



Published in final edited form as:

Am J Community Psychol. 2014 December ; 54(3-4): 384–396. doi:10.1007/s10464-014-9682-y.

Context-Dependent Pathways of the Transmission of Risk from Communities to Individuals

Andrea E. Lamont,

Department of Psychology, Barnwell College, University of South Carolina, 1512 Pendleton Street, Columbia, SC 29208, USA

M. Lee Van Horn, and

Department of Psychology, Barnwell College, University of South Carolina, 1512 Pendleton Street, Columbia, SC 29208, USA

J. David Hawkins

Social Development Research Group, University of Washington, Seattle, WA, USA

Abstract

Research has consistently documented the role of environmental risk factors in the onset of delinquent behavior among youth. Less is known about the processes through which these contextual risks are translated to individual youth behavior. The aim of the current study is to examine the role of family risk factors in the transmission of community risk. Data was obtained from a nationally representative sample of over 30,000 middle school youth and community key informants (CKI). A multilevel, moderated mediation model was estimated with family risk as the moderator of the effect of CKI ratings of community risk on youth perceptions of risk. Results showed that when youth came from low risk families (measured by parental use of positive family management strategies), youth perceptions of risk mediated the effects of community risk on youth delinquency; however, there was no evidence of a significant mediated effect under conditions of high risk (measured by poor family management). This appears to be because youth from high-risk families perceived their neighborhoods as high-risk, regardless of actual levels of risk (as reported by CKI). This study finds that the relationship between communities and adolescent behavior is complex and interacts with the family environment.

Keywords

Youth delinquency; Moderation; Mediation; Environmental risk; Youth perceptions; Community risk

Introduction

Youth delinquency is not a random event. Developmental scientists have long agreed that factors in all major ecological domains play a role in the onset and maintenance of antisocial and delinquent behavior over time (Hawkins et al. 1992; Farrington and Welsh 2007;

Sampson 1997; Sampson and Raudenbush 1999). Previous research demonstrates synergism of risk, such that the joint effect of multiple risk factors exceeds that of any one particular factor alone (Rutter 1979). Despite a substantial foundation of identified risk and protective factors in the developmental literature, the processes through which contextual risk factors translate to individual behavior remains relatively unknown. Multifinality is the notion that one etiologic factor can lead to many different outcomes, and the particular outcome experienced will depend on individual factors and presence of other contextual risks. This means that mere exposure to ecological risk does not necessarily translate to maladaptive behavioral outcomes. There is a need to delineate the processes through which delinquent behaviors develop in the context of environmental risk.

One possible mechanism that has been suggested in the literature is the individual's interpretations or perceptions of their contexts. Previous research has documented a relationship between an adolescent's perceptions of their environment and their behavior (Hawkins et al. 1992). One of the ways that community risk—defined in this study as both physical deterioration and poor social bonds—is thought to impact individual behaviors is through the individual's perceptions of this risk. In their theory of broken windows, Wilson and Kelling (1982) argue that a failure to address community problems can set off a chain reaction of community deterioration and crime. Even a single incident of disorder (such as the metaphorical “broken window”) may foster beliefs among community residents that formal and informal mechanisms of social control have failed, leading residents to adjust their behavior accordingly (e.g., by lessening participation in public places). This response to community conditions may incidentally may actually increase criminal behavior.

Only one study known to date has tested explanatory pathways between community risk and youth delinquency through youth perceptions of their community (Van Horn et al. 2007). Somewhat surprisingly, the authors found limited support for the mediated pathway; and noted that perceptions of community risk among youth were only weakly correlated with each other, as well as with independent ratings of the same community risks (Van Horn et al. 2007). This suggests that youth perceptions of community risks are related to other processes above and beyond actual community-level risk.

In the current paper, we examine how multiple ecological risk factors jointly explain pathways to delinquency. Specifically, we propose that observed variation in perceptions of risk among youth (Van Horn et al. 2007) may be related to family risks that either ameliorate or exacerbate exposure to community-level risk; and that these perceptions, in turn, predict individual behavior. We use the term community to refer to both physical location (e.g., neighborhood) and social relationships contained within the physical place. The conceptual model for this paper is presented in Fig. 1. We posit that families play a role in how youth perceive community risk, in addition to having a direct influence on the ways in which communities impact individual behavior. Our overall aim is to understand the mechanisms that underlie the transmission of risk from the community to the individual.

Community Risk Factors and Delinquency

Since the seminal work of Shaw and McKay (1942, 1969), the notion that delinquency occurs in the context of disadvantage has been well-accepted. Leading theoretical

explanations for this phenomena suggest that community disadvantage poses a risk to development because unfavorable structural characteristics impede the development of the type of high-quality social organizational structure that is needed to adequately inhibit problem behavior among youth (Leventhal et al. 2009; Leventhal and Brooks-Gunn 2000; Lenzi et al. 2013; Sampson et al. 1997; Bursik 1988; Sampson et al. 2002; Wilson and Kelling 1982). Physical deterioration and disorder increase perceptions of a lack of formal or informal control, which may reduce important social ties that would otherwise prevent problem behavior and crime (Gau and Pratt 2010; Wilson and Kelling 1982; Lenzi et al. 2013). Social disorganization includes low levels of sense of belongingness, perceived social support, and social cohesion among neighbors (Gorman-Smith et al. 2000; Lenzi et al. 2013). Low social capital and/or collective efficacy reduce the capacity for adults to adequately join together to promote pro-social behavior and dissuade delinquency (Sampson et al. 1997; Simons et al. 2005). Data show that youth raised in communities characterized by high levels of social disorganization are at an increased risk of engaging in a range of maladaptive and antisocial behaviors (Karriker-Jaffe et al. 2009; Erickson et al. 2012; Hawkins et al. 2004; Simons et al. 2012; Brooks-Gunn et al. 1993; Kingston et al. 2009; Maimon and Browning 2010; Sampson et al. 1997). Although often connoted with an urban problem, community risks also play an important role in youth development in rural and non-metropolitan areas (Connell et al. 2010; Chilenski 2011; Karriker-Jaffe et al. 2009; Farmer et al. 2004), though the types of risk that are most salient for development may vary across setting (Chilenski and Greenberg 2009). In fact, as much as 15–27 % of the variance in delinquency across communities can be explained by community-level risks (Van Horn et al. 2007).

Substantial empirical attention has been previously placed on the identification of community risk factors in order to explain higher rates of delinquent behavior in certain contexts (e.g. Farrington and Welsh 2007; Chilenski and Greenberg 2009). From an intervention standpoint, however, the mere identification of risk factors is a necessary, yet insufficient, condition. In order to develop effective preventative interventions, we must not only *identify* risks, but also have an understanding of the pathways through which, and conditions under, contextual risk translates to youth behavior. Further, many tests of social disorganization indicate weak (albeit significant) effects (Stewart et al. 2002; Gottfredson et al. 1991). A potential explanation for these small effects is that the configuration of risk across multiple ecological domains works together synergistically to cause behavior (Stewart et al. 2002); the omission of this synergistic relationship may be hiding true relations. Since it is generally challenging to change broad community conditions, understanding the processes through which community contextual risk is transmitted to the individual may be informative for prevention programs by identifying more malleable points of intervention. Nonetheless, few studies have examined cross-level moderation of community effects on youth outcomes, with no studies known to date that examine the context-dependency of underlying mechanisms of risk.

