



Marital conflict and fifth-graders' risk for injury[☆]

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ABSTRACT

Background: Injuries are the leading cause of morbidity and mortality for American children. Marital conflict has been associated with a range of negative health outcomes, but little is known about how marital conflict may influence risk of injury among children. We hypothesized marital conflict would be related to increased youth injury risk after controlling for relevant demographic and parenting covariates. **Methods:** A community sample of 3218 fifth-graders recruited from three US locales was utilized. Ordinal logistic regression models were used to predict the frequency of unintentional injuries from marital conflict while adjusting for demographics, parenting factors (nurturance, communication, involvement with youth), and family cohesion.

Results: Higher levels of marital conflict were associated with higher rates of injury that required professional medical attention (OR = 1.20, 95% CI 1.06, 1.35 per standard deviation). The same association held after inclusion of all covariates in a multivariate ordinal logistic regression model.

Conclusions: Parental marital conflict is associated with higher rates of injuries requiring professional medical attention in preadolescent children.

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1. Introduction

Injuries are the leading cause of morbidity and mortality for American children. Annually, pediatric injuries lead to approximately 14,000 deaths and 8.6 million emergency room encounters in the United States (National Center for Injury Prevention and Control [NCIPC]). Additionally, it is estimated that each year the United States spends over \$8 billion on the medical treatment of pediatric injuries (Sattin and Corso, 2007).

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Identifying risk factors for pediatric injury is complex, as injuries are believed to be caused by a wide range of developmental, psychosocial and environmental factors (Schwebel and Gaines, 2007). Among the strongest behavioral correlates of pediatric injury risk is the role of parenting behavior (Schwebel and Gaines, 2007). High quality parental supervision and monitoring is particularly associated with lower pediatric injury risk among toddlers and preschoolers (Morrongiello, 2005; Morrongiello et al., 2004, 2006; Schwebel and Bounds, 2003), and even among children at elevated risk for injury due to temperamental or psychopathological traits (Schwebel et al., 2004).

Given the importance of parental supervision and monitoring in early childhood, one might suspect that high levels of parent marital conflict would be related to increased pediatric injury risk throughout development. This association might emerge via multiple causal pathways. Marital conflict is known to influence multiple aspects of individual and family health (Fincham, 2003; Karney and Bradbury, 1995). Parents occupied with frequent disputes are likely to be cognitively and/or physically distracted from parenting duties. They may become self-focused, irritable, and worried about their own personal relationships. These cognitions and distractions may result in inconsistent enforcement of safety-relevant rules, inadequate monitoring of children's behavior, poor modeling

of safety-conscious behavior, and general chaos in the home environment, all established correlates of pediatric injury (Schwebel and Gaines, 2007). Marital conflict also can lead to or be associated with personal health problems such as parental depression, substance use, or other mental and physical illnesses, which are also established correlates of pediatric injury (Damashek et al., 2009; Phelan et al., 2007; Schwebel and Brezaussek, 2008; Schwebel and Gaines, 2007). Finally, marital conflict is associated with family stressors such as financial difficulties that are associated with pediatric injury risk (Schwebel and Gaines, 2007).

Previous research on relations between parent marital conflict and pediatric injury is sparse, but still instructive for the development of the current study hypotheses. In one relevant analysis, Hango and Houseknecht (2005) studied a sample of 1090 children enrolled in the National Longitudinal Survey of Youth. Children, ages 2–8 at the start of the study, were followed for seven years. Neither parental conflict at the start of the study nor experience of a parental divorce over the seven years was related (at $p < 0.05$ level) to medically attended injuries in the final year. Another recent study found that the departure of a father (or father-figure) from the home for young children 6–36-months-old resulted in subsequent (36 months to the end of first grade) injury rates similar to young children living in a single-parent or two-parent home, but less than that of young children living in a home where a father or father-figure joined the household (Schwebel and Brezaussek, 2007).

