California Center for Population Research
University of California - Los Angeles

Spillover between Family and Peer Conflict in Adolescents' Daily Lives

Grace H. Chung
Lisa Flook
Andrew J. Fuligni

CCPR-020-08

August 5, 2008
Latest Revised: August 2008

California Center for Population Research
On-Line Working Paper Series

Running head: FAMILY AND PEER SPILLOVER

Spillover between Family and Peer Conflict in Adolescents' Daily Lives[1]

Grace H. Chung

Montclair State University

Lisa Flook

Andrew J. Fuligni

University of California, Los Angeles

(Submitted August 5, 2008)

[1] The study was supported by the Russell Sage Foundation and the preparation of this paper was supported by National Institute of Mental Health through Family Research Consortium IV postdoctoral fellowship awarded to the first author. Correspondence should be made to Grace H. Chung at the Department of Family and Child Studies, Montclair State University, 1 Normal Ave, Montclair, NJ 07043 chungg@mail.montclair.edu

Abstract

This study used a daily diary method to examine a bidirectional spillover of conflict between the family and peer domains among 578 adolescents in the ninth grade from Chinese, Mexican, and European backgrounds. Overall, we found support for the bidirectional nature of the daily spillover between family and peer conflict across gender, ethnicity, and generation. Adolescents' emotional distress partially explained the short term spillover between family and peer conflict. In addition, a longitudinal spillover was observed across the four years of high school across domains. Significance of these findings and suggestions for future research are presented.

Keywords: family conflict, peer conflict, adolescents, emotional distress, daily diary

Family and peers represent two prominent arenas for interpersonal interactions in adolescence (Larson, 1983). Although each domain has received a substantial amount of scholarly attention, our view of the relationship between the two has remained largely one-sided. For instance, research has extensively documented the impact of family dynamics (e.g., marital conflict and parenting) on adolescents' peer relations (e.g., Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; McCloskey & Lichter, 2003; McCloskey & Stuewig, 2001), but it is unclear whether and how events in the peer domain affect what happens in their home (Parke & O'Neil, 1999). In the present study, we addressed this gap by examining a bidirectional spillover of conflict between the family and peer domains during the high school years. By assessing conflict episodes in each domain on a daily basis, the present study complemented the previous research that relied primarily on global or aggregate measures of family and peer interactions to study the family peer linkage.

Evidence shows that conflict in each of these interpersonal domains is a normative but emotionally potent event in adolescents' daily lives. In families, adolescents begin to seek autonomy, which emerges as a common source of conflict with his or her parents (Laursen, 1995) and conflict with parents has been shown to become more intense during this period (Laursen, Coy, & Collins, 1998). Peer relations grow noticeably salient over family (Savin-Williams & Berndt, 1990) and trigger more frequent conflict (Noakes & Rinaldi, 2006). Moreover, as one may expect in the context of these changes, adolescents react to family and peer conflict with significantly greater distress than do preadolescents (Rudolph & Hammen, 1999). In light of this greater reactivity to conflict during the teenage years, we examined conflict spillover as a process that can effectively inform the nature of the family peer linkage, especially during the adolescent years. Thus, drawing from the spillover model (Margolin,

Christensen, & John, 1996; Repetti, 1996), we proposed that conflict with friends would spread beyond the sphere of peers into their home, and vice versa. To test this hypothesis, we employed a daily diary method in order to assess whether conflict in the context of family carries over to the peer domain, and vice versa. This approach enabled us to examine short term daily associations between family conflict and peer conflict within adolescents across fourteen days in ninth grade. We also made an exploratory attempt to identify a pathway for the proposed family peer spillover of conflict by examining adolescent emotional distress as a potential mediator. Further, we assessed not only short term, but also longitudinal spillovers of conflict between family and peers in both directions over the four years of high school.

Short Term Spillover of Conflict between Family and Peers

The spillover model (Almeida, Wethington, & Chandler, 1999; Margolin et al., 1996; Repetti, 1996; Repetti & Wood, 1997) provided a conceptual framework for the present study. According to this model, negative affect triggered by a negative interpersonal event in one setting spills over to affect a subsequent interaction in the other setting. Previous studies with younger children have drawn from this theory to demonstrate that what happens in the peer group does not stay there but carries over to alter children's subsequent interactions with family members (Lehman & Repetti, 2007; Repetti, 1996). For instance, Repetti (1996) and Lehman and Repetti (2007) found short term effects of fluctuations in stressful peer events earlier in the day on the child's negative behavior at home later in the evening. Other researchers have observed that family patterns were also re-enacted in subsequent peer relations (Cooper & Cooper, 1992). Despite the evidence for family peer spillover of negative events in both directions, a unidirectional model of spillover has dominated the field without considering the other course of effect that the spillover might take place. Further, adolescence is a developmental

period in which a peer to family spillover has not received much attention (Brown & Mounts, 2007; Parke & O'Neil, 1999). To complement the prior research, we employed a bidirectional model of spillover by examining short term associations between family conflict and peer conflict in both directions across fourteen days. A longer duration of the study compared to other studies (two and five days in the work by Repetti (1996) and Lehman & Repetti (2007), respectively) enabled us to assess lingering effects of spillover more effectively by examining whether daily increases in peer conflict were associated with more family conflict, and vice versa, the same day, the next day, and even two days later. Further, controlling for prior day conflict in each of these lag spillover models enhanced our confidence with which to infer causal directions of the spillover between the family and peer realms in adolescence.