The Role of the Family in the Transmission of Contextual Risks—Maladaptive family functioning has consistently emerged as a salient predictor of youth delinquency (Loeber and Dishion 1983; Hawkins et al. 1992). Substantial evidence documents linkages

between ineffective parenting practices and delinquent behavior across a range of populations (Gorman-Smith et al. 1996; Hawkins et al. 1992; Farrington and Welsh 2007). In a recent meta-analysis of more than 160 studies, Hoeve et al. (2009) reported that parental monitoring, psychological control, and negative support were amongst the strongest predictors of youth delinquency; these parental factors accounted for, on average, approximately 11 % of all delinquent behavior studied.

Of course, families, similar to individuals, do not exist in isolation. They are naturally embedded within a community context, and are therefore intricately related to other contextual risks. Cumulative risk exposure across multiple ecological domains significantly increases risk for maladaptive outcomes (Stoddard et al. 2013; Farmer et al. 2004; Chilenski and Greenberg 2009); however, at the same time, exposure to protective or promotive factors in one domain may attenuate the effects of risk in the other (Delany-Brumsey et al. 2014). This suggests that families and the communities in which they reside are related in nuanced and complex ways (Delany-Brumsey et al. 2014). Examination of either system alone may yield an inaccurate interpretation of contextual risk.

A popular notion is that families may increase risk by acting as the conduit through which other environmental risks exert their influence (Bowen and Wretman 2014; Tolan et al. 2003; Gorman-Smith 2003). Fursetenberg (1993), Furstenberg et al. (1999) and Garbarino and Sherman (1980), for instance, suggested that community factors shape the quality and type of family management strategies used by parents. In their studies, mothers from poor or disorganized communities were more likely to adopt an individualistic and isolated parenting style than mothers from advantaged contexts, who relied on more social supports for child rearing. As a result of this context-specific parenting style, disadvantaged parents reported more stress, and their children had less availability to protective social supports. In this way, the effects of community risk on youth behavior were exerted, at least partially, through effects on parenting.

An alternative conceptualization of communities and families is that the two systems exert a synergistic effect on development. A substantial body literature reports significant interactions between family and community risk factors (see Schonberg and Shaw 2007), indicating that the joint effect of families and communities together is fundamentally different from the contribution of either system alone (Schonberg and Shaw 2007; Delany-Brumsey et al. 2014). A majority of this work, however, has focused on context-dependent parenting—i.e., how the effects of parenting depend on community context (Schonberg and Shaw 2007; Simons et al. 2005; Gorman-Smith et al. 2000; Gonzales et al. 1996), with few studies examining how the impact of community risk is altered by parents. Studies on community violence suggest that families may play a protective role by buffering youth from violence exposure in the community (Gorman-Smith and Tolan 1998; Gorman-Smith et al. 2004); however, more work is needed to delineate whether a similar buffering effect is observed when risks are less overt than community violence, such as the case of overall social disorganization within a community.

Mechanisms of Contextual Risk: Foundations to the Current Study

Van Horn et al. (2007) studied the extent to which youth perceptions of their community mediated the relationship between community risk and delinquent behavior. The authors posited that community risks would have an effect on youth delinquency because youth would perceive such behavior to be acceptable within their community. Perceptions of community risk were hypothesized to be the mechanism underlying the effects of actual risk and youth behavioral response. Results showed direct effects for both independent ratings and youth perceptions on delinquency, though only minimal support for the mediated pathway was found (Van Horn et al. 2007).

After closer examination, two interesting findings emerged that are worthy of further empirical attention. First, Van Horn et al. (2007) found that youth ratings of community risk factors were only modestly related to independent ratings of community risk. When community leaders and youth rated the *same* constructs in the *same* communities, only between 8 and 10 % of the community-level variance in youth ratings of community risk was explained by the independent ratings. Second, agreement on level of community risk among youth within the same community was low. Intraclass correlations (ICCs), a measure of inter-rater reliability, of youth perceptions of risk ranged from .022 to .065 (Hawkins et al. 2004); for reference, ICCs for community leaders averaged .19 across all items. This low agreement—both between youth ratings of the same communities, and between youth ratings and more objective measures—was surprising. One would expect that ratings of the same community would be more strongly correlated. The high variability in youth ratings suggests that other factors—beyond what *actually* exists in the community—play an important role in youth perceptions.

Research Aims—The purpose of this paper is to test whether the salience of the mediated effect first proposed by Van Horn et al. (2007) is contingent upon risks in other naturally-embedded systems. Specifically, the aim of this paper is to examine how the effects of community risk on youth delinquency through youth perceptions is modified by family risk (see Fig. 1). Similar to Van Horn et al. (2007), we hypothesize that the effects of independent ratings of community risk will increase youth delinquency by increasing youth perceptions of risk; however, we also expect that this pathway will depend partly on exposure to family risk. Low exposure to family risk is expected to buffer the effects of actual community risk on youth perceptions of risk, thereby reducing the likelihood of delinquent behavior for these youth.

Methods

Data came from a large naturalistic experiment examining the diffusion of science-based prevention programming in 41 distinct communities from seven US states (Colorado, Illinois, Kansas, Maine, Oregon, Utah, and Washington), where collaborators were located. Communities were selected through nomination from alcohol and drug prevention agencies in the state, based on their reputation for employing science-based prevention strategies. Nominated communities were matched within each state to three non-nominated communities on total population, percentage non-White citizens, economic indicators

(poverty and unemployment rates), and crime indices. Communities selected for participation were small and medium-sized incorporated towns with an average population of 14,646 (only two communities had populations greater than 41,000 persons) with distinct geographical boundaries (e.g., at least 60 miles apart; were not suburbs of larger cities). Each community had separate governmental, educational, and law enforcement structures, with most communities having only one high school (though some communities had multiple middle schools). A population-based survey was administered to all 6th, 8th, 10th, and 12th grade students in each community; thus, by design, there was considerable overlap between the concept of community and neighborhood in this study, making the distinction between proximal and distal community factors less relevant in this study than in other studies in similar settings (Chilenski 2011). Demographic characteristics of the communities used in this study appear in Table 1. Data from the 2002 survey year is presented here. There was no specific intervention associated with the data used in this study, rather the study was designed to measure the effects of natural variation between communities in prevention planning.

Participants

Data used in this study comes from two primary sources: community key informants (CKI) and youth. Use of multiple methods to assess community effects is desirable, especially in the context of known differences between youth perceptions and actual levels of risk (Chilenski and Greenberg 2009; Van Horn et al. 2007). CKI were defined as persons with a positional leadership role (e.g. mayor, police chief, business leaders, religious leaders) and other persons knowledgeable of prevention programs in their community. The latter group of CKI consisted of persons most frequently nominated by positional community leaders as being knowledgeable of prevention. Between 13 and 18 CKI (with roughly two to five knowledgeable about prevention programming) were interviewed per community. CKI ratings were aggregated and served as a proxy for independent or “objective” ratings of community-level risk (Sampson 1997). A total of 602 CKI were interviewed across all communities. All interviews were conducted over the telephone. Youth participants were obtained through population-sampling of all consenting 6th, 8th, 10th, and 12th grade students across all schools within each community. A total of 31,024 youth participated in this study, with the number of children per community ranging from 132 to 1,482. Participation rates (based on school enrollment) ranged from 48 to 85 % (average 70 % across all grades). Surveys were administered in school during one classroom period.