In perhaps the most thorough analysis of the relation between marital conflict and child injury risk, Rhodes and Iwashyna (2007) recruited 1116 parents of children (mean age 4.41 ± 4.3 years) seen in the emergency room of an urban children's hospital for treatment of non-critical conditions. Parents provided binary (yes or no) responses to 4 inquiries concerning home safety: gun ownership, absence of smoke detectors, unsecured poisons, and inconsistent seatbelt use. Homes were considered unsafe if any affirmative responses were provided. Higher levels of partner (married or unmarried) conflict were associated with more dangerous safety-related practices in their home, even after controlling for relevant demographic and psychosocial covariates.

Taken together, previous evidence concerning associations between marital conflict and child injury risk is mixed. One study found no associations between marital conflict and injuries, a second found the departure of a father/father-figure was not associated with change in young children's injury compared to children who did not experience that departure, and a third found a positive association between marital conflict and dangerous safety-related practices in the home. Prior investigations have tended to focus on toddlers and young children; none examines youth in the pre-teen years.

Given inconsistent and inconclusive results of previous work, this study was developed to better understand associations between marital conflict and child injury risk. We considered direct bivariate relations between marital conflict and child injury risk, but also conducted multivariate analyses with other parenting factors known to influence child injury risk – parental nurturance, involvement, and communication with the youth; as well as family cohesion and demographics – covaried. Our work was conducted using cross-sectional data with a large sample of fifth-grade children. We hypothesized that marital conflict would be associated with increased injury risk among children.

2. Methods

2.1. Study design and data source

This is a cross-sectional study of the 3218 eligible fifth-graders participating in the baseline years (2004–2006) of Healthy Passages, a community-based study of adolescent health outcomes

(Windle et al., 2004). Participants in Healthy Passages were recruited from public schools in three geographic areas: (a) 10 contiguous public school districts in and around Birmingham, Alabama; (b) 25 contiguous public school districts in Los Angeles County, California; and (c) the largest public school district in Houston, Texas. Within these 36 districts, schools with at least 25 fifth-graders (representing over 99% of students enrolled in regular classrooms) were eligible for selection.

Within each of the three sites, a two-stage probability sampling procedure was employed. In the first stage, schools were randomly sampled using probabilities that were a function of how closely a school's racial/ethnic mix corresponded to the site's racial/ethnic target. In the second stage, all fifth-graders ($N = 11,532$) in regular classrooms of sampled schools ($N = 118$) were invited to participate. About 58% of students' families ($N = 6663$) either agreed to be contacted for study participation, or were unsure about participation. Over three-quarters of those students (77%, $N = 5147$) completed an interview. Informed consent to participate was obtained from school superintendents, principals, and teachers; as well as from study participants (who provided developmentally appropriate assent) and their primary caregivers (henceforth referred to as parents). Schools and families were compensated for their time.

Design weights were constructed to reflect different school selection probabilities by racial/ethnic composition. Non-response weights were constructed to model participant non-response as a function of school, student gender, and student race-ethnicity. These two sets of weights were combined into a final weight that represents the population of fifth-graders in the public schools in the catchment areas defining each site. All inferential analyses take into account the complex sample design and the final probability weights. Rare cases of missing data were imputed using a single Markov-Chain Monte Carlo imputation. Demographic variables were not imputed. Further details concerning sampling and weighting are available elsewhere (Windle et al., 2004).

Both parent and youth assessments in the Healthy Passages study were conducted separately using a combination of computer-assisted personal interview (CAPI) and audio-computer assisted self interview (A-CASI) segments. All interviews were completed in private spaces, and they were conducted in English or Spanish according to participants' preference. The study protocol was reviewed and approved by the IRBs of all participating institutions.

2.2. Participants

The original sample includes 5147 fifth graders (mean age = 11.1 years, $SD = 0.6$; 49% male) and their parents. The youths were 34% African American, 35% Hispanic, 24% White non-Hispanic, and 6% multiracial or of other racial/ethnic groups. Because single, separated, divorced, and widowed parents did not complete the instrument on marital conflict, we excluded the 37% of the sample who did not live in a home with two parents, leaving a final analytic sample of 3218 youth. Reflecting national marriage rates across different racial/ethnic groups, our analytic sample included fewer African American youth and more Hispanic and White youth than the full sample.

