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LINKING LOCAL LABOR MARKET OPPORTUNITY TO VIOLENT ADOLESCENT DELINQUENCY

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Most criminological theory is cast at either the macro or micro level. Developmental and integrated theories are an exception as they combine community characteristics such as neighborhood poverty with micro-level processes. What remains lacking, however, is attention to labor market conditions. The authors address this gap by testing a contextual model that links local labor market structure, adolescent attachments, and violent delinquency. Analyses draw from the National Longitudinal Study of Adolescent Health. Our findings suggest that low-wage, service sector employment opportunity directly increases the likelihood of violent delinquency. A small proportion of this effect is mediated by school achievement and attachment. The low-wage service sector effect uncovered remains when important micro-level processes including prior violence are controlled. The authors conclude by discussing the persistent low-wage service sector effect, the intervening processes we do uncover, and implications for future theoretical development and research on local labor markets.

Keywords: *labor market; employment; violence; contextual*

The importance attributed by criminologists to structural causes of delinquency and crime has waxed and waned over the past century. However, over the past 20 years, structural theorizing has been revitalized. Blau and Blau's (1982) "The Costs of Inequality: Metropolitan Structure and Violent Crime" helped to legitimate such efforts, as did the rediscovery of classically grounded perspectives, such as social disorganization (Bursik and Grasmick 1993; Sampson and Groves 1989; Wilson 1996) and strain theories (Agnew 1992, 1999; Messner and Rosenfeld 1997). During approximately the same period of time, several integrated and developmental theories emerged (i.e., Akers 1998; Elliot, Ageton, and Cantor 1979; Hawkins and Weis 1985;

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Sampson and Laub 1993; Thornberry 1987). These perspectives incorporated structural conditions of communities into their models—conditions presumed to influence delinquency above and beyond the impact of individual-level processes.

Despite the importance assigned to structural attributes in contemporary theory and research, structural characteristics are rarely measured. They are also seldom included in tests of "integrated" conceptual models. This is particularly true when it comes to local labor market structure and opportunity. Indeed, with very few exceptions (reviewed below), researchers seeking to test models that integrate structural and micro-level theory have not systematically developed a set of indicators that adequately capture local labor market conditions, nor have they developed an explicit rationale for their inclusion—a rationale grounded in the insights of contemporary stratification theory and research.

In this article, we examine the relationship between labor market conditions and violent adolescent delinquency. We also assess whether the relationship can be explained by mediation through family well-being and adolescent attachments to family, school, and delinquent peers. We view our efforts as an initial step toward demonstrating the importance of local opportunity structures and identifying potential mechanism(s) that may produce the effect. We begin with a brief discussion and critique of prior contextual research. Next, grounding our analysis in the labor market stratification literature, we describe potentially important mediating processes that link structural opportunity with individual outcomes. Finally, we offer a test of the relations described—drawing from a nationally representative sample and employing techniques that are analytically appropriate given the multilevel nature of the associations we discuss.

BACKGROUND

Contextual research on delinquency typically focuses on direct effects of community social and economic disadvantage, such as weakened informal control or poverty, but has tended to ignore potentially influential, indirect mechanisms. Findings can be characterized as, at best, inconsistent. Peeples and Loeber (1994), for instance, reported that neighborhood disadvantage has a direct (positive) effect on each delinquency outcome that they analyzed. Analyses by Simcha-Fagan and Schwartz (1986) suggested a direct effect of disadvantage but only on one of three delinquency measures examined. Elliot et al. (1996), in one of the few studies that considers indirect pathways, found that structural disadvantage affects delinquency indirectly through community-level informal control but only in one of two samples analyzed. In

contrast to the generally supportive findings reported above, Gottfredson, McNeil, and Gottfredson (1991) found a positive effect of an affluence factor on theft/vandalism—a finding that is inconsistent with theoretical expectations. The inconsistency and complexity of this literature is summarized well by Gephart (1997; see also Jencks and Meyer 1990), who noted that "The same neighborhood may be 'protective' with regard to one aspect of adjustment or for one type of family but may function as a 'risk' factor or neutral influence for others" (pp. 29-30).

It is important to note that many of the studies about which we are speaking analyze data collected in one, two, or only a handful of cities (for an exception, see Crutchfield and Pitchford 1997). One consequence is that most if not all of the respondents in each city are exposed to the same labor market conditions. This means that there is likely to be less variability in local conditions measured at the community level and, all else equal, that the chance of linking local conditions to delinquency is reduced. Although these data limitations arguably account for some of the inconsistency noted above, we believe that theoretical limitations are also partially at issue.

The contextual literature is theoretically limited in at least two distinct ways. First, analyses typically overlook stratification dynamics that are, arguably, precursors to poverty, social disorganization, subcultural, and/or strain processes—processes usually given analytic priority. It is indeed surprising, given the often-cited work of Wilson (1987, 1996) and a well-developed literature in the area of stratification, that the community-level and contextual literature attributes so much causal significance to the effect of aggregate poverty or disorganization rather than labor market structure and opportunity. Sampson and Wilson (1995; see also Hagan and Peterson 1995) concurred, noting that much of this research is "hampered by a restricted view of community that fails to account for the larger political and structural forces shaping communities" (p. 48). Although conditions such as poverty or disorganization no doubt influence delinquency, local labor market opportunity is more fundamental and causally prior to the community-level disadvantages that are often given analytic priority (Bruce, Roscigno, and McCall 1998; Crutchfield 1989).

Second, little theoretical effort has been devoted to specifying the more proximate, micro-level social control and learning processes that may mediate a portion of the locality-delinquency relation. This is unfortunate, given that social control theory specifies the influential nature of individual attachments to key institutional structures that foster control and conformity. Principal are attachments to family and education, each of which reduce the likelihood of delinquency and criminal involvement (Hirschi 1969; Jang 1999). Likewise, Akers's (1998) social structure and social-learning model posited that learning processes, such as association with delinquent peers, mediate

the relationship between structural conditions and delinquency. For the most part, contextual research fails to explicitly link and test for such associations. Social control and social-learning research, in contrast, tends to neglect the fluid and dynamic nature of attachment and learning processes and their potential vulnerability to local opportunity.