Measures

Youth ratings of their community, their parents, and self-reported delinquency came from The Communities That Care (CTC) Youth Survey, 2002 (Arthur et al. 2002a, b), a 30-item survey designed to identify risk and protective factors for adolescent substance use and delinquency. Psychometric properties of the CTC Youth Survey are favorable. Configural invariance across race/ethnicity, gender, and grade has been established, and there is evidence that the measure has adequate reliability and validity (Arthur et al. 2002a, b; Glasser et al. 2005). Detailed psychometric work for the instrument has been reported elsewhere (Arthur et al. 2002a, b; Glasser et al. 2005).

Community Risk—Youth rated their community on four distinct dimensions of risk: attachment (e.g. “I’d like to get out of my neighborhood”; “I like my neighborhood”; “If I had to move, I would miss the neighborhood I now live in”), disorganization (e.g. “I feel safe in my neighborhood”; “How much do each of the following statements describe your neighborhood: crime/drug selling, fights, lots of empty or abandoned buildings, lots of graffiti”), norms favorable to drug use (“How wrong would most adults in your neighborhood think it was for kids your age to use: marijuana, alcohol, cigarettes”), and laws against adolescent substance use and delinquency (“If a kids drank alcohol/marijuana/carried a handgun would he or she be caught by the police?”). These scales had comparable measures on the CKI interview, and were used in the earlier work of Van Horn et al. (2007). Across scales, higher scores reflect more risk; thus, attachment is actually a measure of *low attachment*.

Parallel items were administered on CKI interviews, with a few notable exceptions. The same dimensions of risk were assessed; however, CKI were asked to rate the *community* whereas youth were asked to rate their *neighborhood*. Additionally, for attachment, CKI responded to the following items: “This is a tight knit community”, “Most people care a lot about the community”, “Most people think of the community as their home”. These items differed from youth-rated items (listed above). Moderate levels of interrater reliability between CKI ratings of community risk were previously established, along with evidence of adequate variability between communities (Van Horn et al. 2007).

Family Risk—Family risk factors were measured through youth ratings of parental family management practices on the Communities That Care youth survey. Using the factor structure suggested by Glasser et al. (2005), youth rated on a four-point Likert scale how much they agreed with eight statements related to their parents’ knowledge of their whereabouts, rules of the home, and the likelihood of being caught for misbehavior. Higher scores indicated more positive family management (or lower risk). Psychometric properties of the scale are favorable with coefficient alpha reported to be .87 during scale development (Arthur et al. 2002a, b).

Delinquency—Delinquency was assessed using a series of items adopted from the Self-Reported Delinquency scale (SRD) used on the National Youth Survey (Huizinga and Elliott 1986), as well as a few additional behaviors of concern to state planners (e.g., possessing handguns at school). Specifically, youth were asked how often in the past year they: carried a handgun, sold illegal drugs, stole or tried to steal a motor vehicle (such as a car or motorcycle), were arrested, attacked someone with the idea of seriously hurting them, were drunk or high at school, were suspended from school, and took a handgun to school. Responses were provided on an eight-point Likert scale ranging from “Never” to “40+ Times”. The full SRD items have been shown to be valid with both rural and urban populations in an independent sample, though some of the items are more likely to be endorsed by urban youth (Piquero et al. 2002).

Data Analysis

Factor scores for all exogenous variables and the mediator were constructed using the measurement models presented in Van Horn et al. (2007). Factor scores were created using *Mplus* version 6.0 (Muthén and Muthén 2010). Due to significant skew related to a preponderance of zeros on the delinquency items (with the majority of the variability being between youth who reported some versus no delinquency), we used a manifest, binary indicator as the outcome variable. This variable indicated whether or not the youth had engaged in at least one delinquent behavior in the past year. The logit link function was used in all analyses with delinquency as the outcome. The rationale for using a binary outcome is that there is a qualitative difference between youth who engage in delinquency and those who do not; our focus was on this differentiation. Predicting the probability of delinquency through a logistic model was the most parsimonious approach to achieve this. Additionally, we selected this model to be consistent with Van Horn et al. (2007), who also used a manifest, binary variable as an outcome. Mediation and moderation analyses were conducted in *R* (R Development Team 2011), version 2.10 using *nlme* (Pinheiro et al. 2011) for normal outcomes and *lme4* (Bates et al. 2012) for the binary outcome. All variables (except delinquency) were grand-mean centered and standardized prior to estimation, rendering parameter estimates (reported below) standardized effects.

Analysis Model—The current study tests a model of moderated mediation for youth delinquency. Moderated mediation models exist when a mediated effect (i.e. the underlying process through which an independent variable exerts its impact on an outcome) is moderated by (or depends on) another, third variable (Fairchild and Mackinnon 2009; Mackinnon 2008). These models test whether the mediated pathway of the independent variable on the outcome varies in strength and/or direction depending on the level of another explanatory variable; in our case, whether the effect of community risk on youth delinquency through youth perceptions depends on level of family risk.

Composite equations estimated in this study are presented below, using the general notion of Raudenbush and Bryk (2002). Given the nested design of the data (i.e., youth within communities), a random intercept was included in each equation, which captures between community variability in the outcome.

$$\text{Logit}(\text{Del})_{ij} = \gamma_{00} + \gamma_{01} (CKI_j) + \gamma_{10} (\text{Family risk}_{ij}) + \gamma_{11} (CKI_j \times \text{Fam risk}_{ij}) + u_{0j} \quad (1)$$

$$\text{Logit}(\text{Del})_{ij} = \gamma_{00} + \gamma_{01} (CKI_j) + (\text{Youth percept}_{ij}) + \gamma_{20} (\text{Fam risk}_{ij}) + \gamma_{21} (CKI_j \times \text{Fam risk}_{ij}) + u_{0j} \quad (2)$$

$$\text{Youth percept}_{ij} = \gamma_{00} + \gamma_{01} (CKI_j) + \gamma_{10} (\text{Fam risk}_{ij}) + \gamma_{11} (CKI_j \times \text{Fam risk}_{ij}) + e_{ij} + u_{0j} \quad (3)$$

The parameter of interest for our primary research question is γ_{11} of Eq. 3, which indicates that the magnitude of the \widehat{ab} coefficient (the test of the mediated pathway) varies as a function of family risk. The impact on delinquency of each aspect of community risk—i.e., low community attachment, high community disorganization, community norms favorable

to substance use, and community laws against adolescent substance use and delinquency—was modeled separately. Grade level, ethnicity, and sex were included as covariates in all models.

Missing Data—Missing data was accounted for through multiple imputation (MI; Rubin 1987), a flexible, highly efficient approach for handling missing data recommended when data is missing at random (MAR; Schafer and Olsen 1998). In MI, observed data is used to impute a set of $m > 1$ plausible values for the missing data, and then complete-data analysis strategies are used to analyze the m imputed datasets. By combining estimates across imputations, estimates yielded by MI reflect the degree of uncertainty with which missing values can be predicted by observed data (Schafer and Olsen 1998). Ten imputed datasets were created. Because estimates of standard errors of the random effects are not available using MI, the variance components reported here were computed by taking the average across imputations. Resultant confidence intervals associated with these random effects are slightly underestimated and should be interpreted with caution. The percentage of missing information in this study was low (never more than 3 % for the effects of community variables), indicating that missing data had minimal effects on the parameter estimates in the model.