2.3. Measures

Demographic measures. Parents reported their child's gender and race/ethnicity, family income, parent education level, and whether the family had medical insurance for the child. An SES composite was created by standardizing and then averaging household income and primary caregiver's years of formal education.

Parental nurturance. Parental nurturance was assessed by youth-report on the 7-item Barnes Parental Nurturance Scale (Barnes and Windle, 1987; Barnes et al., 1987). Items, answered on a

4-point Likert scale (almost never, sometimes, often, almost always), were summed with higher scores indicating greater parental nurturance. Sample items include, “How often does your {mother/father} give you a hug or kiss?” and “How often do you discuss personal problems with your {mother/father}?” Separate scales were completed by youth concerning maternal nurturance and concerning paternal nurturance; scores were averaged for this study to yield a single score of average parental nurturance ($r=0.66$ for maternal and paternal nurturance). Internal reliability of the scale was good, Cronbach’s $\alpha=0.74$ and 0.79 for mother and father scales, respectively.

Parental communication. Parental communication was assessed by youth-report on a 10-item instrument developed from items in the Parents Matter program (Ball et al., 2004; Dittus et al., 2004). Items focused on parent–child communication about violence, cigarette use, and sexual development. Items, answered on a 3-point Likert scale (never talked about it, talked about it once or twice, talked about it lots of times), were summed with higher scores indicating greater levels of parent–child communication. Sample items include, “How many times have {your parents} ever talked to you about how you should act when you get mad at someone?” and “How many times have {your parents} ever told you not to smoke cigarettes?” Internal reliability of the scale in this sample was good, Cronbach’s $\alpha=0.80$.

Parental involvement. Parental involvement in the youth’s lives was assessed by a 7-item instrument designed to assess parental involvement and knowledge of the child’s activities. Three items were answered on a 4-point ordinal scale (1–4; almost never, sometimes, often, almost always) and the other four items on a 5-point ordinal scale (0–4; not at all, 1–2 times, 3–4 times, 5–6 times, 7 or more times). Items were summed, with higher scores indicating greater involvement. Items were adapted from other instruments designed to assess the same construct (Jacobson and Crockett, 2000; Sastry et al., 2003; Sieving et al., 2001); sample items include, “How often do you know what your child does after school?” and “During the past week, how many times did you and your child eat a meal together?” Internal reliability of the scale in this sample was adequate, Cronbach’s $\alpha=0.69$.

Family cohesion. Family cohesion was assessed by parent-report on an abbreviated version (10 items) of the Family Adaptability and Cohesion Evaluation Scales (FACES III; Olson, 1993). Items were answered on a 5-point Likert scale (almost never, once in a while, sometimes, frequently, almost always) and summed to yield a score ranging from 10 to 50, with higher scores indicating higher family cohesion. Sample items include, “Family members ask each other for help” and “Family togetherness is very important”. Internal reliability of the scale in this sample was good, Cronbach’s $\alpha=0.81$.

Marital conflict. Marital conflict was assessed by parent-report using the O’Leary-Porter Scale (OPS; Porter and O’Leary, 1980), a 10-item instrument designed to screen for spousal discord. Items were answered on a 5-point Likert scale (never, rarely, occasionally, often, very often) and summed to yield a score ranging from 10 to 50, with higher scores indicating greater marital conflict. Sample items include, “How often has this child heard you and your partner argue about your partner’s role in the family?” and “How often do you and/or your partner display verbal hostility in front of this child?” Internal reliability of the scale in this sample was good, Cronbach’s $\alpha=0.80$. Only parents who were currently married completed the marital conflict assessment.

Injury history. Parents reported the number of children’s injuries over the past year that were “serious enough to require professional medical attention.” Previous work documents the accuracy of parental recall of children’s (ages 1–13) serious injuries (e.g., Pless and Pless, 1995), and previous work offers evidence of convergent validity of the parent report in this sample, as the construct was associated with established correlates of injury risk like male

Table 1
Descriptive statistics: percentage or mean (SD).

