

Declines in peer conflict from preschool through first grade: influences from early attachment and social information processing

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The transition from preschool to early school years is critical for the growth of social skills. Using data from the NICHD Study of Early Child Care and Youth Development (for this study $N=942$), the purpose of this study was to evaluate the longitudinal influence of attachment security and social information processing skills (social problem-solving and hostile attribution biases) on normative changes in peer conflict over the transition from preschool to first grade. Using latent growth curve modeling (LGM), this study found that children exhibited progressive declines in peer conflict over this period. Security of attachment (assessed via the Attachment Q-Set at 24 months) was related to lower rates of peer conflict in first grade, and steeper declines in peer conflict from 54 to 84 months. Differences in children's social information processing (assessed at 54 months) were marginally related to steeper declines in peer conflict. These findings suggest that the social skills and social expectations associated with early attachment security, together with subsequent advances in social information processing, are related to changes in peer conflict during the transition to school.

Keywords: peer conflict; social information processing; attachment security

Introduction

The quality of children's peer interactions in the preschool and early school years has enduring implications for school achievement as well as social and emotional development (Buhs & Ladd, 2001; NICHD Early Child Care Research Network, 2003). For this reason, it is important to understand patterns of growth in children's peer interactions, especially as children make the transition from preschool to school. During these years, rapid growth in the ability to effectively process social information, coupled with new opportunities to interact with peers, contribute to substantial shifts in the quality of playmate interactions, such as the degree of conflict with peers. It is especially valuable to know how children progress in their peer social skills, as trajectories of social development starting in kindergarten continue to affect school success throughout elementary school (Mantzicopoulos, 2003; McClelland, Acock, & Morrison, 2006). Using growth curve modeling, this study investigated overall levels of and changes in peer conflict between 54 months

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and first grade. Peer conflict can be defined as behaviors directed to another child that reveal hostility or antagonism, and can include aggression, criticism, verbal attacks, and other actions. The study investigated the role of attachment security and social information processing skills (indexed here by social problem-solving and hostile attribution biases) as sources of individual differences in peer conflict across this significant social developmental transition, and as influences on growth trajectories in peer conflict over time.

Peer conflict in late preschool and early school years

Peer relationships become increasingly central to children's lives during the preschool years, as children typically spend more time interacting with peers. Although interactions with peers during the preschool years are characterized by greater cooperation and more positive social behaviors than in younger years (Dunn, Cutting, & Fisher, 2002), conflicts are common and battles over objects and rules for play erupt frequently (Chen, Fein, Killen, & Tam, 2001; O'Brien, Roy, Jacobs, Macaluso, & Peyton, 1999). While peer conflict presents momentary challenges for children, these conflicts are useful for children's growing conceptions of self, others, and morality (Shantz, 1987), and provide children with opportunities to stretch their understanding of themselves and others. However, if children fail to learn methods for negotiating conflict, long-term difficulties in peer relationships can ensue. Children's growing insight into social interactions may help to decrease peer conflict by facilitating such peer behaviors as conflict resolution and turn taking (Chen et al., 2001). The focus of this paper on peer conflict recognizes the importance of children's efforts to manage conflict with other children as a central forum for the development of social skills and social understanding, and the significance of developmental changes in peer conflict for the growth of social competence.

Normative growth in children's abilities to understand and respond to difficult interactions with peers suggests that conflict with peers should decline with increasing age, but it is also possible that conflict increases because kindergarten children find themselves facing new social demands when beginning school (Hickman, 2006). Some research shows that as preschool children begin to acquire skills for negotiating conflict, negative interactions decline (Dodge, Coie, & Lynam, 2006), but other studies indicate stability in the amount of conflict children experience in interactions with peers from preschool to kindergarten (e.g., Ladd & Price, 1987; Olson, 1992). However, much of the work to date has focused exclusively on children with behavior problems, and relatively little is known about normative trajectories of developmental change in peer conflict as children move from preschool to school settings. Therefore, the first goal of this study was to describe normative changes in the level of peer conflict over the transition from preschool to school for a sample of children not at risk for behavior problems. In describing normative changes in the quality of peer interactions the research question asks: does peer conflict decrease, increase, or remain stable during this important transition?

Individual differences in peer conflict: attachment

Apart from normative trends, there are notable individual differences in the amount of conflict children experience with peers. This study was focused on two potential

sources of individual differences in peer conflict: the influences of attachment security and social information processing skills, indexed here by children's abilities to generate workable solutions to social problems (social problem-solving), and their tendencies to view ambiguous situations in a hostile light (hostile attribution biases).