SPECIFYING LINKS BETWEEN LOCAL OPPORTUNITY AND ADOLESCENT DELINQUENCY

In addressing theoretical and modeling limitations of prior work, we begin with research on social change and stratification—arguably the "glue" that bridges both macro and micro theoretical frameworks as well as the divide between delinquency perspectives and more general sociological concerns (Bruce et al. 1998; Wilson, 1987). Indeed, whether at the micro or macro level, sociological research has traditionally been interested in the issue of social transition, stratification dynamics, and their consequences for a variety of social problems, including alienation, community disorganization, and delinquency/violence (Park, Burgess, and McKenzie 1928; Shaw and McKay 1942; Wirth 1938).

The focus on labor market transition began to garner considerable attention into the 1950s and 1960s as urban areas began to face economic restructuring and suburbanization—trends that continue to shape the contemporary landscape. Especially important, U.S. urban areas have been witness to declining manufacturing sector employment and the growth of a two-tiered labor market—low-skill, low-wage, service sector jobs that are less stable and high-skill, high-wage professional occupations (Kasarda 1987; Massey and Denton 1993; Wacquant and Wilson 1989; Wilson 1996). These shifts in labor market structure, it is argued, have had a profound impact on the life chances of children/adolescents in these areas and have resulted in concentrated pockets of poor and generally unstable families (Anderson 1990; Bruce et al. 1998; Crutchfield and Pitchford 1997; Wilson 1987, 1996).

Recent criminological work has begun to systematically draw from these insights on the character and consequences of labor market opportunity. In an analysis of young adults, for instance, Crutchfield and Pitchford (1997) found associations between secondary labor market concentration and violent crime, concluding that those "in secondary sector occupations are more likely to experience job instability in the form of either lower expectations of job duration or more time out of the labor market and, as a consequence, they have higher levels of criminal involvement" (p. 112). Shihadeh and Ousey (1998) and Parker and McCall (1999) similarly linked arguments regarding economic restructuring and labor market opportunity with analyses of the

deprivation-violent crime relationship, whereas Allan and Steffensmeier (1989) suggested a direct link between poor jobs and young adult offending. In one of the more developed conceptual treatments of local opportunity and disorganization processes, Sampson and Wilson (1995) highlighted the importance of job structures for the well-being of local populations and criminological outcomes. We extend this work by focusing on adolescent delinquency and, more important, by making theoretically and empirically explicit potential mediating mechanisms in these relations.

Family well-being and adolescent attachment processes influential for delinquency may vary spatially and quite markedly as a function of local labor market opportunity. Stratification research has dealt with these themes broadly, making the distinction between core (primary) and peripheral (secondary) labor market areas and suggesting that each has implications for the distribution of resources within a population given varying returns on human capital investment, training, wages, and job stability (for instance, see Bluestone 1970; Hodson 1978; O'Connor 1973; Tolbert, Horan, and Beck 1980). More current work on the topic has highlighted the need for clearer specification of industrial attributes, emphasizing the relative importance and consequences of specific labor market sectors, such as core, low-wage service, extractive, and state (Bloomquist and Summers 1982; Horan and Tolbert 1984; Kaufman, Hodson, and Fligstein 1981; Kletzer 1992; Snipp and Bloomquist 1989), for deprivation and inequality among the local population (e.g., Jacobs 1982; Kalleberg, Wallace, and Althauser 1981; Tomaskovic-Devey 1987; Tomaskovic-Devey and Roscigno 1997; Wilson 1996).

Adolescent employment opportunities may be influential in shaping involvement in delinquency outcomes directly (see Allan and Steffensmeier 1989), yet our model focuses on the effect of labor market opportunity on delinquency through other mechanisms. We suggest that parental employment experiences and opportunity and their consequences for adolescent development within families and among peers, along with the success of local institutions such as schools to motivate adolescents to succeed, may be more important than employment experiences and opportunities for adolescents. Indeed, this distinction is important because the literature suggests that employed adolescents are more likely to engage in delinquency. This occurs largely through detachment from parents and school and exposure to peers who are similarly detached (Hirschi 1969). Moreover, perceptions of local labor market opportunity are an important component of social control, much like attachment to family or school, and may directly affect delinquent involvement if adolescents conclude that the future is not worth investing in. Adolescent perceptions are most likely to solidify through observation of the economic situation of parents and neighbors rather than through an assess-

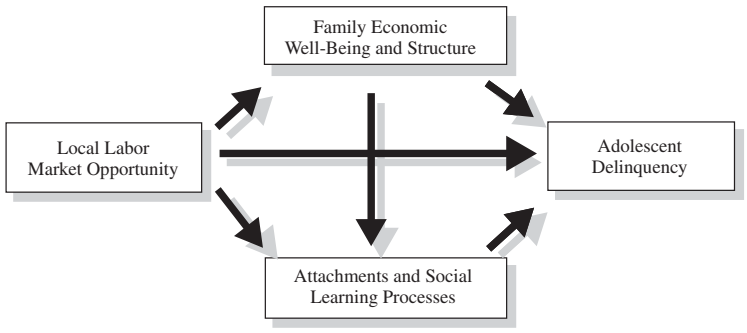

Figure 1: Local Labor Market Opportunity and Its Impact on Adolescent Delinquency through Family, School, and Delinquent Peer Attachment

ment of their own limited experiences. This point is made by Roscigno (1995), who noted,

> Given that perfect information regarding future opportunities is virtually impossible to acquire, it is likely to be the case that this type of information is supplied to a particular adolescent by his or her perceptions and observations regarding the current economic and occupational status of adults in close proximity. (P. 149)

Figure 1 offers a conceptualization of local labor market structures/opportunities and their consequences for delinquency through family well-being and adolescent attachment and social learning. As suggested by the stratification literature, the concentration of competitive low-wage, service sector jobs and high unemployment has adverse effects on family income. Service sector jobs often pay minimum wage or close to it, and thus a greater concentration of such employment is likely to push household incomes downward. Wilson (1987, 1996) also posited that family stability is threatened and family formation is impeded in such a context because males often resist marriage when good paying jobs are not available. Anderson (1990) concurred, noting that when traditional sources of masculinity, such as breadwinner, are systematically absent, family disintegration is more likely, and unconventional attitudes that encourage young males to avoid marriage unfold. Both processes reduce the likelihood that dual-parent households will form or persist.[1] In contrast, an abundance of professional sector opportunity is likely to enhance family well-being.

