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The Role of Economic Strain on Adolescent Delinquency: A Microsocial Process Model

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Abstract

The current study examines the role of economic strain as a moderator of the microsocial processes influencing younger siblings' delinquency (externalizing behavior and substance use) in a longitudinal design. The younger siblings (122 younger brothers and 122 younger sisters) were from 244 families with same-sex biological siblings. Structural equation modeling was utilized to examine a process model whereby mothers' harsh/inconsistent parenting and older sibling delinquency influence younger siblings' delinquent behavior via sibling aggression and delinquent peer affiliation. Findings suggest that indirect mechanisms vary as a function of economic strain, with sibling aggression having a stronger, more detrimental effect on adolescent delinquency in economically strained families. Data suggest that familial economic conditions contextualize the relative roles of parenting, sibling, and peer processes in the transmission of risk to adolescent delinquency.

Keywords

siblings; delinquency; family relations; socioeconomic status

Delinquent behavior, consisting of both externalizing behaviors and substance use, has consistently been shown to be the byproduct of both peer (Patterson, Dishion, & Yoerger, 2000; Snyder et al., 2008; Snyder et al., 2010) and sibling influences (Bullock & Dishion, 2002; Low, Shortt, & Snyder, 2012; Snyder, Reid, & Patterson, 2003). Although externalizing behaviors can appear at earlier ages (Garcia, Shaw, Winslow, & Yaggi, 2000), the onset of substance use typically begins during adolescence, with percentages as high as 39% of eighth grade students having tried alcohol (Johnston, O'Malley, Bachman, & Schulenberg, 2008). The majority of research on adolescent delinquency has focused on socialization processes at the microlevel, with an emphasis on how maladaptive parenting practices (e.g., inconsistent/harsh/inconsistent discipline) influence other relationships (e.g., peers) that maintain and exacerbate adolescent problem behaviors (e.g., Conger & Rueter, 1996). However, the vast majority of these studies have neglected the role of more distal, macrofactors, such as family resources on adolescent adjustment, despite evidence of the deleterious effects of economic strain on adolescent antisocial tendencies (Conger, Ge,

Elder, Jr., Lorenz, & Simmons, 1994; Conger et al., 1991; Skinner, Elder, Jr., & Conger, 1992). The current study examines the moderating role of the family economic context (specifically economic strain) on relationship dynamics at the microsocial level that influence adolescent delinquency.

Social Processes and Adolescent Delinquency

Parental, peer, and sibling relationship dynamics are all veritable predictors of adolescent delinquency. The most studied and robust family dynamic as it relates to children's social adjustment is the coercion process (see Snyder et al., 2003). Patterson's (1976) coercion theory suggests that coercive exchanges are one mechanism through which delinquency originates and is sustained. A coercive exchange occurs when, for example, a child refuses to complete a chore, encouraging the parent to amplify the request. As the interaction intensifies, the parent may stop making the request and the chore may not be completed, negatively reinforcing the child's aversive response. According to the social interaction learning model (SIL), these impaired social interactions and escalation of child dysfunction lead to more reciprocal, aversive conflict and violence that becomes a training ground for problematic behaviors within familial and nonfamilial relationships (Patterson, 1982; Patterson, Dishion, & Bank, 1984; Reid, Patterson, & Snyder, 2002; Slomkowski, Rende, Conger, Simons, & Conger, 2001). Without positive reinforcement of desirable behaviors, children come to shape parental behavior through aggressive tactics, a strategy that carries over to sibling relations, who further normalize and reinforce maladaptive interaction strategies. Because these exchanges within the family impede the development of positive, adaptive social tactics, these patterns may generalize to and become reincarnated in peer interactions (see also Criss & Shaw, 2005; Haynie & McHugh, 2003; Snyder, Bank, & Burraston, 2005), a higher-order training ground for aggressive and antisocial behavior (e.g., Dishion & Andrews, 1995).

Siblings and Peers as Socializing Agents

The evidence for resemblance in substance use and delinquent behavior among siblings is substantial (Criss & Shaw, 2005; Duncan, Duncan, & Hops, 1996; Snyder et al., 2005), and in the case of substance use, is even greater than between children and parents (Ary, Tildesley, Hops, & Andrews, 1993; Fagan & Najman, 2005). Despite the high correlation between siblings' substance use, many studies have established peer use as an equally powerful predictor (see Needle et al., 1986; Stormshak, Comeau, & Shepard, 2004), and research has clearly documented peer relationships as an important context for risk of early substance use. According to SIL theory, through both modeling and aggressive exchanges siblings contribute to antisocial behavior in part by increased conflict in close friendships and affiliation with delinquent peers (see Low et al., 2012; Snyder et al., 2003). Sibling conflict, in turn, has been proposed as an important mediator of familial risk factors and adolescent substance use (East & Khoo, 2005; East & Shi, 1997).