A Daily Diary Approach to Spillover

A daily diary approach was especially useful for capturing micro processes of spillover more immediately as it occurs in adolescents' daily lives. Flook and Fuligni (2008) also employed this method and successfully assessed a daily spillover of stress between family and school among adolescents. In the present study, we examined short term spillovers of conflict within persons across fourteen days. This within persons design allowed for the assessment of changes in conflict that are detected within the same adolescent over a relatively short interval of time (Repetti & Wood, 1997). Thus, an issue of potential confounding factors that are associated with a more traditional, between persons design, such as personality attributes and chronic familial or individual circumstances, is taken care of in studies that employ a within persons design. In addition, having adolescents report on episodes of conflict in each of the family and peer domains each day over a two week period reduced a reporter's retrospective recall bias because this daily reporting allowed them to report events closer to the time that they had

occurred (Almeida, Wethington, & Chandler, 1999). Further, the micro longitudinal aspect of the design can provide a more accurate assessment of the temporal sequencing in which conflict carries over from one domain to another as compared to the traditional longitudinal design because it is easier to control for intervening variables with a relatively shorter interval between the two time points (Almeida et al., 1999).

An Explanatory Mechanism of Spillover

Scholars have expressed a growing need for identifying an explanatory mechanism for family peer linkages (Parke & O'Neil, 1999). To begin this explorative mapping process, we considered adolescent emotional distress as one possible way in which the short term spillover of conflict could take place. According to Almeida, Wethington, and Chandler (1999), adolescents felt more emotionally distressed on days in which their parents argued with each other as well as on days when they argued with their mother or father. In addition, the highest percent of adolescents who had experienced conflict with peers identified anger as the most common affect during and after the conflict (Adams & Laursen, 2001). On the basis of this evidence, we proposed that an adolescent may react to family conflict by being distressed, which in turn may increase his or her likelihood of later engaging in conflict with peers, and vice versa. Thus, our goal was to specify a pathway underlying our proposed spillover of conflict between the family and peer domains by examining adolescent emotional distress as a mediator.

Group Differences in Spillover

One shortcoming of research on family peer linkages is inattention to the possibility of group differences in spillover (Brown & Mount, 2007). In this study, we addressed that gap by assessing whether daily spillovers of conflict between family and peer domains are affected by gender, ethnicity, and generation. There are several reasons to expect these group differences.

Research suggests that females tend to experience greater psychological distress as compared to males in the context of interpersonally stressful events (Almeida & Kessler, 1998; Davies & Windle, 2001). Drawing on this evidence, we expected that girls in this study would engage in more conflict with peers as compared to boys on days in which they encountered family conflict. Regarding ethnic differences, we tentatively hypothesized that peer to family conflict spillover would be less likely for adolescents from Chinese and Mexican backgrounds as compared to European adolescents because familial harmony and parental respect are key values of importance in these families (Chao & Tseng, 2002; García-Coll & Vázquez García, 1995). Given that recent immigrant adolescents may experience higher levels of acculturative stress in both peer and family settings (Romero, Carvajal, Valle, & Orduña, 2007), generational differences were also expected. We speculated that family and peer spillover of conflict would be more likely among adolescents of the first generational status than the second or third generation adolescents.

Longitudinal Spillover of Conflict between Family and Peers

As family and peers continue to be two major interpersonal domains throughout the adolescent period, we assessed whether our proposed spillover effects between the family and peer realms persisted across the high school years. Specifically, we examined if an average level of peer conflict in ninth grade predicted family conflict overall in twelfth grade, controlling for family conflict in ninth grade. In addition, we examined a longitudinal association between family conflict in ninth grade and peer conflict in twelfth grade, also controlling for the average peer conflict in ninth grade. The goal here was to see whether conflict in the family domain continued to have lingering effects in shaping adolescents' peer based experience four years later, and vice versa.

Research Questions

The following five key questions guided our current investigation of spillover between family and peer conflict among adolescents from Chinese, Mexican, and European backgrounds.: (1) Does conflict in family carry over to adolescents' peer domain the same day, the next day, and two days later? (2) Does conflict with peers carry over to adolescents' family domain the same day, the next day, and two days later? (3) Do these daily associations vary according to adolescents' gender, ethnicity, and generation? (4) Does emotional distress mediate the spillover of conflict between the family and peer domains? (5) Does family conflict in ninth grade predict peer conflict in twelfth grade, and vice versa?

Method

Sample

Ninth grade students were recruited from three public high schools in the Los Angeles metropolitan area. Approximately 65% of the recruited students participated in the study, resulting in a total sample of 783 ninth-grade students from various ethnic, socioeconomic, and immigrant backgrounds. The target sample for the current study consisted of 578 adolescents from Mexican (n = 235), Chinese (n = 172), and European (n = 171) backgrounds who completed daily diary checklists in the ninth grade (M = 14.87 years, SD = 0.38). Approximately 18% and 31% of adolescents from Mexican and Chinese backgrounds, respectively, were of the first generation, that is, foreign-born. The majority of the adolescents from Mexican (57%) and Chinese (64%) backgrounds were of the second generation who were born in the U.S. but had at least one foreign born parent. Relatively smaller percentages of adolescents from Mexican (24%) and Chinese (5%) backgrounds, as compared to European adolescents (73%), were of the third generation where at least one of their parents was also born in the U.S. Our sample was fairly

evenly distributed by girls (52%) and boys (48%). A subsample for the longitudinal analyses across the high school years consisted of 376 adolescents from Mexican, Chinese, and European backgrounds who participated in both ninth and twelfth grades.