Family economic well-being and structure, partially patterned by labor market opportunity, will have implications for adolescent attachment to key

social control structures—the family and education. Parents of low socioeconomic status (SES) and single parents are more likely to experience emotional distress, thus undermining their ability to establish a strong relationship with their children. This is not to suggest that adolescents in poor or nontraditionally structured households cannot establish close ties with their parent(s) or that children cannot be reared efficiently and successfully in such an environment. What we are suggesting is that the demands of family life are more overwhelming when both natural parents are not present and where household resources are depressed. Recent research lends support to the arguments we are making, suggesting that family resources are predictive of parent-child bonding (Sampson and Laub 1993).

It is also well documented that family resources and structure are important determinants of school attachment and achievement. Although these effects are produced through both the inability of low SES, nontraditionally structured households to provide important educational resources to children and the class/race segregated nature of the schools these children attend (e.g., Lareau 1989; Roscigno 1998; Thompson, Alexander, and Entwisle 1988), they may also be shaped through cultural opposition/rebellion toward schooling (Cohen 1955; Fordham and Ogbu 1986; Mickelson 1990). It is also the case that public schools themselves are affected by poor labor market contexts, through the generation of school revenue and local decisions regarding investment. Those living in limited-opportunity locales disproportionately attend poorer schools, with adverse climates and limited resources. As a consequence, they are more likely to detach from school, achieve at lower levels, and drop out of school altogether (Roscigno, Tomaskovic-Devey, and Crowley 2000). These links, although consistent with classical perspectives regarding inequality and reproduction in education (e.g., Bowles and Gintis 1976), highlight the spatially varying nature of inequality and educational attachment processes.

Given the structural conditions we are discussing, we also consider the impact of differential association/social-learning variables such as delinquent peer group affiliation, which has well-documented implications for the likelihood of delinquent involvement (Akers 1998; Matsueda 1988; Warr 1993). The general prediction is that ties to peers who do not place value on following normative standards will be more likely where opportunity is constricted. Peer resistance to, or detachment from, conventional norms, rather than inherent to a particular population or merely "cultural," is viewed here as a manifestation of local economic conditions and the implications of those conditions for individual opportunity (Alex-Assensoh 1995; Anderson 1990; Bruce et al. 1998).

The family, school, and peer processes about which we are speaking will shape the likelihood of delinquency and partially mediate effects of family

economic well-being and structure. Here, we draw from a long history of social control and differential association theory and research (Burgess and Akers 1966; Hirschi 1969; Nye 1958; Reiss 1951; Sutherland 1939). When adolescents discuss important issues with their parents, achieve and are attached to school, and avoid delinquent peer networks, they are demonstrating concern and commitment to important social control structures and are less likely to internalize deviant attitudes or be exposed to delinquent role models. Because adolescents in such a situation are more likely to take into consideration the reaction of others before they act and less likely to think its okay to deviate, they are less likely to engage in delinquency. Although these final links are consistent with social control and differential association/social-learning theory and research, they are fundamentally different insomuch as the vulnerability of institutional and informal attachment/control and peer dynamics to local conditions is explicit.

DATA AND MEASUREMENT

The data are nationally representative of adolescents between the ages of 11 and 20 and are drawn from the restricted-use sample of the National Longitudinal Study of Adolescent Health (Add Health), waves 1 and 2, 1994 to 1996. Add Health was designed to examine the effects of multiple social contexts on adolescent health. The data were gathered using a school-based, clustered sampling design. A sample of 134 schools, stratified by region, urbanism, school type, ethnic mix, and size, was selected with probability proportionate to size. Schools provided a roster of all students, and from this list an in-home sample of 27,000 respondents was selected. A Total of 20,745 wave 1 and 14,738 wave 2 interviews were completed. For sensitive questions, such as the delinquency items, the respondents listened to questions through earphones and entered their own responses directly onto a laptop computer—thus minimizing response bias by improving confidentiality. In addition, a parent of each adolescent (the mother was preferred) was asked to complete an interviewer-assisted questionnaire.

Although variables pertaining to family well-being and adolescent attachments are drawn from the first wave of Add Health (1994), we take advantage of the longitudinal nature of the data by predicting delinquency outcomes at a later time point (1996) to bolster confidence in causal ordering. Rather than lose cases or artificially reduce variation through general mean substitution, regression imputation with random error components was used to replace missing items for explanatory family and adolescent attachment measures (Jinn and Sedransk 1989). Individual data were then matched with county-level labor market data derived from the U.S. census. Given our focus on

local economic opportunity, counties are the most appropriate unit because they more adequately capture the geographic boundaries of labor market areas, as standard metropolitan statistical areas (SMSAs) might, but without the loss of more rural areas of the United States (in this regard, see Crutchfield and Pitchford 1997; Horan, Hargis, and Killian 1989; Nielsen and Alderson 1997; Roscigno 1999; Tomaskovic-Devey and Roscigno 1996). Moreover, individuals and families are much less likely to move across county (and labor market) boundaries than would be the case for smaller geographic units, such as blocks or tracts. In our opinion, this sharply reduces but does not negate the potential consequences of selection effects on our analysis. Table 1 reports definitions, means, and standard deviations for all of the study variables.

Violent Delinquency

The analyses focus on an ordered scale that reflects serious self-reported violence. The scale is derived from four items pertaining to serious fighting, assault, and weapons use in the previous 12 months, which were measured in the second wave of data collection. Items used to construct this and other multi-item scales are listed in the appendix. We considered several issues in constructing the scale. First, the response set for each of the items included in the scale yields an ordered (not an interval) level of measurement and varies across the items. For instance, questions inquiring whether the respondent had pulled a knife or gun on someone and whether they had shot or stabbed someone used a response set coded as zero if the respondent had not engaged in these behaviors, one if they had engaged in them once, and two if they engaged in the act two or more times. The questions pertaining to serious physical fighting and hurting someone badly enough to require care from a doctor or nurse have a response set for which engaging in the behavior zero times is coded zero, once or twice is coded as one, three or four is coded as two, and five or more times is coded as three. A consequence of this is that a respondent who had shot/stabbed someone or pulled a knife/gun two times would be scored with a value of two, whereas a respondent who had been in a serious fight or hurt someone badly four times would also be scored with a value of two. This would lead to the conclusion that these two hypothetical respondents had engaged in the same number of violent acts—a conclusion that is misleading. The items therefore cannot really be considered continuous.