Impact of Economic Strain: Interaction of Macro- and Microlevel Environments

SIL theory also posits that parenting mediates the effects of family and environmental stressors on adolescent adjustment, and sets the stage for the generalization of maladaptive dynamics across other environments. Inherent in this model is the acknowledgment that stressors (e.g., mental health, economic strain) challenge parents' resources and skills, but parenting can largely mitigate the impact of contextual demands on children's adjustment. That is, familial resources more generally and economic resources more specifically, influence adolescent development largely by amplifying or mitigating aggressive family

dynamics (Conger, Conger, & Elder, Jr., 1994; Simons, Whitbeck, Melby, & Wu, 1994). Consequently, it may be concluded that disruptions in these relationships provide less than optimal social contexts for which to learn various adaptive and prosocial behaviors. This is described as a “social causation model,” in which constraints at more distal levels affect the quality of microlevel social relations (see Simons et al., 1994; Snyder et al., 2003).

Indeed, the impact of economic strain on various domains of functioning has been well-established, including links with the following: adolescent aggression (Skinner et al., 1992); family coercion and developmental problems (Conger et al., 1994); adolescent alcohol use (Conger et al., 1991; De Haan, Boljevac, & Schaefer, 2010); parenting practices (Barrera et al., 2002; Simons et al., 1994); and sibling relations (Conger et al., 1994; Williams, Conger, & Blozis, 2007).

Effective parenting practices, problem solving, and use of discipline appear vulnerable to disruption in the context of economic strain and arguably play a central role in explaining the link between economic strain and adolescent delinquency. Skinner et al. (1992) demonstrated a link between financial hardship and adolescent aggression via disruptions in the marital relationship and parenting effectiveness. These findings suggest that financial strain may catalyze negative responses within the marital dyad that limit effective parenting skills, particularly with regard to discipline, which in turn evokes aggression from the adolescent. Similarly, Conger, Ge, Elder, Jr., Lorenz, and Simmons (1994) demonstrated that economic pressure instigates a chain of negative family interactions, with a direct effect on parent-adolescent financial conflict and parent’s depressed mood, which leads to parent hostility toward the adolescent, and in turn elevated internalizing and externalizing symptoms. Both aforementioned studies support the theory that conflictual family dynamics are exacerbated by the presence of economic strain through a “spillover” or “cascading” effect on relationships across familial subsystems (e.g., marital, parent–child).

Conger et al. (1994) and Williams et al., (2007) provide initial evidence of the important role parents can play in minimizing the generalization of coercive dynamics across social contexts, by linking economic strain to disruptions in the parent–child relationship and sibling dyads. Findings reveal that economic strain exacerbates parental hostility, which in turn, provides opportunities for siblings to learn (i.e., recapitulate) and reinforce these negative interaction patterns. This is consistent with the tenets of SIL theory and modeling, especially when perceived authority figures are displaying negative behaviors (Bandura, 1977). Further, increases in parental hostility were negatively related to sibling warmth and support. This is one of the first studies to highlight the link between elevations in negative parenting with sibling negativity in economically stressed families. In light of extraneous stressors and heightened parental stress and negativity, conflict in the sibling relationship may be a greater liability that turns off the opportunity to learn required adaptive, prosocial skills to steer one away from incremental involvement in delinquent behavior.

Family Economics as a Moderator of Adolescent Delinquency

Research has suggested higher rates of family conflict in lower socioeconomic status (SES) families (Stein, Jaycox, Kataoka, Rhodes, & Vestal, 2003). A review of the literature indicates that children from families of lower SES experience more deleterious effects from familial stressors (see Repetti, Taylor, & Seeman, 2002). Consistent with the health disparities view, it is suggested that families with limited resources and access to various supports may experience greater “toxicity” when faced with adverse conditions (Carter-Pokras & Baquet, 2002). Thus, families with financial constraints and limitations may not only be more susceptible to experiencing stressors and conflict but also tend to experience greater harm from these stressors. Thus, the potential role of economic hardship as a

moderator of aggressive or harsh/inconsistent interactions and other microsocial processes (within the family) should be examined.

Summary of Current Study

The current study tests a theoretical model in which microsocial processes that influence adolescent delinquency (i.e., harsh/inconsistent parenting, sibling aggression, delinquent peer association) are moderated by economic strain. In doing so, it departs from previous investigations in two unique and important ways. First, this is arguably a more comprehensive model of the proximal, microsocial processes that influence adolescent delinquency within the family, while simultaneously taking more distal influences into account (including peers and the economic context). Second, this study is unique in its examination of the potential moderating impact of economic strain. In other words, the current study moves beyond mean-level differences to examine whether parent, sibling, and peer processes operate similarly for families living with economic strain. The incorporation of sibling delinquency and coercion makes this study one of the first to address whether sibling negativity is uniformly potent across different family economic contexts.