The three schools reflected the ethnic compositions and socioeconomic distribution of the communities where students resided. The first school consisted primarily of students from Latin American and Asian families with lower middle to middle class educational, occupational, and financial backgrounds. Students at the second school mostly came from families with Latin American and European backgrounds and lower-middle to middle class standing. The third school included students mainly with Asian and European backgrounds from middle to upper-middle class families. No single ethnic group dominated any one school.

Procedures

Students who provided their own assent with parent consent forms completed a 30-minute long questionnaire during school time. Students then received a packet of daily diary checklists and were instructed to complete one at the end of each day over fourteen days. On each checklist adolescents reported whether various events had occurred that day, including family conflict, peer conflict, and their emotions. Each checklist took about 5-10 minutes to complete. Students placed each completed diary in a manila envelope and stamped across the seal with a hand-held electronic time stamper provided by the researchers. The stamper marked the current date and time and was programmed so that the date and time could not be altered. After the two-week study period, research assistants visited schools to collect completed diaries. Consent forms and study materials were available in English, Spanish, and Chinese. Spanish and Chinese versions were translated from the English version and then back-translated by bilingual speakers. Seven participants chose to complete the questionnaire in a language other than

English (four in Chinese and three in Spanish). Students were paid $30 for participating and two movie passes were provided if they completed diaries correctly and on-time. Approximately 95% of the diaries were completed and returned; 86% of these were completed on time, meaning either at night or before noon the following day.

Daily Diary Checklist Measures

Family conflict. To assess family conflict, adolescents were asked each day for fourteen days to indicate whether the following had occurred: (1) Argued with your mother about something, (2) Argued with your father about something, (3) Argued with another family member about something, and (4) Got along with your parents. Adolescents checked the box if an event had occurred (coded as "1") but otherwise left it blank (coded as "0"). Responses to item (4) were reverse coded so that an unchecked response indicated that an adolescent "didn't get along with your parents" that day. All scores were summed to create an index of daily family conflict (M = .52, SD = .84, Range = 0-4). For between person, individual level analyses across the high school years, a mean score was calculated for an overall estimate of family conflict in each year of the study (9^{th} grade: M = .12, SD = .12; 12^{th} grade: M = .13, SD = .10).

Peer conflict. Each day for fourteen days, adolescents reported whether the following had occurred: (1) Argued with a close friend, boyfriend, or girlfriend and (2) Didn't get along with your friends. They were the original items and we did not reverse code them. Adolescents checked the box if an event had occurred (coded as "1") but otherwise left it blank (coded as "0"). All marked items each day were summed as an indicator of daily peer conflict (M = .39, SD = .55, Range = 0-2). An index of average peer conflict was obtained for each year by summing the number of marked items over the fourteen days (9^{th} grade: M = .18, SD = .15; 12^{th} grade: M = .19, SD = .14). The longitudinal sample experienced lower levels of peer conflict (M = .18, SD =

.15) as compared with adolescents who participated only in ninth grade (M = .22, SD = .15; $t(388.61) = 2.92$, $p<.01$).

Emotional distress. Daily emotional distress was assessed using the anxiety and depression subscales of the Profile of Moods States (POMS; Lorr & McNair, 1971). These two subscales have been used successfully to measure daily emotional distress in previous diary studies (Bolger, Zuckerman, & Kessler, 2000; Fuligni, Yip, & Tseng, 2002). Participants reported each day on a 5-point Likert-type scale (range = 0: not at all to 4: extremely) the extent to which they felt each item for each subscale. The anxiety subscale items included "on edge", "nervous", "uneasy", and "unable to concentrate". The depression subscale items included "sad", "hopeless", and "discouraged". Higher scores reflect greater anxiety and depression. To assess daily emotional distress, we combined the two subscales by averaging them to create a single daily score.

Results

Analysis Plan

Multilevel modeling was applied to examine within and between subjects spillover effects at the daily level. These daily level analyses were done with the entire ninth grade sample. Daily and individual-level equations were estimated simultaneously using HLM statistical software (Raudenbusch & Bryk, 2002). A similar pattern of results emerged from HGLM and standard HLM analyses; therefore, for ease of interpretation, results of standard HLM models are presented. Daily-level equations allowed for the estimation of bidirectional associations between family conflict and peer conflict, on the same day as well as one and two days apart. Individual-level equations allowed for estimating whether group factors such as gender and ethnicity moderated those daily level associations.

Only diary sheets that were completed on time were included in these analyses. Late diaries were excluded in order to reduce potential biases in reporting. First, the proposed family to peer spillover hypothesis was tested, while controlling for prior day levels of peer conflict. Likewise, one and two-day lagged spillover analyses were performed controlling for prior day levels of the outcome variable in each equation. The same plan of analysis was followed in order to examine spillover in the opposite direction. Second, gender, ethnicity, and generation were examined as potential moderators of family to peer spillover, and interactions between ethnicity and gender were examined. The same tests of potential moderations and interactions were conducted for peer to family spillover. Third, distress was examined as a mediator in the association between same-day and next-day family and peer conflict as well as the reverse association. Next, we examined between subjects effects of high levels of conflict over time, from 9th to 12th grade, using regression analyses.