A second issue is that although the items were selected because they reflect involvement in violent delinquency, the items vary somewhat in seriousness. For instance, actually shooting or stabbing someone is more serious than pulling a knife or gun and threatening to use it. A consequence of this

TABLE 1: Variable Names, Variable Descriptions, and Descriptive Statistics, National Longitudinal Study of Adolescent Health

	Variable Description	M	SD
Endogenous variables			
Violent Delinquency Scale[a]	Four-item scale—see the appendix for item listing	.47	.92
Family income (in 1,000s)[b]	Total household income	45.46	42.17
Biological parents[c]	1 = respondent lives with both biological parents, 0 = other	.50	.50
School achievement[c]	Scale combining student grades in math, English, science, and social studies	.05	1.01
School attachment[c]	Six-item scale—see the appendix for item listing	.01	1.02
Family bonds[c]	Four-item scale—see the appendix for item listing	.05	.98
Peer delinquency[c]	Three-item scale—see the appendix for item listing	2.41	2.64
Exogenous variables			
Labor market[d]			
Low-wage service sector	Proportion employed in service and technical, sales, and administrative support	.45	.05
Unemployment	Percentage of adults between 16 and 65 years of age who are not working	6.80	2.39
Professional sector	Proportion employed in managerial and professional specialty occupations	.25	.05
Extractive sector	Proportion employed in farming, forestry, and fishing occupations	.03	.03
Tract disadvantage[e]	Principal components factor scale combining percentage below poverty line, percentage female households, percentage unemployed, and percentage African American	–.04	.97
Individual level[c]			
Asian	Race/ethnicity variables dummy coded	.03	.18
African American		.15	.36
Hispanic		.12	.33
Native American		.01	.08
Other		.01	.09
Moved	Dummy coded 1 if respondent moved in past two years	.47	.50
Male	Dummy coded 1 if male	.50	.50

(continued)

TABLE 1 (continued)

	Variable Description	M	SD
Age	Age in years	14.54	1.63
Prior violence	Four-item scale—see the appendix for item listing	.58	.86
Drug use	Dummy coded 1 if respondent has used alcohol or other drugs (marijuana, cocaine) in the past 30 days	.15	.35
Access to guns	Dummy coded 1 if respondent reports easy access to guns in the home	.18	.38
Urban	Dummy coded 1 if residence is in an urban area	.32	.47
Suburban	Dummy coded 1 if residence is in a suburban area	.38	.49
Northeast	Dummy coded 1 if residence is in the Northeast	.13	.34
South	Dummy coded 1 if residence is in the South	.37	.48
West	Dummy coded 1 if residence is in the West	.16	.37

a. From 1996 in-home adolescent survey.
b. From 1994 in-home parent survey.
c. From 1994 in-home adolescent survey.
d. From 1990 county census data.
e. From 1990 census tract data.

variation is that a respondent who has threatened to use a weapon twice would appear to be twice as violent as a respondent who has actually shot or stabbed someone once. Although it is debatable whether this conclusion is justifiable, we do not wish to make this assumption.

To address these issues, we have recoded each item as a binary response of zero or one, with zero indicating that the respondent has not engaged in the behavior reflected in the item and one indicating that they have. This coding draws a major distinction between respondents who have or have not engaged in the behavior and downplays variation among those who have. Examination of the frequency distribution for each item suggests that this procedure is reasonable. Most respondents have not engaged in the delinquent acts we measure, yet enough have to generate sufficient variability in our outcome.[2] For those who have, most have engaged in the delinquent act measured by each item only once. We create our scale by summing the (recoded) binary responses to each item yielding a range of zero to four and a focus on the breadth of violent delinquency engaged in by each respondent, rather than the total number of acts committed. This procedure has the advantage of reducing skew and creating a more tightly ordered dependent variable for the analysis. Given that the scale reflects an ordinal level of measurement, we use an ordered logistic regression procedure.

We experimented with other procedures, including summing the number of delinquent acts committed (as reflected in the original response sets for each of the items) and estimating negative binomial and ordinary least squares regression models. We also examined the binary items comprising the scale separately with logistic regression. In addition, we estimated a Rasch model that weights each item by its seriousness. These alternative procedures yield substantively similar results and do not alter the conclusions drawn based on the ordered logistic analysis of our Violence Scale. In general, given the difficulty of including serious chronic offenders (many of whom irregularly attend or drop out of school) in school-based surveys of the general adolescent population (see Cernkovich, Giordano, and Pugh 1985), we suspect that the analysis provides a conservative test of our ideas. After the exclusion of cases with missing data on the Violence Scale, we are left with a sample of 13,238 respondents across 132 locales. We also control for prior violence in analyses of the Violence Scale. It is composed of the same items as the Violence Scale and measured during the first wave.

Explanatory Variables

Measurement of labor market attributes is largely consistent with current research on labor market opportunity, economic development, and related patterns of stratification (e.g., Tomaskovic-Devey and Roscigno 1997). The

two most important indicators, given the emphasis of Wilson (1987, 1996) and criminological work that does incorporate a labor market focus, is low-wage, service sector size and local unemployment. Low-wage, service sector size is composed of the proportion of the civilian labor force employed in service and support (technical, sales, and administrative) occupations. Unemployment is measured by dividing the number of persons between the ages of 16 and 65 who were not working by the number of persons in the civilian population and then converting to a percentage. This measure of unemployment is considered to be superior to census calculations because it takes into account those individuals who are not actively seeking work or, in Wilson's (1996) terminology, those with weak attachment to the labor force. Evidence pertaining to the relationship between local unemployment while receiving considerable attention (e.g., Cantor and Land 1985; Chiricos 1987; Crutchfield and Pitchford 1997) is, at best, mixed.

