

Child–Child Similarity on Attachment and Temperament as Predictors of Positive Interaction During Acquaintanceship at Age 3

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Child–child similarity on attachment and temperament were examined, in turn, as predictors of interaction quality between previously unacquainted children. At 33 months, child–mother attachment security was assessed, and parents reported on child temperament. At 39 months, 114 children were randomly paired into 57 same-sex dyads and observed during 3 laboratory visits over a 1-month period. Positive interaction (composed of ratings of dyadic coordination, social play complexity, and shared positive affect) was assessed from recordings of play sessions at each visit. Multilevel models revealed that child–child similarity on (a) attachment security predicted more rapid increases in positive interaction across the 3 visits for dyads averaging high security, (b) temperamental pleasure predicted more positive interaction, on average, for dyads averaging moderate to high pleasure, and (c) temperamental anger and fearfulness yielded equivocal results. Developmental and methodological implications of investigating child–child similarity on attachment and temperament as a window into the acquaintanceship process among young children are considered.

Keywords: acquaintanceship, attachment, peer interaction, preschool children, temperament

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During the first years of life, children spend large amounts of time with peers in out-of-home care settings (Laughlin, 2010) and are attracted to and respond in socially meaningful ways to other children (see Hay, Caplan, & Nash, 2009). By age three, interactions with peers increase in complexity and often involve extended

bouts of cooperation, negotiation, and shared pretense (Coplan & Arbeau, 2009). Young children also show preferences for specific peers (often of the same sex, Martin et al., 2013), and friendships first emerge for many children during early childhood (Dunn, 2004; Howes, 1996). Through interactions with peers, young children have unique opportunities to learn about regulating emotions, communicating ideas and interests, and balancing their own and others' feelings and desires (Coplan & Arbeau, 2009; Hughes & Dunn, 2007). Moreover, peer relationships during early childhood may lay a foundation for later peer experiences and adjustment (Dunn, 2004; Ladd, Herald, & Andrews, 2006).

Given the centrality and importance of peers in the daily lives of young children, we know surprisingly little about how young children begin to develop relationships with each other and what factors predict whether two children will get along. Acquaintanceship is conceptualized as a process that takes place over time as individuals move from zero-acquaintance (having never met) to acquaintance (having some level of familiarity with each other), but this process can vary widely in temporal and interpersonal dynamics (e.g., whether or how quickly acquaintances become friends; see Berndt & McCandless, 2009; Hinde, 1997). Although few studies have investigated acquaintanceship processes per se, children's play interactions with acquaintances versus strangers tend to be more frequent and complex (Doyle, Connolly, & Rivest, 1980; Furman, 1987). Acquaintance–stranger group comparisons, however, do not capture individual differences in the extent to which interactions among newly acquainted children show posi-

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tive trajectories over time. Indeed, it was this variability that we aimed to predict. In one of the few studies to examine acquaintanceship processes among young children, Gottman (1983) observed 18 pairs of previously unacquainted children over three visits at the home of a “host” child and reported that connectedness, establishment of common ground, and positive reciprocity were core communicative processes that predicted whether children “hit it off.” More recently, Schuhmacher and Kärtner (2015) observed 23 pairs of newly acquainted 2-year-olds and reported that more positive child–child interaction during free play and greater coordination during a joint problem-solving task early on during a laboratory visit predicted children’s tendency to seek out their partner during an optional collaboration task later in the same visit.

By observing dyads of unfamiliar peers over time, these past studies are unique in their attention to individual differences in acquaintanceship processes among young children. Yet, little is known about factors assessed prior to, and independent of, children’s initial acquaintance that predict the quality of their interaction. We aimed to address this gap by using a prospective design in which previously unacquainted pairs of children were observed together over the course of three laboratory visits. Guided by Byrne’s (1971) theory of interpersonal attraction, we investigated the degree to which change in the quality of child–child interaction across visits was predicted by child–child similarity on factors that have shown robust relations to children’s peer functioning: child–mother attachment security and child temperament (see Berlin, Cassidy, & Appleyard, 2008; Eisenberg, Vaughan, & Hofer, 2009; Schneider, Atkinson, & Tardif, 2001).

Child–Child Similarity and Interpersonal Attraction

Byrne (1971) theorized that individuals are attracted to similar others, a process often referred to as homophily (Cairns, Cairns, Neckerman, Gest, & Gariépy, 1988; Kandel, 1978). Similarity of attitudes, personality, or behavior is expected to create an interpersonal context that is predictable and promotes communication and feelings of validation. Similarity most likely promotes attraction at the beginning stages of a relationship (i.e., initial attraction) and may foster reciprocity, which is particularly salient for interactions between peers (Hartup & Stevens, 1997; Hinde, 1997). Interacting with a similar other, therefore, may readily lend itself to establishing common ground, as well as experiencing trust, mutual enjoyment, and reciprocity. As a result, children may be attracted to and befriend similar peers.

Evidence for homophily has emerged in the developmental literature. Among quartets of newly acquainted school-age children, for instance, focal children were more similar to a preferred versus nonpreferred peer on play behaviors (Rubin, Lynch, Coplan, Rose-Krasnor, & Booth, 1994). Further, prospective longitudinal studies employing sophisticated analytic techniques (e.g., Giletta et al., 2011; van Workum, Scholte, Cillessen, Lodder, & Giletta, 2013) indicate that homophily is a function of selection (i.e., children are attracted to and befriend similar peers), deselection (i.e., children terminate friendships with dissimilar peers), and/or socialization (i.e., friends become similar as they spend time together). Evidence for homophily and its role in *interpersonal attraction* comes from selection effects specifically. For instance, child–child similarity on academic self-efficacy (Shin &

Ryan, 2014), alcohol or tobacco use (Laursen, Popp, Burk, Kerr, & Stattin, 2008; Mathys, Burk, & Cillessen, 2013), and aggressive behavior (Sijtsema, Lindenberg, & Veenstra, 2010, but only for low-aggressive boys) predicted friendship selection among preadolescents and adolescents.

Compared with research on school-age children and adolescents, the role of child–child similarity in younger children’s peer selection and socialization has received less attention. In one notable exception, social network analyses were conducted on intensive longitudinal observations of 3- to 5-year-old children in 18 Head Start classrooms and provided evidence for peer selection and socialization effects on gender-typed activities (Martin et al., 2013) and preschool competency (i.e., teacher reports of the child’s age-appropriate social and academic skills; DeLay, Hanish, Martin, & Fabes, 2016). Although impressive in many ways, this study does not shed light on attraction to peers in the initial stages of acquaintanceship. Findings from experimental studies, however, suggest that similarity may be a central process in initial playmate preferences during the first years of life. When presented with a choice to play with one of two puppets, 3-year-olds (Fawcett & Markson, 2010) and 11-month-olds (Mahajan & Wynn, 2012) preferred the puppet who previously expressed a particular toy and/or food preference that matched (vs. did not match) the child’s own preference. Importantly, such puppet preferences did not emerge when puppet–child similarity was arbitrary (e.g., stickers assigned by the experimenter), suggesting that young children’s preferences for similar others involve others who are “like me” in meaningful and/or nontransient ways. Although intriguing, these studies focused on surface similarities, puppets as peers, and a minimal indicator of attraction (i.e., choice to play with the puppet). In extending this prior work, we examined child–child similarity on attachment security and temperament, in turn, as predictors of child–child positive interaction during the acquaintanceship process.

