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## Attachment in middle childhood: predictors, correlates, and implications for adaptation

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### ABSTRACT

Middle childhood is a relative lacuna in behavioral attachment research. We examined antecedents, correlates, and implications of parent-child attachment at age 10 in a longitudinal study of community families from a Midwestern US state ( $N = 102$ , mothers, fathers, and children). Dimensions of security, avoidance, ambivalence, and disorganization of children's attachment to each parent were observed in lengthy naturalistic interactions and assessed using Iowa Attachment Behavioral Coding (IABC). IABC scores were meaningfully associated with history of parental responsiveness (7–80 months) and with earlier and concurrent attachment security, assessed with other established instruments (parent- and observer-rated Attachment Q-Set at 25 months, children's reports at age 8 and 10). Structural equation modeling analyses revealed that the overall history of responsive care was meaningfully associated with Security, Avoidance, and Disorganization at age 10, in both mother-child and father-child relationships, and that most recent care uniquely predicted Security. IABC scores were also meaningfully related to a broad range of measures of child adaptation at ages 10–12. Cumulative history of children's security from infancy to middle childhood, integrating measures across relationships and methodologies, also predicted child adaptation at ages 10–12.

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### KEYWORDS

Attachment; middle childhood; parenting; child adaptive outcomes; child maladaptive outcomes

Ever since Bowlby (1969/1982, 1973) proposed his heuristically powerful theory of early human relationships, research on the role of early attachment in social-emotional development and psychopathology has flourished. That research has consistently found broad associations between early security and adaptive and maladaptive developmental outcomes (Belsky & Nezworski, 1988; Bowlby, 1969/1982; Cassidy, Jones, & Shaver, 2013; DeKlyen & Greenberg, 2008; Fearon, Bakermans-Kranenburg, van IJzendoorn, Lapsley, & Roisman, 2010; Groh et al., 2014; Sroufe, 2005; Thompson, 2006; van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999; Weinfield, Sroufe, Egeland, & Carlson, 2008).

Although attachment remains a key theme throughout development, research has historically focused on infancy through preschool age, and then adolescence through adulthood, leaving a relative lacuna of research in middle childhood. Notably, in the last

two decades, researchers have made great strides in addressing this gap; however, many questions still remain (Bosmans & Kerns, 2015; Kerns, 2008; Kerns & Seibert, *in press*; Marvin & Britner, 2008). Along with the rising interest in middle childhood, multiple valuable assessment methodologies have emerged. Those methodologies, however, have targeted primarily the level of children's attachment representation, and relied mostly on narratives and self-reports. Those measures include narrative-based assessments, such as story stems (e.g., Cassidy, 1988; Granot & Mayseless, 2001; Green, Stanley, Smith, & Goldwyn, 2000), secure base scripts (Psouni & Apetroaia, 2014; Waters, Bosman, Vandevivere, Dujardin, & Waters, 2015), attachment interviews (e.g., Child Attachment Interview, Target, Fonagy, & Shmueli-Goetz, 2003; Friends and Family Interview, Steele & Steele, 2005), and self-reports (e.g., Kerns Security Scale, Kerns, Klepac, & Cole, 1996; People in My Life, Ridenour, Greenberg, & Cook, 2006). Even though observable attachment behaviors have been identified in middle childhood (Bosmans & Kerns, 2015; Kerns & Seibert, *in press*), the development of behavioral coding systems that assess those behaviors has lagged behind. The Strange Situation has been adapted up to age 6 (Main & Cassidy, 1988), and very occasionally up to age 7 or so (e.g., Bureau, Easlerbrooks, & Lyons-Ruth, 2009; Humber & Moss, 2005). Attachment-informed observational codes for preadolescents' and adolescents' behavior (e.g., Allen et al., 2003) have been developed, but they do not target security *per se*. Marvin and Britner (2008) concluded that measures of attachment based on observations of parent-child interactions in middle childhood are urgently needed.

The current article, based on a long-term longitudinal study in a community sample of mothers, fathers, and children, addresses three broad aims. The first aim is to explore the predictors, antecedents, and correlates of the four key dimensions of attachment in middle childhood (security, avoidance, ambivalence, and disorganization). Those dimensions incorporate developmentally-specific features of the parent-child attachment relationship, behaviorally coded at age 10. We address two aspects of this aim: the relations between the history of parental care within the mother-child and father-child dyads and the child's attachment to the given parent at age 10, and the relations between multiple earlier and concurrent measures of attachment security, collected within the given parent-child relationship, and the child's attachment at age 10.

With regard to parental care, we focus on mothers' and fathers' responsiveness as a key variable. Parental responsive, sensitive, and warm care that provides a secure base and safe haven for the child has been broadly considered predictive of secure attachment (Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2003; Belsky & Fearon, 2008; de Wolff & van IJzendoorn, 1997; Thompson, 2006). No studies, however, have examined the history of parental responsiveness as a predictor of *observed* attachment behavior in middle childhood, in both mother-child and father-child dyads.

Because measures of parental responsiveness had been obtained at multiple earlier points in this longitudinal study, we were able to adopt a developmentally-informed strategy to address the links between mothers' and fathers' responsive care and children's attachment at age 10. The importance of such strategies has been recently emphasized (Fraleay, Roisman, & Haltigan, 2013). We examine several possible models. In one, the general history of the parent's responsive care is modeled as predicting organization of attachment at age 10. In another model, we examine responsive care in early development, during toddler and preschool years, and most recent responsive care

as having potentially different effects on attachment organization at age 10. We examine all of the questions with regard to mother–child and father–child relationships.

With regard to the earlier measures of security and their links with attachment in middle childhood, we focus on Strange Situation in infancy, Attachment Q-Set at toddler age (parent- and observer-rated), and children’s self-reported security at ages 8 and 10. All of those measures, whose validity has been supported by extensive evidence, were available in the current study.

The second aim of this study is to examine the implications of attachment at age 10 for children’s developmental outcomes. As indicated earlier, a large body of evidence supports the significance of security and insecurity as, respectively, promoting or undermining adaptive functioning. Consequently, we examine the links between attachment at age 10 and measures of children’s mental health and competence, both parent- and child-reported, from middle childhood to early preadolescence (at ages 10–12). Attachment organization has been also seen as having implications for the child’s receptiveness to parental socialization. Security has been described as rendering the child receptive and willing to accept and embrace parental influence and values (Bretherton, Golby, & Cho, 1997; Kochanska, Kim, & Boldt, 2015; Thompson, 2015; van IJzendoorn, 1997), although this issue has been much less studied in attachment research. We examine the links between aspects of attachment in middle childhood and children’s self-reported receptiveness toward parental values, also at ages 10 and 12.

The final, third, aim of this study was preliminarily to explore the links between the child’s overall history of attachment security from infancy to middle childhood and his or her adaptation. In a previous article, cumulative attachment history from 25 months to age 8 years significantly predicted behavior problems and competence in school and peer group (Boldt, Kochanska, Yoon, & Nordling, 2014). We now wished to replicate these findings using measures of attachment extended downward to infancy and upward to age 10.

To address those three broad aims, we relied on a new, preliminary observational approach to assessing attachment, Iowa Attachment Behavioral Coding (IABC). As urged by Marvin and Britner (2008), the measure was based on observations of lengthy, naturalistic, and diverse parent–child interactions in a broad variety of contexts, including several that were expected to elicit some distress, discomfort, or anxiety. Drawing from the existing literature on attachment in middle childhood (Kerns, 2008; Kerns & Seibert, *in press*), we operationally defined dimensions of security, avoidance, ambivalence, and disorganization, and applied the codes to each child with each parent. In doing so, we aimed to capture the key attachment-related features of the child’s behavior toward the parent: the degree of confidence in his or her relationship with the parent, the willingness to openly share his or her point of view, the strategies deployed to regulate affect (mostly distress), the ability and readiness to seek and request comfort or support from the parent, the degree to which the child accepts parental comfort, and the degree to which comfort is effective. As with measuring adult attachment, examining behaviors that conceptually map onto dimensional aspects of security and insecurity may increase our understanding of individual differences of attachment in middle childhood (Fraley & Roisman, 2014; Fraley & Spieker, 2003).