It is important in the analysis of labor market effects to include other labor market attributes to differentiate potentially distinct effects of each sector. We include indicators of professional and extractive sector size, each of which is detailed in Table 1. Core sector, which subsumes precision production, craft, repair, operator, fabricator, and laborer occupations, is excluded from the equations to avoid a linear dependency among the labor market characteristics. We also control for concentrated disadvantage in the respondent's census tract in an effort to partial out crime-producing processes in the respondent's immediate neighborhood. Tract Disadvantage is a principle components factor scale combining percentage below poverty, percentage unemployed, percentage female-headed households, and percentage African American.

Family income, measured at the individual level, is measured in thousands. Given evidence that delinquency is concentrated at the lower tail of the SES distribution (Farnworth et al. 1994), we test for nonlinear family income effects in each equation. Parental structure is measured as biological, two-parent family, with single-parent and single/stepparent households as the referent. These deviations from the traditional, two-parent family have been shown in prior research to be consequential for children due to turmoil/disruption, depressed resources, and a less than ideal socialization environment (e.g., Hess and Camara 1979; Hetherington, Cox, and Cox 1978; McLanahan and Sandefur 1994; Menaghan 1996; Sandefur, McLanahan, and Wojtkiewicz 1992).

Adolescent attachments to school, family, and delinquent peers are derived from adolescent responses. Family Attachment is a multi-item scale assessing whether the respondent perceives that her or his parents and family care about, understand, and pay attention to her or him, as well as whether the family has fun together (see the appendix). We use two measures of adolescent

attachment to school. The first is achievement measured as an average of the respondent's grades in four subjects: English, math, science, and social studies. The second is a principle components factor scale combining six items that assess whether the respondent has had trouble getting along with teachers and other students, as well as general cohesion within the school (see the appendix). Finally, we include a three-item measure of whether the respondent's three best friends smoke, use alcohol, and use marijuana to measure delinquent peer affiliation. Although we would have employed a direct measure of peer involvement in property-related and violent delinquency had one been available, peer drug use is likely to be a reasonable proxy because drug use is strongly correlated with other forms of delinquent behavior and is often included by researchers in general delinquency scales.

Individual-Level Controls

Along with labor market, family, and attachment measures, we include important controls pertaining to race, sex, age, drug use, and access to guns in the home. Race and sex at the individual level have been shown elsewhere to be important correlates of adolescent delinquency. Relative to the involvement of White adolescents in general delinquency, Asians generally exhibit lower levels, Hispanics similar or lower levels, and African Americans higher levels (Huizinga and Elliot 1987). Labor market and delinquency processes may vary by racial/ethnic group affiliation (for instance, see Parker and McCall 1999). However, in this article our interest lies in theoretical development and analyses pertaining to the general impact of labor market opportunity on adolescent outcomes. We defer examination of racial differences and the role of labor market opportunity in generating them for future research.

With respect to age, the average age of onset for minor delinquency among serious and chronic offenders is 7 (see Bilchik 1998 for a complete discussion of this issue). Escalation to serious delinquency occurs by age 12, and involvement declines slowly thereafter. Because the age of the respondents in our sample ranges from 11 to 20 in wave 1, we expect a negative relationship between age and the Violence Scale. Along with these more common controls, we include an indicator of whether the respondent has moved in the past two years. This selectivity control affords some confidence that the main effects we find are not biased by movement in and out of labor markets areas. This control also likely captures potential disruption and the breaking of social capital ties for adolescents, both of which tend to have negative consequences for adolescent well-being (Ingersoll, Scamman, and Eckerling 1989; Reynolds 1991). Alcohol/drug use among respondents is a dummy variable coded one if the respondent had used alcohol and/or other

substances (e.g., marijuana/cocaine) in the past 30 days. Given the types of serious violence examined in this article, we also incorporate a binary measure of access to guns, which is coded one if the respondent reported that guns are easily accessible in their household. Finally, we include controls for urbanism and region.

ANALYTIC STRATEGY AND RESULTS

To produce correct estimates of standard errors and hence accurate hypothesis tests, standard OLS or logistic regression techniques rely on the assumption that error terms are uncorrelated across observations. This assumption is violated in multilevel data because of the clustering of observations within sampling units. As a result, standard errors are likely to be underestimated thus inflating *t* values (point estimates remain unaffected). The Carolina Population Center (Chantala and Tabor 1999:12) stipulated the use of procedures designed to control for the nesting of observations within aggregate units and formulated specifically for "design-based" survey analysis. The procedure they recommend, available in Stata 6.0, adjusts standard errors for the nesting of cases within strata (in this case region) and primary sampling units (in this case schools) and also allows us to apply the appropriate sample weight (the current version of HLM cannot handle limited outcomes *and* a sample weight).

The analyses (Table 2) focus on our Violent Delinquency Scale. The first equation introduces labor market indicators along with baseline controls including prior violence. The subsequent equations, consistent with our earlier arguments, introduce family background and then attachment and delinquent peer association measures. Relative declines in significant labor market effects, once family, attachment, and social-learning measures are introduced, reflect the mediation of labor market influence through these more proximate and micro-level mechanisms. Similarly, declines in family income and parental structure coefficients across the second and final equations suggest the importance of adolescent attachments and social learning as mediating mechanisms.[3]

We also examine the consequences of local labor market opportunity for family income, parental structure, and adolescent attachments to schools, families, and delinquent peers in Tables 3 and 4. Consistent with the causal ordering outlined previously, we introduce family income and parental structure into the attachment and peer delinquency equations to examine whether labor market effects on attachment are partially mediated through family economic well-being and structure.