Child–Child Similarity on Attachment Security and Temperament

Both attachment and temperament have shown robust associations with children’s peer functioning (see Berlin et al., 2008; Eisenberg et al., 2009; Schneider et al., 2001). Previous studies of attachment-peer and temperament-peer linkages in early childhood, however, have typically investigated children’s interactions with familiar or unfamiliar peers as a window into the individual child’s social skills (e.g., Asendorpf, 1991) or interactions with friends as a window into the quality of an already existing friendship (e.g., McElwain & Volling, 2004). Although important, such studies do not account for the characteristics of the peer partner, and with regard to friendship in particular, do not consider that peer partners are not random. Conversely, studies of homophily demonstrate that child–child pairings are not random, but do not consider how children interact when they are together. In bridging these literatures, we examined child–child similarity on attachment and temperament, in turn, as predictors of child–child interaction. Below, we outline conceptual linkages between attachment (and temperament) and the quality of children’s interactions with peers, and we review the few studies that have assessed child–child similarity on attachment (or temperament) and children’s peer relationships.

A central proposition of attachment theory (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1973) is that a child with a secure working model of the self as worthy of care and others as available for support—developed through repeated, daily interactions with a sensitive, responsive caregiver—will have positive expectations for social interactions, will be responsive to others' cues, and will be confident and efficacious in interactions with others. In contrast, a child with an insecure working model of the self as unworthy and others as unavailable—developed through repeated interactions with an unresponsive and/or hostile caregiver—may exhibit withdrawal, hostility, and unresponsiveness during interactions with others. In support of these propositions, child–mother attachment security (vs. insecurity) has been associated with more positive peer interactions and outcomes (see Berlin et al., 2008; Elicker, Englund, & Sroufe, 1992; Schneider et al., 2001). Because the child's internal working model represents the self, other, and self in relation to other, Sroufe and Fleeson (1986) posited that the child's working model of attachment is ultimately a model of relationships that is “carried forward” into interactions with new relationship partners. In this light, investigating attachment security and peer outcomes at the level of the *dyad* (e.g., child–child similarity on security) is warranted. When a child who has experienced high levels of security interacts with a new peer with similarly high security, the positive initiations and responses of both children will likely be reciprocated and, as such, joint play will be mutually enjoyable, coordinated, and complex. In contrast, when a child high on security interacts with a new peer high on attachment insecurity, children may be less “in step” with each other and interaction may break down.

Two studies provide tentative evidence of the associations between peer relationships and child–child similarity on attachment. First, Park and Waters (1989) observed 37 pairs of preschool-aged friends and reported that dyads in which both children were securely attached, as assessed via maternal reports, exhibited more positive interaction than secure-insecure dyads concurrently (Park & Waters, 1989) and one year later (Kerns, 1994). To our knowledge, this study is the only one, to date, to assess child–mother attachment for both children in a friendship dyad during the preschool period. In a second study, Elicker et al. (1992) examined friendship formation among 11-year-old children during a 4-week summer camp. Children classified as securely attached to mothers at one year were likely to befriend a same-sex peer who also had a secure attachment at age one. Importantly, camp participants were equally divided on attachment status (i.e., 50% had secure classification), yet secure–secure friendship pairs were significantly more frequent than secure-insecure or insecure-insecure pairings, suggesting that similarity on security but not similarity on insecurity predicts friendship formation.

Child temperament, particularly negative emotionality, has also emerged as a predictor of individual differences in peer functioning (see Eisenberg et al., 2009). With respect to negative emotionality, theory and research have distinguished between anger proneness (i.e., the tendency to experience and express anger in situations likely to elicit frustration) and social fearfulness (i.e., the tendency to experience wariness or distress in response to novel social situations, see Rothbart & Bates, 2006). Whereas anger proneness may indicate approach tendencies and has been associated with conflict and aggression with peers (Calkins, Gill, Johnson, & Smith, 1999; Hanish et al., 2004), social fearfulness reflects

inhibition tendencies and has been associated with social reticence and withdrawal (e.g., Asendorpf, 1991; see Rubin, Coplan, & Bowker, 2009).

Mixed evidence has emerged for homophily on temperament (and related behaviors) among existing preschool-aged friendship dyads. For instance, toddler- and preschool-aged friends tend to be similar on measures of behavioral adjustment (Dunn & Cutting, 1999), interaction style (but for cross-gender friends only, Howes & Phillipsen, 1992), and social skills (Howes & Phillipsen, 1992), but not on negative emotionality, activity level, or impulsivity (Dunn & Cutting, 1999; Gleason, Gower, Hohmann, & Gleason, 2005; Howes & Phillipsen, 1992). As such, these past findings point to child–child similarity on positive versus negative characteristics during early childhood. Thus, in addition to examining temperamental anger proneness and social fearfulness, we examined child–child similarity on temperamental pleasure (i.e., the tendency to display positive affect in familiar situations). Because shared positive affect and enjoyment are central indicators of young children's positive peer experiences (e.g., Gottman, 1983; Hartup & Stevens, 1997) and social adjustment (Sallquist, DiDonato, Hanish, Martin, & Fabes, 2012), and because preschool-aged children report playmate preferences for hypothetical peers with positive versus neutral facial expressions (Schultz, Ambike, Buckingham-Howes, & Cheah, 2008), examination of homophily on indices of positive emotionality, such as pleasure, may be especially revealing.

Of the few studies to examine homophily on attachment (or temperament) and young children's peer relations, the focus has been on friend dyads. Caution is needed, however, in drawing conclusions from studies of existing friendships because homophily may be a function of selection, socialization, or both. Although no previous study has examined child–child similarity on attachment or temperament as predictors of child–child interaction during acquaintanceship or with unfamiliar peers, efforts to investigate young children's peer interactions from a dyadic perspective are growing. In two reports using the Actor–Partner Interdependence Model (see Kenny, Kashy, & Cook, 2006), actor and partner effects of attachment and/or temperament on young children's individual behavior with a new peer partner were assessed. Walker, Degnan, Fox, and Henderson (2015) demonstrated that child social fearfulness at 24 months predicted less social engagement by the child during play with unfamiliar peer at 36 months, as well as less social engagement and dysregulated behavior by the child's partner. Further, in a separate report examining children's individual behavior during the same peer play sessions examined here, child–mother attachment security was related to (a) greater responsiveness to the peer partner across visits when the partner anger proneness was low and (b) less assertive behavior at initial acquaintance when partner anger proneness was high (McElwain, Holland, Engle, & Ogolsky, 2014). Taken together, these results highlight that child behavior is a function of both child and partner characteristics (also see Ross & Lollis, 1989).

The present report differs from and complements these prior findings in two key ways. First, our focus is on the quality of child–child *interaction* (e.g., the extent to which partners' play is socially complex and coordinated), which is more than the “sum” of partners' individual behaviors and captures processes that cannot be understood or assessed at the level of individual behavior (Hinde, 1997). For example, one child in a dyad may express high

levels of positive affect (individual behavior) but whether the dyad shows high levels of shared positive affect (dyadic interaction) will depend on the affective, coordinated displays of both children. Second, we aimed to predict variation in rate of change in positive interaction over the three visits, whereas we did not expect (nor did we find) significant interdyad variation in rate of change in children's individual behavior in our prior report. In short, acquaintanceship is not a static entity but an interpersonal process that requires, first and foremost, attention to interactions between partners over time (see Berscheid, 1999; Hinde, 1997). Our examination of change in child–child interaction over time directly reflects our interest in acquaintanceship among young children.

The Current Study

When children were 33 months of age, child–mother attachment security and child temperament were assessed. Six months later, children of the same sex were randomly paired and observed interacting in three laboratory visits scheduled over the course of one month. Our main objective was to examine child–child similarity on attachment security and temperament, in turn, as predictors of child–child positive interaction across the three visits. Positive interaction was indexed by observed levels of child–child coordination, social play complexity, and shared positive affect—interaction qualities that distinguish friends from nonfriends (Newcomb & Bagwell, 1995), predict friendship formation among newly acquainted preschool-aged children (Gottman, 1983) and aid in behavioral identification of friendship dyads in child care settings (Howes, 1996). Although our focus is on acquaintanceship over a limited time span and not on friendship formation per se, all friendships begin with an initial encounter and acquaintanceship phase. We expected that the interaction qualities pertinent to young children's friendships would also show meaningful variation and change over time as new peer partners became acquainted.