Attrition Analyses

Adolescents who participated in both ninth and twelfth grades reported significantly lower levels of family conflict (M = .12, SD = .12) as compared to those who participated only in the ninth grade (M = .15, SD = .14; t(358.11) = 2.39, p<.05). There was no significant difference in the level of emotional distress between the two groups (t(374.76) = 1.13, p>.05).

Spillover between Family and Peer Conflict

Family to Peer Spillover

The following daily-level equation shows the basic model for spillover of family conflict on to peer conflict. As shown below, peer conflict is predicted by family conflict the same day, while controlling for peer conflict from the prior day:

$$Peer\ conflict_{ij} = b_{0j} + b_{1j}(family\ conflict) + b_{2j}(peer\ conflict_{t-1}) +$$

$b_{3j}(\textit{week of study}) + e_{ij}$ (1)

Peer conflict on a given day (i) for a particular adolescent (j) was modeled by each individual's intercept (b_{0j}) and family conflict that same day (b_{1j}). Prior day peer conflict (b_{2j}) was included to parse out the effects of any peer conflict from the previous day and to capture the unique effect of family conflict. In order to reduce possible confounds resulting from effects of the repeated-measures diary method, the week of the study (effect coded -1 for week one, days 1 to 7, and 1 for week two, days 8 to 14) was entered as a control variable in all equations (b_{3j}). The error term in the equation represents unexplained variance (e_{ij}).

In order to test one-day lag spillover, the basic model above was slightly modified so that peer conflict was predicted by prior day family conflict, while controlling for peer conflict the prior day. Prior day peer conflict was included to control for prior day effects and to capture the spillover across days resulting from events in the family domain carrying over to influence changes in conflict in the peer domain the next day. Again, week of the study was entered as a control variable. For two-day lagged spillover, prior day family conflict and peer conflict from the previous day and two days before were included as control variables to isolate the spillover resulting from conflict in the family domain carrying over to the peer domain over a span of three days.

As shown in Table 1, family conflict significantly predicted more peer conflict the same day, even after controlling for peer conflict the prior day. Spillover effects continued to persist one and two days after the occurrence of the initial peer conflict, while controlling for prior levels of conflict. That is, family conflict uniquely predicted peer conflict, not only the same day, but also the next day, and even two days later.

Peer to Family Spillover

The same plan of analysis was followed in order to examine spillover from peer conflict to family conflict. The following daily level equation is the basic model used to predict family conflict from same-day peer conflict, controlling for family conflict on the prior day:

$$\textit{Family conflict}_{ij} = b_{0j} + b_{1j}(\textit{peer conflict}) + b_{2j}(\textit{family conflict}_{t-1}) + b_{3j}(\textit{week of study}) + e_{ij} \quad (2)$$

This model is similar to the model testing spillover in the reverse direction, except here the variables are reversed, with family conflict as the outcome and peer conflict as the predictor. Family conflict on a given day (*i*) for a particular adolescent (*j*) was modeled by each individual's intercept (b_{0j}) and peer conflict experienced that same day (b_{1j}). Prior day family conflict (b_{2j}) was included to control for any prior day effects and thereby capture the unique effect of peer conflict. The week of the study (b_{3j}) was entered as a control variable. The error term in the equation represents unexplained variance (e_{ij}).

For one day lagged spillover of peer to family conflict, prior day family conflict was included to control for any prior day effects and thereby capture the spillover of peer conflict on to changes in family conflict the next day. Two-day lagged spillover was modeled with prior day peer conflict, prior day family conflict and family conflict two days earlier included as controls to capture spillover of experiences from the peer domain to the family domain over a span of three days.

As shown in Table 2, peer conflict modestly but significantly predicted an increase in family conflict the same day controlling for prior day family conflict. Additional lagged spillover analyses indicated that peer conflict continued to independently predict family conflict

the next day, but the effect was no longer significant two days later. The same-day and next-day associations remained significant when controlling for prior levels of family conflict.

Moderation

Family to Peer Spillover

In order to examine whether the spillover of family conflict on to peer conflict varied by gender, ethnicity, or generation, individual level equations were mapped on to the daily level equations from above. Gender and ethnicity were tested together in the same model (Equations 3 & 4). Then generational effects were tested while controlling for ethnicity.

(Intercept) $b_{0j}=c_{00} + c_{01}(gender) + c_{02}(Mexican) + c_{03}(Chinese)+ u_{0j}$ (3)

(Slope) $b_{1j}=c_{10} + c_{11}(gender) + c_{12}(Mexican) + c_{13}(Chinese) + u_{1j}$ (4)

The intercept equation (3) tested whether there are differences in the average levels of peer conflict according to gender, ethnicity, and generation. The slope equation (4) examined gender, ethnicity, and generation as moderators of family to peer spillover effects. Gender was effect coded, -1 for males and 1 for females. Ethnicity was dummy-coded, with adolescents from European backgrounds designated as the baseline group for comparison with adolescents from Mexican and Chinese backgrounds. Comparisons between adolescents from Mexican and Chinese backgrounds were made by changing the baseline group in Equations 3 and 4 to Mexican American adolescents. Generational status (first, second, and third generation) was dummy-coded and tested in the same manner described for ethnicity. Error terms contributing to unexplained variance are represented by u_{0j} and u_{1j}. Error terms were specified as random or fixed according to the significance of variance estimates.

