted to work with children of various age groups (pregnant women, infants <1 year, toddlers 1–3 years, preschoolers 3–5 years, kindergartners, first through third graders, and fourth graders or older) with and without disabilities on a scale of 1 (*no desire to work with this population*) to 5 (*strong desire to work with this population*).

Table 1. Descriptive and psychometric information about each scale.

<i>Construct</i>	<i>No. of items</i>	α	<i>M (SD)</i>	<i>Sample item</i>	<i>Source(s)</i>
Attachment style					
Secure	8	.84	3.78 (0.65)	"I trust other people and I like it when other people can rely on me."	Attachment Styles Questionnaire (Van Oudenhoven et al., 2003)
Fearful	4	.88	2.70 (0.95)	"I am wary to get engaged in close relationships because I'm afraid to get hurt."	
Dismissive	5	.59	3.32 (0.58)	"I feel comfortable without having close relationships with other people."	
Preoccupied	7	.82	2.93 (0.76)	"I often wonder whether people like me."	
Knowledge of infant/toddler development					
Knowledge of individual differences	5	.52	76% (24%)	"Some normal babies do not enjoy being cuddled."	Seventeen items from the Knowledge of Infant Development Inventory (MacPhee, 1981); one new item on biting parallel to the hitting item
Developmentally appropriate expectations	10	.63	70% (21%)	"A baby is about 7 months old before he/she can reach for and grab things."	
Knowledge of effective discipline	3	.60	85% (26%)	"A good way to train children not to hit is to hit them."	
Attitudes about understanding and supporting relationships					
Support for children's bonds with caregivers	3	.65	3.25 (0.76)	"It is important for infants and toddlers to move up into a new room with new teachers and children when they achieve certain milestones, such as walking."	Beliefs About Infant Toddler Education and Care scale (BAITEC; Anderson & McMullen, 2013)
Support for the parent-child relationship	7	.83	3.96 (0.63)	"It is important that parents feel welcome to observe or come into the classroom at any time of the day."	
Attitudes about understanding and supporting learning					
<i>Optimistic view of early development</i>					
Belief that development is self-righting	3	.41	3.40 (0.56)	"I believe that most children develop in a healthy way, at their own pace."	Trust in Organismic Development Scale (Landry et al., 2008b)
Belief that teachers must closely monitor development (reversed)	4	.68	3.71 (0.65)	"I think it's important to carefully supervise each child's development to make sure that it is normal."	
Belief that teachers have little influence on development (reversed)	6	.58	1.89 (0.54)	"The way children turn out often has little to do with how their child care teachers treated them."	Parental Opinion Survey (POS; Luster et al., 1989), reworded for teachers
Belief that early learning matters	5	.71	4.23 (0.60)	"Reading to a child before the child is 2 years old probably has little effect on the child." (reverse-scored)	

(Continued)

Table 1 (continued). Descriptive and psychometric information about each scale.

<i>Construct</i>	<i>No. of items</i>	α	<i>M (SD)</i>	<i>Sample item</i>	<i>Source(s)</i>
Child-led supports for learning					
Endorsement of active, child-directed learning	5	.73	3.76 (0.59)	"Children learn best through active, self-initiated exploration."	Three items from the Parental Modernity Scale (Schaefer & Edgerton, 1985); two items from the Teaching Beliefs Scale (TBS; Stipek & Byler, 1997)
Endorsement of teacher-directed learning (reversed)	8	.67	3.10 (0.50)	"Teachers should not permit a child to leave an activity/task before finishing it."	Six items adapted from the TBS; two new items
Belief that children should be treated as individuals	3	.71	3.19 (1.07)	"It is okay to let children opt out of an activity if they are not interested."	New items developed for this study
Attitudes about guidance of infant/toddler behavior					
Concern about spoiling	7	.91	2.30 (0.88)	"A child care teacher can spoil a baby by giving him/her a great deal of attention."	POS
Endorsement of strictness	4	.72	2.14 (0.69)	"Children who are held to strict rules grow up to be the best adults."	POS
Endorsement of spanking	4	.79	2.36 (0.91)	"Spanking teaches children right from wrong."	Adult-Adolescent Parenting Inventory (Bavolek & Keene, 2001)
Belief that all children should be treated the same	3	.81	3.19 (1.07)	"In order to be fair, child care teachers must treat all children alike."	New items developed for this study

Attachment styles

Four attachment styles (secure, dismissive, preoccupied, and fearful) were assessed via the Attachment Styles Questionnaire (Van Oudenhoven, Hofstra, & Bakker, 2003), which measures general attachment rather than attachment to a specific person.

Competencies for working with infants, toddlers, and families

Participants completed measures of knowledge, attitudes, and practices/skills related to infant and toddler development and care. We used existing measures of knowledge and attitudes if possible and adapted or created items as necessary (described here). Measures

Table 2. Sample narrative vignettes and response options.

Dante is 8 months old and the youngest in your group of infants. He often cries throughout the day. Today, when you put him in his crib for nap time, he cries and cries.

*You sit by Dante's crib and pat him, saying softly, "It can be hard to go to sleep alone. I'm right here." Then you sing a song you think he likes, hoping it will calm him.

You leave Dante alone in his crib and let him cry it out so that he will learn how to soothe himself.

You pick Dante up out of his crib, give him an extra bottle, and rock him until he falls asleep, then put him back into his crib.

You are an educator in a class of eight infants between 3 and 16 months. You are sitting near the pretend play area, watching Jasmine (13 months) and Elaine (11 months) play near each other in the corner with the kitchen toys. Jasmine is using a spoon and lifting it to a doll's mouth, and Elaine is filling a muffin tin with plastic fruit from a big bowl. Jasmine sticks her spoon into Elaine's tin and makes a stirring motion. Elaine watches her, then goes back to playing with the plastic fruit.

*You scoot closer to the girls, and say, "Jasmine, do you think your baby might want a piece of fruit? Elaine, can you help Jasmine get some fruit ready for her baby?"

You watch to make sure that both girls are still playing nicely with each other but do not see a need to say or do anything.

You scoot closer to the girls and say, "Jasmine, can you move over a little, so that Elaine has more room to play?" Then you hand another doll to Elaine and say, "Here, you can feed your baby, too."

Developmentally supportive responses are indicated with asterisks.

were factor analyzed, and the resulting scales and factors are described here; attitude measures are organized by the competency they assessed. We developed the measure of practices/skills specifically for this study.

Knowledge of infant/toddler development. A total of 17 items from the Knowledge of Infant Development Inventory (KIDI; MacPhee, 1981) were used; an additional new item was designed for this study. This new item related to biting and was parallel to the hitting item. Students indicated whether they (a) agreed, (b) disagreed, or (c) were not sure about the accuracy of the 18 statements about caregiving practices and developmental processes and milestones during the first 2 years of life. Responses were then scored as either correct (1 point) or incorrect or unsure (0 points). Exploratory factor analysis of the current data resulted in a conceptually consistent three-factor solution. We labeled the factors Knowledge of Individual Differences, Developmentally Appropriate Expectations, and Knowledge of Effective

Discipline. Subscales were then created using items that loaded most highly onto each of these three. A composite score was created by averaging the percentage of items correct, such that a higher score indicates more accurate knowledge of infant/toddler development.