The following hypotheses were tested: (a) families living in economic strain would have elevated levels of older sibling delinquency and aggression, peer delinquency, and harsh/inconsistent parenting; (b) peer relations would indirectly influence younger sibling delinquency, but sibling aggression would have a more potent influence in economically strained families; (c) harsh/inconsistent parenting would have a stronger influence on younger sibling delinquency for economically strained families.

Method

Sample

Target children were the younger siblings (122 younger brothers and 122 younger sisters) from 244 families with same-sex biological siblings. Families identified in the databases of three collaborating school districts located in a medium-sized metropolitan area in the Pacific Northwest as having (a) one child in the seventh grade of a public middle school, (b) a younger same-sex child in the fourth or fifth grade of a public elementary school (note same-sex siblings were targeted due to funding limitations), and (c) a mother residing in the home, were sent an introduction letter about the study with an option to receive no further contact. Families on the contact list were screened for biological relatedness and invited to participate in a home visit to explain the study. Of the 448 families originally identified by the school districts, 364 families were eligible to participate, and 244 families (67%) completed assessments at Time 1 (T1). Three years after the initial assessment 215 families or 88% completed assessments at Time 2 (T2).

Demographics

Mothers reported the children's race as 83% Euro American, 16% Mixed Race and 1% Native American or Asian American/Pacific Islander. Mothers also reported the children's ethnicity as 7% Hispanic. At T1, the majority (74%) of the children lived with both biological parents in the same household. In 24% of families, the mothers were divorced or separated from the children's fathers, and in 2%, the children's fathers had died. Regarding the mothers, 21% had a high school education or less, 58% attended college, and 21% pursued graduate professional training or degree.

The average household income of the families, including child support and assistance before taxes was \$40,000–\$49,999 at T1 and T2, with one third of the sample reporting incomes of \$30,000–\$39,999 at T1 and T2. Economic strain was determined from the family's utilization

of financial public assistance at T1. The percentage of families that received financial public assistance (e.g., food stamps, Medicaid) or other aid was 19% ($n = 47$) at T1 and 15% ($n = 36$) at T2. The stability of receiving financial public assistance was indicated by the strong association between financial public assistance at T1 and T2, $\chi^2(df 1, N = 244) = 41.45, p < .001$. Families that did not receive financial public assistance were considered economically nonstrained and families that received financial public assistance were considered economically strained. Using the Health and Human Services guidelines from when the sample was recruited in 2001 (<http://aspe.hhs.gov/poverty/11poverty.shtml>) for poverty (which is considered a highly conservative formula), 60% of our families living on some form of public assistance were living in poverty. Thus, use of financial assistance seems to be a valid indicator of economic stress.

Procedures

At T1, the younger siblings were on average 10.87 years old ($SD = .59$, range from 9.29 to 12.62), and participated in laboratory visits with their families (mothers, older siblings) that involved questionnaire completion. Older siblings were on average 13.33 years old ($SD = .67$, range from 12.12 to 14.93) at T1. At T2, when the younger siblings were on average 13.59 years old ($SD = .79$, range from 11.41 to 15.44) a similar laboratory visit was conducted. Mothers and teachers completed questionnaires about the behavior of younger and older siblings at T1 and T2. Teachers across different subject areas (e.g., history) were selected to participate by the families. Families and teachers were compensated for their time related to all assessments.

Constructs and Instruments

The current study utilized latent constructs defined by multiple agents and methods in order to minimize bias and attenuation among observed relations (Bollen & Paxton, 1998). To form latent constructs, indicators were initially identified from the questionnaires based on face validity and a priori theoretical definitions. Guided by the construct building strategy developed by Patterson and Bank (1989), scale items were checked for internal consistency before calculating the scale by taking the mean or sum of items. Scales or indicators were then examined for convergence with other indicators for the same construct. Indicators were also standardized before combining into construct scores.

T1 Predictors

Harsh/inconsistent parenting—Three indicators were used to define a harsh/inconsistent parenting construct. The first indicator was the mean of mothers' and younger siblings' reports on inconsistent and ineffective discipline scales (eight items for mothers' reports and 11 items for younger siblings' reports; Capaldi & Patterson, 1989; Cronbach alphas .58–.86; $M = 2.25, SD = .42$) and one staff rating of whether mother was in good control of the adolescent (Capaldi & Patterson, 1989; $M = 1.62, SD = .87$). The second indicator was the mean of mothers' and younger siblings' reports on maternal psychological and physical aggression to adolescent scales using the Conflict Tactics Scale (seven items each reporter; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998; Cronbach alphas .79–.80; $M = 1.48, SD = .44$). The third indicator was the mean of mothers' and younger siblings' reports on parent-adolescent conflict and antagonism scales using the Network of Relationship Inventory (6 items each reporter; Furman & Buhrmester, 1985; Cronbach alphas .88–.93; $M = 2.39, SD = .52$). Correlations between reporters was .17, $p < .05$ for maternal inconsistent discipline, .40, $p < .001$ for maternal aggression, and .35, $p < .001$ for parent-adolescent conflict and antagonism.