Results

Descriptive statistics show that roughly 34 % of students (21 % of males and 13 % of females) across communities reported engaging in at least one delinquent behavior. Nearly all covariates accounted for a significant amount of variability in youth delinquency and youth perceptions of risk. Covariates were included in all models; however, since the size of these effects changed only slightly across models, covariate estimates are only reported once for each outcome in Table 2. Results for all analysis models are presented in Table 3. Parameters listed under “Model 1” in the table correspond to Eq. 1 and estimate the effect of CKI ratings of community risk, family risk, and the CKI-rated \times family risk interaction on delinquency (logit); “Model 2” parameters correspond to Eq. 2, which estimates the partial effect of youth perceptions of communities, CKI ratings of communities, family risk, and the CKI-rated \times family risk interaction on delinquency (logit); and “Model 3” parameters correspond to Eq. 3, which estimates the effects of communities, family risk, and the CKI-rated \times family interaction on youth perceptions of communities.

Direct and Moderated Effects of Community Risk Factors and Family Management on Youth Delinquency

A significant direct effect of independent ratings of low community attachment (OR 1.16, 95 % CI 1.09–1.24) and high community disorganization (OR 1.10, 95 % CI 1.03–1.18) on the odds of youth delinquency was observed. As expected, increased exposure to these community risks increased the likelihood of engaging in a delinquent act. After accounting for family risk, however, we did not have sufficient evidence to conclude a significant association between law enforcement nor community norms and youth delinquency. Additionally, family risk had a significant direct effect on youth delinquency (OR .49; 95 CI

% .47–.50). Youth from high-risk families had a greater likelihood of engaging in delinquency across all models.

Family risk additionally had a synergistic effect, moderating the relationship between community attachment and delinquent behavior. Low family risk (operationalized as positive family management strategies) buffered youth from the deleterious effects associated with low community attachment (see Fig. 2a). The moderation of community disorganization by family risk followed a similar trend, though it was not found to be significant ($p = .056$).

Does the Pathway from Community Risk to Delinquency Through Youth Perceptions Depend on Family Risk?

We were then interested in testing whether youth perceptions of risk mediated the path from actual (CKI-rated) community risk to youth delinquency; and, if so, whether this path depended on level of family risk. To accomplish this aim, we first tested whether the relationship between community risk and youth perceptions of risk was moderated by family risk (the γ_{11} term in Eq. 3). If so, we tested the significance of the mediated pathway at different levels of the moderator. If there was no moderation of community risk and youth perceptions (γ_{11} was non-significant), we tested the overall mediated path.

For community attachment and disorganization, family risk significantly moderated the effect of CKI ratings of community risk and youth perceptions of the same risk (see Table 3). Interaction plots for these models are shown in Fig. 2b, c. Findings show that youth perceptions of community risk were more strongly related to CKI ratings of risk when youth came from low-risk families than from high-risk families. Perceptions of risk among youth from low-risk families more closely reflected CKI ratings of the same risk, while youth from high-risk families rated their neighborhoods as high-risk, regardless of actual levels of risk. Stated differently, even in the context of low risk, children from high-risk families perceived their communities to be risky.

Given significant moderation, we examined whether the interaction between CKI ratings of risk and family risk suggests differential pathways to delinquency. We tested the slope of the mediated pathway (\widehat{ab} coefficient) at two levels of family risk: the 90th percentile—i.e., youth who reported the lowest risk (high levels of family management strategies)—and the 10th percentile—i.e. youth who reported high risk (low levels of family management). This analysis tests whether family risk determines whether the effects of community risk on youth behavior is due to youth perceptions. For youth who reported low family risk, youth perceptions of communities mediated the relationship between CKI ratings of risk and delinquency (see Table 4). For youth who reported high family risk, there was no evidence of a significant mediated effect.

We did not have sufficient evidence to conclude that family risk moderated the relationship between norms favorable to substance use or law enforcement and youth perceptions (see Table 3). Since no evidence of moderation was detected, we tested the overall mediated pathway. Tests of mediated main effects did not provide evidence of significant mediation of community laws ($ab = .006$, .95 CL $-.001$ to $.014$) or norms favorable to substance use

($ab = -.024$, .95 CL $-.051$ to $.003$) on youth delinquency through youth perceptions. This is consistent with the previous findings of Van Horn et al. (2007).

Discussion

Substantial evidence documents the risks associated with growing up in disadvantaged contexts (Connell et al. 2010; Karriker-Jaffe et al. 2009; Sampson et al. 1997; Lenzi et al. 2013; Bursik 1988; Sampson et al. 2002); however, few studies have examined the pathways through which this risk is translated to individual behavior. Despite exposure, many youth who grow up in risky communities do not experience maladaptive outcomes. The purpose of the current study was to better delineate how ecological systems work together to explain differential pathways to delinquency. Specifically, we tested whether the pathway from community risk to delinquency differed based on exposure to family risk. Results showed that the transmission of community risk to individual delinquency depended on level of family risk. When youth came from low-risk families, youth perceptions of their community mediated the effect of community risk on delinquency. This mediated path appears to be explained by congruence between youth report of perceptions of risk and actual levels of risk in the community (as reported by CKI); youth from lower risk families provided ratings of community risk that were consistent with CKI reports of community risk. This was not the case for youth from families with high-levels of risk, who perceived high-levels of community risk regardless of actual levels of risk in the community. When family risk was high, there was lack of agreement between CKI and youth perceptions of risk, leading to a non-significant mediated pathway between community risk and youth delinquency. We did not find evidence for a significant mediated effect for laws against adolescent drug use or delinquency, or norms favorable to drug use. This may be related to measurement differences between the outcome (which was a global delinquency measure) and measures of risk (which were specific to substance use).

The findings reported here underscore the importance of adopting an ecological approach to understanding behavior. While examination of the effects of a single risk factor is informative, the joint examination of multiple ecological risk factors provides a much richer explanation of behavior. Data clearly indicates that community risks increase the likelihood of engaging in delinquent behavior (Chilenski 2011; Connell et al. 2010; Lenzi et al. 2013; Farmer et al. 2004; Erickson et al. 2012; Hawkins et al. 2004; Sampson et al. 1997); however, identification of this risk provides minimal information about how to intervene. In this study, by simultaneously testing how community risk interacts with family risk, we were able to better understand how community risks are translated to youth. If we overlooked the role of family risk, the magnitude of the mediated effect was negligible (though significant) for community attachment ($ab = .006$, .95 CL $.002-.011$) and disorganization ($ab = .022$, .95 CL $.003-.040$). These findings are similar to those reported in Van Horn et al. (2007), who modeled the main effect of community risks through youth perceptions without explicit consideration of family risk. Without considering families, the mediated effect was of questionable substantive meaning. Yet, by taking level of family risk into consideration, important pathways of risk emerged. This suggests that the omission of a single contextual variable in a model can misconstrue the interpretation of contextual

effects. Joint consideration of multiple risk factors is needed in order to obtain an ecologically-valid understanding of how environments shape development.

Our study adds to the growing evidence on problem behaviors with rural or non-metropolitan populations. Classic community risk studies primarily focused on urban localities (e.g., a study of Chicago neighborhoods; Sampson et al. 1997); and more recent evidence shows that communities can exert similar effects for youth residing in rural or non-metropolitan communities, though the qualitative type of risk most salient for youth may differ across setting (Karriker-Jaffe et al. 2009; Connell et al. 2010; Chilenski and Greenberg 2009). Our findings are consistent with this previous work, showing how community disorganization and low attachment can impact development among rural youth. Additionally, we further the field by explicating the process through which rural/non-metropolitan communities exert their influence on youth development. We show that families play a large role in the transmission of risk, and that the impact of communities on rural/non-metropolitan youth is best understood in the context of family risk. This pathway has not been tested with urban youth. Future research should test this pathway with urban samples to see the extent to which these findings generalize to urban populations. It is possible that family risk interacts differently across types of community risk, some of which may be more common in urban settings (e.g., community violence or gang activity versus physical deterioration). Uncovering differential risk processes across residential settings could have important implications for prevention and intervention strategies, indicating that the target of the intervention may differ depending on place of residence.