Attachment researchers maintain that parent-child attachments early in life are important to social behavior with other partners (Bowlby, 1969). There are several reasons this might be true: the more competent social skills acquired by children in secure relationships, their more positive expectations for the behavior of other people, and the greater self-confidence of secure children would each predict that they would exhibit less conflict with peers compared to insecurely-attached children. Indeed, existing research suggests that children who have secure attachment relationships early in life display more social competence in the preschool and early school years (e.g., Pierrehumbert, Iannotti, & Cummings, 1985; Youngblade & Belsky, 1992). However, while studies like these have shown an association between attachment and peer competence, a meta-analysis indicated that the effect size linking attachment to peer social competence is moderate and becomes more pronounced as children grow older (Schneider, Atkinson, & Tardif, 2001). This makes understanding the association between attachment and growth trajectories in peer conflict especially important.

This study used data from the NICHD Study of Early Child Care and Youth Development (NICHD SECCYD) to address these questions. One advantage of this dataset is that attachment assessments were conducted with the Strange Situation at 15 months, the Attachment Q-Set (AQS) at 24 months, and the modified Strange Situation at 36 months in a large sample. This enables the comparison of findings using each of the three widely-used measures of attachment security in childhood. Although researchers have rarely done so, studies that have used all three measures have found that different attachment measures are differentially predictive of later outcomes, as might be expected given the different ages and psychometric qualities of each instrument (Thompson, 2006; see, e.g., McCartney, Owen, Booth, Clarke-Stewart, & Vandell, 2004; Raikes & Thompson, 2008).

With respect to peer competence, prior research using the NICHD SECCYD has found associations between the security of attachment and positive peer behavior using all three measures, but never together in the same study. Lucas-Thompson and Clarke-Stewart (2007) identified a modest association between AQS security and friendship quality in fourth grade, and McElwain and her colleagues also found a positive association between children's later friendship quality and attachment in the Strange Situation at 15 months (McElwain, Booth-LaForce, & Wu, 2011) and 36 months (McElwain, Booth-LaForce, Lansford, Wu, & Dyer, 2008). McElwain, Cox, Burchinal, and Macfie (2003) also reported that avoidant attachment at 15 months was predictively associated with greater aggression observed during play with friends at 36 months, and secure attachment at 36 months was concurrently associated with less peer aggression. These findings are consistent with the results of studies using other datasets that also find a positive association between attachment security and preschoolers' peer competence (Schneider et al., 2001), although none has examined trajectories of change in peer conflict into the school years. A second goal of this study, therefore, was to further examine the association of attachment security with later peer conflict, comparing results using all three attachment assessments, and particularly whether security is associated with faster declines in peer conflict from preschool through first grade. Steeper declines in rates of peer conflict for

securely- compared to insecurely-attached children could be another important reason for the greater social competence of children with secure attachments.

Social information processing and peer conflict

A substantial body of research has also shown that social information processing abilities have a powerful effect on children's social behavior (Crick & Dodge, 1994; Rubin, Coplan, Chen, Bowker, & McDonald, 2011). Social information processing, including thoughts, beliefs, and expectations about others, enables children to quickly assess social situations and respond to them efficiently, and is a primary source of individual differences in the quality of peer relationships (Dweck & London, 2004). However, social information processing may include attribution biases that contribute to inaccurate judgments, especially in ambiguous situations when the behavior of another can be construed either positively or negatively, and thus contribute to peer conflict.

Even for very young children, there are important individual differences in the quality of social information processing, which in turn affect the quality of interactions with peers. Tendencies to view ambiguous social situations in a negative light, or hostile attribution biases, first become influential in peer interactions during the late preschool and early school years (Runions & Keating, 2007). Children who interpret social information in a negative and inaccurate light are more likely to experience conflictual social interactions (see Rubin et al., 2011, for a review), while children who are more skilled at social problem-solving show higher levels of social competence (Booth, Rose-Krasnor, & Rubin, 1991). While the impact of social information processing on peer interaction has been documented both concurrently and longitudinally, little is known about its significance for *changes* in the amount of peer conflict in the preschool and early school years. Because peer interactions rely more heavily on complex social representations during the preschool and early school years, greater competence at social problem-solving and fewer tendencies to view ambiguous situations in a negative light at the start of this transition may be especially important for decreasing the amount of conflict children experience with peers.

Thus, a third important goal of this study was to document the role that early social problem-solving skills and hostile attribution biases play in developmental changes in children's peer conflict over time. This study examined attachment and social information processing jointly as predictors of peer conflict because both are important for peer interactions (e.g., Burks, Laird, Dodge, Pettit, & Bates, 1999) and, indeed, their influences on peer interactions may be related. Research indicates that securely attached children are less likely to see hostility in ambiguous situations (Cassidy, Kirsh, Scolton, & Parke, 1996), are better at accurately identifying emotions in others (Laible & Thompson, 1998; Ontai & Thompson, 2002; Raikes & Thompson, 2005, 2006), and are also more skilled at devising workable solutions to social problems (Raikes & Thompson, 2008). This suggests that the influences of both attachment security and social information-processing skills should be included in predictive models to understand the nature and developmental course of peer conflict during the school transition.