Variable	Percentage or mean (SD)
Youth sex: male	52%
Youth ethnicity: African American	18%
Youth ethnicity: Hispanic	49%
Youth ethnicity: White	28%
Youth, presence of medical insurance	88%
Household income in \$, annual	61,502 (60,670)
Primary caregiver education	4.0 (2.0)
SES: standardized aggregate	−0.1 (0.7)
Youth age in years	11.1 (0.6)
Maternal nurturance, 7–28	21.6 (4.0)
Paternal nurturance, 7–28	20.2 (4.6)
Parental average nurturance, 7–28	20.9 (3.9)
Parent communication, 10–30	24.0 (4.0)
Parent involvement, 3–28	23.5 (4.2)
Family cohesion, 10–50	41.2 (6.3)
Marital conflict, 10–50	19.3 (5.6)
Youth injury count	0.2 (0.7)

Note. $N=3218$.

gender (OR = 1.61, 95% CI 1.37, 1.89), Hispanic race (OR = 0.64, 95% CI 0.52, 0.79), and youth activity level (OR = 1.23, 95% CI 1.11, 1.36) (Schwebel et al., 2011). For analysis purposes, participants were placed into ordinal categories as having 0 injuries, 1 injury, or 2 or more injuries.

2.4. Statistical analysis

The first analytic step was an examination of descriptive statistics for all variables of interest. Next, we constructed bivariate and then multivariate ordinal logistic regression models, with injury (0 vs. 1 vs. 2 or more) as the dependent variable. Independent variables included in the models were gender, race/ethnicity, study site, presence/absence of medical insurance for the child, the SES aggregate, average parental nurturance, parent communication, parental involvement, family cohesion, and marital conflict. All independent variables were included in bivariate models, and then were entered simultaneously in a multivariate model. All analyses were conducted using SAS (version 9.2) PROC SURVEYLOGISTIC with the cumulative logit link function. Analyses accounted for the complex sampling design (data weighted to represent the populations of interest).

3. Results

Table 1 lists descriptive data for the sample. As shown, injuries requiring professional medical treatment in the past year were relatively uncommon events ($M=0.2$, $SD=0.7$), with 2771 (87% of the sample) participants reporting no injuries. However, 324 (10%) reported one injury, and 106 (3%) reported two or more injuries. These data concord with national norms reported in CDC’s WISQARS database (NCIPC, 2010; crude rate of 10,137 injuries requiring medical attention for US youth ages 10–11 in 2009, just a bit lower than the rate in this sample) and oft-cited epidemiological papers (e.g., a rate of 17.8 injuries per 100 children for 10–13 year old Americans in the 1995 Scheidt et al. (1995) *American Journal of Public Health* manuscript, very similar to the rate in this sample).

Table 2 shows a correlation matrix including the outcome injury variable as well as all predictor variables of interest. No shared variance concerns emerged. Table 3 presents bivariate (first two columns) and multivariate (last two columns) ordinal logistic regression models. Injury requiring professional medical attention in the past year (0 vs. 1 vs. 2 or more) was the dependent variable. Male gender was associated with more injury in both bivariate and multivariate models. Hispanic participants had a lower risk of injury in both models than White adolescents. Of particular

Table 2
Correlation matrix.

Variable	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Injury count															
2. Houston, TX	-0.03														
3. Los Angeles, CA	-0.04	-0.54													
4. Birmingham, AL	-0.04	-0.48	-0.48												
5. Male gender	0.03	0.03	0.03												
6. SES aggregate	0.06	0.03	0.03	0.03											
7. Medical insurance	0.01	0.03	0.03	0.03	0.03										
8. African American	-0.27	-0.19	-0.16	-0.02	-0.02	-0.27									
9. Hispanic	0.01	0.03	0.03	0.03	0.03	0.01	0.12								
10. Multiracial, other	0.02	0.03	0.03	0.03	0.03	0.02	0.12	0.12							
11. Non-Hispanic White	-0.05	-0.03	-0.03	-0.03	-0.03	-0.05	-0.03	-0.03	-0.10						
12. Parental nurturance	0.11	0.07	0.07	0.07	0.07	0.11	0.07	0.07	0.11	0.04					
13. Parent communication	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.10	-0.05				
14. Parental involvement	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.05	-0.05	0.37			
15. Family cohesion	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.37	0.21		
16. Marital conflict	0.27	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.37	0.21	0.21	