This study additionally contributes to the literature by further highlighting issues related to measurement of context. Existing studies often focus on youth perceptions of community risk (Arthur et al. 2002a, b; Resnick et al. 2004; Sampson et al. 1997), which can be subjected to reporter- and method-bias. The need for more objective measures has been promoted as an important direction for the field (Chilenski and Greenberg 2009). Our findings show that youth were fairly accurate reporters of community risk, but *only* when family risk was low. When youth were raised by high-risk families, they were not accurate reporters of community risk; rather, they perceived their communities to be highly risky, regardless of risk. This suggests that individual perceptions of risk are naturally intertwined with risks within the community *and* risks in other ecological domains. Future researchers are urged to consider this natural confounding when assessing community risk from individual perceptions.

Related, our study shows expected variation in ratings of community risk between youth and CKI. This difference in perceptions may be partly related to interactions with other risk systems (discussed above), their different roles in the community (e.g., leader versus resident), or artifacts of measurement. With regards to the latter, in this study, in particular, the survey items administered differed slightly between CKI and youth. (i.e., CKI rated the *community* and youth rated their *neighborhood*). Youth provided ratings of their *neighborhood* (which tapped into more social relations) and CKI provided ratings of *community* (which tapped into a broader concept of place). Communities and neighborhoods may represent different dimensions of risk (Chilenski 2011), thereby explaining some of the observed variation. Placing this in a broader discussion of measurement of risk, this issues

raises a challenge because different raters may naturally rate different risk dimensions. While an individual's perceptions of community are intricately related to both social relations and physical space (as in a neighborhood), community leaders may be lacking this social aspect of community and focus more on the broader dimension. This brings to question the validity of using CKI ratings as "objective", since CKI ratings may not take into account the psychological aspects of community, which are known to be important. Future research should continue to focus on how to measure different dimensions of community, taking both differences in physical space and the psychological sense of community into account.

This study has a certain limitations worth highlighting. First, data in this study is cross-sectional, which does not allow for establishing temporal precedence that would allow for stronger causal statements. Concerns related to temporal ordering are partially mitigated in the current study because the ordering of variables is heavily supported by theory and previous research. Since community risks change less over time (absent intervention) and are assessed independent of the individual, our exogenous variable (community risk) is more likely to pre-date the endogenous variables in the model (youth perceptions and delinquency), which are more likely to change over time. Nonetheless, our mediator (youth perceptions of risk) and outcome (delinquency) are both self-reported at a single time-point; thus, the causal direction of these two variables remains unknown. Threats to validity associated with cross-sectional mediation specifically (Maxwell and Cole 2007) were reduced because the parameter of interest was not an estimate of the mediated effect per se; but, rather, we were interested in whether the mediated effect depended on other risks. The bias associated with estimated mediated effects derived from cross-sectional data (Maxwell and Cole 2007; Cole and Maxwell 2003; Gollob and Reichardt 1987) should affect all levels of the moderator variable, and therefore reduce the degree to which the limitations of the cross-sectional design affect interpretation of results.

Second, the sample used in this study represented youth from small, indicated communities in the year 2002. The sample used in this study was unique in that there was substantial overlap between each community and any sub-communities or neighborhoods contained within. Each community contained typically only one high school and had a single, unified governance structure. The generalizability of these findings to more recent samples or youth residing in urban setting, where the nature of community risk may have certain important qualitative differences, is an area for future inquiry. Additionally, the measure of delinquency we used in this study was based on a well-validated and widely-used delinquency scale in the literature, and included additional items to address concerns of state policy makers. Still, there may be additional delinquent behaviors that are relevant for specifically rural youth that were excluded. Future research should continue to explore differential impacts of community risk across types of delinquent behavior.

Despite a substantial literature on the identification of risk factors, there is little known about the complex ways these risks work together and translate to youth behavior. This study adds to the literature by illustrating one way communities and families impact development, and shows that ignoring the impact of one ecological risk (e.g., by averaging over level of family risk) may lead to inaccurate interpretations of another system (e.g., communities). A

continued examination of the complex and nuanced ways that environments shape individual behavior is an important area for future inquiry. By examining the mechanisms through which community risks translate to individual behavior, prevention scientists may be able to identify more malleable points for intervention. Community risks can pose a challenge to prevention and intervention scientists because community conditions tend to be static and hard to change through a single intervention. Altering the ways in which youth perceive and respond to this risk may be a more effective point of intervention. This study contributes to the growing evidence that suggests interventions should be targeted at different type of risks (Chilenski and Greenberg 2009; Connell et al. 2010), and shows that interventions may be targeted based on risks in other ecological domains, as well. Since the transmission of risk from community to individual behavior is different for youth from high and low risk families, it may be more effective and cost-efficient to target intervention strategies based on these different underlying mechanisms of risk. The scientific field can be greatly enhanced by a more comprehensive understanding of how ecological risks across domains work together to jointly explain the multiple pathways of development.

Acknowledgments

This research was supported by Research Grant 5R01DA015183-03 from the National Institute on Drug Abuse awarded to J. David Hawkins. We are grateful to the co-funding organizations: the National Cancer Institute, the Center for Substance Abuse Prevention, the National Institute on Alcohol Abuse and Alcoholism, the National Institute on Mental Health, and the National Institute on Child Health and Development. The authors would like to thank Abigail Fagan for her thoughtful and helpful comments to an earlier version of this paper.

References

- Arthur MW, Hawkins JD, Pollard JA, Catalano RF, Baglioni AJ. Measuring risk and protective factors for substance use, delinquency, and other adolescent problem behaviors—The Communities That Care Youth Survey. *Evaluation Review*. 2002a; 26(6):575–601. [PubMed: 12465571]
- Arthur MW, Hawkins JD, Pollard JA, Catalano RF, Baglioni AJ. Measuring risk and protective factors for substance use, delinquency, and other adolescent problem behaviors—The Communities That Care Youth Survey. *Evaluation Review*. 2002b; 26:575–601. [PubMed: 12465571]
- Bates, D.; Maechler, M.; Bolker, B. lme4: Linear mixed-effects models using S4 classes.. R package version 0.999999-0. 2012. <http://CRAN.R-project.org/package=lme4>
- Bowen NK, Wretman CJ. Rural neighborhoods and child aggression. *American Journal of Community Psychology*. 2014 doi:10.1007/s10464-014-9673-z.
- Brooks-Gunn J, Duncan GJ, Klebanov PK, Sealand N. Do neighborhoods influence child and adolescent development? *American Journal of Sociology*. 1993; 99:353–395.
- Bursik RJ. Social disorganization and theories of crime and delinquency. *Criminology*. 1988; 26:519–551.
- Chilenski SM. From the macro to the micro: A geographic examination of the community context and early adolescent problem behaviors. *American Journal of Community Psychology*. 2011; 48(3–4): 352–364. doi:10.1007/s10464-011-9428-z. [PubMed: 21336674]
- Chilenski SM, Greenberg MT. The importance of the community context in the epidemiology of early adolescent substance use and delinquency in a rural sample. *American Journal of Community Psychology*. 2009; 44(3–4):287–301. doi:10. 1007/s10464-009-9258-4. [PubMed: 19838797]
- Cole DA, Maxwell SE. Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology*. 2003; 112(4):558–577. [PubMed: 14674869]
- Connell CM, Gilreath TD, Aklin WM, Brex RA. Social-ecological influences on patterns of substance use among non-metropolitan high school students. *American Journal of Community Psychology*. 2010; 45(1–2):36–48. doi:10.1007/s10464-009-9289-x. [PubMed: 20077132]