Testing child–child similarity on attachment and temperament was central to this report, but we also assessed child–child mean attachment security (or temperament) by averaging partners' scores. Child–child similarity does not indicate the overall level of attachment security or temperament; high similarity may indicate the partners are similarly low, moderate, or high on the predictor. Thus, mean scores provide important information not captured by the similarity scores, and as noted by Kenny (1988; also see Rovine, 1994), statistical interpretation of dyadic similarity (or difference) scores is aided when dyadic means scores are included as covariates in model tests. Finally, via tests of the Dyadic Mean $\times$ Dyadic Similarity interaction, we assessed whether associations between child–child similarity on attachment (or temperament) and observed positive interaction varied as a function of the dyad's mean security or temperament.

In accordance with interpersonal attraction theory (Byrne, 1971), we hypothesized that higher levels of child–child similarity on attachment security and temperament, in turn, would be related to a more rapid rate of increase in positive interaction over the three visits and higher levels of positive interaction at the final visit, once children had become acquainted. Because previous studies have reported friends' similarity on (a) secure but not insecure attachment (Elicker et al., 1992), and (b) positive but not negative temperament characteristics, at least in early childhood (e.g., Gleason et al., 2005; Howes & Phillipsen,

1992), we also expected that such associations would be stronger when a dyad's mean score indicated more optimal functioning (e.g., high attachment security or pleasure; low anger proneness or social fear). Lastly, we examined several potential covariates, including maternal education, dyad gender, past peer contact, and children's general engagement during each of the peer visits (i.e., the extent to which the children were “on task” in terms of being actively involved with the toys and/or each other during the play session vs. “off task” and standing by mother).

Method

Participants

Children ($N = 114$, 58 girls) and their parents participated in a short-term longitudinal study of social development. Families were recruited via birth announcements and informational flyers distributed through local organizations and child care centers. At Time 1, mothers and children ($M = 32.67$ months, $SD = .77$, Range = 31 to 35 months) participated in a laboratory visit, and parents completed questionnaires. At Time 2 ($M = 38.81$ months, $SD = 1.46$, Range = 36 to 42 months), children of the same sex and approximately the same age (Mean age space = 1.12 months, $SD = 1.19$, Range = 0 to 5 months) were randomly paired into 57 dyads (29 girl dyads) and observed together during three laboratory visits scheduled over one month (i.e., days between first and third visits: $M = 20.4$, $SD = 10.9$, Range = 7 to 62). Mothers averaged 33.10 ($SD = 5.67$, Range = 24 to 54) years of age and 16.52 ($SD = 2.49$, Range = 12 to 20) years of education, and fathers averaged 34.57 ($SD = 5.77$, Range = 23 to 52) years of age and 16.09 ($SD = 2.69$, Range = 10 to 20) years of education. For 78% of the sample, both parents were European American. The median family income was \$65,000 ($SD = \$33,432$, Range: 18,000 to 180,000). Maternal reports of the child's contact with nonfamilial peers indicated that, on average, children had weekly contact with 4.94 peers and interacted with peers for 12.5 hours per week. Fifty-eight children were enrolled in out-of-home child care for at least 10 hours per week.

Of participating families at Time 1 ($N = 128$), 14 did not participate in the Time 2 peer visits. Comparisons between included versus excluded families revealed no significant differences on Time 1 assessments (i.e., attachment security, temperament, $ps \geq .527$) and only one difference on the demographic measures: fathers of families included ($M = 34.57$) were older than fathers of families with missing data ($M = 30.56$), $t(118) = 2.06$, $p = .041$.

Time 1 (33 months): Attachment and Temperament Assessments

During a 90-min laboratory visit, mother–child dyads were observed in a series of interactive tasks, including a modified Strange Situation that occurred at the beginning of the visit. Mothers and fathers received separate questionnaire packets, including items tapping child temperament, to complete at home and return by mail.

Child–mother attachment security. The modified 17-min Strange Situation procedure (Cassidy & Marvin, 1992) consists of 5 episodes: 3-min warm-up, 3-min separation from mother, 3-min

reunion with mother, second 5-min separation, and second 3-min reunion. During the separation episodes, no “stranger” was present, and mothers received no instructions about what to tell their child during the departure from the playroom. Children were classified as secure ($n = 77$), avoidant ($n = 6$), dependent/resistant ($n = 14$), controlling/insecure other ($n = 16$), or uncodeable ($n = 1$). Coders also rated child–mother security on a 9-point scale, ranging from 1 (*highly insecure*; e.g., highly avoidant, ambivalent or disorganized, or displaying a combination of strategies) to 9 (*highly secure*; e.g., highly at ease in initiating interaction or contact; during reunion, child is calm, but pleased to see mother return).

Two trained coders, certified by Jude Cassidy, coded the Strange Situation protocols. Twenty percent of the protocols were double-coded, and disagreements were resolved by consensus. For the 4-way classification, interobserver agreement (before consensus) was 88% ($\kappa = .77$). For the 9-point security rating, interobserver agreement assessed via an intraclass correlation was .82. Given our objective to examine child–child similarity on attachment security as a predictor of interaction quality, we utilized the 9-point security scale because it permitted a more fine-grained assessment of similarity between child partners. Child–mother attachment security assessed via the Cassidy and Marvin (1992) system has been related in expected ways to concurrent maternal and child functioning (Moss, Bureau, Cyr, Mongeau, & St-Laurent, 2004).

Child temperament. Mothers and fathers independently completed three subscales of the Toddler Behavior Assessment Questionnaire (TBAQ; Goldsmith, 1996). Parents rated how often, in the last month, their child exhibited *anger proneness* (e.g., “When it was time for bed or a nap and your child did not want to go, how often did s/he protest by crying loudly?”, 19 items, $\alpha = .89$ and .90, mothers and fathers respectively), *social fearfulness* (e.g., “If a stranger came to your home or your apartment, how often did your child cling or hold on to you and not want to let go?”, 19 items, $\alpha = .87$ and .91), and *pleasure* (e.g., “When playing quietly with one of his or her favorite toys, how often did your child smile?”, 19 items, $\alpha = .86$ and .84). Items were rated on a 7-point scale ranging from 1 (*never*) to 7 (*always*), and a “does not apply” response option was also available. Subscales were computed by averaging ratings (with reverse scoring when appropriate) across items rated on the 7-point scale. Associations between mother and father subscale scores were moderate to strong ($r = .48, .60$, and $.31$ $ps < .001$, anger proneness, social fear, and pleasure respectively). To obtain more representative measures of child behavior (see Rushton, Brainerd, & Pressley, 1983), we computed composite scores by averaging across mother and father reports for each subscale. For four families, only one parent (1 father, 3 mothers) reported on the child’s temperament, and data from the single reporter were used in place of the mother–father composite. Goldsmith (1996) reported substantial convergence between parental reports on the TBAQ and parent and teacher reports of other conceptually related child behaviors, and temperamental characteristics assessed via the TBAQ have been related in expected ways to toddler-aged children’s observed behavior with peer partners (e.g., Walker et al., 2015) and parent-reported behavioral adjustment (e.g., Engle & McElwain, 2011).