Attitudes about infant/toddler development and care. A total of 56 Likert items tapped students' attitudes related to the three competencies that are the foci of this study (understanding and supporting relationships, understanding and supporting learning, and guidance of infant/toddler behavior). Students indicated their level of agreement with each statement (1 = *strongly disagree* to 5 = *strongly agree*). Many statements were reworded from existing instruments developed for parents so as to be appropriate for childless individuals as well as for parents.

A series of exploratory factor analyses followed by tests of inter-item reliability identified 13 conceptually coherent factors, each of which fell into one of the three competency dimensions we set out to assess. First we examined factors within sets of items that came from the same scale (e.g., all items from the Parental Modernity Scale), then we examined factors within our preconceptualized dimensions (e.g., all items related to support for autonomy). Next we analyzed all 56 items together. This analysis of all items produced factors more similar to the preconceptualized dimensions than to the factors within the preexisting scales; thus, we used factors that were derived from subsets of conceptually similar items that originated across measures. Using the sets of items that loaded most highly onto each factor (with each item belonging to only one set), we analyzed each set for reliability using Cronbach's alpha. We eliminated only items that loaded onto their own factor or without which the alphas were made higher. Each set of items, generated from the factors, was then made into a composite by averaging the scores, reversed as needed, so that a higher score indicates a higher endorsement of the specific attitude or belief. We describe each factor next, organized by competency.

Competency 1: Understanding and supporting relationships. Two factors tapped students' attitudes concerning the importance of infants' and toddlers' relationships with teachers and parents. The first factor, Support for Children's Bonds with Caregivers, drew its three

items from the Beliefs About Infant Toddler Education and Care scale (BAITEC; Anderson & McMullen, 2013). It assessed attitudes about infants' and toddlers' needs for care from a small number of consistent adults. The second factor, Support for the Parent–Child Relationship, consisted of six newly created items plus one item from the BAITEC. These items assessed awareness of everyday teacher practices that can support the parent–child relationship.

Competency 2: Understanding and supporting learning. Seven factors emerged from items concerning infant/toddler learning, which can be organized into two overarching concepts: an optimistic view of early development and child-led supports for learning.

Optimistic view of early development. Items in the four factors within this conceptual domain were derived from two scales, the Trust in Organismic Development Scale (Landry, Smith, Swank, & Gutten-tag, 2008a) and the Parental Opinion Survey (POS; Luster & Rhoades, 1989). The first two factors were derived from the Trust in Organismic Development Scale items. The first of these, Belief That Development is Self-Righting, assessed the expectation that one need not worry much about normal, healthy child development because it tends to unfold naturally and at the child's individual pace. Conversely, the second factor, Belief That Teachers Must Closely Monitor Development, assessed the belief that healthy development depends on close adult supervision. Though these two beliefs were negatively correlated, they were not two ends of the same belief continuum but separate beliefs that could be held simultaneously. The items from the POS also formed two factors with opposing directionality. The first, Belief That Teachers Have Little Influence on Development, measured beliefs that teachers have little ultimate impact on the development of children in their care. The second factor, Belief That Early Learning Matters, tapped beliefs that infants and toddlers are engaged in important learning that will influence later development.

Composite scores for each of these four factors were created by averaging the items within them. The scores for Belief That Teachers Must Closely Monitor Development and Belief That Teachers Have Little Influence on Development were both reversed. Together the composite scores for these four factors created a conceptually and empirically coherent domain ($\alpha = .62$). Thus, for our final analyses,

we created one variable representing this domain by averaging the z scores of the four factors.³

Child-led supports for learning. Items in the three factors related to this domain were largely from the Teaching Beliefs Scale (Stipek & Byler, 1997) and the Parental Modernity Scale (Schaefer & Edgerton, 1985), along with three newly created items focused on treating children as individuals. The factor Endorsement of Active, Child-Directed Learning assessed the valuing of child autonomy in play and exploration. Conversely, the factor Endorsement of Teacher-Directed Learning included statements expressing belief in the importance of high teacher control. The Belief That Children Should Be Treated as Individuals factor consisted of three new items stating that allowances should be made for individual differences.

Together these factors produced one conceptually and empirically coherent set of attitudes related to child-led supports for learning. We created composite scores for each of the factors by averaging associated items. The Endorsement of Teacher-Directed Learning composite score was reversed. Together these three composite scores created a conceptually coherent domain ($\alpha = .57$); thus, for our final analysis, we created one variable to represent the composite of these beliefs by averaging the z scores of the three factors.

Competency 3: Guidance of infant/toddler behavior. Four factors related to infant/toddler guidance were identified. The 18 items making up the four factors were largely from the POS and the Adult- Adolescent Parenting Inventory (Bavolek & Keene, 2001), along with newly created items related to treating children equally despite individual differences. Four factors emerged from these items: Three were explicitly related to discipline (Concern About Spoiling, Endorsement of Strictness, and Endorsement of Spanking), and the final one was Belief That All Children Should be Treated the Same. The factor Concern About Spoiling included all seven statements from the spoiling subscale of the POS (Luster & Rhoades, 1989) and assessed beliefs that infants and toddlers will

3. Although the individual factors had stronger alphas than the composites, it was necessary to develop fewer variables for our final regression models testing attachment, knowledge, and attitudes as simultaneous predictors of skills. Because of the covariance between the related composite scores, they would have competed with each other if entered separately in a regression framework, and the great number of variables would have limited our degrees of freedom.

be spoiled if caregivers are highly responsive and physically affectionate. The four items from the POS discipline and control subscale produced our Endorsement of Strictness factor. High scores on these items indicated a valuing of obedience and firm discipline, even with babies. The Endorsement of Spanking factor assessed the belief that spanking is an effective form of discipline and was formed by four items from the Adult-Adolescent Parenting Inventory (Bavolek & Keene, 2001). Finally, the factor Belief That All Children Should be Treated the Same consisted of three new items assessing the belief that caregivers should treat all children alike regardless of their individual differences. Together the composite scores for these four factors formed one conceptually coherent dimension on beliefs about guidance ($\alpha = .63$); thus, we created a composite score by averaging the z scores.

Skills for responding in developmentally supportive ways. To assess infant/toddler education skills, we created 12 vignettes to elicit responses in six dimensions commonly observed in measures of interaction quality: sensitive responding to children's needs, support for autonomy, structure and limit setting, verbal communication, developmental stimulation, and fostering positive peer interactions (see Table 2 for examples). We used a multiple-choice format in which one response was more developmentally supportive whereas alternatives reflected low warmth/sensitivity, over/undercontrol by the teacher, or inappropriately high or low developmental expectations.⁴ Stems and response options were piloted among a group of 15 infant/toddler and early education scholars and modified until at least 70% of these expert respondents chose the option designed as developmentally supportive. On average 82% of student respondents chose the developmentally supportive option (range = 70%–92%) for the vignettes in their final versions. Students' total interaction skill scores were calculated as the percentage of developmentally supportive responses selected ($M = 57.7\%$, $SD = 17.7\%$).