There were no differences in the average level of daily peer conflict by gender, ethnicity, or generation. Likewise, gender and ethnicity did not moderate the spillover of same-day family

conflict on to peer conflict. However, same-day spillover of family to peer conflict was significantly moderated by generational status. First generation adolescents experienced more peer conflict on days when they reported family conflict as compared to third generation adolescents ($b_{1st\ gen} = .09$, $b_{2nd\ gen} = .06$, $b_{3rd\ gen} = .02$, $p<.05$). There was not substantial variability in one- and two-day lagged spillover, as indicated by the non-significant variance component for family conflict predicting friend conflict one and two days later; therefore, individual-level moderators were not examined for these associations. These results indicate that, regardless of gender and ethnicity, adolescents experienced more friend conflict when family conflict occurred the same day, one day, or two days prior. For first generation adolescents, same-day spillover of family to peer conflict was even more pronounced than for third generation adolescents.

To test for interactions between gender and ethnicity, an interaction term was added as an additional individual level predictor to Equations 3 and 4. No significant gender by ethnicity interactions emerged.

Peer to Family Spillover

At the individual level, the same equations, as described in Equations 3 and 4 above, were used to examine differences in daily family conflict and spillover of peer to family conflict according to gender, ethnicity, and generation.

No differences emerged in the average level of daily family conflict by gender. Ethnic differences were found such that Chinese American adolescents reported less family conflict on average as compared to European American adolescents ($b_{CA} = .28$, $b_{EA} = .38$, $b_{MA} = .36$, $p<.01$). However, this ethnic difference disappeared once generation was taken into account ($b_{CA} = .38$, $b_{EA} = .42$, $b_{MA} = .43$, $p>.10$), and generation was a significant predictor of average daily level of family conflict. First generation adolescents reported less family conflict on average than third

generation adolescents ($b_{1st\ gen}$ = .31, $b_{2nd\ gen}$ = .38, $b_{3rd\ gen}$ = .42, p<.01). With regard to spillover, boys exhibited more spillover of peer conflict on to subsequent family conflict. That is, when boys reported peer conflict they experienced more family conflict the following day (b_{boy} = .10, b_{girl} = .01, p<.05). Same-day and two-day lag spillover effects, however, did not differ by gender. There were no significant ethnic or generational differences in the spillover of peer conflict on to family conflict the same-day, one day, or two-days later. These results indicate that spillover of peer to family conflict was robust across gender and ethnicity. Stronger spillover effects were detected only for boys in the case of peer conflict predicting next day family conflict. No significant gender by ethnicity interactions were found.

Mediation

Daily emotional distress as a mediator of the spillover of family to peer conflict

Given the significant daily level association between family and peer conflict, additional analyses were conducted in order to examine whether this association was mediated by adolescent's daily distress. The extent to which daily adolescent distress mediated the daily association between family and peer conflict was examined as follows for same-day peer and family conflict:

$$\textit{Peer conflict}_{ij} = b_{0j} + b_{1j}(\textit{emotional distress}) + b_{2j}(\textit{family conflict}) + b_{3j}(\textit{peer conflict}_{t-1}) \; b_{3j}(\textit{week of study}) + e_{ij} \quad (5)$$

Prior day emotional distress was tested as a mediator of prior day family conflict predicting next day peer conflict. Likewise, emotional distress from two days prior was tested as a mediator of two day prior family conflict predicting later peer conflict.

These mediation analyses were conducted in accordance with the guidelines suggested by Kenny, Korchmaros, and Bolger (2003). Using this strategy takes into account the covariance

between lower level paths in multilevel models with variability in the paths across upper level units. Specifically, the strategy involves reporting the amount of variability in the total effect of the predictor (i.e., family conflict) that is accounted for by variation in the mediator (i.e., emotional distress). Results indicated that emotional distress was a significant predictor of same day peer conflict (b = .08, p<.01), and the variance of emotional distress explained 29% of the variation in the effect of family conflict on peer conflict. Emotional distress did not mediate one or two-day lagged spillover of family to peer conflict.

Daily emotional distress as a mediator of the spillover of peer to family conflict

The extent to which daily adolescent distress mediated the daily association between peer and family conflict was examined as follows:

$$\textit{Family conflict}_{ij} = b_{0j} + b_{1j}(\textit{emotional distress}) + b_{2j}(\textit{peer conflict}) + b_{3j}(\textit{family conflict}_{t-1}) + b_{4j}(\textit{week of study}) + e_{ij} \quad (6)$$

Prior day emotional distress was tested as a mediator of prior day family conflict predicting next day peer conflict. Because two day prior peer conflict was not a significant predictor of family conflict, emotional distress from two days prior was not tested as a mediator.

Daily distress was a significant predictor of family conflict (b = .24, p<.01). Daily level mediational analyses (Kenny et al., 2003) indicated that 26% of the variation in the effect of peer conflict on family conflict was explained by the variance of adolescent distress. Emotional distress one day prior was also a significant predictor of next day family conflict (b = .04, p<.05) and mediated the association between prior day peer conflict and next day family conflict. Specifically, variation in emotional distress one day prior explained 15% of the variance of the overall effect of prior day peer conflict on family conflict next day.