- Delany-Brumsey A, Mays VM, Cochran SD. Does neighborhood social capital buffer the effects of maternal depression on adolescent behavior problems? *American Journal of Community Psychology*. 2014; 53(3–4):275–285. [PubMed: 24659390]
- Erickson PG, Harrison L, Cook S, Cousineau M, Adlaf E. A comparative study of the influence of collective efficacy on substance use among adolescent students in Philadelphia, Toronto, and Montreal. *Addiction Research & Theory*. 2012; 20(1):11–20.
- Fairchild AJ, MacKinnon DP. A general model for testing mediation and moderation effects. *Prevention Science*. 2009; 10(2):87–99. doi:10.1007/s11121-008-0109-6. [PubMed: 19003535]
- Farmer TW, Price LN, O'Neal KK, Leung M, Goforth JB, Cairns BD, et al. Exploring risk in early adolescent African American youth. *American Journal of Community Psychology*. 2004; 33(1–2): 51–59. doi:10.1023/B:AJCP.0000014318.16652.30. [PubMed: 15055754]
- Farrington, DP.; Welsh, BC. *Saving children from a life of crime: Early risk factors and effective interventions*. Oxford University Press; New York: 2007.
- Furstenberg, F. How families manage risk and opportunity in dangerous neighborhoods.. In: Wilson, EJ., editor. *Sociology and the Public Agenda*. Sage; Newbury Park, CA: 1993. p. 231-258.
- Furstenberg, FR.; Cook, T.; Eccles, J.; Elder, GR.; Sameroff, A. *Managing to make it: Urban families and adolescent success*. Studies on successful adolescent development. The MacArthur Foundation; Chicago, IL: 1999. Retrieved from EBSCOhost
- Garbarino J, Sherman D. High-risk neighborhoods and high-risk families: The human ecology of child maltreatment. *Child Development*. 1980; 51(1):188–198. [PubMed: 7363733]
- Gau JM, Pratt TC. Revisiting broken windows theory: Examining the sources of the discriminant validity of perceived disorder and crime. *Journal of Criminal Justice*. 2010; 38(4):758–766.
- Glasser RR, Van Horn ML, Arthur MW, Hawkins JD, Catalano RF. Measurement properties of the communities that care youth survey across demographic groups. *Journal of Quantitative Criminology*. 2005; 21:73–102.
- Gollob HF, Reichardt CS. Taking account of time lags in causal models. *Child Development*. 1987; 58(1):80–92. [PubMed: 3816351]
- Gonzales NA, Cauce A, Friedman RJ, Mason CA. Family, peer, and neighborhood influences on academic achievement among African-American adolescents: One-year prospective effects. *American Journal of Community Psychology*. 1996; 24(3):365–387. doi:10.1007/BF02512027. [PubMed: 8864209]
- Gorman-Smith, D. The social ecology of community and neighborhood and risk for antisocial behavior.. In: Essau, CA.; Essau, CA., editors. *Conduct and oppositional defiant disorders: Epidemiology, risk factors, and treatment*. Lawrence Erlbaum Associates; Mahwah, NJ: 2003. p. 117-136.
- Gorman-Smith D, Henry DB, Tolan PH. Exposure to community violence and violence perpetration: The protective effects of family functioning. *Journal of Clinical Child and Adolescent Psychology*. 2004; 33(3):439–449. [PubMed: 15271602]
- Gorman-Smith D, Tolan P. The role of exposure to community violent and developmental problems among inner-city youth. *Development and Psychopathology*. 1998; 10:101–116. [PubMed: 9524810]
- Gorman-Smith D, Tolan PH, Henry DB. A developmental-ecological model of the relations of family functioning to patterns of delinquency. *Journal of Quantitative Criminology*. 2000; 16(2):169–198.
- Gorman-Smith D, Tolan PH, Zelli A, Huesmann LR. The relation of family functioning to violence among inner-city minority youths. *Journal of Family Psychology*. 1996; 10:115–129.
- Gottfredson DC, McNeil RJ, Gottfredson GD. Social area influences on delinquency: A multilevel analysis. *Journal of Research in Crime and Delinquency*. 1991; 28:197–226.
- Hawkins JD, Catalano RF, Miller JY. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin*. 1992; 112:64–105. [PubMed: 1529040]
- Hawkins JD, Van Horn ML, Arthur MW. Community variation in risk and protective factors and substance use outcomes. *Prevention Science*. 2004; 5(4):213–220. [PubMed: 15566047]
- Hoeve M, Dubas J, Eichelsheim VI, van der Laan PH, Smeenk W, Gerris JM. The relationship between parenting and delinquency: A meta-analysis. *Journal of Abnormal Child Psychology*: An

- Official Publication of the International Society for Research in Child and Adolescent Psychopathology. 2009; 37(6):749–775.
- Huizinga D, Elliott DS. Reassessing the reliability and validity of self-report delinquent measures. *Journal of Quantitative Criminology*. 1986; 2(4):294–327.
- Karriker-Jaffe KJ, Foshee VA, Ennett ST, Suchindran C. Sex differences in the effects of neighborhood socioeconomic disadvantage and social organization on rural adolescents' aggression trajectories. *American Journal of Community Psychology*. 2009; 43(3–4):189–203. doi: 10.1007/s10464-009-9236-x. [PubMed: 19347576]
- Kingston B, Huizinga D, Elliott DS. A test of social disorganization theory in high-risk urban neighborhoods. *Youth & Society*. 2009; 41(1):53–79.
- Lenzi M, Vieno A, Santinello M, Perkins DD. How neighborhood structural and institutional features can shape neighborhood social connectedness: A multilevel study of adolescent perceptions. *American Journal of Community Psychology*. 2013; 51(3–4):451–467. doi:10.1007/s10464-012-9563-1. [PubMed: 23264043]
- Leventhal T, Brooks-Gunn J. The neighborhoods they live in: The effects of neighborhood residence on child and adolescent outcomes. *Psychological Bulletin*. 2000; 126:309–337. [PubMed: 10748645]
- Leventhal, T.; Dupéré, V.; Brooks-Gunn, J. Neighborhood influences on adolescent development.. In: Lerner, RM.; Steinberg, L., editors. *Handbook of adolescent psychology*. 3rd ed.. Wiley; Hoboken, NJ: 2009. p. 411-443.
- Loeber R, Dishion T. Early predictors of male delinquency: A review. *Psychological Bulletin*. 1983; 94:68–99. [PubMed: 6353467]
- MacKinnon, DP. *Introduction to statistical mediation analysis*. Taylor & Francis Group/Lawrence Erlbaum Associates; New York, NY: 2008.
- Maimon D, Browning CR. Unstructured socializing, collective efficacy, and violent behavior among urban youth. *Criminology: An Interdisciplinary Journal*. 2010; 48(2):443–474. doi:10.1111/j.1745-9125.2010.00192.x.
- Maxwell SE, Cole DA. Bias in cross-sectional analyses of longitudinal mediation. *Psychological Methods*. 2007; 12(1):23–44. [PubMed: 17402810]
- Muthén, LK.; Muthén, B. *Mplus (version 6.0)*. Muthén & Muthén; Los Angeles, CA: 2010.
- Pinheiro J, Bates D, DebRoy S, Sarkar D, R Development Core Team. *nlme: Linear and nonlinear mixed effects models*. R package version 3.1-102. 2011
- Piquero AR, MacIntosh R, Hickman M. The Validity of a Self-reported Delinquency Scale: Comparisons across gender, age, race, and place of residence. *Sociological Methods & Research*. 2002; 30:492–529.
- R Development Core Team. *R: A language and environment for statistical computing*. R Foundation for Statistical Computing; Vienna, Austria: 2011. <http://www.R-project.org>
- Raudenbush, SW.; Bryk, AS. *Hierarchical linear models: Applications and data analysis methods*. 2nd ed.. Sage; London: 2002.
- Resnick MD, Ireland M, Borowsky I. Youth violence perpetration: What protects? What predicts? Findings from the national study of adolescent health. *Journal of Adolescent Health*. 2004; 35:424–433. [PubMed: 15488438]
- Rubin, DB. *Multiple imputation for nonresponse in surveys*. Wiley; New York: 1987.
- Rutter, M. Protective factors in children's responses to stress and disadvantage.. In: Albee, GW.; Joffe, JM.; Kent, MW.; Rolf, JE., editors. *Primary prevention of psychopathology: Vol. 3: Social competence in children*. University Press of New England; Hanover, NH: 1979. p. 44-79.
- Sampson RJ. Collective regulation of adolescent misbehavior: Validation results from eighty Chicago neighborhoods. *Journal of Adolescent Research*. 1997; 12:227–244.
- Sampson RJ, Morenoff J, Gannon-Rowley T. Assessing neighborhood effects: Social processes and new directions in research. *Annual Review of Sociology*. 2002; 28:443–478.
- Sampson RJ, Raudenbush SW. Systematic social observation of public spaces: A new look at disorder in urban neighborhoods. *American Journal of Sociology*. 1999; 105:603–651.