## Method

### Participants

Two-parent, intact families of infants born in 2001–2002, living in a Midwestern college town and surrounding areas, volunteered in response to advertisements and fliers distributed in the community for a longitudinal study. A family was accepted if the parents were living together, with both willing to participate and speak English during sessions, the infant was their biological child, normally developing and free of major birth complications or health problems, and the family had no plans to move in the next five years. Families ranged in education (25% of mothers and 30% of fathers had no more than a high school education, 54% of mothers and 51% of fathers had an associate or college degree, and 21% of mothers and 20% of fathers had a postgraduate education), annual family income (8% made less than US\$20,000, 17% made between US\$20,000 and US\$40,000, 26% made between US\$40,000 and US\$60,000, and 49% made over US\$60,000), and ethnic background (90% of mothers and 84% of fathers were White, 3% of mothers and 8% of fathers Hispanic, 2% of mothers and 3% of fathers African American, 1% of mothers and 3% of fathers Asian, 1% of mothers Pacific Islander, and 2% of mothers and fathers reported Other; 20% of families had at least one non-White parent). Fifteen couples were divorced by the time children were 10; in 11 of those, one or both parents remained in the study.

### Overview

We report data collected at seven months ( $N = 102$ , 51 girls), 15 months ( $N = 101$ , 51 girls), 25 months ( $N = 100$ , 50 girls), 38 months ( $N = 100$ , 50 girls), 52 months ( $N = 99$ , 49 girls), 67 months ( $N = 92$ , 45 girls), 80 months ( $N = 90$ , 43 girls), 100 months ( $N = 87$ , 41 girls), 123 months ( $N = 82$ , 37 girls), and 147 months ( $N = 79$ , 39 girls). At all assessments except at 80 months, there were observational mother–child and father–child sessions, 2–4 hours long, typically conducted 2–3 weeks from each other, all video-recorded for future coding. Most took place in a developmental psychology laboratory (at seven months, the sessions were at home; at 38 months, sessions were at home and in the laboratory). At 80 months, there were no parent–child observations, and the assessments focused on the child. All sessions were conducted by female experimenters (Es), who guided the dyad throughout the session. Mother–child and father–child dyads were seen separately; the parent order varied such that, at each time, in approximately 50% of families the mother came first (for each family, the parent order further varied across the times). One exception was the assessment at seven months, when the mother–child session was first.

All behavioral data were coded from videos. Reliability was typically established on 15–20% of cases, followed by frequent realignments to prevent observer drift. Kappas, weighted kappas, and alphas or intra-class correlations, ICCs (note that the best practices have evolved over the last 10 years) were used. Because many of the constructs have been published (e.g., Boldt et al., 2014; Kochanska, Boldt, Kim, Yoon, & Philibert, 2015; Kochanska et al., 2015; Kochanska & Kim, 2013), descriptions herein are abbreviated.

### *Iowa Attachment Behavioral Coding, age 10*

Experienced coders viewed each mother–child and father–child dyad interacting in 11 contexts lasting approximately 67 minutes, as well as the transitions between the contexts (cumulatively approximately 80 min per dyad), adapted from attachment-informed research programs (the Minnesota Longitudinal Study, Sroufe, 1991; Sroufe, Egeland, Carlson, & Collins, 2005; research by Allen and colleagues, Allen et al., 2003; Hare, Marston, & Allen, 2011). Prior to each situation or context, following a standardized script, E instructed each parent–child dyad on what to do during that context and how long it would last, saying she would return once the situation was completed. E returned after the predetermined time and informed the parent–child dyad that the activity was over; she then proceeded to give instructions for the next context. The description of these contexts follows.

“Campaigns”: Dyad devises campaigns (a physical fitness and a cell phone campaign for one dyad; a good nutrition and a fights/conflicts campaign for the other dyad). “Puzzles”: Interactive puzzle solving (first the child instructs the parent while the parent is blindfolded for one puzzle, then they switch roles for the next one). “Hot topics”: Dyad chooses and discusses two family “Hot topics”, followed by one “Fun topic”: Discussion of an activity the dyad enjoys doing as a family. “Plan an outing”: Dyad plans an all-expenses-paid outing (a trip or a visit to the Mall of America). “Difficult scenario”: Dyad discusses a hypothetical difficult decision scenario (e.g., choosing whom to save after a crash). “Seeking advice”: Child seeks advice from the parent on a troubling issue. The dyad also was observed in “Snack/free time”.

After viewing the entire 80 minute interaction, coders rated each child on 12 attachment-related behavioral codes regarding the child’s level of confidence with the parent, how engaged the child was with the parent, whether the conversation style tended to be personal or impersonal, the child’s level and appropriateness of negative and positive emotional arousal and expression, and the level of comfort and support he or she sought and accepted from the parent. Reliability, for the two coders, based on 20% of cases, weighted kappas, was .54 to .78 for the child attachment-related behavioral codes. More details regarding these codes, including specific operationalization and conventions for each code, can be requested from the first author. After the coders rated each child on the 12 attachment-related behavioral codes, they then gave each child one overall rating on each attachment dimension that reflected a conceptual, clinical in nature (rather than a simple mean) integration of the previous codes. The dimensions were: Security, Avoidance, Ambivalence, and Disorganization. Those final codes ranged from 1 = not at all descriptive of child, to 5 = very descriptive of child. A child could display some features descriptive of more than one category.

During the year-long reliability process, coders extensively reviewed and discussed each code. Reliability, for the two coders, for the 20% of cases, weighted kappas, were: .84 for Security, .75 for Avoidance, .55 for Ambivalence, and .77 for Disorganization. After reliability was established, each parent–child dyad was coded by one coder; no coder coded the same child with both parents. Regularly scheduled realignments were also conducted to prevent coder drift. The descriptions of each attachment dimension follow.

### *Security*

Coders considered the degree to which the child displayed a range of well-regulated emotions, sought comfort when distressed or aroused, readily accepted comfort from the parent, and that comfort appeared to be effective. They also rated whether the child appeared confident in his or her own abilities and performance, enjoyed interacting with and was responsive to the parent, appeared confident and comfortable in their relationship, and was able to share personal references and his or her point of view with ease. Overall, the coders evaluated whether the child seemed to have a “special”, tension-free, trusting, and comfortable connection with the parent.

### *Avoidance*

Coders considered whether the child appeared to over-control and under-express his or her emotions. They also considered whether he or she failed to seek comfort when distressed or aroused, and when offered comfort by the parent, would likely dismiss, ignore, or reject it. They also rated an impersonal quality of interaction with the parent, with conversations being superficial, impersonal, or lacking affective content or tone. Overall, the coders evaluated whether the child appeared to attempt to avoid interaction with his or her parent, such as seeming busy or engrossed in another activity.

### *Ambivalence*

Coders considered whether the child appeared to display an exaggerated emotion expression. They also rated whether he or she appeared ambivalent or conflicted about seeking comfort: at times demanding it and at others, rejecting it. When comfort was offered, it did not appear to be effective. The child acted in a childish or babyish manner. Overall, the coders evaluated whether the child appeared to intermix hostility, fear, avoidance, or sadness with attempts to seek contact or comfort with his or her parent.

### *Disorganization*

Coders considered whether the child fluctuated between under- and over-expressing emotion, exhibited odd, bizarre, or atypical features, or behaved in an exaggerated or odd manner. They also considered whether the child attempted to assume control over the relationship with the parent through role-reversal, expressed by punitive behavior, rejection, or an attempt to embarrass, or whether he or she showed caregiving behavior with an overly bright affect or an attempt to cheer or direct the parent.