Older sibling delinquency—A construct for older sibling delinquent behavior was defined by three indicators to represent mother, teacher, and youth reports of externalizing behavior problems and substance use. The first indicator was the mean of mothers' reports on the broad-band externalizing scale comprised of older sibling rule-breaking and aggressive behavior using the Child Behavior Checklist (32 items; CBCL; Achenbach & Rescorla, 2001; Cronbach's alpha .92; $M = 6.52$, $SD = 6.89$), delinquency scale (nine items; Elliott, Huizinga, & Ageton, 1985; Cronbach's alpha .61; $M = .54$, $SD = .54$), and usage of alcohol, tobacco, marijuana, and drugs during the previous 6–12 months (five items; Katz & Gottman, 1986; Cronbach's alpha .59; $M = .09$, $SD = .31$) and one item from the CBCL; Achenbach & Rescorla, 2001; $M = .04$, $SD = .19$). The second indicator was the mean of teachers' reports on the broad-band externalizing scale comprised of older sibling rule-breaking and aggressive behavior using the CBCL (30 items; Achenbach & Rescorla, 2001; Cronbach's alpha .93; $M = 3.05$, $SD = 5.93$) and older sibling usage of alcohol, drugs, and tobacco during the previous 6 months (one item from the Peer Involvement and Social Skills; PSOSK; Walker & McConnell, 1988; $M = .15$, $SD = .37$) and one item from the CBCL; Achenbach & Rescorla, 2001; $M = .06$, $SD = .27$). The third indicator was the mean of older siblings' reports on the delinquency scale (27 items; Elliott et al., 1983; Cronbach's alpha .91; $M = .36$, $SD = .59$) and usage of alcohol, tobacco, and marijuana during the previous 12 months (three items; Katz & Gottman, 1986; Cronbach's alpha .83; $M = .25$, $SD = .90$). The correlation between mother and teacher reports of externalizing behavior was .39, $p < .001$, the correlation between mother and older sibling reports of delinquency was .30, $p < .001$, and the correlations between mother, teacher, and older sibling reports of substance use ranged from .48–.58, $p < .001$.

Sibling aggression—The sibling aggression construct was the mean of older siblings', younger siblings', and mothers' reports on older and younger sibling physical aggression, psychological aggression, relational aggression, and relational aggression (involving mother) scales using the Conflict Tactics Scale with relational aggression items (14 items each reporter; Straus, Hamby, Boney-McCoy, & Sugarman, 1996; Crick, Bigbee, & Howe, 1996; Cronbach alphas .88–.91; $M = 2.75$, $SD = 1.29$). The interreporter correlations ranged from .39 to .47, $p < .001$.

Younger sibling delinquent peer association—The delinquent peer affiliation construct was defined by three indicators to represent mother, teacher, and youth reports. The first indicator was the mean of mothers' reports (six items; Capaldi & Patterson, 1989; Cronbach's alpha .71; $M = 1.17$, $SD = 1.26$) and one item from the CBCL; Achenbach & Rescorla, 2001; $M = .11$, $SD = .32$), the second indicator was the mean of teachers' reports using the PSOSK (four items; Walker & McConnell, 1988; Cronbach's alpha .81; $M = 1.56$, $SD = .56$) and one item from the CBCL (Achenbach & Rescorla, 2001; $M = .23$, $SD = .51$), and the third indicator was the mean of younger siblings' reports on the degree to which the younger siblings associate with friends who get in trouble, participate in antisocial activities, and use substances (21 items; Capaldi & Patterson, 1989; Cronbach's alpha .87; $M = 1.21$, $SD = .26$) and 10 items from the peer network interview; Dishion, Poulin, & Medici-Skaggs, 2000; Cronbach's alpha .83; $M = 1.19$, $SD = .81$). The interreporter correlations ranged from .30, $p < .001$ to .36, $p < .001$.

T2 Outcome

Younger sibling delinquency—A parallel construct (see older sibling above) for younger sibling delinquent behavior at T2 was defined by externalizing behavior problems and substance use. The first indicator was the mean of mothers' reports on the broad-band externalizing scale comprised of younger sibling rule-breaking and aggressive behavior using the CBCL (35 items; Achenbach & Rescorla, 2001; Cronbach's alpha .90; $M = 7.26$,