4. Defining developmentally appropriate practice in an ecologically valid way is necessarily a complex endeavor. Some controversy exists, for example, over whether such definitions can accommodate sociocultural context and children's unique developmental needs (see Raines & Johnston, 2003). We thank an anonymous reviewer for calling our attention to this controversy. We acknowledge that appropriateness in practice necessitates responsiveness to a particular child in a particular context. The concern for responsiveness to cultural and individual factors is not unique to this study but is relevant to any effort to measure or define high-quality teaching practices.

Analyses and results

Preliminary analyses

Of the 207 participants who completed the survey, 199 provided data for all measures. To reduce missing data, when creating the composite scores for attachment, knowledge, attitudes, and skills, we averaged the existing items answered by each respondent, as long as no more than one item was missing for that composite. In all subsequent analyses, if data were missing for an individual respondent, that respondent was eliminated from that specific analysis. The participants came from four different universities and were pooled into a single sample. We used analysis of variance to explore possible differences between participants from different universities that could have potentially influenced our analyses. There were no differences between universities in participants' attachments, career goals related to working with young children, or several of the attitude dimensions. However, there were differences in the numbers of courses taken, percentage of KIDI items correct, four of the broad attitude dimensions, and the percentage of vignette responses that were developmentally supportive. Thus, we controlled for university in our final regression analyses using dummy variables for three of the four universities. The possible differences between students of different universities was not of interest in the current study, so although we controlled for site in the regression analyses, we do not report the differences of the effects of sites on the intercepts.

Analytic approach

All analyses were conducted in SPSS. First we describe mean levels and associations between students' coursework and career goals, knowledge of infant/toddler development, attitudes toward infant/toddler care and education, and caregiving skills. Next we examine associations among students' attachment styles and their knowledge, attitudes, skills, and career goals, including differences between those who did and did not intend to work with young children. Finally, we use a series of regression models to examine the mediating role of attitudes in the associations between attachment styles and caregiving

skills and between knowledge and skills. We examined these relations both for the whole sample of student respondents (reflecting the breadth of students who may be in entry-level courses that include child development and family content) and for the subgroup of respondents who planned to have careers involving work with young children (reflecting the students likely to be in upper division or major-only courses focused on young children).

Career goals

A total of 82 respondents (40%) indicated that they intended to pursue careers working with young children in positions such as child care center director (9.2% of 207), child care provider (14%), child life specialist (8.2%), child therapist (2.4%), EC educator (22.2%), early interventionist (6.3%), and preschool center director (4.3%). See **Table 3** for the degree to which respondents wanted to work with children of various ages with and without disabilities.

Table 3. Descriptive statistics and correlations with attachment for populations of professional interest.

<i>Population of professional interest</i>	<i>Students' average desire to work with each population, from No Desire (1) to Strong Desire (5) (n = 202)</i>		<i>Correlations with attachment for students whose career goals involved young children (n = 82)</i>			
	<i>M (SD)</i>	<i>% Rating 4 or 5</i>	<i>Security</i>	<i>Fearfulness</i>	<i>Dismissiveness</i>	<i>Preoccupation</i>
Pregnant women	2.58 (1.19)	19.9%	-.072	-.018	.016	.044
Parents of typically developing children	3.26 (1.16)	42.4%	.088	-.076	-.063	.056
Parents of children with special needs	3.16 (1.24)	43.6%	.180	-.260*	.118	-.167
Infants (<1 year) who are typically developing	3.19 (1.36)	47.1%	-.027	-.024	.044	.038
Infants (<1 year) with special needs	3.05 (1.37)	43.7%	.172	-.201†	.015	-.214†
Toddlers (1–3 years) who are typically developing	3.50 (1.25)	57.3%	.195†	-.150	.035	-.069
Toddlers (1–3 years) with special needs	3.26 (1.30)	46.8%	.286**	-.264*	.112	-.231*
Preschoolers (3–5 years) who are typically developing	3.57 (1.22)	58.6%	.151	-.129	-.117	-.078
Preschoolers (3–5 years) with special needs	3.39 (1.30)	52.2%	.100	-.201†	-.031	-.178
Kindergartners who are typically developing	3.61 (1.26)	60.8%	.197†	-.119	-.250*	-.073
Kindergartners with special needs	3.36 (1.33)	51.4%	.233*	-.267*	-.032	-.242*
First through third graders who are typically developing	3.39 (1.34)	53.2%	.171	-.143	-.060	.006
First through third graders with special needs	3.18 (1.34)	45.3%	.178	-.200†	-.019	-.152
Fourth graders or older who are typically developing	3.07 (1.33)	45.9%	.121	-.151	.028	.034
Fourth graders or older who have special needs	2.95 (1.31)	40.0%	.161	-.241*	.067	-.123

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

Associations between attachment and students' education and career goals

To investigate effects of students' attachment on education and career goals, we tested associations of the attachment subscales with courses taken; whether students' career goals involved work with young children; and, for those who wanted to work in EC, the specific populations with whom they most wanted to work. We suspected that those with more secure attachments would be more willing to work with populations that might be perceived as requiring closer teacher-child relationships or a higher degree of emotional availability, such as toddlers and/or children with special needs.

Courses taken

The average number of child-related courses taken across all participants was 1.85 ($SD = 1.49$), with a range of 0 to 6. The average number of more general human development or education classes was 2.31 ($SD = 1.91$), ranging from 0 to 9. Attachment fearfulness was negatively correlated with the number of courses taken related to children ($r = -.19, p < .01$) and with human development or education courses ($r = -.22, p < .01$).

Career goals

Students whose career goals focused on EC had significantly higher attachment security ($M_{EC} = 3.89$ vs. $M_{other} = 3.70$; $t = 2.07, p = .04$) and lower attachment fearfulness ($M^{EC} = 2.52$ vs. $M_{other} = 2.82$; $t = -2.25, p = .03$) compared to students who did not have career goals involving young children.

Populations of interest

On average, among those who had EC career goals, students had less desire to work with children who have special needs than with those who are typically developing. Furthermore, paired-samples t tests indicated a lower average desire to work with children with special needs compared to those who are typically developing for children in

most age groups: toddlers ($t = 2.49, p = .02$), preschoolers ($t = 2.38, p = .02$), and kindergartners ($t = 2.16, p = .03$). The difference for infants approached significance ($t = 1.85, p = .07$).

For students with EC career goals ($n = 82$), we correlated attachment scores with desire to work with each population. Attachment security was positively correlated with desire to work with toddlers and kindergartners, and children with special needs (see Table 3). Fearfulness and preoccupation were negatively correlated with desire to work with those with special needs.

Associations between attachment and knowledge of infant/toddler development

Among all participants, attachment security had a small positive correlation with the percentage of correct KIDI items ($r = .15, p = .04$) and particularly with knowledge of effective discipline ($r = .24, p < .01$); however, attachment was not related to knowledge for the group of students with EC career goals.