TABLE 2: Ordered Logistic Model of Labor Market Structure on Violent Delinquency Scale (metric coefficients)

	Violent Delinquency Scale						
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
Variables	*B*	*B*	*B*	*B*	*B*	*B*	*B*
Labor market sector							
Low-wage, service	1.98**	2.01**	1.87**	1.91**	2.04**	2.08**	2.03**
Unemployment	.001	–.001	.001	.001	–.001	–.004	–.006
Professional	.31	.43	.43	.35	.25	.48	.59
Extractive	1.86	1.74	1.87	1.92	1.84	1.99	1.86
Tract disadvantage	.15***	.13***	.14***	.15***	.16**	.14***	.13***
Family and attachment							
Family income		–.002***					–.002**
Biological parents		–.14**					–.06
School achievement			–.14***				–.07**
School attachment				–.19***			–.09**
Family bonds					–.22***		–.16***
Peer delinquency						.13***	.11***
Individual-level/controls							
Asian	–.44**	–.45**	–.40**	–.39*	–.46**	–.38*	–.35*
African American	–.05	–.09	–.08	–.03	–.02	.07	.03
Hispanic	.19*	.15	.16	.23**	.22**	.21**	.19*
Native American	.33	.30	.25	.30	.35	.32	.26
Other	–.11	–.13	–.10	–.09	–.16	–.06	–.11
Moved	.15**	.09	.12*	.13*	.13*	.12*	.06
Male	.61***	.62***	.58***	.63***	.67**	.66***	.69***
Age	–.03	–.03	–.03*	–.03	–.05**	–.09***	–.09***
Prior violence	1.72***	1.70***	1.69***	1.66***	1.68**	1.63***	1.56***
Drug use	.86***	.85***	.82***	.77***	.79**	.43***	.38***
Access to guns	.56***	.59***	.59***	.56***	.56**	.57***	.59***
Urban	.21**	.20**	.22***	.22**	.20**	.21**	.20**
Suburban	.11	.12	.12	.11	.10	.10	.11
Northeast	.04	.05	.03	.05	.06	.05	.08
South	–.06	–.05	–.07	–.06	–.05	–.04	–.03
West	.11	.12	.11	.10	.09	.16	.15
R^2	.19	.19	.19	.19	.19	.20	.20
N	13,238	13,238	13,238	13,238	13,238	13,238	13,238

NOTE: R^2 estimates are obtained by reestimating models using ordinary least squares.
*p < .10, two-tailed test. **p < .05, two-tailed test. ***p < .01, two-tailed test.

Labor Market Opportunity and Adolescent Delinquency

Table 2 examines our argument regarding potential labor market effects on violent delinquency and its mediation through family well-being, attachments to family and school, and delinquent peer association. The effect of labor market structure on violent delinquency is presented in equations 1 through 7, with potential mediators entered in each succeeding equation.

TABLE 3: Regression Models of Labor Market Structure and Family Background on Family, School, and Delinquent Peer Attachment (metric coefficients)

	Family Income	*Biological Parents*[a]	*School Achievement*	
	(1)	*(3)*	*(5)*	*(6)*
Variables	*B*	*B*	*B*	*B*
Labor market sector				
Low-wage service	–11.09	.24	–.84*	–.86*
Unemployment	.26	–.04**	.01	.01
Professional	81.91***	–.20	1.07**	.89
Extractive	–50.74*	2.46	.001	.16
Tract disadvantage	–6.87***	–.22***	–.08***	–.05***
Family background				
Family income[b]				.005***
Family income squared[c]				–.01***
Biological Parents [b]				.15***
Individual-level/controls				
Asian	–2.39	–.07	.35***	.35***
African American	–8.21***	–.89***	–.28***	–.23***
Hispanic	–15.22***	–.12	–.30***	–.24***
Native American	–16.16***	–.40	–.55***	–.48***
Other	–8.71***	–.15	.04	.07
Moved	–8.69***	–.95***	–.20***	–.14***
Male[b]			–.28***	–.27***
Age[b]			–.05***	–.04***
Drug use[b]			–.39***	–.37***
Access to guns[b]			.08**	.05
Urban	–2.08	–.30***	.02	.03
Suburban	4.28***	–.06	.07*	.05
Northeast	2.28	.07	–.08	–.08
South	.17	.14	–.01	–.01
West	1.98	–.03	–.06	–.07
R^2	.10	.09	.11	.12
N	13,238	13,238	13,238	13,238

a. Logistic model, logits presented.
b. Variable not included in the income and biological parents equations.
c. Coefficient multiplied by 10,000 to reduce places to the right of the decimal.
*$p < .10$, two-tailed test. **$p < .05$, two-tailed test. ***$p < .01$, two-tailed test.

Consistent with our arguments, findings indicate that the likelihood of an adolescent engaging in violence is heightened in locales of low-wage service sector concentration. This effect is independent of tract-level disadvantage, which also increases the likelihood of violence.

Family income and structure are added to the modeling in equation 2. Results reveal significant and expected negative effects of living with both biological parents on violent behavior. The low-wage service sector effect actually increases, albeit minimally, with the introduction of family well-

TABLE 4: Hierarchical Models of Labor Market Structure and Family Background on Family, School, and Delinquent Peer Attachment (metric coefficients)

	School Attachment		*Family Bonds*		*Peer Delinquency*	
	(1)	*(2)*	*(3)*	*(4)*	*(7)*	*(8)*
Variables	*B*	*B*	*B*	*B*	*B*	*B*
Labor market sector						
Low-wage service	–.18	–.18	.07	.07	–1.45	–1.42
Unemployment	–.004	–.003	–.001	.001	.04	.04
Professional	.13	.06	.07	.04	–1.02	–.88
Extractive	.89	.90	.29	.26	–2.69	–2.78
Tract disadvantage	–.01	–.002	.01	.02	.04	.01
Family background						
Family income		.001***		.03[a]		–.004***
Family income squared		*ns*		*ns*		.05*** [b]
Biological parents		.13***		.17***		–.37***
Individual-level/controls						
Asian	.25***	.25	–.04	–.04	–.67***	–.67***
African American	–.06	–.03	.03	.06*	–.59***	–.68***
Hispanic	.10**	.11***	.08**	.09***	–.21**	–.27***
Native American	–.24	–.21	–.01	.003	.20	.12
Other	–.07	–.06	–.20	–.19	–.51	–.55*
Moved	–.13***	–.09***	–.09	–.05*	.24***	.13*
Male	–.01	–.01	.12	.12***	–.01	–.02
Age	–.03***	–.03	–.08	–.08***	.38***	.37***
Drug use	–.58***	–.56***	–.48***	–.46***	3.57***	3.52***
Access to guns	–.04	–.06*	–.06*	–.07***	.05	.10
Urban	.03	.04	–.02	–.01	.01	–.01
Suburban	.02	.02	–.001	–.001	–.01	.02
Northeast	.07	.06	.09*	.09	–.06	–.05
South	.05	.05	.07*	.07*	–.23	–.22
West	–.04	–.04	–.01	–.01	–.23	–.22*
R^2	.06	.06	.06	.07	.33	.34
N	13,238	13,238	13,238	13,238	13,238	13,238