## *Earlier security measures, ages 15 months to 8 years*

### *Security observed in strange situation, 15 months*

The standard Strange Situation (Ainsworth & Wittig, 1969) was conducted as the first procedure during the session, and coded by professional coders at another university, blind to all other information about the families (one coder coded a given child with one parent only). Coding reliability, kappas, were .78 for the four main attachment categories (avoidant, A; secure, B; resistant, C; and disorganized or unclassifiable, D/U). All cases coded with low confidence by one coder and all DU cases were double coded and adjudicated. Children’s interactive behaviors (1–7, proximity seeking, proximity maintenance, avoidance, and ambivalence) were coded in Episodes 5 and 8 (the reunions);

reliabilities, alphas, were above .89. Continuous security scores, based on the interactive behaviors and crying (kappas above .90), following Richters, Waters, and Vaughn (1988), were computed and used in this study.

### *Parent-reported security, 25 months*

Mothers and fathers completed the Attachment Q-Sort (AQS, Version 3; Waters, 1987) in the laboratory. Parents were given detailed instruction by E. They first sorted the 90 cards into three piles (characteristic, somewhat characteristic, and uncharacteristic of their child) to become familiar with the cards, and then further sorted the cards into nine 10-card piles ranging from 1, “most uncharacteristic”, to 9, “most characteristic” of their child. E was available to answer questions throughout the sort. Each parent’s sort was correlated with the criterion sort representing the “ideal secure child” and the final security scores were created according to the standard instructions.

### *Observer-rated security, 25 months*

A trained coder, blind to the parents’ AQS data, having observed each dyad during the entire 2½-hour laboratory session in multiple, psychologically diverse contexts, completed AQS for each mother–child and father–child dyad. Based on coding 20% of the sample, reliability, intra-class correlation (ICC) was .85.

### *Child-reported security, 8 years*

Children were interviewed using Kerns Security Scale (KSS, Kerns et al., 1996), a 15-item questionnaire designed to assess children’s perceptions of security in their relationships with their mothers and fathers. E read the questionnaire to the child without the parent present, and the child indicated, first, which description of each item was most like him/her, and second, whether this description was “very true” or “sort of true”. Each item was scored from 1 to 4. The scores were tallied, with higher scores indicating more perceived security. At age 8, Cronbach’s alphas were .67 and .68, for children’s perceptions of security with mothers and fathers, respectively.

### *Child-reported security, 10 years*

Children were interviewed with regard to their perception of the parents as attachment figures using KSS and People in My Life (PIML, Ridenour et al., 2006), a well-validated 21-item measure for that age group. The child reported his or her feelings toward each parent (during separate sessions), rating each item from 1 = almost never or never true to 4 = almost always or always true. Cronbach’s alphas for KSS were .80 and .78 and for PIML .89 and .87 for children’s perceptions of security with mothers and fathers, respectively. As those two measures were significantly correlated,  $r(79) = .70$  for security with mothers and  $r(78) = .78$  for security with fathers, they were standardized and aggregated into one self-reported security score with each parent.

### *History of parental responsive care, 7 months to 80 months*

#### *Observed contexts*

The mother’s and the father’s responsiveness to the child at 7, 15, 25, 38, 52, 67, and 80 months was coded in observed parent–child interactions in naturalistic, carefully



scripted, developmentally appropriate contexts, such as play, snack, parent busy, chores (toy cleanup), opening a gift together. The observed times were 43, 42, 47, 77, 65, 60, and 60 min respectively (total 394 minutes for each parent–child dyad). Coders rated parental responsiveness after each context, using one overall rating, on a scale from 1 (very unresponsive) to 7 (very responsive). The rating incorporated the classic dimensions (Ainsworth, Bell, & Stayton, 1971): sensitivity–insensitivity, cooperation–interference, and acceptance–rejection. Reliabilities, alphas, were all above .90 at each assessment

### *Data aggregation*

Codes across all contexts were then averaged into an overall code of parental responsive care for each parent at each age (alphas ranged from .67–.85 for mothers and .71–.84 for fathers).

### *Child adaptation, ages 10 and 12*

#### *Child overall behavior problems*

**Parent-reported child behavior problems.** Mothers and fathers rated their children's behavior problems in Child Symptom Inventory-4 (CSI-4, Gadow & Sprafkin, 2002) at age 10 and Adolescent Symptom Inventory-4 (ASI-4R, Gadow & Sprafkin, 2008) at age 12, well-established instruments that correspond to DSM-IV (American Psychiatric Association, 2000). Symptom Severity scoring was used, such that each item was rated from 0 = never to 3 = very often. For each parent's rating on CSI-4 and ASI-4R, overall behavior problems scores were calculated. In CSI-4, that score incorporated 14 symptom severity scores, including internalizing problems (depression, generalized anxiety disorder, specific phobia, obsessive-compulsive disorder, post-traumatic stress disorder, tic disorder, social phobia, separation anxiety), externalizing problems (oppositional defiant disorder, conduct disorder), as well as attention-deficit hyperactivity disorder, schizophrenia, pervasive developmental disorder, and elimination (enuresis-encopresis). In ASI-4R, that score incorporated 21 symptom severity scores, including the problems included in CSI-4, as well as panic attacks, somatization, antisocial personality, schizoid personality, bipolar, anorexia nervosa, bulimia nervosa, and substance use, but no longer included pervasive developmental disorder.

**Child-reported behavior problems.** When children were age 10, they completed the Dominic-R interview, administered by E in an interactive computerized format, according to the instructions (Valla, 2000; Valla, Bergeron, & Smolla, 2000). Ninety-one short vignettes featuring Dominic/Dominique, depicting specific behavior problems, were presented, and the child indicated if he or she was like the protagonist (yes or no). This score incorporated 81 items that indicated tendencies towards opposition, conduct problems, attention-deficit hyperactivity disorder, separation anxiety, generalized anxiety, specific phobias, and depression.

When children were age 12, they completed the Youth's Inventory-4 (YI-4, Gadow & Sprafkin, 1999), administered by E. This score incorporated 19 symptom severity scores, including those problems included in the ASI-4 (completed by the parents) excluding elimination disorders and antisocial personality, and substituting disturbing events for

post-traumatic stress disorder and eating problems for anorexia nervosa and bulimia nervosa. Both Dominic-R and the YI-4 produce behavior problem scores designed to map onto DSM-IV (American Psychiatric Association, 2000).

**Overall measure of child overall behavior problems.** As mother-, father-, and child ratings significantly correlated across assessments and with each other, scores from all three informants were standardized and aggregated into a child overall behavior problems score. Reliability, Cronbach's alpha, for the six scores (three informants, two assessments) was high, .84.

### **Parent-rated child competence**

At ages 10 and 12, mothers and fathers rated the child in the Health Behavior Questionnaire (HBQ, Essex et al., 2002). Three scales were selected to represent the child's competence in the ecologies of school and the peer group, *School Engagement*, *Peer Acceptance-Rejection*, and *Prosocial Behavior*. All 12 scores (both parents, three scales, at ages 10 and 12) were standardized and averaged into one overall parent-rated score of competent, adaptive functioning in school, and peer ecologies. Cronbach's alpha was high, .84.

### **Child self-reported receptiveness to parental values**

When children were ages 10 and 12, they completed a 17-item questionnaire, slightly adapted from Adolescent Values Inventory (Allen, Weissberg, & Hawkins, 1989). We used a subset of 12 items, rated from 1 to 4, which was identified by Allen and colleagues (1989) as representing internalization of parental and, more generally, adult values (alphas .69 and .64 at ages 10 and 12). The scores at age 10 and 12 significantly correlated,  $r(71) = .39$ ,  $p = .001$ , and were averaged into one score to form child self-reported receptiveness to parental values. Descriptive data for all measures are reported in Table 1.