Our research was thus guided by several objectives. First, this study investigated normative change in conflict with peers over the transition from preschool and the early school years. This study anticipated a decline in peer conflict during this period

owing to growth in social skills and social understanding. Second, it was hypothesized that children with secure attachment relationships early in life would experience less conflict with peers in the early school years and, moreover, would exhibit faster rates of decline in peer conflict from preschool to the early school years. This study did not have specific hypotheses concerning which measure(s) of attachment security would be so predictive. Third, it was hypothesized that children with strong social problem-solving skills and who made fewer hostile attributions at the beginning of the transition from preschool to the school years would engage in fewer negative interactions with peers in the early school years, and that these features of social information processing would be associated with steeper declines in negative peer interactions over the transition from preschool to the early school years.

Finally, because both child gender (Hay, Zahn-Waxler, Cummings, & Iannotti, 1992; Murphy & Eisenberg, 2002) and socioeconomic status (Bradley & Corwyn, 2002) have been linked to peer conflict in earlier research, this study included gender and family income-to-needs ratio in our models. During the early school years, boys are less likely than girls to identify constructive, prosocial strategies in efforts to resolve conflict with peers and generally tend to employ more overtly aggressive strategies in their interactions with peers (Hay et al., 1992; Murphy & Eisenberg, 2002). As such, this study expected boys to engage in higher levels of peer conflict than girls. While this study expected lower socioeconomic status to be associated with higher levels of peer conflict (Bradley & Corwyn, 2002; Dodge, Pettit, & Bates, 1994), it was suspected that socioeconomic status may play a less significant role in affecting day-to-day peer conflict in this normative sample than it would in a sample of young children at-risk for conduct problems.

Method

Participants

Data were collected from 1364 families who participated in the NICHD Study of Early Child Care and Youth Development. A description of the sample characteristics and the measures of this study can be found in Table 1. Parents

Table 1. Sample description.

	Child's age at data collection	<i>N</i>	Percent	Mean	<i>SD</i>	Range
<i>Demographic characteristics</i>						
Gender:						
Male		563	51%			
Female		548	49%			
Family income-to-needs ratio	54 months-1 st Grade	1073		3.59	3.17	.10–56.96
<i>Child variables</i>						
Attachment security (AQS)	24 months	1084		.29	.20	–.49–.75
Social problem-solving	54 months	1050		.00	2.40	–6.68–5.54
Hostile attribution bias	54 months	1013		1.72	1.33	0–4.00
<i>Peer conflict</i>						
	54 months	1008		2.38	.46	1–3.75
	Kindergarten	800		2.25	.53	1–3.88
	1 st Grade	747		2.15	.53	1–3.75

and their infants were recruited through hospital visits across 10 locations in the US in 1991. All women giving birth in the hospitals during selected 24-hour intervals were screened for participation in the study. The families came from diverse sociocultural and socioeconomic backgrounds with 24% ethnic minority children and 40% of the families with an incomes-to-needs ratio of less than 2.0. On average, mothers completed 14.23 years of education ($SD = 2.51$), with 11% of the mothers never completing high school. The sample was comprised of 52% boys and 48% girls. Seventy-four percent of the total sample had data on peer conflict in preschool, 59% in kindergarten, and 55% in first grade. While actual numbers in each of the analyses vary due to missing data, the current analyses include participants with information on at least one of the variables of interest for the present study ($N = 942$).

Procedures

Children and families were followed from the time the child was one month old and continue to be studied. The current analyses focus on measurement occasions from when the children were 15 months, 24 months, 36 months, 54 months, and in kindergarten.

Measures

Security of attachment

There were three assessments of the security attachment when children were 15, 24, and 36 months old. At 15 months, infants and mothers visited a laboratory playroom and were observed in the Strange Situation procedure (Ainsworth, Blehar, Waters, & Wall, 1978). Experienced coders used standard assessment procedures to classify infants as securely-attached, insecure-avoidant, insecure-resistant, or insecure-disorganized from videotaped records. Additional training and intensive supervision were instituted to maintain validity of the coding. To assess intercoder reliability, Strange Situation assessments were double-coded, yielding an estimate of intercoder agreement of 82% ($\kappa = .69$).

Attachment security was assessed in the home when children were 24 months of age using the Attachment-Q Sort (AQS; Waters & Deane, 1985). Extensively trained observers visited the home of participants for approximately two hours to observe unstructured, everyday interactions between the mother and target child. Immediately following the observations, the 90-item Attachment Q-Sort was completed by the observers and resulting profiles were correlated with the profile of a prototypically secure child. Values of -1 to 1 were possible, with values closer to 1 indicating that the child was more secure and values closer to -1 indicating that the child was less secure. Inter-observer reliability using Pearson correlation was $.77$ with reliability reassessed within sites throughout the data collection period.