- Sampson RJ, Raudenbush SW, Earls R. Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science*. 1997; 277:918–924. [PubMed: 9252316]
- Schafer JL, Olsen MK. Multiple imputation for multivariate missing-data problems: A data analyst's perspective. *Multivariate Behavioral Research*. 1998; 33(4):545–571. [PubMed: 26753828]
- Schonberg MA, Shaw DS. Do the predictors of child conduct problems vary by high- and low-levels of socioeconomic and neighborhood risk? *Clinical Child and Family Psychology*. 2007; 10(2): 101–136.
- Shaw, CR.; McKay, HD. *Juvenile delinquency and urban areas*. University of Chicago Press; Chicago: 1942.
- Shaw, CR.; McKay, HD. *Juvenile delinquency and urban areas* (rev. ed.). University of Chicago Press; Chicago, IL: 1969.
- Simons RL, Lei MK, Stewart EA, Beach SRH, Brody GH, Philibert RA, et al. Social adversity, genetic variation, street code, and aggression: A genetically informed model of violent behavior. *Youth Violence and Juvenile Justice*. 2012; 10(1):3–24. [PubMed: 23785260]
- Simons RL, Simons L, Burt C, Brody GH, Cutrona C. Collective efficacy, authoritative parenting and delinquency: A longitudinal test of a model integrating community-and family-level processes. *Criminology: An Interdisciplinary Journal*. 2005; 43(4):989–1029.
- Stewart EA, Simons RL, Conger RD. Assessing neighborhood and social psychological influences on childhood violence in an African-American sample. *Criminology*. 2002; 40(4):801–829.
- Stoddard SA, Whiteside L, Zimmerman MA, Cunningham RM, Chermack ST, Walton MA. The relationship between cumulative risk and promotive factors and violent behavior among urban adolescents. *American Journal of Community Psychology*. 2013; 51(1–2):57–65. doi:10.1007/s10464-012-9541-7. [PubMed: 22744013]
- Tolan P, Gorman-Smith D, Henry D. The developmental ecology of urban males' youth violence. *Developmental Psychology*. 2003; 39(2):274–291. [PubMed: 12661886]
- Van Horn ML, Hawkins JD, Arthur MW, Catalano RF. Assessing community effects on adolescent substance use and delinquency. *Journal of Community Psychology*. 2007; 35(8):925–946.
- Wilson JQ, Kelling GL. The police and neighborhood safety: Broken windows. *The Atlantic Monthly*. Mar.1982 :29–38.

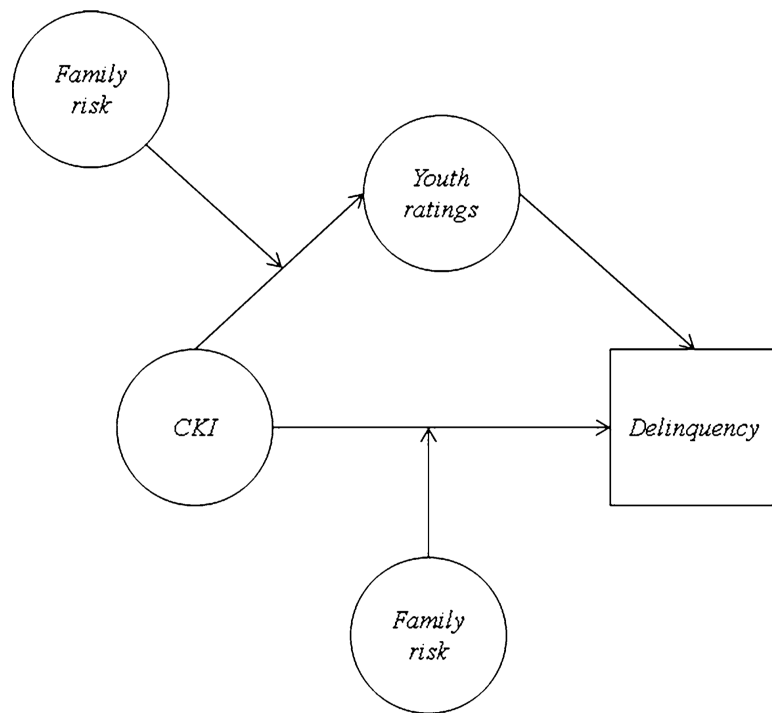


Fig. 1.
Conceptual model of the transmission of risk from communities to individuals