Associations between attachment and attitudes toward infant/toddler care and education

To examine the influence of students' attachment on attitudes related to infant/toddler development, care, and education, we examined correlations between each of the attachment subscales and each of the attitude scales for the whole sample and for those with EC career goals. As seen in **Table 4**, with a few notable exceptions, the patterns were very similar for both groups.

Attachment is associated with attitudes about relationships

For the whole sample, attachment security was related to endorsement of practices that support parent-child and child-caregiver relationships, whereas fearfulness was inversely associated with these endorsements. Dismissiveness was inversely associated with support for caregiver-child relationships but had no association with attitudes about parent-child relationships. As presented in Table 4, for the group with EC goals, attachment was unrelated to attitudes about

Table 4. Correlations between attachment and knowledge, attitudes, and skills related to infant/toddler development, care, and education for all respondents and those whose career goal involved work with young children.

Competency dimension	Component knowledge, attitude, or skill	All participants (n = 204)				Those whose career goals involved work with young children (n = 82)			
		Security	Fearfulness	Dismissiveness	Preoccupation	Security	Fearfulness	Dismissiveness	Preoccupation
Knowledge	Knowledge of individual differences	.108	-.065	-.078	.100	.138	-.125	-.024	.060
	Developmentally appropriate expectations	.077	.037	-.041	.043	.007	.066	-.051	.105
	Knowledge of effective discipline	.236**	-.084	.057	.021	.165	-.158	.001	.048
Support relationships	Support teacher-child relationships	.157*	-.180*	-.158*	.035	.113	-.114	-.119	-.075
	Support parent-child relationships	.351**	-.225**	-.014	-.049	.378**	-.341**	-.025	-.313**
Understand learning	Development is self-righting	.297**	-.10	3.085	.073	.336**	-.214†	-.036	-.069
	Teachers must monitor development	.141*	-.004	-.041	.056	.173	.024	.074	-.132
	Teachers have little influence	-.198**	.184**	.102	.002	-.236*	.129	.169	.074
Support learning	Early learning matters	.324**	-.183**	.031	-.005	.351**	-.140	.039	-.103
	Endorse child-led learning	.360**	-.190**	.031	.046	.350**	-.237*	-.090	-.105
	Endorse teacher-directed learning	-.054	.242**	.212**	-.008	.084	.179	.170	-.101
	Treat children as individuals	.280**	-.233**	-.091	.067	.241*	-.320**	-.220†	.014
Guidance of infant/toddler behavior (strictness and control) skills	Treat children the same	.037	.046	.150*	-.038	.028	.014	.104	.004
	Concern about spoiling	-.046	.123†	.105	-.021	-.005	.054	.141	-.137
	Endorse strict discipline	-.124†	.256**	.152*	.115	-.123	.306**	.231*	.165
	Endorse spanking	-.143*	.211**	.105	-.043	-.205†	.240*	.172	.174
Total interaction skills	.127†	-.166*	-.143*	-.003	.066	-.236*	-.139	-.233*	

† p < .10 ; * p < .05 ; ** p < .01

practices that support the caregiver–child relationship, but security, fearfulness, and preoccupation were all associated in the expected directions with attitudes about supporting the parent–child relationship.

Attachment is associated with attitudes about learning

Attachment security was positively related to most attitudes thought to be supportive of children’s development and learning. For example, security was positively correlated with more hopeful views of the nature of development and learning, including the attitudes that early learning matters for long-term development, that teachers can influence development, and that development is in general self-righting. Among the total sample, but not those with EC career goals, fearfulness was positively related to the belief that teachers have little influence on children’s development and negatively related to the belief that early learning matters for later development. For both groups attachment security was related to attitudes about practices supportive of development. For the total sample, fearfulness and dismissiveness were associated with endorsement of teacher-directed learning.

Attachment is associated with attitudes about guidance of infant/toddler behavior

Attachment fearfulness was positively associated with attitudes endorsing greater strictness and control in infant/toddler guidance for both the total group and those with EC career goals; attachment security was inversely associated with these attitudes. In the total sample, dismissiveness was related to stronger attitudes in treating children the same despite individual differences; in the EC career group, dismissiveness was related to endorsing strict discipline.

Mechanisms of the influence of attachment and knowledge on interaction skills

To examine influences of students’ attachment on skills for working with infants and toddlers, we treated students’ choices of developmentally supportive responses in the vignettes as indicators of skills. Total

interaction skill scores were correlated with students' knowledge of infant/toddler development (KIDI score) for the total sample ($r = .22$, $p < .01$) and those who planned to work with young children ($r = .35$, $p < .01$). As presented in Table 4, interaction skills scores were also associated with attachment. For both the overall and EC career samples, attachment fearfulness had the most robust association with interaction skills. Dismissiveness was inversely associated with interaction skills for the total sample, and preoccupation was inversely associated with interaction skills for those with EC career goals.

Attitudes as a mediator of attachment and interaction skills

Next we used linear regression to test whether attitudes mediated the associations between attachment fearfulness and interaction skills, controlling for knowledge of child development and university site. We used a composite score composed of the attitudes related to each competency dimension: understanding and supporting relationships, understanding and supporting learning, and guidance of infant/toddler behavior (see Table 4 for the alignment between specific attitudes and competency dimensions). First we used linear regression to establish the predictive relationships between attachment fearfulness and each of the attitude composites (see **Table 5**). Then we fit a series of regression models to test the effects of attachment on interaction skills, controlling for knowledge and university site, and systematically added the attitudes composites related to each competency to determine whether the effect of attachment fearfulness was diminished when each attitude was added (**Table 6**). We used the Sobel test of mediation significance to determine whether each attitude composite mediated effects of attachment fearfulness on interaction skills.

For the whole sample, there was evidence of mediation paths from attachment fearfulness through attitudes to students' interaction skills (see **Figure 1**); effects of students' fearfulness on interaction skills were mediated by attitudes related to supporting the parent-child relationship ($Z = 2.06$, $p < .05$) and showed a trend toward mediation through attitudes related to supporting the teacher-child relationship ($Z = 1.74$, $p = .08$). Attachment fearfulness was also mediated by attitudes related to child-focused supports for learning ($Z = 1.97$, $p <$

Table 5. Results of regression models (unstandardized betas, standard errors) for the effects of attachment fearfulness on attitude composite scores, controlling knowledge.

<i>Model parameters</i>	<i>Model A: Support teacher–child relation</i>	<i>Model B: Support parent–child relation</i>	<i>Model C: Nature of learning: optimistic</i>	<i>Model D: Support for learning: child focused</i>	<i>Model E Guidance strictness and control</i>
All participants (n = 202)					
Intercept (composite Z-score)	–0.06 (0.08)	–0.10 (0.09)	–0.09 (0.08)	–0.24** (0.08)	–0.18* (0.08)
University controls					
Attachment fearfulness (Z-score)	–0.15* (0.07)	–0.21** (0.07)	–0.15* (0.07)	–0.26*** (0.07)	0.24*** (0.07)
Knowledge (Zscore)	0.20** (0.07)	0.17* (0.07)	0.43*** (0.07)	0.34*** (0.07)	–0.29*** (0.07)
Model fit					
R ²	0.19	0.09	0.21	0.27	0.24
F	9.10**	3.75***	10.31***	14.35***	11.96***
Those whose career goals involve work with young children (n = 82)					
Intercept (composite Z-score)	0.25 (0.15)	0.20 (0.14)	0.00 (0.15)	0.08 (0.14)	–0.47** (0.14)
University controls					
Attachment fearfulness (Z-score)	–0.10 (0.11)	–0.33** (0.10)	–0.18 (0.11)	–0.34** (0.10)	0.13 (0.10)
Knowledge (Z-score)	0.38** (0.13)	0.09 (0.12)	0.43** (0.13)	0.44*** (0.11)	–0.33** (0.12)
Model fit					
R ²	0.26	0.18	0.20	0.34	0.38
F	4.88**	3.01*	3.49**	7.05***	8.39***

The dependent variable and predictors are each in Z-score units so that betas represent effect sizes.