Notes. All variables standardized prior to correlation. $N = 3218$. All $r_s \geq |0.04|$ have $p < 0.05$ and all $r_s \geq |0.05|$ have $p < 0.01$.

relevance to the present hypotheses were results from the marital conflict and parenting variables. As shown in Table 3, the only non-demographic variable related to injury outcomes was marital conflict. The odds ratios for marital conflict of 1.20 indicate that the odds of injury increase by 20% for each SD increase in marital conflict. In the multivariate model, the increase in risk for marital conflict is similar to the protective effect of SES, where a SD decrease is associated with an 18% ($1/0.85 \times 100$) increase in the odds of injury.

4. Discussion

Results suggest high levels of marital conflict are associated with fifth graders' injury risk. This association remained unchanged after controlling for the influences of demographic and other key parenting and family factors. The results confirm earlier work that reported relations between marital conflict and parents of young children implementing safety interventions at homes (Rhodes and Iwashyna, 2007), but contrast with other findings that reported no relations between marital conflict and divorce and subsequent injury risk (Hango and Houseknecht, 2005; Schwebel and Brezausek, 2007).

Parental marital conflict is associated with a wide range of socioemotional and health outcomes among children (Cummings and Davies, 2002), but this is among the first and most rigorous studies to report significant relations between marital conflict and pediatric injury risk. The mechanism behind the relation remains unclear and should be examined in future research. Several hypotheses may be posited. First, because cognitive distraction, financial difficulties, and mental illness frequently co-occur with marital distress, it may be that parents who experience spousal conflict are less involved in parent supervision and monitoring, in modeling safe behaviors, and in protecting the home environment from injury risks; indeed the higher the marital conflict in our sample, the lower the parental communication, parent nurturance, and family cohesion. Further, all three constructs have been identified as relevant to injury risk among adolescents (e.g., Page, 1986; Schwebel et al., 2009, 2011) and research investigating the process through which parents with frequent marital conflict may interact with and build relationships with their adolescents suggests marital conflict may result in reduced attention to, monitoring of, and modeling of safe behavior for adolescents (Cummings and Davies, 2002; Davies and Cummings, 1994). At an extreme, parents engaging in aggressive or physical marital conflict may actually aggress against or injure their children as well.

A second hypothesized mechanism is that parents with marital conflict have children who develop more risky behavior patterns (Cummings et al., 2004; Tschann et al., 2009). The children may engage in violent, aggressive, or conflicting behaviors that lead to injury with greater frequency, on some occasions modeling behavior they witnessed their parents enact. They may also be willing to take more risks while bicycling, engaging in sport, or in other environments that could lead to injury. The O'Leary-Porter Scale that was used to assess marital conflict in this sample includes a single item on physical aggression between parents, and we verified in *post hoc* analyses that the individual item is associated with youth injury outcome in this sample at a magnitude ($p < 0.01$) similar to that of the full 10-item scale. Note also that causality of this potential mechanism may be cyclical. That is, it may be that aggressive, oppositional, and violent behavior in children increases parental stress and marital conflict, which in turn exacerbates difficult child behavior in a cyclical manner (Patterson et al., 1984).

A third hypothesized mechanism for the association between marital conflict and fifth graders' injury history is that children react to marital conflict in ways that may increase the risk of injury. In some cases, youth may find themselves injured, purposely or

Table 3
Bivariate and multivariate ordinal logistic regression models, with parent reports of injury requiring medical attention in the past 12 months (0/1/2+) as dependent variable.