## **Results**

### **Preliminary analyses**

As may be expected based on attachment research in normative samples, children's Security scores were the highest, Disorganization scores were the lowest, and Avoidance and Ambivalence placed in-between. We examined the eight IABC scores (four dimensions, Security, Avoidance, Ambivalence, and Disorganization, each obtained for the child with the mother and for the child with the father) to compare across the dimensions and across parents (thus, "dimension" and "parent" were the within-subject factors). The effect of the attachment dimension was significant:  $F(3, 70) = 88.16$ ,  $p < .001$ , qualified further by the effect of interaction of Parent by Attachment Dimension:  $F(3,70) = 5.98$ ,  $p < .01$ . Follow-up  $t$ -tests indicated that children showed more Avoidance with fathers than with mothers;  $t(72) = -2.66$ ,  $p < .05$ , and more Ambivalence and Disorganization with mothers than with fathers;  $t(72) = 2.73$ ,  $p < .01$ , and  $t(72) = 2.50$ ,  $p < .05$ , respectively.

Second, associations of IABC scores were examined within and across parent-child dyads. These are presented in Table 2.

**Table 1.** Descriptive data for all measures.

	<i>M</i>	<i>SD</i>	Range	<i>N</i>
<i>Attachment measures</i>				
Iowa Attachment Behavioral Coding, age 10				
M-C				
Security	2.87	1.09	1–5	78
Avoidance	1.56	0.80	1–4	78
Ambivalence	2.76	1.14	1–5	78
Disorganization	1.36	0.88	1–5	78
F-C				
Security	3.01	0.94	1–5	74
Avoidance	1.92	1.03	1–5	74
Ambivalence	2.26	1.11	1–5	74
Disorganization	1.15	0.46	1–3	74
Security in Strange Situation, 15 months				
M-C				
	–0.01	1.16	–2.56–2.43	100
F-C				
	0.02	1.20	–3.39–2.21	99
Security in parent-reported AQS, 25 months				
M-C				
	0.37	0.20	–0.20–0.80	100
F-C				
	0.34	0.20	–0.13–0.76	100
Security in observer-rated AQS, 25 months				
M-C				
	0.29	0.24	–0.46–0.79	100
F-C				
	0.28	0.22	–0.25–0.77	100
Child-reported security (KSS), age 8				
M-C				
	52.10	5.66	30–60	86
F-C				
	50.58	6.16	35–60	84
Child-reported security (KSS, PIML), age 10 <sup>a</sup>				
M-C				
	0.00	0.92	–3.55–1.08	79
F-C				
	0.00	0.94	–4.51–1.21	78
<i>History of parental responsive care</i>				
M responsive care, 7 months	4.82	0.73	2.50–6.50	102
M responsive care, 15 months	4.95	0.78	3.00–6.33	101
M responsive care, 25 months	4.87	0.95	2.00–6.33	100
M responsive care, 38 months	4.91	0.63	2.95–6.23	99
M responsive care, 52 months	5.07	0.55	2.67–5.83	98
M responsive care, 67 months	5.04	0.77	2.50–6.00	90
M responsive care, 80 months	4.75	0.97	2.50–6.17	87
F responsive care, 7 months	4.44	0.93	2.00–6.17	102
F responsive care, 15 months	4.51	0.93	2.17–6.17	101
F responsive care, 25 months	4.44	0.98	1.67–6.33	100
F responsive care, 38 months	4.60	0.78	2.33–6.33	99
F responsive care, 52 months	4.79	0.69	2.17–5.83	98
F responsive care, 67 months	4.64	0.81	2.33–6.00	88
F responsive care, 80 months	4.29	0.93	1.67–6.00	85
<i>Measures of child adaptation, age 10–12</i>				
M-reported child behavior problems, age 10	31.30	17.49	8–84	81
F-reported child behavior problems, age 10	34.63	17.98	6–91	78
C self-reported child behavior problems, age 10	15.47	13.56	0–62	79
M-reported child behavior problems, age 12	32.58	23.59	6–116	78
F-reported child behavior problems, age 12	29.75	20.40	3–119	75
C self-reported child behavior problems, age 12	53.44	23.57	5–143	73
Child overall behavior problems <sup>a</sup>	0.03	0.77	–1.05–2.23	84
M-reported child competence, age 10	0.00	0.69	–1.52–1.06	81
F-reported child competence, age 10	0.00	0.78	–2.29–1.11	78
M-reported child competence, age 12	0.00	0.75	–2.21–1.14	78
F-reported child competence, age 12	0.00	0.75	–1.95–1.24	75
Child overall competence <sup>a</sup>	–0.01	0.62	–1.75–0.87	84
C-reported receptiveness to parental values, age 10	3.75	0.27	2.67–4.00	79
C-reported receptiveness to parental values, age 12	3.65	0.29	2.33–4.00	74
Child self-reported receptiveness to parental values	3.71	0.24	2.50–4.00	82

M = mother; F = father; C = child; <sup>a</sup> = mean of standardized constituent variables;

AQS = Attachment Q-Set; KSS = Kerns Security Scale; PIML = People in My Life;

Child Overall Behavior Problems = aggregated mother- and father-rated scores,

Child Symptom Inventory-4, age 10, Adolescent Symptom Inventory-4, age 12, parent version,

Child self-reported scores, Dominic-R, age 10, and Youth Inventory-4, age 12.

Child Competence = Mother- and Father-rated scores on Health Behavior Questionnaire, ages 10 and 12. Child Self-

Reported Receptiveness to Parental Values = Adolescent Values Inventory, ages 10 and 12.

**Table 2.** Correlations of Iowa Attachment Behavioral Coding scores (1–5) across parents and within parent at age 10.

	Mother-child				Father-child			
	Security	Avoidance	Ambivalence	Disorganization	Security	Avoidance	Ambivalence	Disorganization
Mother-child								
Security	–	–.16	–.76***	–.62***	.55***	.04	–.42***	–.42***
Avoidance		–	–.27*	.23*	–.22	.37**	–.18	.32**
Ambivalence			–	.33**	–.40**	–.07	.38**	.12
Disorganization				–	–.48***	–.02	.36**	.76***
Father-child								
Security					–	–.28*	–.57***	–.38**
Avoidance						–	–.46***	.08
Ambivalence							–	.30**

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

Correlations among the attachment scores for mother-child are in the upper left quadrant. Correlations among the attachment scores for father-child are in the lower right quadrant. Correlations for attachment scores across mother and father are in the upper right quadrant.

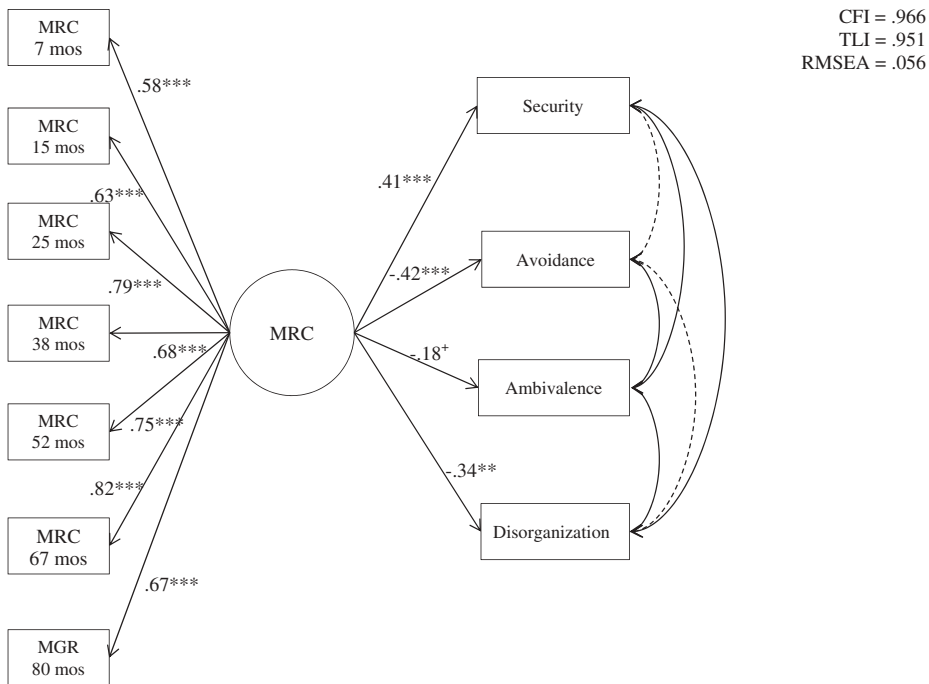
Associations of the scores within parent-child dyads were all in the expected direction. Security was significantly negatively associated with Ambivalence and Disorganization for mother-child and father-child dyads. Moreover, Avoidance and Ambivalence were significantly negatively associated for mother-child and father-child dyads. Disorganization was also significantly moderately associated with Ambivalence for mother-child dyads and for father-child dyads. Inter-parent associations were significant for all four dimensions of IABC.