Time 2 (39 months): Peer Assessments

Previously unacquainted children were randomly paired into same-sex dyads and invited for three laboratory visits scheduled at approximately 1-week intervals. Following a 5-min warm-up period at the beginning of each visit, children’s interactions during a 15-min free play session and a 10-min novel toy task were recorded for subsequent coding. For the free play session, different age-appropriate toys were available at each visit. The order of toys was counterbalanced across dyads, and each set of toys included dress-up clothes and related props, play figures, and a large toy that children could use simultaneously (e.g., oversized stuffed horse). For the novel toy task, a research assistant removed all free-play toys, and children were introduced to a Play-Doh toy (fun-cutter, diner, and ice cream truck; order counterbalanced across dyads) while seated together at a table. Mothers were present in the playroom and received verbal and written instructions requesting that they remain seated throughout the play sessions and not initiate interaction with the children or direct the children’s play in any way.¹

Dyadic interaction codes. Independent teams of coders, who were blind to all other study data, assessed individual child behavior and dyadic interaction during 30-s intervals. Within the dyadic coding team, different coders rated the same dyad (a) across the two play sessions within a given visit and (b) in the same play session (e.g., free play) across visits. Three dyadic codes, which were modified from previous coding systems (Howes, Droege, & Matheson, 1994; Park & Waters, 1989; Youngblade & Belsky, 1992), were used in this report. *Social play complexity* was coded on a 7-point scale: 1 (*solitary*), 2 (*onlooker*), 3 (*parallel*), 4 (*simple social*), 5 (*simple social pretend*), 6 (*cooperative pretend*), and 7 (*complex social pretend*). The most complex level of play observed in each interval was coded, regardless of duration. *Coordination* captured the degree to which children’s interactions were smooth and synchronous (i.e., the children acted in coordination with each other’s actions, play behaviors, and social cues) and was rated on a 4-point scale, ranging from 0 (*no opportunity for coordination*, i.e., no interaction or social cue occurred during the interval) to 3 (*high degree of coordination*). *Shared positive affect* assessed the degree to which children showed mutual enjoyment as indicated by joint smiling or laughter accompanied by eye contact or joint attention to an event and was rated on a 4-point scale, ranging from 0 (*no shared positive affect*) to 3 (*high degree of shared positive affect*).

Within a given visit, scores for shared positive affect and coordination were computed across all 30-s intervals coded, yielding scores based on 25 min of observation per visit. For shared positive affect, mean ratings were calculated by summing ratings across intervals within a given visit and dividing by the number of

¹ Maternal involvement during the play sessions was infrequent, and we did not assess maternal behavior during official coding. Mothers received instructions before the peers visits and immediately before the play sessions to refrain from interacting with their children. Although maternal involvement was infrequent, we took steps in our coding procedure to minimize any effect of maternal behavior, such that any child behavior that was a direct result of maternal direction or intervention was not coded.

intervals coded. For coordination, the sum was divided by the number of intervals in which there was an opportunity for coordination (i.e., at least one child exhibited a social cue). The structured novel toy task limited our ability to assess the full range of play (from solitary to complex social pretend) and, thus, mean ratings for social play complexity were computed from the free-play session only. Observers were trained on a subsample of tapes until agreement was 80% or higher. Twenty-six percent of the protocols were double-coded. Interobserver reliability, assessed via intraclass correlations, was .89 for social play, .86 for coordination, and .92 for shared positive affect.

For each peer visit, we conducted a principal components analysis for the three interaction variables. The three interaction variables loaded on one factor (loadings ranged from .66 to .92), and the single factor accounted for 73%, 68%, and 69% of the variance among the interaction variables at visits 1, 2, and 3, respectively. Thus, we created composite scores of *positive interaction*. Because the interaction variables were assessed on different scales (e.g., 4-point scale for shared positive affect; 7-point scale for social play complexity), we first standardized the interaction variables across all dyads and occasions (i.e., visits). Next, for each peer visit, we computed a positive interaction score by averaging the three standardized scores. Similar observational measures of children's interactions with peers in child care or friends in dyadic tasks have been used to create reliable composites of positive interaction, which were related to family and child functioning in expected ways (e.g., McElwain, Halberstadt, & Volling, 2007; NICHD Early Child Care Research Network, 2001; Ramani, Brownell, & Campbell, 2010).

Child engagement/on-task behavior. An independent team of coders assessed each child's individual behavior during the play sessions (see McElwain et al., 2014, for further details), and we examined *child engagement* as a potential covariate in the current report. Engagement was an index of "on-task" behavior (i.e., the extent to which each child in the dyad played with the toys or interacted with the other child) and was *not* an index of interaction quality. Within each 30-s interval, child engagement was rated as 0 (*none*; child spends most or all of the interval in proximity to the mother and does not play with toys or interact with the other child), 1 (*low*; the child wanders around the playroom or watches the other child for most or all of the interval; engagement with toys or partner is fleeting), or 2 (*moderate or high*; the child explores toys or interacts with the other child for some or all of the interval). Within each visit, ratings on engagement were summed across intervals and divided by the number of intervals coded. Because of negative skewness, square root transformations were conducted on reflected scores, and transformed scores were then reflected again so that higher scores indicated greater engagement. Interobserver reliability, assessed for 20% of the protocols, was .91 (intraclass correlation).

Data Analytic Plan

Multilevel models were estimated in Mplus 7.3 (Muthén & Muthén, 1998–2012) using full information maximum likelihood. We used Wald tests to assess the significance of individual fixed effects and -2Δ log likelihood (LL) ratio tests to assess the significance of random effects (i.e., variance and covariance components). Time was a level-1 predictor, and we estimated a random

intercept and slope for time. Because we were interested in whether children exhibited high levels of positive interaction at the final visit (i.e., once the pair had become acquainted), we coded time as -2 (visit 1), -1 (visit 2), and 0 (visit 3). In preliminary analyses, we tested a series of unconditional models, followed by tests of multilevel models in which potential covariates were examined as predictors of the random intercept and slope for positive interaction. Covariates significantly associated with the intercept or slope were included in the main models.

For our main models, we computed dyadic mean and dyadic similarity scores for each predictor variable (e.g., attachment security, pleasure). In creating *dyadic mean* scores, we averaged partners' scores on a given predictor. In creating *dyadic similarity* scores, we computed the absolute difference between partners for a given predictor and then reflected the difference score so that higher scores indicated greater similarity between partners. Interpretive problems may arise from the use of difference scores when the individual scores used to create the difference score (a) have unequal variances (e.g., older vs. younger siblings' caregiving toward the other) or (b) are interdependent (e.g., repeated assessments over time; see Rovine, 1994). Neither concern was pertinent to the current study. Unfamiliar children were randomly paired, and partners' scores on a given predictor showed equal variation and were independent.

We tested our hypotheses via a series of multilevel models, in which time was a within-dyad (or level-1) predictor and the dyadic mean and similarity scores were between-dyad (or level-2) predictors. For each predictor, the multilevel model was tested in two steps. First, we tested a model in which the dyadic mean score, the dyadic similarity score, and the Mean $\times$ Similarity interaction term were entered as predictors of the intercept only, controlling for time. Second, we added the dyadic mean, dyadic similarity, and Mean $\times$ Similarity scores as predictors of rate of change in positive interaction over the three visits (i.e., slope). The tests of the predictors on the slope reflected cross-level interactions between our level-1 predictor (i.e., time) and level-2 predictors (i.e., dyadic mean, dyadic similarity, and Mean $\times$ Similarity interaction). To minimize multicollinearity between the lower- and higher-order terms (i.e., main effects vs. Mean $\times$ Similarity interaction), the dyadic mean and similarity scores were centered (i.e., raw score minus the sample mean; see Table 1 for Means) and used in all model tests.