Longitudinal Associations across High School

Longitudinal spillover between family conflict and peer conflict was examined between 9th and 12th grade using multiple regression analyses. Average family conflict in 9th grade was entered as a predictor of average peer conflict in 12th grade while controlling for earlier family conflict in 9th grade. Similarly, average peer conflict in 9th grade was examined as a predictor of average family conflict in 12th grade while controlling for peer conflict in 9th grade. Results showed that more family conflict in 9th grade predicted more peer conflict at the end of high school ($\beta = .13$, $t(375) = 2.45$, $p<.05$). Likewise, a higher level of peer conflict in 9th grade predicted more family conflict four years later ($\beta = .13$, $t(375) = 2.51$, $p<.05$). No gender or ethnic differences emerged in these longitudinal associations.

Discussion

We used the daily diary method to examine a bidirectionality of the family and peer linkage by focusing specifically on conflict in each domain experienced by adolescents from Chinese, Mexican, and European backgrounds. Results of this study underscore the interrelatedness between family and peers during adolescence, where family conflict led to increases in peer conflict, and vice versa. The present study is the first to have captured a microscopic view of this reciprocity at the daily level and its longer term association across the high school years. Further, the daily diary method served as an essential tool for taking a snapshot of how conflict spills over across family and peer worlds in adolescents' daily lives. By controlling for prior conflict, this method established a temporal order of events, suggesting a directionality of spillover. Findings reported in this article advance our current understanding of family and peer linkage during adolescence in several important ways as follows.

Consistent with our expectations, the spillover between family and peer conflict was a two way phenomenon. This finding adds to the previous developmental research that has taken primarily a unidirectional approach to examine family and peer linkage. Following family conflict, adolescents tended to engage in more conflict with peers, and vice versa, demonstrating that family and peers exert mutual influences on each other. Although the notion of interdependence between family and peers first emerged decades ago (see Bronfenbrenner, 1986), an empirical effort to understand it is a new development in the field. Our study can, thus, serve as a starting point to expand this area of research.

Current findings also offer new insights about the impact of conflict in the daily lives of adolescents. Spillover of conflict has been previously documented within the family system, where conflict carried over from an interparental dyad to a parent-child subsystem (Almeida et al., 1998). Our data expand the prior research by establishing interpersonal conflict as an event that triggers a domino effect beyond the family or peer context in which conflict had initially occurred, affecting adolescents' subsequent interactions in the other domain. Such a chain reaction across the family and peer worlds is set off specifically by conflict in either realm, which highlights the extent to which conflict per se can cause changes in adolescents' daily experience with family or friends.

Additionally, it is important to note that the duration of family to peer spillover was longer than that of peer to family. In other words, the effect of family conflict persisted longer. It is possible that peer conflict may be more quickly resolved and perceived more favorably, thus its effect on adolescents' family domain might be less enduring. According to Adams and Laursen (2001), adolescents reported relatively more friendly affect after peer conflict as compared to family conflict, whereas conflict with family accompanied more of neutral or angry

affect afterward. Also, adolescents used more positive conflict resolution skills in response to peer conflict than to family conflict. Overall, in both relationships, adolescent affect after the conflict was associated with their resolution styles. Consistently, as previous work by Cooper and Cooper (1992) indicated, adolescents with positive conflict resolution skills (e.g., negotiation) were less likely to display negative emotions in family interactions subsequent to negative peer interactions. It might be worthwhile for future studies to explore how adolescents' conflict resolution styles might facilitate or hinder spillover between family and peer conflict.

Although family and peer conflict spillover was apparent across gender, ethnicity, and generation for the most part, two out of eighteen group differences emerged that are worth noting here. Although adolescents of different generations reported similar levels of family conflict on average, the first generation (i.e., foreign born) adolescents were more likely to experience conflict with peers as compared to their third generation counterparts when family conflict occurred even after controlling for ethnic backgrounds. The foreign born adolescents may be more affected by family conflict perhaps because it may be more disturbing particularly in the context of immigrant families. For these adolescents, family may be a central source of support in the process of adjusting to the new country following immigration.

Moreover, in contrast to our expectation, the effect of peer conflict was stronger for boys in terms of being associated with more family conflict the following day. Previous studies show that girls are more likely to use cooperative and prosocial tactics to solve conflict specifically with peers as compared to boys who tend to use more assertive and aggressive strategies (Noakes & Rinaldi, 2006; Rose & Asher, 1999). According to Noakes and Rinaldi (2006), girls, as compared to boys, may end up feeling relatively more positive following conflict with friends

since girls tend to resolve conflict more quickly and in a pleasant manner, thus peer to family spillover may be less likely for girls.

The present study found support for adolescents' daily emotional distress as a partial explanation for the short term spillover between family and peer conflict. Our modest-sized mediation effect indicates that other things could be operating but our study found that emotional distress occurring specifically as a result of conflict partially explained the spillover of conflict between family and peer domains. Thus, it highlights the importance of fostering adolescents' ability to regulate emotional distress incurred by the conflictual interaction. Given that previous studies have primarily focused on pathways at the individual level among younger children (Ladd, 1992; Parke, Burks, Carson, Neville, & Boyum, 1994), the present study contributes to the extant research by capturing the daily processes of spillover in an understudied developmental period. Adolescents' anger, rather than depressed or anxious feelings, may be a stronger mediator of the conflict spillover. It will be important for future research to identify other daily level mechanisms through which the spillover between family and peer conflict might occur.