### *Predictors and antecedents of attachment in middle childhood (IABC scores at age 10)*

#### *History of parental responsive care, 7 months to 80 months*

For the following analyses, we used Mplus Version 7, using the Maximum Likelihood with Robust Standard Errors (MLR) estimator (Muthen & Muthen, 2012). MLR uses full maximum likelihood (FIML) estimation to treat missing data, and is thus ideal and preferred treatment of missing data for relatively small sample sizes (Enders, 2001; Wothke, 2000). The MLR estimator is robust to non-normality (Muthen & Muthen, 2012).

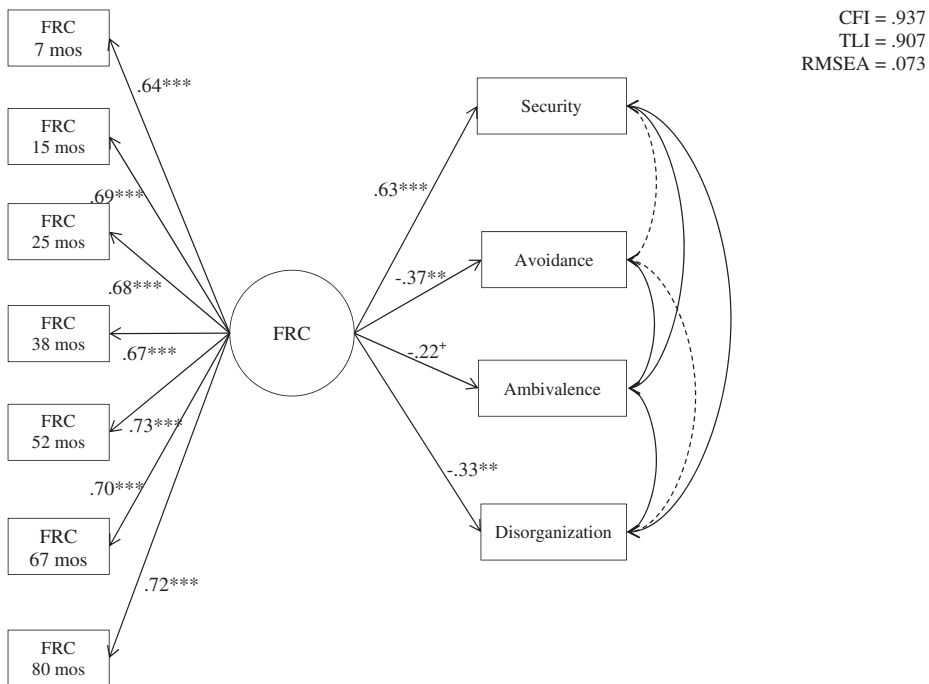
For mother-child and father-child dyads, separately, we first created a latent variable representing the history of responsive care using the respective parent's responsive care scores from 7, 15, 25, 38, 52, 67, and 80 months. The respective dyad's IABC scores were then regressed on the history of responsive care, with gender covaried. Results are shown in Figure 1 for mother-child dyads and Figure 2 for father-child dyads. Multiple model indices (presented in Figures 1 and 2) indicated adequate fit for both mothers and fathers. For both mother-child and father-child dyads, the history of parental responsive care was significantly associated with higher Security and lower Avoidance and Disorganization. The history of responsive care was also marginally associated with lower Ambivalence. For mother-child dyads, the model accounted for 17% of the variance in Security, 22% of the variance in Avoidance, 5% of the variance in Ambivalence, and 11% of the variance in Disorganization. For father-child dyads, the model accounted for 47% of the variance in Security, 16% of the variance in Avoidance, 5% of the variance in Ambivalence, and 14% of the variance in Disorganization.



**Figure 1.** Model examining mother responsive care from seven to 80 months as predictor of mother–child attachment organization. Standardized coefficients are reported. Significant paths are represented by solid lines and non-significant paths are represented by dashed lines. Gender is covaried.  $^+p < .10$ ;  $*p < .05$ ;  $**p < .01$ ;  $***p < .001$ . MRC = Mother Responsive Care.

In the next set of analyses, we examined pathways linking responsive care in multiple developmental periods to attachment at age 10, and the unique contributions of responsive care during distinct developmental periods in attachment organization. Moreover, we examined whether early versus the most recent care had different effects on the attachment scores at age 10. To that effect, we aggregated scores of parental responsive care (again, for mothers and for fathers) into three separate scores of early responsive care for distinct developmental periods: the first two years (average of 7, 15, and 25 months), the toddler and preschool age (average of 38, 53, and 67 months), and the early school age (80 months). The model, along with the results for significant paths, is depicted in Figure 3 (mother–child dyads) and Figure 4 (father–child dyads). Multiple model indices (presented in Figures 3 and 4) indicated adequate fit for both mothers and fathers.

For mother–child dyads, maternal responsive care during early school age was *uniquely* associated with higher Security and lower Ambivalence and Disorganization when accounting for responsive care during earlier developmental periods. Additionally, maternal responsive care during toddler and preschool age was marginally associated with lower Avoidance. For mother–child dyads, the model accounted for 18% of the variance in Security, 20% of the variance in Avoidance, 8% of the variance in Ambivalence, and 14% of the variance in Disorganization.



**Figure 2.** Model examining father responsive care from seven to 80 months as predictor of father–child attachment organization. Standardized coefficients are reported. Significant paths are represented by solid lines and non-significant paths are represented by dashed lines. Gender is covaried.  $^+p < .10$ ;  $*p < .05$ ;  $**p < .01$ ;  $***p < .001$ . FRC = Father Responsive Care

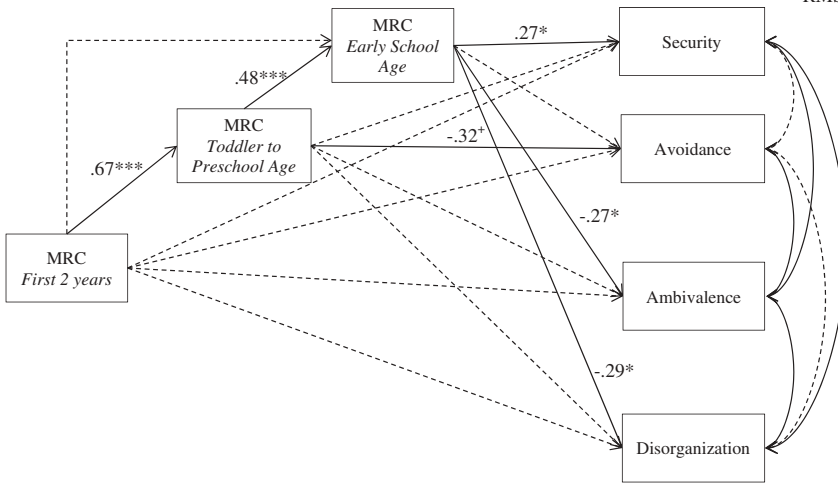
For father–child dyads, paternal responsive care during early school age was significantly associated with higher Security and lower Avoidance. Paternal responsive care during early school age also was marginally associated with lower Disorganization. For father–child dyads, the model accounted for 44% of the variance in Security, 23% of the variance in Avoidance, 5% of the variance in Ambivalence, and 15% of the variance in Disorganization.