When children were 36 months old, they and their mothers were observed in the lab in a modified Strange Situation assessment developed by Cassidy, Marvin, and the MacArthur Working Group on Attachment (1992). From videotapes, teams of three well-trained coders used the procedures recommended by this group to assign children to securely-attached, insecure-avoidant, insecure-ambivalent, and

insecure-controlling/insecure-other classifications. Reliability was estimated based on 867 randomly paired cases, yielding intercoder agreement of 76% ($\kappa = .58$).

Children's social problem-solving

At 54 months, children's social problem-solving skills were assessed by presenting them with five stories depicting social problems like wanting to make friends with another child or gaining possession of a desired toy. The child was asked what he could say or do in each situation to accomplish the desired goal, and was prompted for at least two solutions. Children's score for "socially competent solutions" was a composite variable, created by standardizing and summing three variables: (1) the number of prosocial responses generated by the child, (2) the variety of responses generated for solving the social problems presented, and (3) the total number of solutions the child was able to produce for each story. Scores ranged from -6.68 to 5.54, with higher scores indicating more socially competent responses. Cronbach's alpha for this variable was 0.83. All coding was conducted in a central location, and raters achieved adequate reliability across all variables (kappas ranged from 0.83 to 0.91). This social problem-solving measure is the most widely used assessment of young children's thinking about social problem-solving and can be used for children as young as three years of age (Rubin, 1983).

Children's hostile attribution biases at 54 months

At 54 months, children were presented with cartoon drawings of ambiguous social situations in which the peer's intent was ambiguous (e.g., a peer knocks over a tower of blocks that the child had constructed) and were asked to say whether the peer's intent was positive or negative. Four stories were presented, followed by questions by the experimenter about what happened in the situation ("Was it an accident, or was it on purpose?"), and how the child would respond. A point was given for each time the child interpreted the peer's intent as negative, with a total score of 4 possible. Cronbach's alpha for this scale was 0.64. The mean for the sample was 1.72 ($SD = 1.33$), with higher scores indicating more instances of interpreting ambiguous peer intent in a hostile light. Hostile attributions tend to be significantly associated with children's problem behaviors in non-clinical samples, supporting the validity of this measure (Rubin et al., 2011).

Quality of peer interaction: peer conflict

Quality of peer interaction was assessed using a scale adapted from Clark and Ladd's (2000) Quality of Classroom Friends scale when children were 54 months, in kindergarten, and in first grade. First, mothers were asked to report on their child's interactions with one to two of their regular peers, including descriptions of the nature and frequency of their interactions (i.e., how often and where they played). These interactions could have been shared with friends or with other children encountered in play groups or other settings, and did not necessarily consist of the same peers on each assessment occasion. Mothers then rated interactions characteristic of the child-peer dyad, including interactional harmony, balance, and conflict on a 4-point scale (1 = strongly disagree to 4 = strongly agree). The Conflict subscale was used to assess peer conflict in this study. The Conflict subscale

consisted of the mean score of eight of the original 19 items that comprised the full Quality of Classroom Friends scale. The eight items assessed whether children: (1) compete for toys, (2) say “I hate you” or “I’m not going to play with you” when angry, (3) fight verbally, (4) grab and take things from each other, (5) criticize each other, (6) often show a pattern where one child dominates over the other, (7) accuse each other of unfairness, and (8) protest when the other child attempts to control play. The items on this measure thus encompass a broader range of conflict behaviors than those that would be included on a measure of aggression or externalizing behavior. In previous research, Clark and Ladd (2000) found that peer conflict was negatively correlated with peer acceptance, suggesting that this is a valid way to assess peer conflict in young children. Cronbach’s alphas for this subscale were consistent across measurement occasions: .83 (54 months), .80 (kindergarten), and .82 (first grade).

Data analyses

Growth curve analyses were conducted to: (1) describe patterns of change over time in peer conflict during the transition from preschool to school, and (2) determine the extent to which early attachment security, social problem-solving, and hostile attribution biases were sources of individual differences in the quality of peer interaction in first grade and as influences on growth trajectories over the transition from preschool to school. This study pursued these questions using latent growth curve modeling (LGM). Mplus version 6.1 (Muthén & Muthén, 1998-2011) with full information maximum likelihood (FIML) was used to carry out LGM in the analyses.

LGM offers advantages over traditional “fixed effects” models because it allows for the inclusion of individual variation on both the slope and the intercept (Curran & Muthén, 1999). Another advantage of LGM is that it is possible to perform these analyses even with missing data, which is a considerable benefit when working with longitudinal data. LGM uses FIML to estimate models with missing data, an approach that is preferable when data can be assumed to be missing at random (which was a reasonable assumption for this sample) in order to maximize statistical power by including as many cases as possible in the analyses (Enders, 2001). By using maximum likelihood estimation, this study was able to use all available data in the sample even though some cases did not have complete data on all of the measures used in the analyses presented here.