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

.05) but only a trend of mediation through optimistic views of development ($Z = 1.81$, $p = .07$). Finally, the effect of fearfulness was mediated by attitudes regarding strictness and control in the guidance of infant/ toddler behavior ($Z = 2.84$, $p < .01$).

For students with EC career goals, there was a direct effect of attachment fearfulness on interaction skills at the $p < .10$ level (see Table 6) but only one significant mediating path through attitudes toward supporting learning through child-focused strategies ($Z = 2.32$, $p < .05$). Attachment fearfulness predicted attitudes related to supporting parent–child relationships, but these attitudes did not mediate the association between attachment fearfulness and interaction skills.

Table 6. Results of regression models (unstandardized betas, standard errors) for the effects of attachment fearfulness, knowledge of development, and attitude composites on interaction skills.

Model parameters	<i>All participants (n = 204)</i>				<i>Those whose career goals involved work with young children (n = 82)</i>			
	<i>Model A: Baseline</i>	<i>Model B: Relation</i>	<i>Model C: Learning</i>	<i>Model D: Guidance</i>	<i>Model E: Baseline</i>	<i>Model F: Relation</i>	<i>Model G: Learning</i>	<i>Model H: Guidance</i>
Intercept (2.86)	57.56** (1.55)	58.14*** (1.50)	59.07*** (1.48)	56.40*** (1.47)	65.53*** (2.78)	64.64*** (2.84)	64.85*** (2.63)	62.46***
University controls								
Attachment fearfulness	-2.81* (1.22)	-1.52 (1.22)	-1.02 (1.19)	-1.22 (1.19)	-3.92† (1.98)	-3.70† (2.10)	-1.33 (2.02)	-3.04 (1.91)
Knowledge	3.48** (1.27)	2.14† (1.27)	0.36 (1.33)	1.52 (1.26)	4.76* (2.33)	3.29* (2.46)	1.64 (2.47)	2.60 (2.34)
Supporting teacher-child relationships		3.88*** (1.30)				3.97† (2.20)		
Supporting parent-child relationships		3.42** (1.21)				-0.48 (2.33)		
Nature of learning: optimistic			4.96** (1.46)				-1.04 (2.29)	
Supporting learning: child focused			3.27* (1.41)				8.09** (2.54)	
Guidance: strictness and control				-9.67*** (1.90)				-9.58** (3.34)
Model fit								
R ²	.11	.15	.22	.21	.24	.27	.35	.32
R ² change from baseline model	.07***	.12***	.11**	.04	.11**	.08**		
F	4.55**	5.85**	7.88***	8.58**	4.41**	3.67**	5.14***	5.43***
F change from baseline model	8.23***	14.60***	25.81***	1.63	5.53**	8.24**		

Predictors are each in Z-score units so that betas represent the effect of 1 SD.

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

Attitudes as a mediator of knowledge and skills

Next we tested whether the effect of students' knowledge of infant/toddler development (KIDI scores) on interaction skills was mediated by attitudes. For the whole sample (see **Figure 2**), attitudes related to an optimistic view of development ($Z = 2.97, p < .01$), child-focused supports for learning ($Z = 2.09, p < .05$), and strict and controlling guidance ($Z = 3.21, p < .001$) each mediated the association between knowledge and interaction skills; there was a trend toward mediation

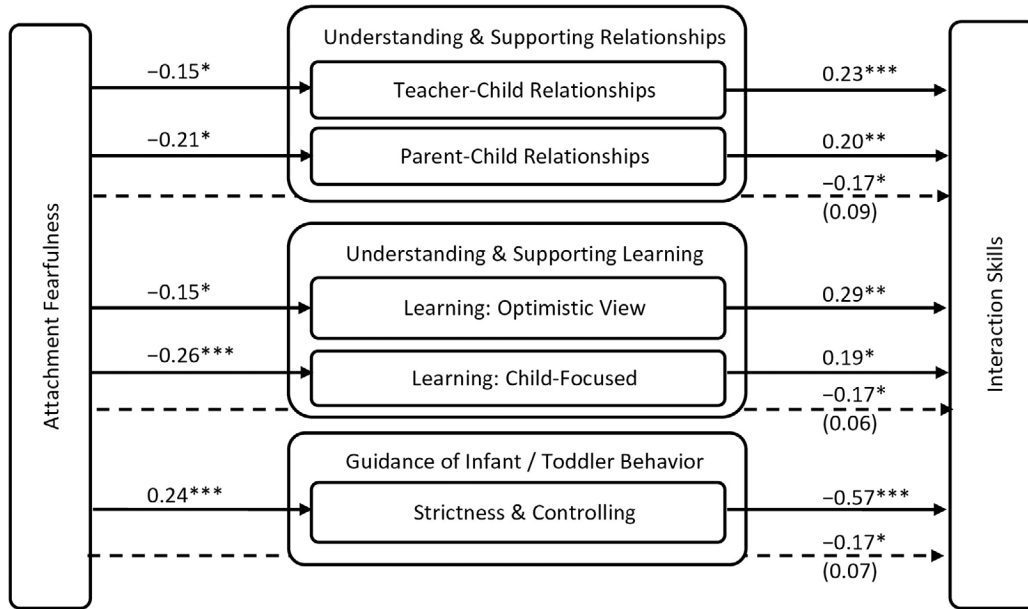


Figure 1. Mediation of the effect of attachment fearfulness on interaction skills through students' attitudes for all respondents ($n = 199$). Solid lines represent direct effects, whereas dashed lines represent mediation.