### *Associations between earlier and concurrent attachment security measures, 15 months to 10 years*

Associations between earlier and concurrent established security measures and attachment in middle childhood (IABC scores) are shown in Table 3. There were multiple associations in the expected direction, starting with the measures at 25 months (but not in infancy; security in Strange Situation was not predictive of IABC scores).

For mother–child dyads, IABC Security was positively associated with observer-reported AQS security scores at 25 months and KSS at age 8. IABC Avoidance, Ambivalence, and Disorganization were all associated negatively with observer-rated AQS security at age 10. IABC Ambivalence and Disorganization were also negatively associated with children’s self-reported security, KSS, at age 8. IABC Avoidance was

CFI = .999  
 TLI = .980  
 RMSEA = .043

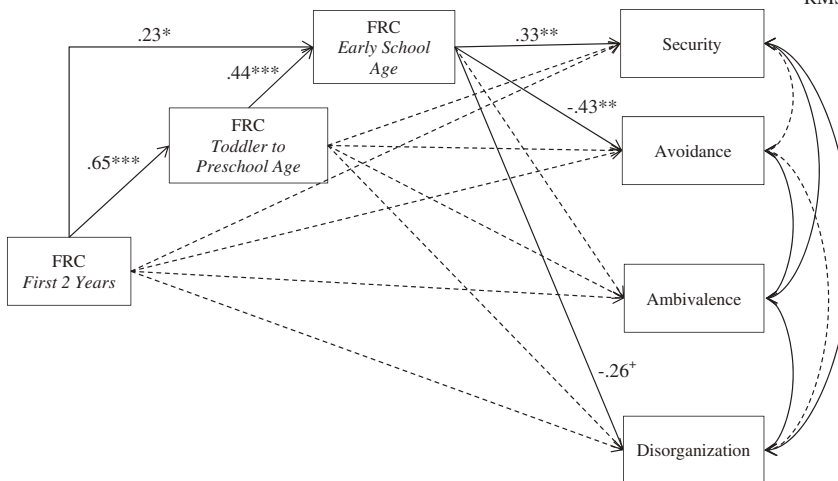


**Figure 3.** Model examining mother responsive care at three developmental periods (First 2 Years, Toddler to Preschool Age, Early School Age) as predictor of mother–child attachment organization. Standardized coefficients are reported. Significant paths are represented by solid lines and non-significant paths are represented by dashed lines. Gender is covaried.

+ $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

MRC = Mother Responsive Care; First 2 Years = Aggregate of MRC at 7, 15, 25 mos. Toddler to Preschool Age = Aggregate of MRC at 38, 52, 67 mos. Early School Age = MRC at 80 mos.

CFI = .999  
 TLI = .993  
 RMSEA = .026



**Figure 4.** Model examining father responsive care at three developmental periods (First 2 Years, Toddler to Preschool Age, Early School Age) as predictor of father–child attachment organization. Standardized coefficients are reported. Significant paths are represented by solid lines and non-significant paths are represented by dashed lines. Gender is covaried.

+ $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

FRC = Father Responsive Care; First 2 Years = Aggregate of FRC at 7, 15, 25 mos. Toddler to Preschool Age = Aggregate of FRC at 38, 52, 67 mos. Early School Age = FRC at 80 mos.

**Table 3.** Correlations between the Iowa Attachment Behavioral Coding scores (1–5) and other established attachment measures.

Security scores – other instruments					
<i>Mother–child (N = 78)</i>					
IABC Scores, age 10	SS, 15 mo	AQS, 25 mo	OAQS, 25 mo	KSS, age 8	KSS, PIML, age 10
Security	.10	.18	.49***	.35**	.12
Avoidance	.05	–.20	–.44***	–.04	–.30**
Ambivalence	–.03	–.03	–.23*	–.28*	.11
Disorganization	–.13	–.08	–.39***	–.23*	–.20
<i>Father–child (N = 74)</i>					
Security	.04	.22	.47***	.15	.10
Avoidance	.08	–.28*	–.24*	–.10	–.13
Ambivalence	.01	.01	–.13	–.06	.05
Disorganization	–.03	–.12	–.14	.02	–.39**

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

IABC = Iowa Attachment Behavioral Coding; SS = Strange Situation; AQS = parent-reported attachment Q-Set; OAQS = observer-reported attachment Q-Set; KSS = child-reported Kerns Security Scale; PIML = child-reported People in My Life.

associated negatively with children's self-reported security at age 10 (composite of KSS and PIML).

For father–child dyads, IABC Security was positively associated with observed-rated AQS security at 25 months. IABC Avoidance was negatively related with both father- and observer-rated AQS at 25 months. Finally, IABC Disorganization was negatively associated with children's self-reported security at age 10 (composite of KSS and PIML).

### **Associations between attachment in middle childhood (IABC scores at age 10), and measures of child adaptation, ages 10–12**

First, we examined associations between the IABC scores at age 10 and measures of child adaptation at ages 10–12 (see Table 4).

Security with both parents was associated with children's fewer behavior problems and higher competence (and security with mothers also related with higher receptiveness to parental values). Disorganization with both parents was associated with more

**Table 4.** Correlations between the Iowa Attachment Behavioral Coding scores (1–5) and measures of child adaptation at age 10–12.

Attachment measures	Child overall behavior problems	Child overall competence	Child self-reported receptiveness to parental values
<i>Mother–child (N = 78)</i>			
Security	–.31**	.27*	.23*
Avoidance	.16	–.26*	–.31**
Ambivalence	.13	–.03	.00
Disorganization	.46***	–.34**	–.30**
<i>Father–child (N = 74)</i>			
Security	–.27*	.32**	.17
Avoidance	–.09	–.05	–.09
Ambivalence	.26*	–.23	–.07
Disorganization	.31**	–.21	–.44***

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

IABC = Iowa Attachment Behavioral Coding; Child overall behavior problems = aggregated mother- and father-rated scores; Child Symptom Inventory-4, Adolescent Symptom Inventory-4, parent version, Child self-reported scores, Dominic-R and Youth Inventory-4. Child Competence = Mother- and Father-rated scores on Health Behavior Questionnaire. Child Self-Reported Receptiveness to Parental Values = Adolescent Values Inventory.



behavior problems and poorer receptiveness to parental values (and disorganization with mothers, also with lower competence). Additionally, Avoidance with mothers was linked to lower competence and receptiveness to values, and Ambivalence with fathers – to more behavior problems. There were no findings for Ambivalence with mothers and for Avoidance with fathers.

We then conducted hierarchical multiple regressions for each of the outcomes (children's overall behavior problems, competence, and self-reported receptiveness to parental values). We entered children's gender (0 = girl, 1 = boy) in Step 1 for each regression. For Step 2, we used the forward method of entry to examine which of the IABC scores (with the scores for both mother–child and father–child dyads examined together) would provide the most parsimonious explanatory model for each equation.

For the child's overall behavior problems and for child competence, Disorganization in mother–child dyads emerged as a significant predictor,  $Beta = .45$ ,  $p < .001$ ,  $B = .38$ ,  $SE = .09$ , 95% CI [.20, .56],  $F(2, 70) = 9.83$ ,  $p < .001$ ; and  $Beta = -.34$ ,  $p < .01$ ,  $B = -.23$ ,  $SE = .07$ , 95% CI [-.38, -.09],  $F(2, 70) = 9.20$ ,  $p < .001$ , respectively. Children with higher Disorganization scores had more behavior problems and were lower in competence. Gender was significantly associated with child competence in Step 2,  $Beta = -.30$ ,  $p < .01$  (girls were seen as more competent).