Following the procedures outlined by Aiken and West (1991; also see Bauer & Curran, 2005), we probed significant Mean $\times$ Similarity interactions on the *intercept* by plotting the association between dyadic similarity on a given predictor and the positive interaction outcome (intercept) at high (1 *SD* above the Mean) and low (1 *SD* below the Mean) levels of the dyadic mean score. Simple slopes tests were conducted to assess whether the association between dyadic similarity and positive interaction at a given level of the dyadic mean score differed significantly from 0. A significant Mean $\times$ Similarity interactions on the *slope* of positive interaction represented a cross-level interaction between dyadic mean and similarity scores at level 2 and time at level 1 (i.e., Mean $\times$ Similarity $\times$ Time). As a first step in probing a 3-way interaction, we tested dyadic similarity as a predictor of the slope (i.e., Similarity $\times$ Time interaction) at high (1 *SD* $>$ Mean) and low (1 *SD* $<$ Mean) levels of the dyadic mean score. Next, we further decomposed the interaction by plotting the main effect of time

Table 1
Intercorrelations and Descriptive Statistics for the Study Measures

Dyadic study measures	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Attachment, mean	—	.25	-.23	.07	-.26*	.15	-.01	.03	.16	.15	-.01	.13	.16	.20
2. Attachment, similarity		—	-.11	-.06	.02	-.02	.06	.26*	.29*	.08	.21	.18	.24	.29*
3. Anger, mean			—	.10	.19	.14	-.06	-.01	-.14	-.13	.06	-.08	-.13	-.07
4. Anger, similarity				—	.23	.28*	-.32*	-.06	-.13	-.28*	-.23	-.24	-.28*	-.30*
5. Social fear, mean					—	-.04	-.37**	.02	-.07	-.08	-.22	-.25	-.30*	-.35**
6. Social fear, similarity						—	.15	.05	.05	-.10	-.09	.05	-.02	.05
7. Pleasure, mean							—	.25	.01	-.00	.24	.17	.32*	.32*
8. Pleasure, similarity								—	.14	-.03	.20	.20	.31*	.34**
9. Engagement v1, mean									—	.56***	.60***	.72***	.67***	.56***
10. Engagement v2, mean										—	.50***	.42**	.52***	.35**
11. Engagement v3, mean											—	.42**	.50***	.70***
12. Positive interaction v1												—	.78***	.56***
13. Positive interaction v2													—	.75***
14. Positive interaction v3														—
Mean	5.64	3.73	3.66	1.59	3.56	2.42	5.74	1.27	1.56	1.60	1.64	-.02	-.08	.10
SD	1.16	1.57	.51	.63	.63	.83	.35	.44	.25	.23	.22	.89	.75	.86
Min	2	0	2.49	.00	1.96	.00	4.80	.00	1.03	1.10	.95	-1.20	-1.16	-1.34
Max	8	6	4.84	2.45	4.98	3.83	6.28	1.85	2.00	1.93	2.00	2.17	2.13	1.97

Note. v1 = visit 1, v2 = visit 2, and v3 = visit 3. Mean = dyad partners' mean score on the variable of interest; Similarity = dyad partners' similarity score on the variable of interest.

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

(i.e., the slope) as a function of low, moderate, and high levels of dyadic similarity when (a) the dyadic mean score was high (1 $SD > \text{Mean}$) and (b) the dyadic mean score was low (1 $SD < \text{Mean}$). We also tested whether the simple slopes differed significantly from 0 (see Aiken & West, 1991).

Missing data on the predictors were minimal (1.8% total): one child was missing data on attachment security because of technical difficulties, and one child was missing data on temperament. As recommended by Widaman (2006) when missing data are minimal, we conducted a single imputation to impute values for our two missing data points. All study measures, as well as child sex and the family demographic measures (parental education, age, and family income), were entered in the imputation model. We present results utilizing the imputed values, although results were the same across data sets with and without the imputed values. Data were also missing on the outcome measure. Because of scheduling difficulties, 1 dyad was missing data for visits 2 and 3, and two dyads were missing data for visit 3. Imputation of outcome scores is not recommended and viewed as less critical when complete data are available on the predictor values (see Widaman, 2006) and, thus, we did not impute missing outcome values. We note that tests of the multilevel models estimated parameters using all available outcome data: 167 data points out of a total possible 171 data points (57 dyads $\times$ 3 visits).

Results

Preliminary Analyses

Unconditional model tests. We tested a series of unconditional models for child–child positive interaction (see Table S1 in the online supplement), and we also calculated the intraclass correlation (ICC) from the empty means, random intercept model to estimate the proportions of between- and within-dyad variability for child–child positive interaction. The ICC was .68, indicating that 68% of the variation in positive interaction was between dyads

(i.e., individual differences in positive interaction) and 32% of the variation was within dyads (i.e., time-specific deviations around the dyad's mean level of positive interaction). Comparison between the random intercept model and empty means model (i.e., fixed intercept only) revealed significant interdyad variation in the intercept ($var_{\text{intercept}} = .471$, $SE = .103$; $-2\Delta LL [1] = 80.54$, $p < .001$). Further, comparison of the random slope model with the random intercept/fixed slope model revealed significant interdyad variation in rate of change in positive interaction ($var_{\text{slope}} = .108$, $SE = .034$; $-2\Delta LL [2] = 14.312$, $p < .001$), although the fixed effect of time was nonsignificant ($B_{\text{slope}} = .052$, $SE = .055$, $p = .345$). Thus, the fixed effect for the time slope indicates that positive interaction did not change across visits, *on average*. A null fixed time slope in combination with significant interdyad variation around the slope indicates that positive interaction was decreasing for some dyads and increasing for other dyads over the course of the three visits; it was this variability in positive interaction over time that we aimed to predict.

Model tests of covariates. Next, we conducted a series of preliminary multilevel models to examine the following potential covariates: dyad gender, child age at the peer visits, number of days between the first and final peer visit, maternal years of education, and prior peer contact (based on a composite of 3 standardized items capturing frequency, number, and regularity of peer contacts, $\alpha = .72$). Because each dyad had a single positive interaction score per visit, it was not possible to examine each child's individual scores on the covariate measures. Thus, except for dyad gender (coded as boy–boy = 0, girl–girl = 1) and days between peer visits (both of which were already measured at the level of the dyad), we averaged scores for a given covariate across dyad partners. For each covariate, a multilevel model was tested in which the covariate was included as a between-dyad predictor of the random intercept and random slope for positive interaction. No significant associations emerged, and these characteristics (i.e., gender, child

age, days between visits, maternal education, and prior peer contact) were not considered further.

We also examined child engagement during the play sessions. For the reasons outlined above, child engagement was averaged across dyad members within each visit. Because engagement was a time-varying covariate, we created both within-dyad (i.e., a dyad-mean centered score at each visit by subtracting the dyad's overall mean from the dyad's score at a given visit) and between-dyad (i.e., the dyad's engagement averaged across all three visits, which was grand-mean centered to increase interpretability) scores. The multilevel model revealed a significant within-dyad association between engagement and positive interaction; higher engagement at a given visit (compared with the dyad's mean engagement across visits) was related to greater positive interaction at the same visit ($B = 1.194$, $SE = .277$, $p < .001$). Between-dyad engagement (i.e., dyad's average engagement across visits) was related to greater positive interaction at the final visit ($B = 2.806$, $SE = .429$, $p < .001$) but was not associated with rate of change in positive interaction ($B = .010$, $SE = .253$, $p = .969$). Accordingly, we included within- and between-dyad levels of engagement as covariates in the models. Correlations and descriptive statistics for the study measures included in the main models are shown in Table 1.

Multilevel Models Predicting Child–Child Positive Interaction

Because tests of the unconditional models indicated variability across dyads in the intercept and rate of change for positive interaction, we proceeded with tests of the main models. In light of

the preliminary analyses, within-dyad engagement (centered on the dyad's mean engagement) was added as a level-1 predictor and between-dyad engagement (dyad's engagement averaged across the three visits) was entered as a level-2 predictor of the intercept. For all models tested, engagement at level 1 predicted positive interaction, such that more engagement at a given visit (compared with the dyad's mean across visits) was associated with more positive interaction at the same visit (see Table 2). Engagement at level 2 was also a significant predictor of the intercept for all models tested (see Table 2). Dyads averaging higher levels of engagement across visits exhibited more positive interaction, on average.