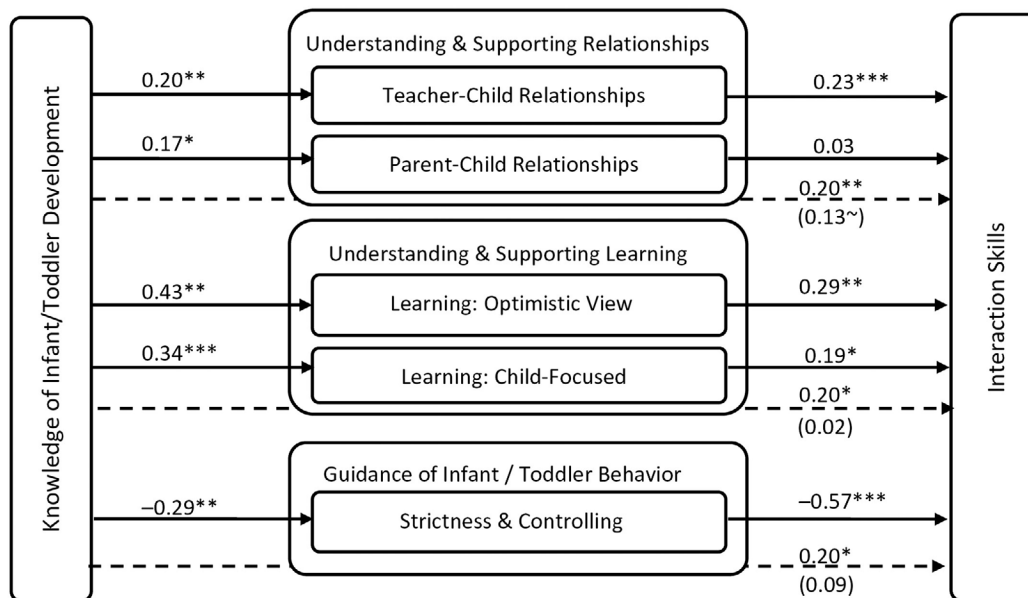


Figure 2. Mediation of the effect of knowledge on interaction skills through students' attitudes for all respondents ($n = 199$). Solid lines represent direct effects, whereas dashed lines represent mediation.

through supporting parent–child relationships ($Z = 1.84, p = .07$). For those with EC career goals, child-focused supports for learning ($Z = 2.49, p < .05$) and strict and controlling guidance ($Z = 1.99, p < .05$) mediated effects of knowledge on interaction skills.

Discussion

The purpose of this study was to investigate associations among university EC students' attachment styles; their expectations regarding their future professional roles; and their knowledge, attitudes, and skills related to working with infants and toddlers. Our results demonstrate that EC students' attachment styles are related to their career interests and to their knowledge, attitudes, and skills relevant to infant/toddler development and care. Based on our results, we propose a conceptual model of a mediated relationship between students' adult attachment styles and caregiving skill via attitudes about children's early development and relationships. Together, but with some limitations, these results and the proposed model point to future research directions and implications for university teaching to prepare the future teachers of infants and young children.

Students who want to work with young children are more securely attached than others

Students whose career goals focused on working with young children reported a more secure attachment style than those wishing to work with others. This is consistent with the findings of Horppu and Ikonen-Varila (2004) that secure students were more likely than dismissing students to identify working with young children as their first career choice. It is also consistent with the findings of Riley (2009), which showed that although insecure attachment appeared to be a motivator for entering the teaching field in search of reparative experiences in relationships with children, those who wanted to work with younger students (in this case elementary compared to secondary students) were less anxious and less avoidant. In the current study, greater security and less fearfulness were positively related to the desire to work with younger children and those with disabilities. This

addresses, in part, concerns within the field that educators with insecure attachments should not work with infants and toddlers (e.g., Berlin, 2012); in fact, there seems to be some self-selection at work, considering that greater attachment fearfulness was inversely associated with the number of child development courses taken and with the desire to work with younger children. According to theory, both fearfulness and avoidance stem from an internalization of early adverse experiences in the family. These early adverse experiences result in a disturbance in the capacity to form interpersonal attachments due to an internalized aversion to strong feelings (Bartholomew, 1990). Given that infants and young children are dependent on adults and express their needs with behaviors that can be interpreted as negative (i.e., clinginess, crying, tantrums), this self-selection effect is not surprising. Thus, it is possible that attachment has its first effects on students' knowledge, attitudes, and skills by influencing their career goals and related coursework.

Attachment security is associated with a positive orientation toward working with children who have special needs

Scores on attachment security were positively related to expressed interests in working with children who have special needs. Conversely, higher fearful or preoccupied attachment scores were associated with less interest in working with these children. This negative orientation toward working with children who have special needs may be related to fearful and preoccupied students' greater anxiety in general, which may be amplified when considering the challenges of working with a population about whom they likely have limited knowledge or whom they perceive to be more dependent on adults. According to Bartholomew (1990), fearful adults are averse to strong needs in self and others and thus deactivate and avoid negative feelings and intimate relationships. Perhaps the strong dependency needs of young children with special needs overwhelm adults with fearful attachment styles, leaving them to feel ineffective and helpless. The positive orientation toward working with children with special needs on the part of more secure students may be related to the higher social self-efficacy characteristic of individuals with a secure internal working model. This model may help students anticipate successfully meeting the needs

of vulnerable children. It will be important to further investigate associations among attachment styles, knowledge, confidence, and social self-efficacy in order to inform the preparation of EC professionals who will work with vulnerable populations.

Attachment security is associated with more knowledge and more developmentally supportive attitudes

Security of attachment was positively associated with knowledge about infant/toddler development. Moreover, for the group with EC career goals, though attachment was not associated with attitudes about the caregiver–child relationship, it was related to attitudes about the parent–child relationship. Self-selection into EC emphasis areas may have limited attachment style variability among these students, or child development content in courses they have taken may have effectively addressed practices related to caregiver–child relationships, eliminating the effect of attachment security on these attitudes. Courses may not have sufficiently addressed parent–child relationships or professionals’ roles in supporting these, however, leaving this attitude more vulnerable to the effects of students’ own attachment styles.

Attachment security and fearfulness were consistently associated, in opposing directions, with attitudes about learning. Secure attachment is related to positive views of self and others and the ability to coherently reflect on the influences on one’s own life (Bartholomew & Horowitz, 1991). It is not surprising, then, that those with secure attachments expressed more optimism about children’s tendencies to make good choices and develop in positive ways. Also, they believed that as teachers, they will be responsible for influencing the lives of children in their care. Students who scored high on fearfulness tended to minimize the importance of adults in the lives of children and even the importance of the early years, which is consistent with their tendency to minimize the importance of intimate relationships. Fearfulness appears to have consistent negative associations with the attitudes and skills needed for working with infants, toddlers, and families, and its influence on skills—the ability to choose the most developmentally supportive response—appears to be largely mediated through attitudes.

Note that fearfulness and dismissiveness were associated with the endorsement of strict discipline and spanking, whereas more secure beliefs were inversely related to endorsement of these practices. These results are consistent with research showing that parents with insecure attachments score higher on the structure dimension of Baumrind's (1973) parenting styles, exerting more control, expecting more mature behavior from children, and showing less support for children's autonomy (Pearson et al., 1994). This may reflect differences in students' expectations for harsh or controlling interactions in close relationships. These findings extend Rholes and colleagues' (1997) report that insecure college students tend to endorse stricter disciplinary practices and those of Morris-Rothschild and Brassard (2006), who found that teachers with higher anxiety and avoidance approached classroom conflict management with less compromise and less integration of the needs of students and teachers into conflict resolution. Our findings suggest that this pattern is also evident among undergraduates with EC career interests. Whereas dismissing and fearful adult attachment styles both reflect the minimization of the importance of close relationships, a fearful attachment style represents a distortion in the balance between dependence and independence and a fear of losing boundaries (Bartholomew, 1990). According to George and Solomon (2008), adults have a biological drive to care for and protect children, called the *caregiving system*, which is activated by child distress. Adults with fearful attachment styles may experience anxiety and helplessness in response to children's distress, which dysregulates their caregiving system and results in harsher discipline strategies.