For the child's self-reported receptiveness to parental values, Disorganization with father,  $Beta = -.36$ ,  $p < .01$ ,  $B = -.19$ ,  $SE = .06$ , 95% CI [-.31, -.07], and Avoidance with mother,  $Beta = -.23$ ,  $p < .05$ ,  $B = -.07$ ,  $SE = .04$ , 95% CI [-.14, .00] emerged as significant predictors,  $F(3, 69) = 7.13$ ,  $p < .001$ . Children with higher Disorganization scores with fathers and higher Avoidance scores with mothers reported less reported receptiveness.

### **Overall trajectory of attachment security from 15 months to 10 years: links with child adaptation**

We adopted a strategy used in another article that examined the attachment security trajectory from 25 months to age 8 (Boldt et al., 2014), but we extended it downward, to include infancy, and upward, to include age 10. A cumulative score was derived, based on all available attachment security measures in the child's attachment security history (Strange Situation at 15 months, parent-reported Attachment Q-Set and observer-rated Attachment Q-Set, each at 25 months, KSS at age 8 and 10, PIML at age 10, and the IABC Security scores at age 10), in both relationships. For each security measure, the child received 1 point if his or her score was in the lowest 1/3rd of the distribution, 2 points if the score was between the lowest 1/3rd and the highest 1/3rd, and 3 points if the score was in the highest 1/3rd. We then calculated a mean cumulative score to correct for missing data:  $M = 2.02$ ,  $SD = 0.41$ , range 1–3, normally distributed (skewness =  $-.01$ , kurtosis =  $-.30$ ). We used this cumulative score reflecting the attachment security history (with higher scores denoting more secure histories) as a predictor of children's adaptation in middle childhood in the regressions, in which child gender was entered first and the cumulative attachment security history score was entered second. Children's overall behavior problems, competence, and self-reported receptiveness to parental values, were the dependent variables. The cumulative attachment security history score significantly predicted children's overall behavior problems,  $Beta = -.35$ ,  $p < .01$ ,  $B = -.72$ ,  $SE = .22$ , 95% CI [–1.16, –.28], competence,  $Beta = .33$ ,  $p < .01$ ,  $B = .55$ ,  $SE = .18$ , 95% CI

[.20, .90], and self-reported receptiveness to parental values,  $Beta = .30$ ,  $p < .05$ ,  $B = .19$ ,  $SE = .07$ , 95% CI [.05, .34].

## Discussion

In middle childhood, children navigate between parents' and peers' influences that are often at odds with each other (Allen, Chango, Szwedo, Schad, & Marston, 2012; Sroufe et al., 2005; Steinberg & Morris, 2001). Parents shift from closely monitoring and directly controlling their children to distally supervising, and children increasingly control what they do and what they disclose to the parents. Achieving competence in multiple contexts becomes a key developmental task (Sroufe et al., 2005). Regulation of secure-base contact becomes a mutual, dyadic enterprise (Kerns, 2008). Middle childhood is the precursor to adolescence, a period of profound transformations of emotional, cognitive, and behavioral systems that surround attachment relationships (Allen, 2008).

Despite the importance of middle childhood, research on parent-child attachment relationships during this developmental period is still fairly new. Most of what we know about attachment processes during middle childhood is based on self-reports or narrative interviews (e.g., Finnegan, Hodges, & Perry, 1996; Kerns et al., 1996; Kerns, Abraham, Schlegelmilch, & Morgan, 2007; Ridenour et al., 2006; Target et al., 2003). Although those measures are valuable, without behavioral observations of attachment behaviors in parent-child interactions (Marvin & Britner, 2008), the overall picture they produce is highly incomplete (Kerns & Seibert, *in press*; Laible, 2005).

### *Mother-child and father-child attachment in middle childhood*

To study predictors, correlates, and implications of attachment in middle childhood, informed by attachment theory, we developed an observational approach, IABC. We endeavored to capture individual differences in those aspects of the child's interactions with the parents that are theoretically informative of his or her attachment behaviors. We incorporated a broad range of paradigms in naturalistic contexts designed to elicit interactions infused with both positive and negative emotions. We examined both mother-child and father-child relationships, and coded them reliably. Although the current work must be seen as an initial attempt to validate this approach, and much more research is needed, particularly with broader and more diverse – ethnically and clinically – samples, we believe that it has significant promise. It can be productively used by any researcher who has video records of sufficiently lengthy, naturalistic, affectively charged, and diverse parent-child interactions.

Of course, one might legitimately argue that our IABC scores may not reflect attachment – or not only attachment. For example, they may be linked to qualities of children's temperament, such as negative emotionality. Because multiple data on children's temperament were available in this study, we very preliminarily explored potential links between negative emotionality (assessed using the often-replicated Negative Emotionality factor scores that emerged in mothers' and fathers' ratings in the Child Behavior Questionnaire [CBQ]; Rothbart & Bates, 2006) with the IABC scores. Only one very modest correlation was found,  $r(74) = .32$ ,  $p = .005$ , between mothers' Negative

Emotionality ratings and children's Avoidance with fathers, suggesting that IABC scores have little overlap with child temperament characteristics.

The findings were consistent with expectations. For both relationships, Security scores were the highest and Disorganization scores were the lowest. Within a given parent-child relationship, the IABC scores appeared both distinct and associated in predicted ways with each other. For both mother-child and father-child dyads, Security was negatively associated with Ambivalence and Disorganization. Also, as expected, the IABC scores for each attachment dimension were significantly associated across parents. This is a relatively typical finding that has often been reported (Berlin, Cassidy, & Appleyard, 2008). Note that the question of whether attachment is unique to the relationship or is a quality of the person, or perhaps, over the course of development, changes from relationship-specific to being descriptive of the individual, is still debated (Thompson, 2006). A closely related controversy concerns concordance in the child's attachment across parents. Some studies found no concordance (e.g., Main & Weston, 1981), but some did (e.g., Boldt et al., 2014; El-Sheikh & Buckhalt, 2003; Fox, Kimmerly, & Schafer, 1991; Kerns, Tomich, Aspelmeier, & Contreras, 2000). Our data suggest that the child's attachment behaviors in middle childhood were moderately consistent across parents. Perhaps, as proposed by Thompson (2006), attachment comes to reflect in part the quality of the specific relationship and in part the child's individuality. More research on developmentally changing concordance in mother-child and father-child attachment is needed.

Although we found no differences in children's Security with either parent, Avoidance was higher with fathers and Ambivalence and Disorganization with mothers. Perhaps this reflects subtle differences in children's emotional expression in the two relationships, with children tending to be more subdued with fathers and more expressive with mothers. This in turn may be the result of differences in the histories of parents' response to children's emotional cues. Fathers have been found to be less supportive of children's negative emotions, using more minimizing or punitive emotion socialization strategies (e.g., Eisenberg, Fabes, & Murphy, 1996; McElwain, Halberstadt, & Volling, 2007). A more complete future examination should consider the parent's and the child's gender; our sample, however, was not sufficiently large.