Below we report findings for the dyadic mean and similarity scores on attachment and temperament, in turn, as predictors of child–child positive interaction. As described in the Data Analytic Plan, we tested the models in two steps. For the models examining social fearfulness and pleasure as predictors, no significant associations with the slope (i.e., cross-level interactions with time) emerged in step 2. Hence, we present results from step 1 (i.e., predictor-intercept associations only) for the models examining social fearfulness and pleasure, and we present the full step-2 model (i.e., predictor-intercept and predictor-slope associations) for attachment security and anger proneness. Cross-level interactions with time were not included in the step-1 model, thus predictor-intercept associations are interpreted in terms of the average effect of a given predictor on positive interaction across visits. Because cross-level interactions with time were included in the step-2 model, predictor-intercept associations are interpreted with respect to positive interaction when time is 0 (i.e., at the third

Table 2
Dyadic Mean and Similarity Scores as Predictors of Child–Child Positive Interaction Across the Three Peer Visits

Parameters	PR: Attachment		PR: Anger proneness		PR: Social fearfulness		PR: Pleasure	
	<i>Est.</i>	<i>SE</i>	<i>Est.</i>	<i>SE</i>	<i>Est.</i>	<i>SE</i>	<i>Est.</i>	<i>SE</i>
Fixed effects								
Intercept	-.051	.081	.005	.080	-.014	.080	-.040	.076
Level-1 predictors								
Time (visit 3 = 0), within-dyad	-.038	.046	.010	.047	-.002	.049	-.002	.049
Engagement, within-dyad	1.229***	.277	1.228***	.282	1.191***	.277	1.181***	.27
Level-2 predictors of intercept								
Engagement, between-dyad	2.691***	.352	2.665***	.347	2.676***	.326	2.522***	.310
Predictor, mean	.014	.085	-.051	.157	-.270**	.100	.456*	.183
Predictor, similarity	.082	.052	-.197	.129	.048	.076	.475**	.166
Mean $\times$ Similarity	.088	.052	-.437	.238	-.071	.153	.696*	.358
Level-2 predictors of slope								
Predictor, mean	-.029	.048	-.028	.093	—	—	—	—
Predictor, similarity	.043	.029	-.035	.074	—	—	—	—
Mean $\times$ Similarity	.081**	.029	-.306*	.140	—	—	—	—
Random effects								
Residual variance (within)	.074	.020	.074	.020	.075	.021	.075	.020
Residual variance (between): intercept	.263	.065	.275	.067	.273	.067	.229	.059
(Residual) variance (between): slope	.063	.023	.073	.025	.086	.027	.087	.027
Variance (between): engagement	1.064	.756	1.045	.754	.908	.734	.942	.740
Model fit								
Parameters	15		15		12		12	
-2LL	241.656		245.866		245.53		238.302	

Note. PR = predictors (e.g., attachment security dyadic mean and similarity scores were the predictors in the first model). For each model tested, the covariance between the intercept and slope for positive interaction was also estimated.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

and final visit). Unstandardized estimates and standard errors of the model parameters are shown in Table 2.

Attachment security. The main effects of the dyadic mean and similarity scores for attachment security were nonsignificant predictors of the intercept and slope. The Mean $\times$ Similarity interaction, however, predicted the slope (see Table 2). To probe this cross-level interaction between attachment scores at level 2 and time at level 1, we first tested dyadic similarity on attachment security as a predictor of the slope (i.e., the Similarity $\times$ Time interaction) at high ($1\ SD > \text{Mean}$) and low ($1\ SD < \text{Mean}$) levels of dyadic mean security. Similarity was a significant predictor of the slope at high ($B = .136, SE = .049, p = .005$) but not low ($B = -.050, SE = .040, p = .216$) levels of dyadic mean security. When dyad partners averaged high levels of security, greater similarity on security predicted a more rapid rate of increase in positive interaction over the three visits.

Next, we plotted the main effect of time on positive interaction as a function of dyadic similarity and mean levels of security. Figure 1a depicts the slope of positive interaction as a function of low, moderate, and high levels of dyadic similarity when dyadic mean security is high ($1\ SD > \text{Mean}$). Figure 1b depicts the slope of positive interaction as a function of low, moderate, and high levels of dyadic similarity when dyadic mean security is low ($1\ SD < \text{Mean}$).

We also tested whether each of the simple slopes differed significantly from zero. Probes indicated that when dyadic mean security was high, positive interaction increased over time when similarity on security was high, but decreased over time when similarity was low (see Figure 1a). When dyadic mean security was low, positive interaction did not significantly change across the three visits at high, moderate, or low levels of similarity (see Figure 1b).

Anger proneness. The main effects of dyadic mean and similarity scores for anger proneness were nonsignificant predictors of the intercept and slope, although the Mean $\times$ Similarity interaction predicted the slope (see Table 2). Probes of this cross-level interaction indicated that greater child–child similarity on anger proneness predicted (a) more rapid decreases in positive interaction over time at high levels ($1\ SD > \text{Mean}$) of the dyadic mean on anger proneness ($B = -.191, SE = .110, p = .082$), and (b) more rapid increases in positive interaction over time at low levels ($1\ SD < \text{Mean}$) of dyadic mean on anger proneness ($B = .121, SE = .096, p = .205$), although neither probe of the Similarity $\times$ Time interaction reached significance.

Plots of the main effect of time on positive interaction as a function of dyadic similarity and dyadic mean levels of anger

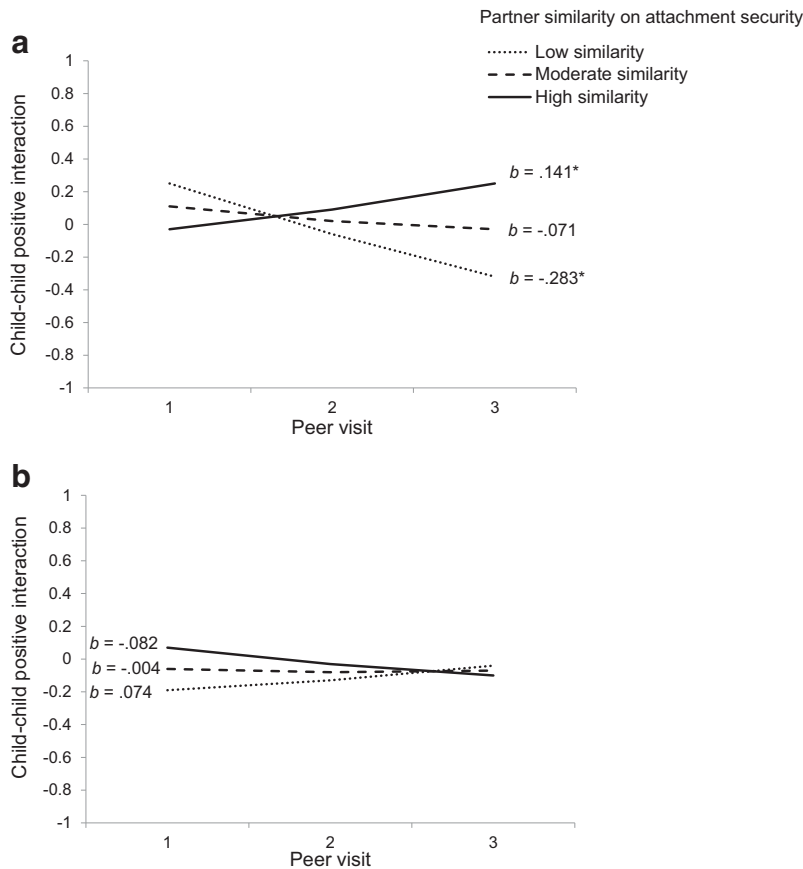


Figure 1. Change in child-child positive interaction over the three peer visits as a function of low ($1\ SD < \text{Mean}$), moderate (Mean) and high ($1\ SD > \text{Mean}$) levels of partner similarity on attachment security and (a) high dyadic mean score on attachment security (Figure 1a) and (b) low dyadic mean score on attachment security (Figure 1b). * $p \leq .05$

prone to anger are shown in Figure 2. When dyadic mean anger proneness was high ($1\text{ SD} > \text{Mean}$), positive interaction decreased over time when similarity was high, but increased over time when similarity was low (see Figure 2a). In contrast, when dyadic mean anger proneness was low ($1\text{ SD} < \text{Mean}$), positive interaction increased over time when similarity was high (see Figure 2b). Yet, all simple slopes were nonsignificant (see Figure 2).