Variable	Bivariate models		Multivariate model	
	OR	95% CI	OR	95% CI
Site				
Birmingham, Alabama (reference)	1.00	–	1.00	–
Houston, Texas	0.65**	0.49, 0.86	0.81	0.61, 1.07
Los Angeles, California	0.60**	0.47, 0.77	0.74	0.53, 1.03
Youth male gender	1.53**	1.23, 1.91	1.61**	1.27, 2.04
SES aggregate (standardized)	1.00	0.92, 1.08	0.85**	0.77, 0.94
Youth medical insurance	1.25	0.86, 1.82	1.18	0.81, 1.72
Youth race/ethnicity				
African American	0.99	0.74, 1.33	0.81	0.59, 1.13
Hispanic	0.64**	0.50, 0.84	0.55**	0.38, 0.81
Multiracial or other race/ethnicity	0.92	0.47, 1.81	1.10	0.57, 2.11
Non-Hispanic White (reference)	1.00	–	1.00	–
Parental nurturance (standardized)	1.08	0.96, 1.22	1.07	0.94, 1.22
Parent communication (standardized)	1.07	0.97, 1.18	1.12	0.99, 1.27
Parental involvement (standardized)	1.01	0.90, 1.13	0.97	0.85, 1.10
Family cohesion (standardized)	0.99	0.88, 1.13	1.02	0.89, 1.17
Marital conflict (standardized)	1.20**	1.06, 1.35	1.20*	1.04, 1.37

Notes. OR = odds ratio. CI = confidence interval. N = 3218.

* $p < 0.05$.

** $p < 0.01$.

unintentionally, as a means to seek or gain attention from parents who are otherwise distracted. On other occasions, youth may seek out interpersonal relationships with peers when they fail to get appropriate attention from parents; engaging with peers may lead to increased injury risk (Schwebel and Gaines, 2007).

In future work, these hypothesized mechanisms for the association between marital conflict and injury should be examined with sophisticated research designs such as prospective longitudinal study. We also note that the hypothesized mechanisms are not necessarily exclusive. It may be that more than one of them proves true, and they work together to increase risk.

A surprise in our results was the fact that other parenting and family variables, including parent nurturance, involvement and communication with the youth, and family cohesion, were not associated with children's injuries. Interpreting null results is always risky, but developmental explanations seem most plausible. Most previous work linking parenting factors to child injury has studied younger children (Morrongiello and Schwebel, 2008; Schwebel and Gaines, 2007). However, by fifth grade, children are generally in a developmental stage when they are taking many potentially injurious actions independent of adult supervision. Therefore, parenting factors may be less relevant to their safety than environmental factors (e.g., home and neighborhood safety, marital conflict exposure) and intrapersonal factors (e.g., gender, personality/temperament, cognitive and executive function skills). Future work should investigate this and other hypotheses that might explain our null findings.

Our research has strengths and limitations. Strengths include the large and diverse sample of a developmental stage (fifth graders) that has not been studied often; the inclusion of reports from both mothers and fathers; and the use of reports from both youth and parents to best assess the constructs of interest. Limitations include the use of retrospective self-report injury data rather than prospective reports or medical/insurance records and the reliance on self-report measures. Future work might extend these findings and consider interventions that incorporate youth injury prevention into broader strategies to reduce marital conflict among parents. One other limitation is our focus on fifth-graders. Although there are advantages to limiting analyses to a single developmental stage – most important, it reduces noise from developmental issues – it also limits generalizability to other developmental stages. It is unclear whether these findings might apply to younger children or older adolescents, especially since

both injury patterns and correlates (Morrongiello and Schwebel, 2008) and the effects of marital conflict on children (Grych and Fincham, 2001) change and evolve across developmental stages.

In closing, we mention implications of the findings for injury prevention and clinical practice. Although child injury prevention would surely not be a primary reason to seek marital counseling, these findings suggest one benefit of a reduction of marital conflict may be to reduce risk of injury to children in the family. More broadly, the results reinforce the notion that injury risk is associated with a complex set of individual, family, and environmental factors, and that general improvement in family functioning may have multiple positive health benefits to the family. Injury prevention work should consider family system functioning as a critical part of prevention strategy development.

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