LGM is a powerful technique for studying individual differences in change over time (McArdle & Epstein, 1987). A basic assumption driving LGM is that individuals differ in their outcome levels and rates of change over time and that these differences are a function of differences in background characteristics such as gender, social problem-solving skills, and attachment security. Background characteristics or predictors are seen as covariates of peer conflict at a particular point in time (in this case, the intercept was placed at first grade) and the rate of change over time in peer conflict (Muthén & Khoo, 1998). Given that the outcome of interest was children’s scores on peer conflict in first grade and not children’s scores in peer conflict at the beginning of the study, time was centered at first grade; therefore, the intercept reported in the results represents children’s level of peer conflict in first grade (after the transition). The basic linear growth model is composed of two latent factors: the intercept and the slope (growth rate). Our main interest was determining how the slope, or growth rate, for peer conflict and the

intercept, or final scores, in peer conflict in first grade were influenced by children's early attachment security, children's social problem-solving skills at 54 months, and hostile attribution biases at 54 months (see Figure 1).

Several models were compared that included measures of attachment security at either 15, 24, or 36 months, or combinations of these measures (at 15 and 24 months, 24 and 36 months, or 15, 24, and 36 months), using a secure/insecure distinction for the Strange Situation measures, along with social problem-solving and hostile attribution bias measures. The model including the security of attachment at 24 months (AQS) alone yielded the best fit to the data¹. Consequently, the findings that follow report on this model.

Results

Preliminary analyses

Descriptive statistics for the study variables are presented in Table 1. With respect to the security of attachment at 15 months, 60% of children were classified as secure, 14% were insecure-avoidant, 8% insecure-resistant, and 15% disorganized (the remaining 3% were deemed unclassifiable, and were not included in analyses). For 36 month Strange Situation observations, 61% were classified secure, 5% insecure-avoidant, 17% insecure-ambivalent, and 16% insecure-controlling/insecure-other (a very small proportion were unclassifiable). These proportions are comparable to those found for nonclinical samples, and the AQS mean for this sample was also consistent with average scores for other non-risk samples (see van IJzendoorn, Vereijken, Bakermans-Kranenburg, & Riksen-Walraven, 2004). Average scores in peer conflict were consistently above 2.0 on the 4-point scale, indicating that children's scores for peer conflict were modest to moderate.

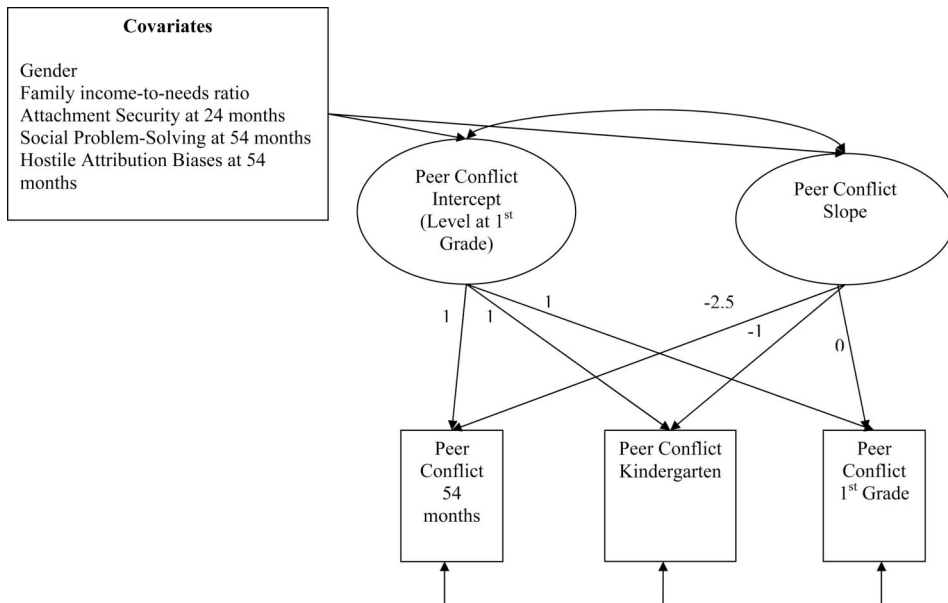


Figure 1. Conceptual illustration of the latent growth curve model examining predictors of changes in peer conflict during early childhood.