Conceptual model: attitudes mediate the effects of attachment and knowledge on interaction skills

We intended to conduct a theoretically driven examination of how students' attachment styles are related to their knowledge, attitudes, and skills for working with infants, toddlers, and their families within three of the competency dimensions deemed important for the infant/toddler workforce. Based on our results, and informed by attachment theory, we propose the conceptual model presented in **Figure 3**.

Our data are correlational and cross-sectional and thus cannot provide any causal conclusions. Therefore, we look to attachment theory

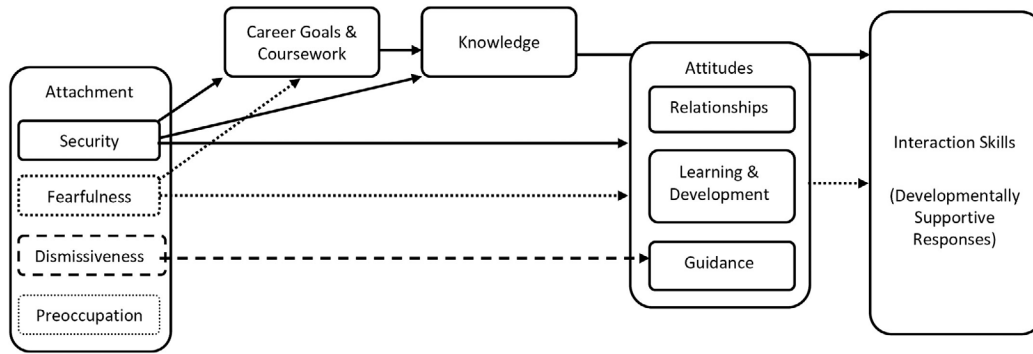


Figure 3. Proposed conceptual model. Solid lines represent effects of attachment security, dotted lines represent effects of attachment fearfulness, and dashed lines represent effects of attachment dismissiveness.

to provide a conceptual explanation for how individuals' attachment style can influence knowledge, attitudes, and skills. This conceptual model also provides us with a roadmap for future investigation.

Attachment security and fearfulness both predicted, in opposite directions, students' career goals and related educational choices (i.e., courses taken). It is important to keep in mind that both securely and insecurely attached individuals place a high value on relationships, yet because individuals with an insecure attachment style are likely to have a history of inconsistently met security needs, they adopt strategies of either deactivating the attachment system to avoid emotional aspects of relationships to minimize anxiety or activating it in a hypervigilant way, which can result in consistently elevated anxiety. We propose that because secure and preoccupied individuals explicitly value attachment relationships, they are more oriented toward working with children, whereas dismissing and fearful individuals are less likely to choose a career working with young children; these choices represent consistency with attachment-based strategies of coping with relationship-related anxieties.

We propose an indirect influence of attachment on students' knowledge of infant/toddler development, as previous knowledge influences subsequent learning (Ambrose et al., 2010; Bauer, 2009). Internal working models operate as interpretive schemas, and it is much easier to learn information that confirms one's schemas than information that could disconfirm them (Atherton, 2013; Weston, Blagov, Harenski, Kilts, & Hamann, 2006). This may explain why dismissing individuals,

who likely had their own bids for nurturance rebuffed, adopt a strategy of minimizing the importance of nurturance and child-centered approaches to caregiving (Bartholomew, 1990). When faced with a toddler who is upset, a dismissing individual may interpret crying or tantrums as behavior problems to control rather than as a sign that soothing and support in self-regulation are needed. Individuals with a fearful attachment style may have experienced having their own attachment needs rejected along with overwhelming negative affect from caregivers (Bartholomew, 1990). As a result, they may develop helpless caregiving representations and find themselves flooded with negative emotion and unable to respond to children in sensitive ways (George & Solomon, 2008; Solomon & George, 2011). Thus, we found that stricter, less developmentally supportive responses are preferred by insecure individuals. A secure individual is more likely to perceive a child's behavior as indicating his or her needs and have a script for comforting and helping him or her to regulate his or her behavior.

Our conceptual model also proposes that attachment directly influences attitudes about relationships, learning and development, and guidance. Individuals with fearful or dismissive internal working models are more likely to have negative models of others and the social world; thus, fearfulness and dismissiveness are associated with less developmentally supportive attitudes in these areas. For example, negative working models may include assumptions that children are hedonistic and will do whatever they can get away with to satisfy their own needs; thus, controlling guidance strategies are necessary. Conversely, individuals with secure beliefs may have working models characterized by assumptions that despite being immature and relatively self-centered, children have essentially prosocial orientations but need the guidance of supportive adults to develop social and self-regulatory skills. Examination of these hypotheses will await longitudinal studies that can examine moderating effects of attachment on actual openness to learning from coursework on child development and practices that support it.

Our model proposes that both attitudes and knowledge influence students' interaction skills, but knowledge may be partially mediated by attitudes. In this study, our findings suggest that security and fearfulness influence attitudes about relationships, learning and development, and guidance, whereas dismissiveness influences guidance

specifically. Fearfulness appears to have the most consistent effect on both attitudes and interaction skills, and the effect on skills may be largely mediated by attitudes. Attitudes associated with internal working models may constrain or facilitate students' learning about children's development, learning, and family relationships as well as students' learning of interaction skills for working with children and families.

Limitations and future directions

We recognize that our study has limitations as well as strengths. For one, the study population represents, at present, only the 25% of the future infant/toddler workforce who will have a 4-year degree (National Survey of Early Care and Education Project Team, 2013). This more educated group of EC teachers is likely to have come from families facing less economic stress and home environments more conducive to secure attachment (Diener, Casady, & Wright, 2003).

This convenience sample was composed of students from four universities, and results should be interpreted with caution. Our proposed model of how attachment affects the knowledge, attitudes, and skills of the future infant/toddler workforce should be empirically tested with a larger and more diverse sample. This may help to resolve some of the low reliabilities of some of the factors found in the current sample and enable us to test site-level variations in factors. Furthermore, as we saw in our preliminary analyses, baseline levels of knowledge, attitudes, and skills are likely to vary in American subcultures, which will be reflected in university populations across U.S. regions. Thus, in addition to simply controlling for these differences, it would be useful to carefully address them from a sociocultural perspective and by using multilevel model techniques and to consider the implications of the results for higher education pedagogy.

Furthermore, a longitudinal design is needed to examine possible effects of adult attachment on changes in students' knowledge, attitudes, and skills, that is, learning produced via university coursework and other educational experiences. We expect that students' attachment styles will predict their choice of coursework, which will influence what they learn; then among those who choose courses related to infant/toddler development, their attachment styles could buffer

or enhance their gains in knowledge, or change in attitudes, either of which could mediate the path from adult attachment to students' interaction skills with young children. Finally, we acknowledge that the use of vignettes with correct and incorrect responses constrained our ability to measure how well students would actually respond to children with particular developmental needs in particular social and cultural contexts. In future research, we need to move beyond self-reports to actual observations of infant and toddler teaching in real-world settings.