In addition to the short term effect of daily conflict across domains, we documented that the spillover effect sustained over the years of high school. It shows that daily conflict can have a lasting impact on the ways in which adolescents interact with family and peers even years later. This is powerful because it shows that the effect of daily episodes of relational conflict is so enduring that it predicts greater levels of conflict across domains over the high school period. The results further emphasize the previously suggested importance of helping adolescents acquire skills to alleviate emotional distress associated with conflict.

Findings reported in this article must be interpreted with limitations of the study in mind. A multi-faceted approach to assess conflict is needed. For instance, content and intensity of conflict would provide a more comprehensive measure of family and peer conflict in future studies. Assessing multiple moderators of spillover, such as conflict resolution styles, will identify what might protect adolescents from conflict spillover across their daily interpersonal domains. Also, it will be important to examine daily and long term consequences of conflict on various aspects of family and peer relations other than conflict, such as engaging in deviant/antisocial peer behaviors and seeking peer or family support. Further, our reliance solely on adolescents' self-reports to assess family conflict is a limitation. Having multiple reporters would allow a more reliable and objective assessment of conflict. It is unclear to what extent adolescents' perceptions of family conflict accurately represent interactions with parents and other family members.

Overall, our understanding of family and peer spillover of conflict was advanced by a combination of a between subjects model, which compared adolescents with different levels of conflict over the high school years, and a within subjects model, which examined changes in conflict that can be observed within the same adolescent over fourteen days. Adolescents' experiences in the home as well as outside the home shape each other on a daily basis and continue to do so across the high school years. The study highlights the significance of conflict in the daily lives of adolescents by showing that family and peer conflict not only leads to greater emotional distress within adolescents, but also the impact of each conflict persists across time and domains.

References

Adams, R., & Laursen, B. (2001). The organization and dynamics of adolescent conflict with parents and friends. *Journal of Marriage and Family, 63*, 97-110.

Almeida, D. M., & Kessler, R.C. (1998). Everyday stressors and gender differences in daily distress. *Journal of Personality and Social Psychology, 75*(3), 670-680.

Almeida, D. M., Wethington, E., & Chandler, A. L. (1999). Daily transmission of tensions between marital dyads and parent-child dyads. *Journal of Marriage and the Family, 61*(1), 49-61.

Bolger, N., Zuckerman, A., & Kessler, R. C. (2000). Invisible support and adjustment to stress. *Journal of Personality and Social Psychology, 79*, 953-961.

Bronfenbrenner, U. (1986). Ecology of the family as a context for human development: Research perspectives. *Developmental Psychology, 22*(6), 723-742.

Brown, B. B., & Mounts, N. S. (2007). The cultural context of family-peer linkages in adolescence. *New Directions for Child and Adolescent Development, 116*, 1-15.

Chao, R., & Tseng, V. (2002). Parenting of Asians. In M. H. Bornstein (Ed.), *Handbook of parenting: Vol. 4: Social conditions and applied parenting (*2nd ed., pp. 59-93). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Collins, W. A., Maccoby, E. E., Steinberg, L., Hetherington, E. M., & Bornstein, M. H. (2000). Contemporary research on parenting: The case for nature and nurture. *American Psychologist, 55*(2), 218-232.

Cooper, C. R., & Cooper, R. G. (1992). Links between adolescents' relationships with their parents and peers: Models, evidence, and mechanisms. In R. D. Parke, & G. W. Ladd (Eds.), *Family-peer relationships: Modes of linkage* (pp. 135-158). Hillsdale, NJ:

Lawrence Erlbaum Associates, Inc.

Davies, P. T., & Windle, M. (2001). Interparental discord and adolescent adjustment trajectories: The potentiating and protective role of interpersonal attributes. *Child Development, 72*(4),1163-1178.

Flook, L., & Fuligni, A. J. (2008). Family and school spillover in adolescents' daily lives. *Child Development, 79*(3), 776-787.

Fuligni, A. J., Yip, T., & Tseng, V. (2002). The impact of family obligation on the daily activities and psychological well-being of Chinese American adolescents. *Child Development, 73*(1), 302-314.

García-Coll, C., & Vázquez García, H. A. (1995). Hispanic children and their families: On a different track from the very beginning. In H. E. Fitzgerald, & B. M. Lester, et al. (Eds.), *Children of poverty: Research, health, and policy issues. Reference books on family issues, Vol. 23 and Garland reference library of social science, Vol. 968* (pp. 57-83). New York, NY: Garland Publishing, Inc.

Kenny, D. A., Korchmaros, J. D., & Bolger, N. (2003). Lower level mediation in multilevel models. *Psychological Methods, 8*, 115-128.

Larson, R. W. (1983). Adolescents' daily experience with family and friends: Contrasting opportunity systems. *Journal of Marriage and the Family, 45*(4), 739-750.

Laursen, B. (1995). Conflict and social interaction in adolescent relationships. *Journal of Research on Adolescence, 5*(1), 55-70.

Laursen, B., Coy, K. C., & Collins, W. A. (1998). Reconsidering changes in parent-child conflict across adolescence: A meta-analysis. *Child Development, 69*(3), 817-832.