a. Coefficient multiplied by 100 to reduce places to the right of the decimal.
b. Coefficient multiplied by 10,000 to reduce places to the right of the decimal.
*p < .10, two-tailed test. **p < .05, two-tailed test. ***p < .01, two-tailed test.

being. Equations 3 through 6 introduce adolescent attachments to family, school, and delinquent peers. Notably, the impact of low-wage service sector concentration decreases by about 5.5 percent when adolescent achievement is entered and 3.5 percent when school attachment is entered. Inclusion of the remaining indicators of micro-process does not contribute to the explanation of the service sector effect. However, each of the attachment measures has the expected effect on violent delinquency. Furthermore, the inclusion of all indicators of micro-level process (equation 7) reduces the effect of family

structure on violence. Taken together, these findings offer support for the contention that labor market opportunity is directly influential for adolescent violence and suggest that a small portion of the effect is attributable to the patterning of adolescent grades and attachment to school.

The findings for the individual-level control variables are generally consistent with prior research. Once the equations are fully specified, only Hispanic adolescents are more likely to be involved in serious forms of delinquency than are Whites, and males are more likely to be involved than are females. Age is also inversely related, reflecting the maturation process (i.e., "aging out"). Prior violence, recent drug use, and access to guns in the home also enhance the likelihood of violent delinquency.

Labor Market Opportunity, Family Well-Being, and Adolescent Attachment

Given minimal mediation of the low-wage, service sector effect on violence, we present but discuss briefly models examining labor market effects on our micro measures. In general, findings (Tables 3 and 4) lend some support to our contention that labor market opportunity is directly important for family well-being and school achievement. In particular, low-wage service sector concentration is associated with decreased family income relative to localities characterized by higher wage managerial/professional occupations, and unemployment is associated with decreased family intactness. Consistent with our predictions, family income, intactness, or both have implications for adolescent attachments to family, school, and peers in the expected directions.

The weakest direct effects of labor market structure are evident in the school attachment, family bond, and peer delinquency equations. Yet, this may not be as anomalous as it seems. Interactional theory (Thornberry 1987) suggests that as adolescents develop, their emotional energy is displaced away from the family and toward the school environment. The effect of labor market structure on family processes may be more likely to manifest during early childhood—a possible research avenue. The remaining question, to which we now turn, has to do with the underlying processes that may help explain the relationship between the low-wage, service sector and delinquency.

DISCUSSION

There is a growing contextual literature that examines the effect of community-level characteristics and individual-level delinquency outcomes. It is often

unclear, however, how the structural features identified actually manifest themselves at the individual level. Most micro theorizing, on the other hand, overlooks the context within which individuals are embedded and, more specifically, the vulnerability of micro-level processes to local economic and social conditions. In this article, we suggest that the roots of delinquency can be traced to the economic and social opportunities available to families and adolescents, both of which are patterned by, and embedded in, the spatially varying character of local labor market opportunity. Following recent urban research (Crutchfield 1989; Crutchfield and Pitchford 1997; Sampson and Wilson 1995; Wilson 1987, 1996), the primary contention was that the absence of work and the presence of traditionally low-paying service sector employment influence delinquency by weakening families and key attachment processes—mechanisms long viewed as proximate precursors of delinquency. The conceptualization offered suggests that (1) structural opportunity patterns delinquent outcomes through more proximate social control and social-learning processes, and (2) key attachments that foster social control at the individual level are themselves vulnerable to the dynamics and character of local labor market opportunity.

Overall, the data suggest that labor market conditions directly affect violent delinquency: Low-wage service sector concentration has a persistent effect on adolescent violence even with important micro-level processes and prior violence controlled. Little evidence of mediation was uncovered suggesting that theoretical modification of our labor market approach may be necessary. Other processes need to be considered, and research should consider whether the effects of labor markets vary across the life course. The labor market opportunities and experiences of parents may be most salient when their offspring are infants and toddlers. It is also the case that the measurement of peer processes was limited by a lack of more suitable items. Thus, peer processes may play a more influential role in explaining the labor market effects uncovered than is suggested by our analysis.

What are the other processes that potentially generate this persistent effect? One plausible interpretation of the persistent low-wage service sector–delinquency relationship is that adolescents and their families are continually evaluating the opportunities that are available to them in their local labor market. When adolescents perceive their future opportunities to be bright, they invest in and indeed envision future involvement in the mainstream world of work and begin to adjust their behavior so it is consistent with normative structures common to most workplaces. Yet, when employment prospects and mobility potential appear dim, adolescents realize they cannot count on legitimate social mobility opportunity, which places them at heightened risk of delinquency.

Given our finding that educational processes mediate a small portion of the effect, we suspect that a more complete examination of educational institutions in relation to economic conditions may shed further insight. For instance, Sullivan (1989), in an ethnographic account of inner-city adolescents, argued that involvement by youth in economic (income producing) crime is preceded by irregular school attendance. Most of the inner-city sample studied viewed pursuit of a high school degree with ambiguity because their parents and relatives tended to hold jobs that required little formal education. Most parents did not expect their sons to work and contribute economically to the family unless they were not in school. Given the generally soft labor market conditions in Brooklyn, New York, in the mid-1970s and general indifference toward school, adolescents of school age but not in school were more likely to attempt to produce income through participation in economic crime. Studies that examine the interplay between education, work, and crime may hold the key to explaining the service sector effect we have uncovered.