Social fearfulness. The dyadic mean score on social fearfulness predicted the intercept of positive interaction (see Table 2). Across visits, dyads averaging higher social fearfulness exhibited less positive interaction on average. The main effect of dyadic similarity and the Mean $\times$ Similarity interaction for social fearfulness, however, were nonsignificant.

Pleasure. The dyadic mean and similarity scores for pleasure each predicted the intercept of positive interaction, and these main effects were qualified by a Mean $\times$ Similarity interaction (see Table 2). As shown in Figure 3, simple slope analyses indicated that partners' greater similarity on temperamental pleasure predicted higher levels of positive interaction across visits, but only when dyadic mean pleasure was moderate (Mean) or high ($1\text{ SD} > \text{Mean}$).

Discussion

Guided by interpersonal attraction theory and related evidence (Byrne, 1971; Hartup & Stevens, 1997; Hinde, 1997), we examined the extent to which child–child similarity on attachment security and temperament between randomly paired, unacquainted 3-year-old children predicted child–child interaction quality over three laboratory visits. Consistent with our expectations as well as prior research examining homophily among young children, child–child similarity on positive characteristics—specifically, high levels of child–mother attachment security and moderate to high levels of child temperamental pleasure—were related to greater positive child–child interaction during the laboratory play sessions. Notably, these associations emerged above and beyond the dyad's level of engagement or on-task behavior, which increases confidence that associations were not simply attributable to children's tendency to be involved with the toys and/or each other. In contrast to the findings for attachment security and temperamental pleasure, however, child–child similarity on temperamental anger proneness and social fearfulness yielded equivocal results. Below, we discuss each finding in turn.

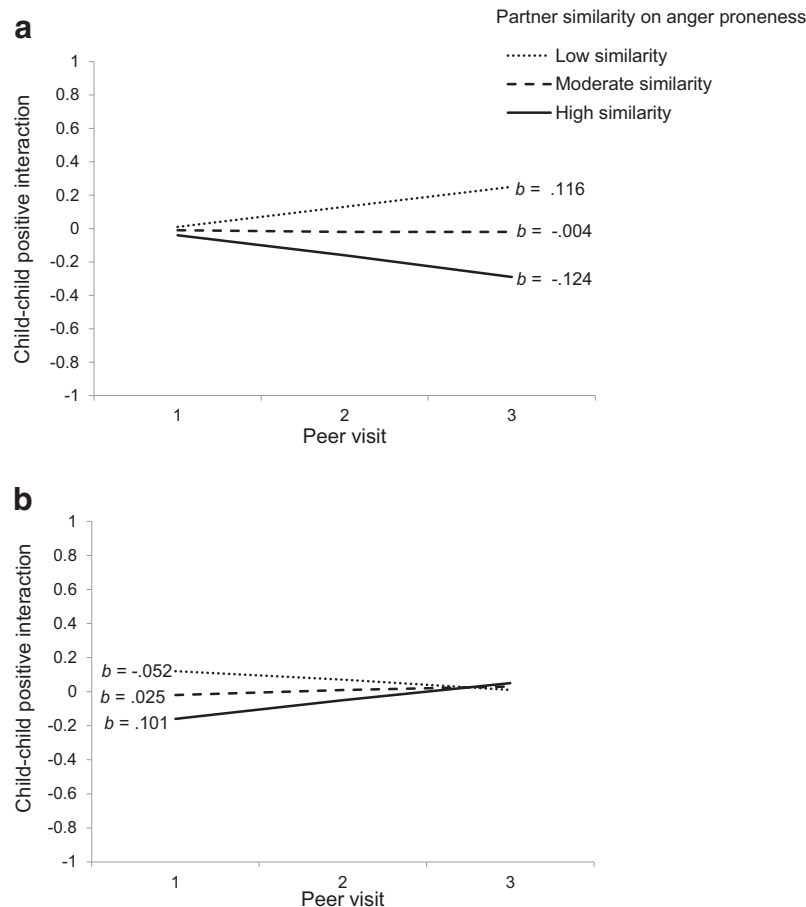


Figure 2. Change in child–child positive interaction over the three peer visits as a function of low ($1\text{ SD} < \text{Mean}$), moderate (Mean) and high ($1\text{ SD} > \text{Mean}$) levels of partner similarity on anger proneness and (a) high dyadic mean score on anger proneness (Figure 2a) and (b) low dyadic mean score on anger proneness (Figure 2b).

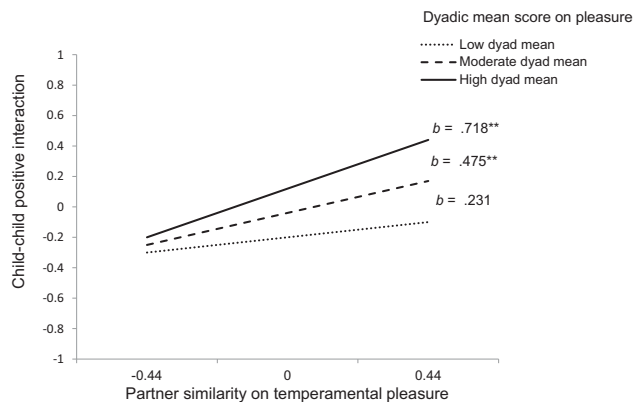


Figure 3. The relation between partner similarity on temperamental pleasure and positive interaction (intercept only) at low ($1\text{ SD} < \text{Mean}$), moderate (Mean) and high ($1\text{ SD} > \text{Mean}$) levels dyadic mean score on temperamental pleasure. ** $p < .01$.

Dyad partners who were more similar on child–mother attachment security showed more rapid increases in positive interaction over time, but only for dyads averaging high security. In further decomposing this interaction, for dyads averaging high security, positive interaction increased over time when child–child similarity on security was high, but decreased over time when child–child similarity on security was low. These results align with our prediction that greater child–child similarity would be related to more positive interaction between child partners, but only when the dyad’s average level on the characteristic indicated more optimal functioning. In contrast, interaction may become disjointed and disrupted when a child with a high level of security is matched with a partner who has experienced greater attachment insecurity. Although few studies have investigated child–child similarity on attachment, the current results are consistent with and extend findings from Elicker et al.’s (1992) study of friendship formation among secure-secure dyads of preadolescents during a summer camp experience. Our findings are also concordant with Park and Waters’ (1989) study of existing preschool-aged friendship dyads, in which positive interaction was greater among secure-secure versus secure-insecure dyads. Because of the dichotomous secure versus insecure attachment scores used in these past studies, conclusions about homophily are limited. In contrast, the current study utilized a well-established system for scoring child–mother attachment security on a continuum. Doing so enabled us to assess partners’ degree of similarity in a fine-grained manner.