Bivariate correlations between continuous measures – the control variables (gender, family income-to needs ratio at 54 months), independent variables (social problem-solving at 54 months, hostile attribution biases at 54 months, and attachment security at 24 months) and the dependent variables (peer conflict at 54 months, kindergarten, and first grade) – are reported in Table 2. Significant correlations were found between peer conflict scores at 54 months, kindergarten, and first grade, indicating some consistency in individual differences. Attachment security at 24 months was significantly and negatively correlated with peer conflict on all occasions, although the magnitude of association was modest. Social problem-solving and peer conflict were not significantly correlated at any time. However, social problem-solving and attachment security were modestly and positively correlated. Hostile attribution bias was positively correlated with peer conflict at each time point, although again these associations were modest.

Latent growth modeling analyses

The basic linear growth model is composed of two latent factors, the intercept and slope, with the repeated measures of peer conflict over time as the indicators of the latent factors (see Figure 1). The first latent factor represents the intercept, in the present case peer conflict at the first grade assessment, and all factor loadings of the repeated measures are set to 1.0. The second latent factor represents the slope of the growth curve with the factor loadings set to represent linear change over time set to -2.5, 1, 0 (spaced according to relative time between assessments) (Curran, Harford, & Muthén, 1996).

Unconditional model

A two-factor linear growth model as described above was estimated for peer conflict across three time points. The first step in latent growth analyses was to test for the presence of change over time in peer conflict with no predictors in the model. The unconditional LGM provided acceptable fit to the data ($\chi^2 (df=1) = .36, p = .55$; RMSEA = 0.00, comparative fit index [CFI] = 1.0, SRMR = .01). Results indicated that there were significant decreases in children's scores for peer conflict over time, with scores for peer conflict decreasing an average of 0.09 points across each measurement occasion (i.e., from 54 months to kindergarten, kindergarten to first grade; $\beta = -.45, p < .01$). Both the intercept ($\alpha_{\text{int}} = 2.16, p < .001$) and the slope ($\alpha_{\text{slope}} = -.09, p < .001$) means were significantly different from zero, indicating that peer conflict significantly decreased over time. There was significant variation across individuals in final scores ($\psi_{\text{int}} = .18, p < .001$) and rates of change ($\psi_{\text{slope}} = .02, p < .001$) in peer conflict, indicating notable variations in children's individual trajectories. Further, final status was significantly related to the rate of change in peer conflict ($\psi_{\text{int,slope}} = .60, p < .001$), such that those children who showed faster declines in peer conflict across the three assessments also exhibited lower levels of peer conflict in first grade.

Conditional models

In the next models, variables hypothesized to affect children's peer conflict at first grade and their growth rates from 54 months to first grade were included. The

Table 2. Correlations among study variables in latent growth curve analyses.

Variable	1	2	3	4	5	6	7	8
1. Peer conflict at 54 months	–							
2. Peer conflict at Kindergarten	.43**	–						
3. Peer conflict at Grade 1	.36**	.51**	–					
4. Gender	.03	.06	.01	–				
5. Family income-to-needs-ratio	–.06	–.07	–.06	–.04	–			
6. Attachment security at 24 months	–.06*	–.14**	–.15**	–.12**	.11**	–		
7. Social problem-solving	.03	–.04	–.06	.14**	.08*	.15**	–	
8. Hostile attribution bias	.07*	.07*	.08*	.07*	–.08*	–.06	–.03	–

Ns = 611–1043; * $p \leq .05$; ** $p \leq .01$.

predictors included attachment status and social problem-solving at 54 months, and hostile attribution bias at 54 months. As noted earlier, the model including the security of attachment at 24 months alone provided the best fit to the data. Results are presented in Table 3 which include the standardized estimates. Attachment security at 24 months was significantly associated with peer conflict ($\beta = -.18$, $p < .01$), indicating that more secure children at 24 months engaged in less conflict with peers in first grade. Hostile attribution bias was positively associated with peer conflict, although modestly ($\beta = .08$, $p = .05$), indicating that children with such a bias at 54 months were more likely to engage in peer conflict in first grade.

There were also associations with the slope of the change in peer conflict between preschool and first grade. There was a significant negative association of attachment security with the slope ($\beta = -.13$, $p < .01$), indicating that peer conflict declined at a faster rate for children higher in security than for less secure children. Profiles of change for children with different levels of attachment security are depicted in Figure 2. This figure displays both the overall lower levels of peer conflict in more securely attached children, and their greater decline in peer conflict over time.

Contrary to hypotheses that social problem-solving would be associated with overall lower levels of peer conflict, the top half of Table 3 shows that there was not a significant main effect of social problem-solving on peer conflict in first grade ($\beta = -.05$, $p = .29$). However, the bottom half of the table shows that social problem-solving skills at 54 months were marginally associated with declines in peer conflict ($\beta = -.11$, $p = .06$). Children with greater social problem-solving skills at 54 months declined in peer conflict at a somewhat faster rate over time than did their

Table 3. Latent growth model summary of peer conflict: 54 months to kindergarten to first grade.