$SD = 7.18$), delinquency scale (nine items; Elliott et al., 1983; Cronbach's alpha .63; $M = .41$, $SD = .54$), and usage of alcohol, tobacco, marijuana, and drugs during the previous 6–12 months (five items; Katz & Gottman, 1986; Cronbach's alpha .90; $M = .13$, $SD = .60$ and three items from the CBCL; Achenbach & Rescorla, 2001; Cronbach's alpha .77; $M = .02$, $SD = .13$). The second indicator was the mean of teachers' reports on the broad-band externalizing scale comprised of younger sibling rule-breaking and aggressive behavior using the CBCL (32 items; Achenbach & Rescorla, 2001; Cronbach's alpha .93; $M = 3.05$, $SD = 6.08$) and usage of alcohol, tobacco, and drugs during the previous 6 months (two items from the CBCL; Achenbach & Rescorla, 2001; $M = .02$, $SD = .12$ and one item from the PSOSK; Walker & McConnell, 1988; $M = .13$, $SD = .60$). The third indicator was the mean of younger siblings' reports on the delinquency scale (27 items; Elliott et al., 1983; Cronbach's alpha .83; $M = .19$, $SD = .34$) and usage of alcohol, tobacco, and marijuana during the previous 12 months (three items; Katz & Gottman, 1986; Cronbach's alpha .72; $M = .29$, $SD = .90$). The correlation between mother and teacher reports of externalizing behavior was .41, $p < .001$, the correlation between mother and younger sibling reports of delinquency was .20, $p < .01$, and the correlations between mother, teacher, and younger sibling reports of substance use ranged from .44–.66, $p < .001$.

Results

Preliminary Analyses and Plan of Analysis

Preliminary analyses were conducted to determine the nature and extent of missing data. Missingness by variable was 0% at T1 and 12% on substance use at T2 (due to teacher report). Model based likelihood methods that assume missing at random (MAR) data are still the current recommended standard (Schafer & Graham, 2002) because the older alternative (complete case analysis or listwise deletion) is based on an even more unrealistic assumption of missing completely at random (MCAR) and tends to perform even worse in terms of bias and power. Using analysis of variance analyses, there were no demographic differences between families who did/did not participate at T2 (e.g., family structure, household income), nor were there different rates of baseline behavior, including substance use or conflict. Therefore, we proceeded under the assumption of MAR. Thus, in subsequent analyses, missing scores were estimated using full information maximum likelihood (FIML) estimates in AMOS (Arbuckle, 1999). Second, data were assessed for assumptions of normality. All variables had acceptable levels of skew and kurtosis (skew < 3 and kurtosis < 10).

Analyses were conducted in two steps. The first step entailed fitting the measurement model while allowing the constructs to correlate freely. In the second step we fit a structural equation model (AMOS 16) to test our hypotheses, using multigroup comparisons to contrast families based on economic strain. This allowed us to assess mean-level differences in constructs, as well as differences in proposed pathways (using z score differences). Goodness of fit for each model was assessed by examining the comparative fit index (CFI), root mean square error of approximation (RMSEA), and χ^2/df ; according to conventional guidelines, a CFI of .90 and an RMSEA of .08 or less are considered to be a reasonable fit (Hu & Bentler, 1999). According to Arbuckle and Wothke (1999), a χ^2/df ratio between 1 and 3 indicates a good fit.

Measurement Model and Construct Intercorrelations

Before testing the structural model, we assessed the measurement model for invariance among factor loadings (i.e., confirmatory factor analysis) and intercorrelations among constructs. Table 1 describes the indicator correlations of the T1 predictors with younger sibling delinquency at T2. The measurement model yielded a good fit to the data ($\chi^2/df =$

1.38, $p < .01$, CFI = .96, RMSEA = .04). All factor loadings were significant at $p < .05$, and all were invariant except for parent-adolescent conflict. Thus, all loadings were freely estimated across groups except mother-younger sibling conflict. Means for latent variables were derived by allowing the means of constructs to estimate freely and fixing indicators intercepts to zero. Parameter comparisons of latent constructs revealed that aggressive parenting and older siblings' and younger siblings' delinquency were higher in economically strained families ($M = .43$, $SD = .14$; $M = .48$, $SD = .18$; $M = .24$, $SD = .12$) compared to those in nonstrained families ($M = -.10$, $SD = .05$; $M = -.04$, $SD = .12$; $M = .04$, $SD = .02$). However, there were no mean-level differences for sibling aggression ($M = -.17$, $SD = .14$; vs. $M = .06$, $SD = .06$) and delinquent peer affiliation ($M = .04$, $SD = .13$ vs. $M = .01$, $SD = .04$) for strained and nonstrained families, respectively.

SEM Model

A multigroup model was tested in which financial strain conditioned the structural paths in the model. Then, path coefficients were compared for significance (based on z score differences, utilizing betas and critical ratio differences) across models. Hypothesized SEM models were tested with AMOS 16 software. In addition to offering advantages over standard regression methods, SEM has yielded similar results to multilevel modeling approaches when analyzing family data involving sibling pairs (Khoo & Muthén, 2000). Therefore, there is growing sentiment that SEM "provides unbiased estimates of the parameters and standard errors despite the nesting of individuals within families" (Brody, Kim, McBride-Murray, & Brown, 2005, p. 193). The model provided an adequate fit to the data ($\chi^2/df = 1.67$, CFI = .94, RMSEA = .05). Specific pathways and tests of mediation are discussed below.