We also suspect that processes occurring within schools may be central to our understanding of serious delinquency. The disparate placement of lower SES adolescents on non-college bound or vocationally specific educational tracks, for instance, may be influential not only in generating depressed achievement but also by generating resistance or rebellion to traditional and institutional control structures. Cohen's (1955) now classic work dealing with the formation of peer subcultures in school and labeling dealt with this topic quite explicitly, although, perhaps due to the critique it received (see Kornhauser 1978), little criminological or delinquency theory has addressed this possibility since. There is, however, a useful contemporary body of educational research from which we can draw. This research suggests that adolescents from poorer backgrounds have a heightened probability of low track placement regardless of true ability (Ainsworth-Darnell and Roscigno 2001; Dauber, Alexander, and Entwisle 1996) and that within these low-tracked classrooms, alternative normative guidelines, conducive to delinquent behavior and outbursts, emerge (Willis 1977). Moreover, and assuming it to be the case that such students are from similarly deprived backgrounds, such tracking can set up a context within which delinquent peer associations may develop—associations that may have a strong and more proximate effect on adolescent behavior. If these scenarios are indeed the case, then alternative conceptions of detachment and peer association, which locate their formation at the institutional rather than locality level, may be warranted.

We similarly believe that processes described by strain theorists, such as the development of anger, depression, frustration, and stress, are likely important mediators and could be incorporated into the theoretical logic we have specified (see Agnew 1992). Likewise, Messner and Rosenfeld (1997)

suggested that the potentially inhibiting social controls exerted by institutions such as family and school may be weakened in a context of diminished opportunity, freeing individuals to focus on alternative and often illicit methods of increasing material well-being. Thus, labor markets that provide meager opportunities are arguably an important source of negative emotions and weakened institutional control, contributing to the spatial concentration of delinquency.

Further research is necessary to clarify the mechanisms at work. Our conceptual framework and analytic strategy nevertheless build on and extend the small but growing literature on the locality-delinquency relation and the impact of local labor market opportunity. Crutchfield and Pitchford (1997), whose work reflects this tradition, suggested that much crime and delinquency is situational, committed spontaneously in a "situation of company." Young adults whose work lives are characterized by frequent bouts of unemployment and who live in a context where many others are similarly situated, rationalize that there is little to lose if they decide not to get up for work. This type of rational decision-making increases the odds that such individuals will be exposed to situations that are conducive to criminal offending and victimization (e.g., hanging around on the streets at night). Our analyses suggest that the roots of adult offending problems, identified by researchers such as Crutchfield and Pitchford (1987), partially take hold even earlier in the life course as individuals move through adolescence. It is here that impressions about the future begin to form. When that future does not appear promising, adolescents are more likely to become disinterested in formal education and perhaps seek out alternative sources of status among peer cliques or possibly gangs (Bruce 1997). This puts them at heightened risk of delinquent involvement in the short term. Over the long term, they run the risk of falling into the pattern described by Crutchfield and Pitchford (1987) because postindustrial employers place a premium on formal education.

We believe that much contemporary research has drifted away from a fundamental insight derived from theorizing and research on labor markets—that the social conditions to which families and individuals are exposed and thus respond stem largely from the type of employment opportunities available. Because income and family structure are partially shaped by the availability of legitimate employment, the structure and functioning of local labor markets should be, logically speaking, fundamental in terms of foci. Family economic well-being and structure are, in turn, consequential for adolescent attachments to important social control structures—processes that are often treated as exogenous in delinquency studies. Our approach reflects an effort to bridge these insights and the macro-micro divide inherent in most delinquency research. Finally, given our findings, we suggest that theorists constructing cross-level, integrated delinquency models should consider

incorporating local labor market processes explicitly into their models and explore further the effects of labor market conditions on micro-level processes that lead to delinquency outcomes.

APPENDIX
Items Used in Multi-Item Scales

Violence Scale ($\alpha = .77$)
- In the past 12 months, how often did you:
  - Get into a serious physical fight?
  - Hurt someone badly enough to need bandages or care from a doctor or nurse?
  - Pull a knife or gun on someone?
  - Shoot or stab someone?

Prior Violence Scale ($\alpha = .77$)
- Comprising identical items as the Violence Scale but measured at wave 1.

School Attachment ($\alpha = .73$)
- You feel close to people at school.
- You feel like you are part of your school.
- You are happy to be at your school.
- The teachers at your school treat students fairly.
- Since school started this year, how often have you had trouble:
  - Getting along with your teachers?
  - Getting along with other students?

Family Attachment ($\alpha = .76$)
- How much do you feel that:
  - Your parents care about you?
  - People in your family understand you?
  - You and your family have fun together?
  - Your family pays attention to you?

Delinquent Peers ($\alpha = .76$)
- Of your three best friends, how many:
  - Smoke at least one cigarette a day?
  - Drink alcohol at least once a month?
  - Use marijuana at least once a month?

NOTE: The response set for all items is recoded where necessary so that higher scale values reflect heightened delinquency, school attachment, family bonds, and delinquent peer involvement.

NOTES

1. Although extractive sector size (i.e., agriculture, fishing, mining) similarly has been shown to depress family economic well-being due to the seasonal and relatively unstable nature of such work (e.g., Lobao 1990; Tomaskovic-Devey and Roscigno 1997), negative effects on family structure will not be evident due to higher levels of fundamentalist religiosity in such areas. Core sector employment, our referent, is typically defined by concentration in industries that are capital intensive, more unionized, and involved in the manufacturing of durable goods (Hodson 1983; Sakamoto and Chen 1991). Although generally associated with less poverty than either low-wage, service, or extractive sectors (e.g., Bloomquist and Summers 1982; Jacobs 1982; Tomaskovic-Devey 1987), core industrial effects on family income and structure will be negative relative to sectors composed of higher status managerial and professional occupations.

2. More specifically, 20 percent of the sample has been in a serious fight in the previous year, 8 percent have seriously injured someone such that they need medical attention, 4 percent have pulled a knife or gun, and 2 percent have actually shot or stabbed someone.

3. The primary focus of this article is on mediation of macro effects through micro processes. We acknowledge the possibility of conditional effects. Such effects are beyond the scope of this article, but are nevertheless an interesting avenue for future research.

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