Furthermore, our multi-university group began this project with the acknowledgment that although all of the nine competencies we identified must inform EC practice and thus coursework, it was not feasible to construct a survey tapping student knowledge, attitudes, and skill in all competencies at once; thus, we chose to focus on three. One of the competencies we had identified was diversity and inclusion. The need to infuse respect for cultural diversity in EC professionals' understandings of the causes and outcomes associated with particular family and child care practices is great (Dahlberg, Moss, & Pence, 2013; Edwards & Raikes, 2002). It is important that future research include measures that permit the assessment of instructors' and students' knowledge, attitudes, and skills related to cultural and ability-related diversity. A number of important research questions could be posed. For example, perhaps secure attachment, because it is based on fundamental trust in others, is positively associated with openness to family diversity and a willingness to reflect on the appropriateness of specific child care practices for children of various cultural and family structure backgrounds. The same may be true concerning openness to individual differences, including differences in ability.

Pedagogical implications for preparing infant/toddler professionals

Our findings raise important questions for EC teacher education. Some argue, given the importance of teacher-child interactions, that attachment security is a critical disposition for infant/toddler teachers (Berlin, 2012). Although further research is needed, our findings suggest that adult attachment may also be important in the EC workforce and preservice teachers' education. Adults who remain insecure may "be

less creative and flexible, and more defensive” (van Ijzendoorn, Juffer, & Duyvesteyn, 1995, p. 245), and faculty preparing future EC teachers may need to watch for indicators of difficulty in students’ work with children and find ways to support better child–teacher interactions. Though Kilmann, Carranza, and Vendemia (2006) demonstrated that systematic intervention can significantly improve insecure college students’ attachment-related beliefs and emotions, changing preservice teachers’ attachment is often not a realistic goal; attachment representations, built over time, are relatively stable (Waters, Weinfield, & Hamilton, 2000). There is also a cultural issue to keep in mind as one considers intervention: it is not known whether there are cultural differences among college students in the strength of relations between adult attachment styles and the knowledge, attitudes, and skills students bring to work with children, especially infants and toddlers. It may be that in some cultural groups, attachment styles are less predictive than we found, perhaps because traditions allow less leeway for divergences in ways of caring for the youngest age groups.

A systematic approach to effectively incorporating knowledge of students’ characteristics and dispositions into pedagogical considerations would require faculty members to undertake multiple steps, including (a) reliable assessment of attachment and other psychosocial factors; (b) adaptation of instruction to student characteristics; and (c) sensitive supervision designed to impart knowledge, develop skills and confidence, and enhance reflective functioning (RF). To date, no models that incorporate psychosocial factors that college students bring to EC training programs have been developed. However, in one study, attachment-focused, manualized intervention with insecure college students did significantly improve relationship beliefs, self-esteem, and regulation of anger compared to a no-intervention control group (Kilmann, Urbaniak, & Parnell, 2006). Although this intervention did not specifically target EC education students, it does indicate that attachment-related beliefs and emotions are amenable to change. The parenting literature also suggests that instead of targeting parents’ working models directly, interventions can effectively target sensitive behaviors and RF (Slade, 2007; Suchman et al., 2010; van Ijzendoorn, 1995); perhaps this is also the case for preservice teachers. As van Ijzendoorn (1995) concluded from a meta-analysis of attachment interventions, increasing adults’ sensitive behavior

does not necessarily influence the teacher's attachment representations but could reinforce the importance of sensitivity. For example, the experience of noticing children's attachment-related cues and responding contingently can be rewarded via the impact on children's behavior and development, which in turn may enable teachers with insecure adult attachment to revise their beliefs about the importance of attachment relationships.

Targeting RF may be another effective way of supporting preservice teachers' abilities to notice infant cues and respond sensitively. RF is the ability to recognize thoughts, emotions, and intentions in oneself and others; link these mental states to behavior; and take another's perspective to understand his or her behavior (Fonagy, Steele, Steele, Moran, & Higgitt, 1991; Slade, 2005). Adults higher in RF are more likely to reflect on a child's internal experience (Slade, Grienberger, Bernbach, Levy, & Locker, 2005) and respond sensitively to child behavior, fostering secure attachment (Kelly, Slade, & Grienberger, 2005; Slade et al., 2005; Stacks et al., 2014). King and La Paro (2015) found that preschool teachers' use of mental state talk with children (an indicator of RF) was linked to indicators of classroom quality using the Classroom Assessment Scoring System (CLASS). Furthermore, parenting interventions targeting RF have improved parent sensitivity and child attachment (Suchman et al., 2010). RF training could be a central component in a model for educating infant/toddler professionals via higher education. Other disciplines utilize person-centered models in higher education that carefully consider students' backgrounds (Clouston & Whitcombe, 2005). These models include carefully crafting opportunities for cognitive dissonance that make students more aware of their own biases and reactions and provide opportunities to question their assumptions and attitudes (Neighbor, 1992). Such a model could be developed for future EC professionals, considering students' attachments and attitudes and utilizing cases or problems that produce cognitive dissonance as opportunities for RF training.

The National Center for Research on Early Childhood Education (NCRECE) systematically studies strategies that promote responsive teaching of young children, including the ability to respond in a supportive way to children's emotional, behavioral, and cognitive cues (Hamre et al., 2014). NCRECE research shows that future teachers

need opportunities to observe and practice responsive teaching and receive ongoing coaching (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). Observing exemplar teacher videos has been associated with growth in emotionally supportive teacher behaviors (Pianta et al., 2014). University EC education faculty who teach infant/toddler courses may consider focusing on increasing knowledge and skills related specifically to developmentally supportive teacher–child interactions, including reading and responding to cues with sensitivity and warmth. Courses should include video examples and practice observing child cues and adult sensitive responses.

Another approach is offered by EC mental health consultation (Heller et al., 2012), which has been shown to improve teacher RF (Virmani, Masyn, Thompson, Connors-Burrow, & Mansell, 2013; Virmani & Ontai, 2010), teacher–child interactions, and child outcomes (Alkon, Ramler, & MacLennan, 2003; Heller et al., 2012; Perry, Allen, Brennan, & Bradley, 2010; Virmani et al., 2013). Early Childhood Education (ECE) faculty could build reflective supervision into student teaching by modeling a reflection; facilitating wondering about the meaning behind child behaviors; and asking about students' emotional reactions to case studies, vignettes, and video examples (Slade, 2007).

Conclusion

The attachment security of students studying child development is related to their knowledge, attitudes, and skills for working with infants, toddlers, and their families. Though higher education is unlikely to change students' attachment styles, experts must develop a student-centered pedagogical approach that is sensitive to students' relationship histories and that can help them understand the effects of those histories on their own attitudes about and responses to children—be they other people's children if they do enter the EC workforce, their own children if they are or become parents, or children they will encounter in other settings. Such a model could incorporate current understandings of attachment interventions that effectively support change in adults' attachment-related behaviors and ultimately support children's optimal development.

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