	B	SE	β	<i>p</i> -value
Intercept (conflict at first grade)				
Gender	.00	.04	.00	.98
Family income-to-needs ratio	-.01	.01	-.05	.25
Attachment security	-.38	.09	-.18	.01
Social problem-solving	-.01	.01	-.05	.29
Hostile attribution bias	.03	.01	.08	.05
Constant	2.26	.05	45.67	< .01
Slope (change over 54 months, kindergarten, and first grade)				
Gender	-.00	.02	-.00	.96
Family income-to-needs ratio	.00	.00	.00	.96
Attachment security	-.09	.04	-.13	.01
Social problem-solving	-.01	.00	-.11	.06
Hostile attribution bias	.00	.01	.02	.69
Constant	-.06	.02	-2.77	.01
Fit indices				
CFI	1.0	TLI	1.0	
RMSEA	.00	SRMR	.01	
X^2 , <i>df</i> , <i>p</i> -value	3.27, 6, .77	LL	-9138.47	
Parameters	18			

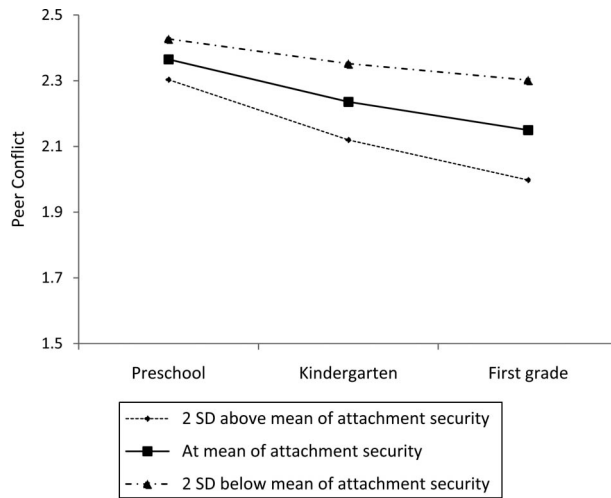


Figure 2. Differential effects of attachment security on children's peer conflict trajectories during early childhood.

peers who had poorer social problem-solving skills at 54 months. While children's hostile attribution biases were significantly associated with overall levels of peer conflict in first grade, hostile attribution bias was not associated with the rate of change in peer conflict over time. After including all predictor variables, there was still significant residual variation across individuals in final scores ($\psi_{\text{int}} = .17$, $p < .001$) and rates of change in peer conflict ($\psi_{\text{slope}} = .02$, $p < .01$).

In sum, results indicated that attachment security at 24 months and, to a lesser extent, social problem-solving skills at 54 months were associated with greater declines in peer conflict from preschool to first grade. Attachment security also was associated with lower levels of peer conflict in first grade, but social problem-solving was not. Children's hostile attribution biases in preschool were associated with higher levels of peer conflict in first grade, but did not have a significant association with growth rates. Overall, the fit indices in Table 3 indicate that this model was a very satisfactory fit to the data.

Discussion

Peer relationships in the preschool and early school years set the stage for long-term social and academic success. This study was designed to describe developmental changes in peer conflict during this key developmental transition. Several important conclusions emerge from this study. First, examining trajectories of developmental change reveal normative declines in peer conflict from preschool to the early school years. Second, there are meaningful individual differences in rates of change over time, which our analyses found to be associated with attachment security and, to a lesser extent, children's social information processing skills. Finally, attachment security, although it was measured at an earlier time, had a stronger association with overall levels of peer conflict in first grade than did social information processing. Finally, contrary to our predictions, neither socioeconomic status nor gender was a reliable predictor of overall levels or changes in peer conflict.

Normative positive trends in peer relationships were noted. Children engaged in decreasing conflict with peers over time, consistent with expectations that most children gain greater skill in negotiating conflict with peers and enjoy more positive relationships as they grow older (see Laursen, Finkelstein, & Townsend Betts, 2001, for a review). Although this conclusion has been implied in previous research, this is one of the first studies to document normative declines in peer conflict from the preschool to the early school years by tracking children's individual trajectories.

At the same time, there were notable individual differences in the quality of children's interactions with peers in first grade, and in how quickly children's peer conflict declined over time. First, attachment security at 24 months was associated with lower levels of peer conflict in first grade, and faster declines in peer conflict from preschool to the early school years. The benefits of a secure attachment for subsequent peer interaction has been noted in previous studies, of course, and may have several causes, including greater social skills developed in the context of secure parent-child relationships, secure children's greater self-confidence in social interaction, the more positive internal working models inspired by secure attachment, or a combination of these influences. In addition, this study is the first to demonstrate that early attachment security is associated with the rate of decline in peer conflict. The conclusion that secure attachment is associated with a steeper decline in peer conflict during the school transition is important because it suggests that security has accelerated benefits for the quality of peer interaction just as children are entering the more complex social environment of the primary grades and social skills are expanding. This may occur because of the compounding benefits of the social representations, self-confidence, and/or social skills afforded by a secure attachment at a time that social abilities are expanding. More broadly, the view that secure and insecure attachments are associated with different rates of change over time in socioemotional functioning is a new way of understanding the sequelae of attachment security in early childhood.