We consider our finding in the context of growing and consistent evidence that child–mother attachment security relates to peer functioning, and especially child–friend interaction, in expected ways (see Berlin et al., 2008; Schneider et al., 2001). Interpretive challenges arise when examining children’s existing friendships, however, because it is unclear whether attachment–friend associations emerge because children who experience high levels of attachment security tend to (a) select certain peers as friends, which then leads to higher quality friendships, or (b) bring positive expectations, attitudes, and behaviors to interpersonal interactions, which then foster higher

quality friendships—regardless of the friend’s characteristics. Most likely, both processes occur. Because of theoretical and statistical models that emphasize analysis at the level of the individual child, however, the latter explanation has dominated the literature. The current findings highlight important dyad-level processes, in which children with similarly high levels of attachment security (and thus, interpersonal competencies) may be more likely to play together in coordinated, socially complex, and affectively positive ways—interaction qualities that have been shown to predict friendship (Howes, 1996) and friendship formation (Gottman, 1983) among young children. In this light, we speculate that past findings of positive peer outcomes among individual children who exhibit attachment security may be explained, in part, by the peer partners to whom those children are drawn. Although our examination of acquaintanceship over a limited number of visits does not permit conclusions about friendship formation per se, dyads in our study who showed increases in positive interaction across visits, especially those predicted by child–child similarity, may be displaying the early precursors of friendship formation. Looking forward, there is a need for theory and research on attachment-related differences in children’s peer relationships to attend to acquaintanceship processes, interpersonal attraction, and peer selection at the level of the dyad.

Child–child similarity on temperamental pleasure also predicted more positive interaction for dyads averaging moderate or high pleasure. In contrast to the finding for attachment security, however, this association was not qualified by time (i.e., the Mean $\times$ Similarity interaction for temperamental pleasure did not predict interdyad rate of change in positive interaction), suggesting that children similarly high on temperamental pleasure may have “hit it off” immediately and engaged in high but stable levels of positive interaction across the three laboratory visits. This finding is consistent with Fredrickson’s (1998) broaden-and-build theory of positive emotions, in which “joy creates the urge to play and be playful in the broadest sense of the word” (pp. 304–305). By broadening the individual’s thought-action tendencies (as in promoting play), positive emotions present opportunities for the individual to build physical, intellectual, and social resources. Although Fredrickson’s theorizing focused on the individual, she noted implications of such processes at the level of the dyad: “Shared experiences of positive emotions—through mutual smiles or social play—create not only mutual enjoyment in the moment, but also enduring alliances, friendships, or family bonds” (Fredrickson, 1998, p. 311). Whereas studies of temperament–peer associations have typically focused on components of negative emotionality, the current findings signal the need to better understand the role of positive emotionality in children’s peer experiences, especially with respect to acquaintanceship.

Results for child temperamental anger were equivocal. When child–child dyads were characterized by high similarity on anger proneness, we observed an increase in positive interaction over time when dyad mean anger was low, and a decrease in positive interaction over time when dyad mean anger was high. Yet, neither simple slope reached significance, and conclusions cannot be drawn from these results. Such null findings are consistent, however, with prior studies showing no evidence of homophily on negative temperamental characteristics (e.g., negative emotional-

ity, impulsivity) among existing friendship dyads (Dunn & Cutting, 1999; Gleason et al., 2005; Howes & Phillipsen, 1992).

Lastly, although prior studies of school-age children and preadolescents provide evidence of homophily on shyness among existing friendship dyads (e.g., Rubin, Wojslawowicz, Rose-Krasnor, Booth-LaForce, & Burgess, 2006), child–child similarity on social fearfulness did not predict child–child interaction quality in the current study. Other processes (e.g., mutual socialization, default selection) may explain friends' homophily on shyness in prior studies, and prospective studies have yielded evidence of socialization processes but not selection effects for homophily on other internalizing types of behaviors, such as depressive symptoms, among adolescent samples (e.g., Giletta et al., 2011). Despite null findings for child–child similarity on social fearfulness, dyads with higher mean levels of social fearfulness engaged in less positive interaction—a result that is consistent with Rubin et al.'s (2006) finding that shy school-age children had less positive friendships. Because social fearfulness often results in the child's inhibited behavior and withdrawal from interaction (e.g., Asendorpf, 1991), as well as less social engagement by peer partners (Walker et al., 2015), high levels of social fearfulness of one child may be sufficient to impede positive exchanges between newly acquainted children.

Taken together, the results provide support for the role of homophily in acquaintanceship processes among young, same-sex children—albeit homophily on *positive characteristics* (high attachment security; moderate to high pleasure). In prior studies of preschool-aged friends, null findings for homophily may have been attributable to a focus on negative characteristics such as impulsivity (e.g., Gleason et al., 2005). When homophily has been reported among young friends, evidence emerges for similarity on positive characteristics such as social skills (Howes & Phillipsen, 1992) and behavioral adjustment (Dunn & Cutting, 1999). In contrast, evidence of homophily in middle childhood and adolescence is robust, with homophily emerging for positive (e.g., Shin & Ryan, 2014) as well as negative characteristics (e.g., Mathys et al., 2013). Similarity on negative characteristics or deviant behavior may provide a common ground on which older children and adolescents, but not younger children, can “connect” and become friends. Yet, children who are similar on negative characteristics may also become friends by “default.” Sijtsema et al. (2010), for instance, reported that highly aggressive preadolescent boys preferred emotionally supportive and low-aggressive peers as friends, but their “realized” friendships (as assessed via mutual nominations) were with other highly aggressive, low prosocial boys. Because we observed children in a dyadic context, we can only speculate on transactions between dyadic- and group-level processes that may result in homophily on characteristics such as attachment insecurity or anger proneness. Extending investigations of young children's acquaintanceship processes to group contexts is needed to further test selection versus default hypotheses regarding homophily on negative characteristics.

A second reason why homophily has been less often observed for younger children may be age-related differences in children's degree of choice in selecting playmates. Whereas older children and adolescents likely have a broad pool of potential friends from which to draw and exercise relative autonomy in selection processes, preschool-aged children may have smaller peer networks and peer selection may be more dependent on factors such as propinquity or parental preferences. Likewise, homophilic “selection”

at any age may be a by-product of situational factors. Namely, similar children may be drawn to a particular activity or grouped together by a third party (e.g., teacher), and a relationship may develop not because the children share similar characteristics per se but because they simply have greater opportunity to interact (“induced homophily,” McPherson & Smith-Lovin, 1987). The current study design, in which previously unacquainted children were randomly paired, controls for these critical alternative explanations for homophilic selection.

We acknowledge several limitations of our study. First, young children tend to select same-sex playmates (Martin et al., 2013), and we matched children on sex. It could be argued that similarity effects of attachment or temperament are confounded with similarity on gender, although preliminary analyses revealed no gender differences on the study measures. Interestingly, toddler- and preschool-aged cross-sex friends may be especially likely to exhibit similarity on social skills and behavioral adjustment (Howes & Phillipsen, 1992), and research on homophilic selection and acquaintanceship processes among cross-sex dyads is warranted. Second, children were observed over three play sessions—the minimum number of time points necessary to examine change over time. Although we detected significant interdyad differences in rate of change in interaction quality and our predictors accounted for variation in rate of change, examining child–child interaction quality over more time points would permit tests of curvilinear effects that capture later stabilization, maintenance, or decreases in positive interaction. Lastly, because of the labor- and time-intensive nature of the repeated observations presented here, the number of dyads observed was modest. Nonetheless, our sample was considerably larger compared with the few other studies of this kind (i.e., 18 pairs observed by Gottman, 1983; 23 pairs observed by Schuhmacher & Kärtner, 2015), and we assessed child–child interaction in relatively extended observational sessions (25 min per visit), which increases confidence in the results.

Despite these limitations, the current study is the first to assess and find child–child similarity on attachment and temperament as predictors of child–child interaction quality during early childhood. In doing so, we bridge and extend the literature on homophilic selection of peer partners, on the one hand, and individual-level analyses characterizing attachment and temperament research, on the other hand. Our results indicate that children's characteristics are not simply additive in predicting which dyads engage in positive interactions. Rather, child–child similarity on positive attributes appears to pave the way for young children's coordinated, socially complex, and affectively positive play experiences—precisely the types of interactions that foster young children's social and emotional growth (Coplan & Arbeau, 2009) and characterize friendships during early childhood (Dunn, 2004; Howes, 1996). Friends are first strangers and then acquaintances. By understanding acquaintanceship processes early in the life course, we will be better positioned to foster children's positive interactions and relationships with each other.

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