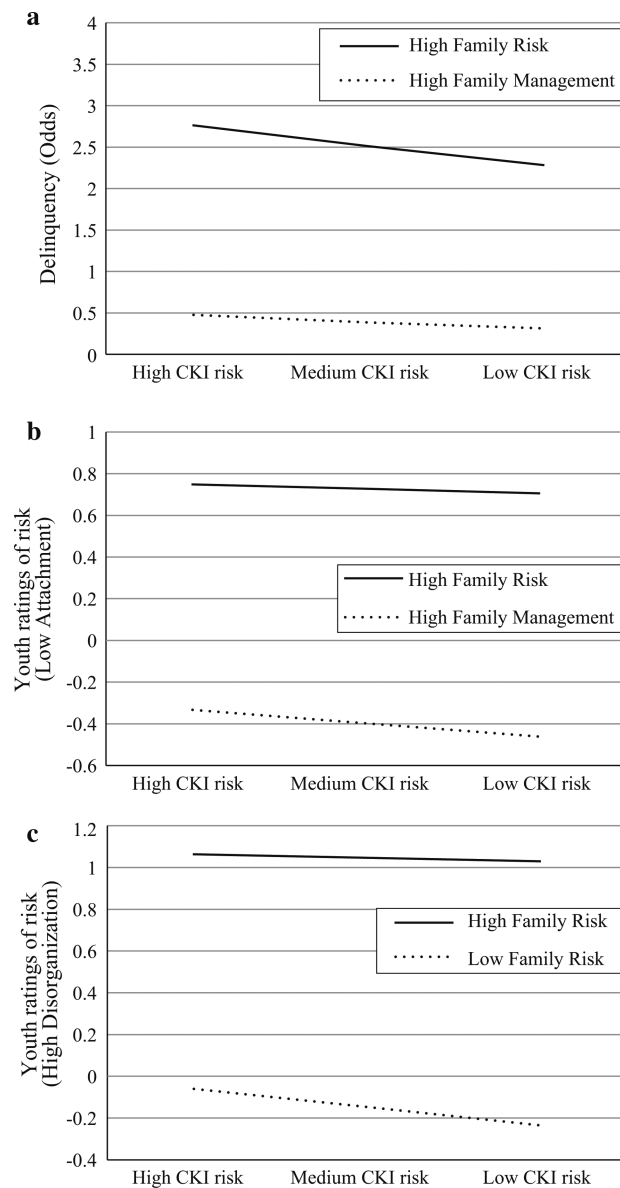


Fig. 2. Interaction plots between **a** family risk and CKI ratings of attachment on delinquency and **b** family risk and CKI ratings of attachment on youth ratings; and between **c** family risk and CKI ratings of disorganization on youth ratings

Table 1

Descriptive statistics across communities

	Minimum	Maximum
Total population	1,578	106,221
Juvenile population (aged 10-17 years)	201	12,350
Sex		
Percent male	44	52
Percent female	48	56
Race		
Percent White	64	98
Percent Black	0	19
Ethnicity		
Percent Hispanic origin	1	65

Data come from the 2000 census, where Hispanic ancestry included as a separate variable from race

Table 2

Parameter estimates in the covariate only model

	Estimate (SE)		df
Model 1: Direct effects of covariates on delinquency			
Intercept	.024 (.068)		13,329.38
Sex	−.387 (.013) *		2,206.70
Grade 6	−.271 (.020) *		6,555.54
Grade 8	.006 (.019)		5,429.46
Grade 10	.080 (.019) *		8,538.26
Black	.381 (.031) *		4,288.44
Native	.210 (.024) *		3,277.09
Hispanic	.024 (.068)		13,329.38

	Attachment		Disorganization		Laws		Norms	
	Estimate (SE)	df	Estimate (SE)	df	Estimate (SE)	df	Estimate (SE)	df
Model 2: Direct effects of covariates on mediator (youth perceptions of community risks)								
Intercept	.186 (.031) *	1,654.47	.461 (.038) *	4,560.36	−.256 (.031) *	13,594.37	−.087 (.041) *	31,024.00
Sex	−.025 (.006) *	340.42	−.069 (.006) *	1,772.64	−.063 (.005) *	13,974.59	−.067 (.005) *	839.87
Grade 6	−.262 (.009) *	13,040.46	−.101 (.009) *	779.88	−.535 (.008) *	2,178.83	−.463 (.008) *	4,162.22
Grade 8	−.101 (.009)	10,509.14	.013 (.009)	1,423.56	−.224 (.008) *	2,402.02	−.243 (.008) *	2,424.97
Grade 10	−.027 (.009)	17,642.17	.019 (.009) *	1,597.84	−.043 (.008) *	750.55	−.092 (.008) *	1,647.05
Black	.184 (.014)	2,696.19	.253 (.014) *	12,972.61	.082 (.013) *	5,653.40	.089 (.013) *	5,145.99
Native	.107 (.017)	483.04	.148 (.016) *	1,512.55	.035 (.015) *	850.62	.112 (.015) *	1,335.05
Hispanic	.091 (.011)	18,438.15	.118 (.011) *	1,848.64	−.023 (.010) *	4,034.61	.039 (.010) *	12,993.44

*
 $p < .05$

Table 3

Standardized parameter estimates

Model/parameter	Attachment		Disorganization		Laws		Community norms	
	Estimate (SE)	df	Estimate (SE)	df	Estimate (SE)	df	Estimate (SE)	df
<i>Model 1</i>								
Random int.	.034		.044		.049		.053	
Intercept	.057 (.064)	4,034.40	.073 (.066)	4,202.69	.071 (.067)	4,442.76	.069 (.068)	4,508.89
CKI ratings	.148 (.034) *	31,024.00	.095 (.036) *	8,495.38	.066 (.036)	31,024.00	-.026 (.038)	31,024.00
Family risk	-.724 (.017) *	703.05	-.724 (.017) *	698.46	-.722 (.017) *	622.51	-.721 (.017) *	639.45
CKI × family	.044 (.015) *	1,330.54	.032 (.017)	208.97	.024 (.016)	1,559.26	-.005 (.016)	710.59
<i>Model 2</i>								
Random int.	.034		.034		.046		.043	
Intercept	.022 (.065)	3,477.55	-.157 (.066) *	2,956.14	.123 (.067)	4,416.37	.116 (.067)	4,995.15
CKI rating	.142 (.033) *	31,024.00	.074 (.033) *	6,577.52	.060 (.035)	31,024.00	.000 (.035)	31,024.00
Family risk	-.663 (.018) *	665.46	-.548 (.018) *	497.69	-.613 (.018) *	792.39	-.494 (.019) *	311.95
Youth ratings	.154 (.015) *	1,344.78	.444 (.016) *	501.97	.247 (.018) *	450.02	.568 (.017) *	1,317.55
CKI × family	.042 (.016) *	1,120.80	.018 (.017)	217.88	.023 (.016)	1,612.08	-.008 (.016)	776.81
<i>Model 3</i>								
Random int.	.005		.019		.008		.025	
Intercept	.208 (.027) *	924.53	.496 (.031) *	5,220.63	-.225 (.025) *	2,857.52	-.062 (.032)	24,914.06
CKI rating	.041 (.013) *	4,516.43	.049 (.021) *	31,024.00	.026 (.015)	26,197.31	-.042 (.024)	31,024.00
Family risk	-.435 (.006) *	10,113.88	-.462 (.006) *	1,136.66	-.481 (.005) *	2,826.87	-.468 (.005) *	2,408.77
CKI × family	.017 (.005) *	4,193.40	.027 (.005) *	1,690.32	.004 (.005)	1,104.99	.007 (.005)	465.81

Degrees of freedom were calculated using the formulas for multiple imputation; parameters listed under “Model 1” in the table correspond to Eq. 1 and estimate the effect of CKI ratings of community risk, family risk, and the CKI-rated × family risk interaction on delinquency (logit); “Model 2” parameters correspond to Eq. 2, which estimates the partial effect of youth perceptions of communities, CKI ratings of communities, family risk, and the CKI-rated × family risk interaction on delinquency (logit); and “Model 3” parameters correspond to Eq. 3, which estimates the effects of communities, family risk, and the CKI-rated × family interaction on youth perceptions of communities

* $p < .05$

Table 4

Values of the mediated effect at varying levels of family management

Family management	\hat{ab} (SE)	df	Z value	<u>.95 confidence limits</u>	
				Lower	Upper
<i>Attachment</i>					
90th percentile	.010 (.003)	8,630.06	3.87	.005	.015
10th percentile	.003 (.002)	1,940.37	1.40	-.001	.008
<i>Disorganization</i>					
90th percentile	.039 (.010)	16,215.00	3.80	.019	.059
10th percentile	.007 (.010)	365,807.30	.75	-.012	.027