Economically nonstrained families—In this model (see Figure 1), higher levels of harsh/inconsistent parenting and older sibling delinquency were related to greater levels of delinquent peer affiliation, which was, in turn, related to higher levels of younger sibling delinquency. Bootstrapping estimates were used to formally test mediation. Estimates revealed that delinquent peer affiliation mediated the direct path from both harsh/inconsistent parenting on younger sibling delinquency, as well as the pathway from older sibling delinquency to younger sibling delinquency. In order to determine whether these paths (albeit reduced to nonsignificance) were necessary for optimal model fit, we examined differences in chi-square without these paths. Removing the direct path from older sibling delinquency (T1) to younger sibling delinquency (T2) ($\beta = .05$, $p > .05$) did not significantly alter model fit ($\Delta\chi^2/\Delta df = .5$, $p > .05$), nor did removal of the direct path from parenting (T1) to younger sibling delinquency (T2) ($\beta = .19$, $p > .05$) ($\Delta\chi^2/\Delta df = 1.25$, $p > .05$). Thus, for the sake of parsimony, these direct paths were removed from the final models (as shown in Figure 1).

Economically strained families—In this model (see Figure 2), harsh/inconsistent parenting influenced sibling aggression, which in turn, related to higher levels of younger sibling delinquency. Older sibling delinquency was related to higher levels of delinquent peer affiliation, which was, in turn, related to higher levels of younger sibling delinquency. Bootstrapping revealed that sibling aggression mediated the relation between harsh/inconsistent parenting and younger sibling delinquency, and delinquent peer affiliation mediated the relation between older sibling delinquency and younger siblings' delinquency. Because the direct path from older sibling delinquency (T1) to younger sibling delinquency (T2) was nonsignificant ($\beta = .07$, $p > .05$), as was the path from parenting (T1) to younger sibling delinquency (T2) ($\beta = -.45$, $p > .05$), these direct paths were removed from the final model given no significant change in model fit (see above paragraph).

Multigroup comparisons—Group differences on parameter estimates were determined by comparing parameter estimates for each group and critical ratios, which yield z scores. Data revealed that the path from sibling aggression to younger sibling delinquency was significantly different across groups ($z = 2.12, p < .01$), as was the path from older sibling delinquency to sibling aggression ($z = 1.96, p < .05$).

Discussion

SIL theory (Patterson, 1982) suggests that parenting modifies the effects of environmental stressors on adolescent adjustment, while acknowledging that economic strain heightens risk for disruption in parent-child dynamics and parent management skills. Consistent with this theory, a few investigations in the last two decades have documented the pivotal role of family conflict and coercion in the link between economic hardship and adolescent adjustment (Conger, Conger, & Elder, 1994; Conger et al., 1994; Conger et al., 1991). Using developmental process models, these studies suggest that economic hardship heightens parent-child conflict through spousal hostility and parents' depressed mood. More recent studies also validate the role of parenting (i.e., aggressive dynamics) in preventing the spillover of economic stress on the sibling relationship (Williams et al., 2007).

The current study both validates and extends previous research (Barrera et al., 2002; Conger et al., 1994; Conger et al., 1994; Simons et al., 1994) on economic hardship and adolescent antisocial behavior by examining the moderating role of economic strain on the microsocial dynamics that influence adolescent delinquency. There are two fundamental ways in which economic strain may influence adolescent adjustment; families living under stressful conditions may simply experience more ecological risk factors (e.g., more hostility, conflict, exposure to antisocial peers), and economic stress may qualitatively alter susceptibility to risk factors, resulting in modified pathways to adolescent adjustment. A moderated process model allows us to assess both potential mechanisms. Specifically, we assessed whether economic strain amplifies (or modifies) the microsocial dynamics among parent, sibling, and peer relations that contribute to delinquent behavior. This hypothesis is predicated on a social-ecological framework, whereby the relative weight attributed to any particular relationship subsystem (on antisocial behavior) is likely to be modified by environmental factors.

The model tested in the current study suggests that parents' and siblings' relative influence on younger sibling delinquency may differ as a function of the economic environment. In noneconomically strained families, harsh/inconsistent parenting and older sibling delinquency influenced younger sibling delinquency via delinquent peer affiliation. Consistent with hypotheses, for economically strained families, sibling conflict and aggression had a much more potent and "poisonous" effect on the transmission of adolescent delinquency in economically strained families (despite similar mean levels across groups). All younger siblings experience a "double whammy" effect whereby parents and siblings are reinforcing social interaction dynamics. Given that younger and older siblings experience similar parenting, younger siblings experience the consequences of that parenting twice, once directly and once through older siblings' behavior. However, as predicted, parenting is particularly stressed or compromised in the face of economic strain, which may make sibling aggression incrementally more potent. Although previous research has examined economic stress as potentially exacerbating coercive family dynamics (Simons et al., 1994), this study is novel in proposing that the impact of sibling conflict is not uniform, but rather is modified by macrolevel stressors. Otherwise stated, while sibling aggression is relatively normative through adolescence (Duncan, 1999), stress in the broader family context may magnify the repercussions of such low support, especially since one cannot de-select siblings (as they can peers).