### ***History of parental responsive care and mother-child and father-child attachment in middle childhood***

Consistent with many meta-analyses and reviews that have repeatedly supported modest but reliable associations between the quality of care and features of children's attachment bonds, as originally proposed by Bowlby, 1969/1982, the overall history of parental responsive care, going back to infancy, was meaningfully associated with Security, Avoidance, and Disorganization (and marginally, Ambivalence) in middle childhood, in both mother-child and father-child relationships. Additionally, our examination of care during distinct periods in development (the first two years, toddler to preschool age, early school age) revealed that the most recent responsive care – during early school age – was *uniquely* associated with higher IABC Security scores for both mother-child and father-child dyads when controlling for responsive care during

earlier developmental periods. As well, for mother–child dyads, responsive care at early school age was uniquely associated with lower Ambivalence and Disorganization. For father–child dyads, responsive care at early school age was also *uniquely* associated with lower Avoidance, and marginally, with lower Disorganization. We believe that our analyses, which addressed both the effects of the cumulative history of parental responsive care and the effects of care in particular developmental periods, are a strength of this study. Although, for the current purpose, the choice of the developmental periods was somewhat arbitrary, the finding of most recent care as linked to Security at age 10 in both relationships was particularly noteworthy. Moreover, although the overall level of responsive care had a similar effect on attachment organization for mother–child and father–child dyads, more recent levels of responsive care had somewhat different effects on the expression of insecurity. More research is needed to examine whether more recent levels of responsive care may be differentially influential for insecurity in mother–child and father–child dyads above the effects of overall levels of responsive care.

We note that for both mother–child and father–child dyads, the fit of all four overall models linking the history of responsive care from infancy to early school age with the four attachment dimensions at age 10, for both parents, was good. Although not unexpected, and consistent with very large extant literature, this is nevertheless a useful contribution and a key finding in our study. Moreover, although links between responsive care and future attachment organization are established, few studies have relied on robust, extensive behavioral data, collected longitudinally over 10 years, and the specific forms of the relations continue to be compelling (Fraley et al., 2013). Fewer yet have included children and both parents. In the current work, we consider these findings to be one substantial aspect of the validation of our proposed IABC approach.

Despite good fit of all the models, there were intriguing differences between mother–child and father–child dyads that call for further exploration. The history of care appeared to predict more variance in children’s Security with fathers than in their Security with mothers (although the links were significant in both relationships). At this point, the interpretation of this pattern of findings has to be tentative. Thompson (2006) noted that the bases of security and the contexts in which it is engendered may be different in the two relationships. In our study, parental care was observed in standard contexts, the same for both parents. Although the contexts were quite diverse (e.g., play, meals, free time, routine chores, conversations, joint tasks, etc.), they included almost no situations in which the child was injured, hurt, sick, or frightened. Mothers are typically seen as the attachment figures to whom children turn in those circumstances. Perhaps if we had extensive data on mothers’ care in such instances, we would have found that it predicts a higher percent of variance in Security. Note that relevant research findings are mixed, with some studies showing relatively similar antecedents for security with both parents (Lucassen et al., 2011), although moderated by ecological factors (Lickenbrock & Braungart-Rieker, 2015), and some showing a greater role of fathers’ sensitivity on future security, particularly at older ages, parallel to our findings (Grossmann et al., 2002).

It is possible – although certainly in need of empirical testing – that our pattern of findings on maternal care was influenced by the fact that mothers' responsiveness scores were significantly higher than fathers' scores at all studied ages. Consequently, variations in the scores were less consequential for Security than in case of fathers.

### ***Mother-child and father-child attachment in middle childhood and other measures of attachment***

Earlier and concurrent attachment security measures were meaningfully associated with IABC scores, although those relations were only for measures obtained in post-infancy periods. The findings inform the ongoing controversy regarding whether attachment is stable over time. Children's attachment representation may not consolidate until early childhood and, as the quality of care changes, attachment organization is also expected to change accordingly (Bowlby, 1969/1982; Groh et al., 2014). Indeed, attachment security has not always been found to be stable from infancy to late adolescence (Fraleigh, 2002; Groh et al., 2014; Pinquart, Feußner, & Ahnert, 2013; Thompson, 2006; Weinfield, Whaley, & Egeland, 2004), although stability has also been reported (Waters, Weinfield, & Hamilton, 2000). It is sometimes questioned if various measures of attachment actually assess the same construct, whether implemented at different time points or obtained concurrently (Kerns & Seibert, *in press*). Consequently, a challenge for future research on inter-parent attachment concordance (or lack of it) is to account for the variability and developmental differences in the assessment of attachment, as well as in the attachment construct itself as children mature (Thompson, 2008).

It was intriguing – and at this point difficult to interpret – that, at age 10, although expected negative associations were found for children's self-reported security in the combined KSS and PIML and observed Avoidance and Disorganization, there were no significant links between those self-reports and children's observed Security (when the two self-reported instruments were examined separately, they were also unrelated to observed Security). Note that both KSS and PIML ask the questions about trust in the parent and confidence in his or her protection in a direct and straightforward way. Perhaps less direct, narrative, measures would reveal meaningful associations with Security. We note, however, that children's reports in KSS obtained two years earlier were moderately predictive of the observed Security with mothers at age 10.

### ***Mother-child and father-child attachment in middle childhood and children's developmental outcomes***

Attachment in middle childhood was associated in conceptually expected ways with concurrent and future measures of children's developmental maladaptive and adaptive outcomes: behavior problems, competence, and child self-reported receptiveness to parental values. The findings for Security and Disorganization were consistent for both mother-child and father-child dyads: Higher Security was associated with children's fewer behavior problems and higher competence, and higher Disorganization was associated with more behavior problems and poorer receptiveness to parental values. Those findings, consistent across parents and across a wide range of developmental outcomes, are among our most robust and

promising results, providing good support for the validation of the IABC measure. Moreover, note that none of the reported links between children's IABC scores and the outcomes were subject to shared method variance – a significant strength of this study. Additionally, an extension of this direction of analyses was very promising. We employed a multi-method, multi-informant, multi-assessment approach to examine the trajectory of attachment, integrating both mother–child and father–child relationships, multiple time points, and diverse methods. The measure of cumulative history of security from infancy to age 10 significantly predicted later adaptive and maladaptive developmental outcomes. The value of such approach has been increasingly acknowledged (Boldt et al., 2014; Groh et al., 2014).

### *Limitations of the study*

This study had several limitations. The associations between children's attachment at age 10 and their developmental outcomes at ages 10 and 12 were, in part, concurrent. We will continue to examine those links longitudinally as next assessments in this ongoing study become available. The families and children came from a low-risk community sample and most functioned well: parental care was largely adaptive, children's level of behavior problems was relatively low, and their competence in school and peer group relatively high. An application of IABC to parents and children at high risk for attachment problems (e.g., families with a history of paternal psychopathology or child maltreatment) would be particularly informative. Also, although diverse in income and education, the families' ethnic diversity was limited (although we note that 20% included at least one non-White parent).

Note that, throughout the analyses, the findings for Security and Disorganization appeared most robust, but the findings for Avoidance and Ambivalence were relatively weaker. At the level of coding, inter-coder reliability for Ambivalence, although moderate, was relatively lower than for the other three IABC dimensions. It is difficult to identify ambivalent behaviors in contexts that are only mildly stressful. Behaviors consistent with the other three dimensions were easier to target and recognize. Also, in middle childhood, some degree of emotional lability is normative, making distinctions between Security and Ambivalence difficult. Also, because of some behavioral overlap between Ambivalence and Disorganization, such as the presence of hostility or fear, it is possible that Disorganization, which was robustly associated with children's adaption, may have diminished the role of Ambivalence once accounting for their association. Moreover, as parent–child attachment is considered dimensionally, more research is needed to examine the interplay of these dimensions and how the interplay may differentially be associated to adaptive and maladaptive outcomes.

In spite of these limitations, we believe that this work, although quite preliminary, makes useful contributions and informs research of attachment in middle childhood, an area that remains in need of study. The new approach, IABC, has promise and can be used by other researchers. The study incorporates multi-method, multi-informant, multi-wave assessments for both mother–child and father–child dyads from infancy to middle childhood. Consequently, this work informs perennial questions, such as whether attachment is stable, how to conceptualize it as children mature, how the history of parental care influences children's attachment, and how attachment, in turn, relates to children's maladaptation and adaptation. Those themes remain critical in developmental psychology and psychopathology.

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## Disclosure statement

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