Lehman, B.J. & Repetti, R.L. (2007). Bad days don't end when the school bell rings: The lingering effects of negative school events on children's mood, self-esteem, and perceptions of parent-child interaction. *Social Development, 16*(3), 1-23.

Lorr, M., & McNair, D. M. (1971). *The profile of mood states manual.* San Francisco: Educational and Industrial Testing Service.

Margolin, G., Christensen, A., & John, R. S. (1996). The continuance and spill-over of everyday tensions in distressed and nondistressed families. *Journal of Family Psychology, 10*, 304-321.

McCloskey, L. A., & Lichter, E. L. (2003). The contribution of marital violence to adolescent aggression across different relationships. *Journal of Interpersonal Violence, 18*(4), 390-412.

McCloskey, L. A., & Stuewig, J. (2001). The quality of peer relationships among children exposed to family violence. *Development and Psychopathology, 13*, 83-96.

Noakes, M. A., & Rinaldi, C. M. (2006). Age and gender differences in peer conflict. *Journal of Youth and Adolescence, 35*, 881-891.

Parke, R. D., & O'Neil, R. (1999). Social relationships across contexts: Family-peer linkages. In W. A. Collins, & B. Laursen (Eds.), *Relationships as developmental contexts* (pp. 211-240). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Raudenbush, S.W. & Bryk, A.S. (2002). *Hierarchical Linear Models applications and data* analysis methods. Thousand Oaks, CA, US: Sage Publications.

Romero, A. J., Carvajal, S. C., Valle, F., & Orduña, M. (2007). Adolescent bicultural stress and its impact on mental well-being among Latinos, Asian Americans, and European Americans. *Journal of Community Psychology, 35*(4), 519-534.

Repetti, R.L. (1996). The effects of perceived daily social and academic failure experiences on school-age children's subsequent interactions with parents. *Child Development*, 67, 1467-1482.

Repetti, R. L., & Wood, J. (1997). Effects of daily stress at work on mothers' interactions with preschoolers. *Journal of Family Psychology, 11*(1), 90-108.

Rose, A. J., & Asher, S. R. (1999). Children's goals and strategies in response to conflicts within a friendship. *Developmental Psychology, 35*, 69-79.

Rudolph, K. D., & Hammen, C. (1999). Age and gender as determinants of stress exposure, generation, and reactions in youngsters: A transactional perspective. *Child Development, 70*(3), 660-677

Savin-Williams, R. C., & Berndt, T. J. (1990). Friendship and peer relations. In S. S. Feldman & G. R. Elliot (Eds.), *At the threshold: The developing adolescent* (pp. 277-307). Cambridge, MA: Harvard University Press.

Table 1. *Predicting Daily Peer Conflict from Family Conflict on the Same Day, One Day and Two Days Prior*

Same-Day		One Day Prior		Two Days Prior	
Daily Level	Peer Conflict *b (SE)*	Daily Level	Peer Conflict *b (SE)*	Daily Level	Peer Conflict *b (SE)*
Intercept	.26 (.01)**	Intercept	.27 (.01)**	Intercept	.22 (.01)**
Family Conflict	.05 (.01)**	Family Conflict $_{(t-1)}$	.03 (.01)**	Family Conflict $_{(t-1)}$	.03 (.01)**
Peer Conflict $_{(t-1)}$	.22 (.01)**	Peer Conflict $_{(t-1)}$	.22 (.01)**	Family Conflict $_{(t-2)}$	.02 (.01)**
Week of Study	.00 (.00)	Week of Study	.00 (.00)	Peer Conflict $_{(t-1)}$	.22 (.01)**
				Peer Conflict $_{(t-2)}$	.11 (.01)**
				Week of Study	.00 (.00)
Variance Component of Predictor	.01**		.000		.001*

*p<.05, **p<.01

Notes. Subscripts: (t-1)=one day prior, (t-2)=two days prior. Gender coded: -1=boy, 1=girl. Week of Study coded: -1= week one (days 1-7), 1= week two (days 8-14).

Table 2. *Predicting Daily Family Conflict from Peer Conflict on the Same Day, One Day and Two Days Prior*

Same-Day		One Day Prior		Two Days Prior	
Daily Level	Family Conflict *b (SE)*	Daily Level	Family Conflict *b (SE)*	Daily Level	Family Conflict *b (SE)*
Intercept	.36 (.02)**	Intercept	.38 (.02)**	Intercept	.30 (.02)**
Peer Conflict	.09 (.02)**	Peer Conflict $_{(t-1)}$	.05 (.02)*	Peer Conflict $_{(t-1)}$	.04 (.02)*
Family Conflict $_{(t-1)}$	.19 (.01)**	Family Conflict $_{(t-1)}$	.19 (.01)**	Peer Conflict $_{(t-2)}$	.02 (.02)
Week of Study	-.04 (.01)**	Week of Study	-.04 (.01)**	Family Conflict $_{(t-1)}$	.20 (.01)**
				Family Conflict $_{(t-2)}$	.14 (.01)**
				Week of Study	-.04 (.01)**
Variance Component of Predictor	.03**		.02*		.00

*p<.05, **p<.01

Notes. Subscripts: (t-1)=one day prior, (t-2)=two days prior. Gender coded: -1=boy, 1=girl. Week of Study coded: -1= week one (days 1-7), 1= week two (days 8-14).