Further exploration of the prediction of social developmental trajectories from early attachment security is thus warranted. This is especially so because of the three measures of attachment security tested from the NICHD SECCYD, the AQS measure at 24 months was alone included in the model that provided the best fit to the data. Including Strange Situation classifications at 15 or 36 months did not improve model fit. These three attachment assessments differ in significant ways, of course, including the age of assessment, the psychometrics of the instrument, the approach to assessing the security of attachment (i.e., secure base behavior at home vs. laboratory separation-reunion procedure), and how differences in insecurity are characterized, each of which could contribute to the findings of this study. It is possible that the AQS had greatest predictive power because it relies on observations of secure base behavior in the home, which may provide a more multifaceted assessment of attachment-related predictors of social competence than laboratory-based procedures. In the end, however, this is a conjecture, and it will require more systematic studies of datasets that include multiple attachment assessments (including the NICHD SECCYD) to elucidate why different measures of the security of attachment yield differential associations with theoretically predicted sequelae.

Second, these results demonstrated a small but potentially meaningful role for social-information processing variables in peer conflict. Social problem-solving skills in preschool were marginally associated with rates of change in peer conflict, while

hostile attribution bias in preschool was associated with higher levels of peer conflict but not change over time. This suggests that children who think more coherently and positively about social interactions also may be faster in gaining the social skills that promote more adaptive conflict resolution with peers, but that a hostile attribution bias was important for affecting peer conflict levels at each age (according to the bivariate correlational analyses) but did not influence the rate of change in peer conflict during this period. Taken together, these results suggest that different facets of social information processing are important to different aspects of peer conflict in childhood, and also suggests that growth modeling is a useful method for providing a more complete picture of these developmental changes. Social problem-solving skill may be critical for helping children gain insight into methods for avoiding peer conflict as social competence develops, reflected in its association with rate of change, while hostile attribution biases may be more stable over time and thus are reflected in overall rates of peer conflict. The differential roles of different aspects of social information processing in peer conflict should be examined carefully in future research.

Third, this study failed to find effects of either gender or socioeconomic status in changes or overall levels of peer conflict. There are several possible reasons why this study failed to do so. First, the effects of gender on peer conflict may become more pronounced as children grow older. Much of the existing literature on peer conflict has drawn on samples of children in middle childhood, rather than in early childhood as this study did. In addition, many of the studies finding gender differences in peer interaction (including Runions & Keating, 2007, who also used the NICHD sample) have focused on externalizing behavior rather than peer conflict. Peer conflict may be more universally apparent among girls and boys than externalizing behavior, especially when it is assessed (as in this study) using more moderate indicators, such as criticism, squabbling, and competition. The null findings of this study concerning socioeconomic status were consistent with Runions and Keating (2007), and therefore may be due to characteristics of this sample. While some children in the NICHD study were economically disadvantaged, this sample was not nationally representative and there was selective attrition over time of the most economically disadvantaged subsample. Finally, the relatively small effect sizes for this study – a characteristic noted by other researchers who have used this dataset in similar ways (Runions & Keating, 2007) – may also have limited detection of gender or socioeconomic differences.

We note other limitations to the present study. First, most children in this sample showed moderate levels of negative interactions with peers at the start of this developmental transition, and average levels were lower at the final time point, suggesting that few children in this sample were at risk for serious difficulties in peer conflict. The prevalence of problem behaviors in peer interactions is low in most samples of children, and children in this sample were, on average, growing up in relatively low-risk homes. Second, this study relied on maternal reports for assessing peer conflict which may have biased the report of children's conflictual encounters, including associations with gender, owing to social desirability concerns or other reasons. Although direct observation of children's peer interaction would have been preferable, maternal reports have been usefully informative in other research on early peer interaction (see Rubin et al., 2011). Third, while individual differences in levels and growth trajectories in peer conflict were predicted by attachment and social information processing measures, considerable variance remains to be

explained. This can be studied in the future by examining the influence of family factors such as marital quality and maternal depression as well as using multiple measures of children's developing social cognition.

Overall, these findings suggest that the quality of peer interactions in young children naturally improves over time, but is also affected by the quality of parent-child relationships in the toddler years, and the manner in which children think about social interactions in preschool. One strength of this study was its reliance on latent growth modeling, which enables the examination of developmental trajectories over time. In addition to providing new insight into theoretical propositions regarding the development of social competence, this modeling also presents new opportunities to examine how attachment is associated with the growth of socioemotional competencies over time.

Note

1. Findings from these analyses are available on request from the corresponding author.

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