These findings have important implications for intervention and treatment, especially since that 80% of individuals in the United States have at least one sibling, and are more likely to grow up with their siblings than with their fathers (Noller, 2005). On a basic level, this study emphasizes the importance of addressing multiple family systems and processes, as surprisingly few interventions incorporate siblings in the assessment and treatment plan. Brief, family driven interventions such as the Family Check-Up (Dishion & Stormshak, 2007) may be particularly well suited to families experiencing economic strain, as they target maladaptive social dynamics among all subsystems within an ecological framework that addresses strengths and challenges across nested ecological contexts. At a minimum, this study should encourage practitioners and prevention researchers to consider the importance of gathering detailed information about the social dynamics and diverse ecologies both within and outside the family environment.

Although the current study elucidates some important differences in microsocial processes as a function of economic strain, it should be noted that levels of affiliation with delinquent peers did not differ across families, which was contrary to our hypothesis. This finding should be viewed in light of the fact that our findings may not generalize to families living in poverty as defined by strict government standards (that may reflect a harsher poverty). The current article focuses on families facing economic stress (as indicated by reliance on aid), which is related to, but not synonymous with poverty per se. Some of the documented relations may be modified by conditions of extreme poverty, as well as urban versus rural poverty. Consistent with our hypotheses, peer delinquency operated similarly, explaining the relationship between family interactions, older sibling delinquency, and adolescent delinquency regardless of family financial status.

Several strengths of this study should be noted. Multiple reporters and methods were utilized to define latent constructs in the current study, reducing shared method variance as an alternate explanation of the observed relationships. Use of multiple reporters also provides cross-contextual perspectives that yield more precise prevention implications (Lochman, 2004). The current study tested the sibling influence model using a longitudinal design covering a 3-year time span allowing for a unique developmental perspective; however, additional data points would allow for a more formal test of temporal sequencing (i.e., mediation) and more flexible analysis of growth in adolescent delinquency. The absence of repeated measures of younger sibling delinquency also limits the interpretation of the data in this study. Because the model did not include younger sibling delinquency at T1, the degree to which family interaction, older sibling delinquency, and delinquent peer affiliation would be similarly associated with adolescent delinquency after controlling for earlier manifestations of delinquency could not be determined. Despite the study's strengths, the generalization of the study's findings is limited to a predominantly Euro American sample living in a medium-sized Northwestern city. Further studies are needed to replicate these findings using larger, more socially and economically diverse samples from urban settings (e.g., nonintact families). Lastly, the current sample was limited to same-sex sibling dyads, precluding an assessment of mixed-gender sibling influence on delinquency. Some studies suggest influence (and concordance) on delinquency may be greater with same-sex dyads, though not consistently (see Craine, Tanaka, Nishina & Conger, 2009). Future work would benefit from examining the conditioning role of gender composition, and the underlying mechanisms that account for differences in similarity in delinquent behavior.

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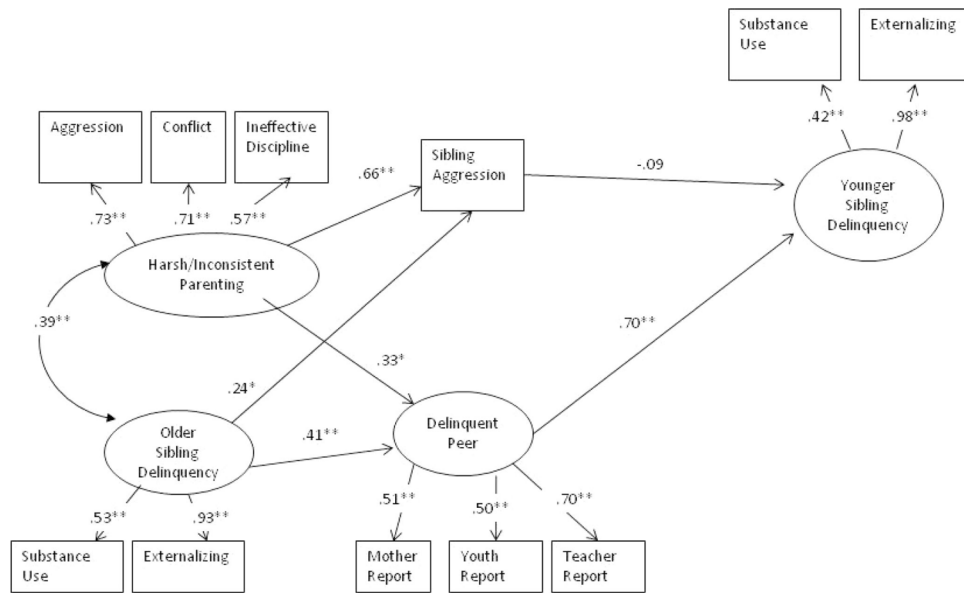


Figure 1.
Structural equation model for noneconomically strained families.

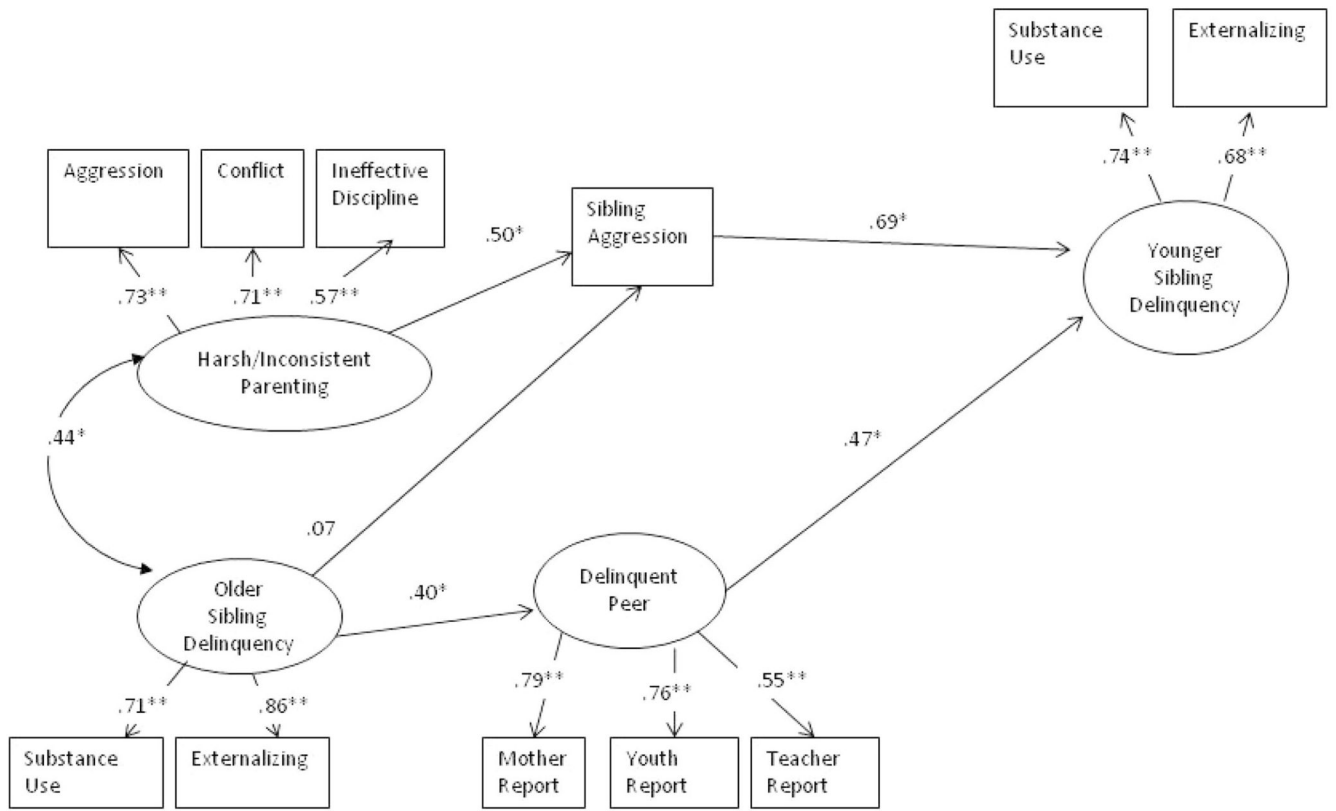


Figure 2. Structural equation model for economically strained families.

Table 1

Intercorrelations Among Construct Indicators

	1	2	3	4	5	6	7	8	9	10	11
1. T1 Mother discipline	1										
2. T1 Mother aggression	.45**	1									
3. T1 Mother-YS conflict	.38**	.54**	1								
4. T1 OS Substance use	.41**	.33**	.27**	1							
5. T1 OS Externalizing	.17**	.02	.06	.54**	1						
6. T2 YS Substance use	.30**	.27**	.32**	.41**	.34**	1					
7. T2 YS Externalizing	.21**	.09	.20**	.37**	.42**	.52**	1				
8. T1 Sibling aggression	.51**	.49**	.43**	.46**	.16*	.35**	.21**	1			
9. T1 YS Delinquent peer-YS report	.22**	.18**	.19**	.26**	.23**	.38**	.33**	.19**	1		
10. T1 YS Delinquent peer-M report	.19**	.24**	.28**	.33**	.23**	.56**	.34**	.23**	.38**	1	
11. T1 YS Delinquent peer-T report	.16*	.13*	.16*	.37**	.29**	.37**	.17*	.22**	.36**	.36**	1

Note. YS = Younger Sibling; OS = Older Sibling; T = Teacher; M = Mother.

* $p < .05$.

** $p < .01$.