Longitudinal Perspectives on Adolescent Street Gangs

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Street gangs have been of primary concern to the public, policy makers, and criminologists for well over a century. There is a very good reason for such concern: gang members contribute disproportionately to the overall level of crime, especially violent and serious offenses (Battin-Pearson, Thornberry, Hawkins, & Krohn, 1998; Curry, 2000; Curry, Ball, & Decker, 1996; Hill, Hawkins, Catalano, Maguin, & Kosterman, 1995; Howell, 2000; Huff, 1996; Klein & Maxson, 2006; Miller, 1975; Thornberry, Krohn, Lizotte, & Chard-Wierschem, 1993; Thornberry, Krohn, Lizotte, Smith, & Tobin, 2003; Thrasher, 1927). The research focus on gangs has led to important theoretical developments in the study of crime (Cloward & Ohlin, 1960; Cohen, 1955; Miller, 1958; Shaw & McKay, 1942; Thrasher, 1927) as well as being the impetus for many community-based prevention programs (e.g., Esbensen & Osgood, 1997; Howell, 1998; Kennedy, Piehl, & Braga, 1996; Klein, 1969; Kobrin, 1959; Mattick & Caplan, 1962; Miller, 1962; Thrasher, 1936).

In spite of these efforts gangs not only remain a significant problem, they have proliferated at an alarming rate in recent years. Klein and Maxson (2006) reviewed studies of gang proliferation and report that between 1980 and 1990 there was a dramatic increase in the number of large cities (100,000 population or more) that reported gang problems, increasing from 15% prior to 1980 to 70% by 1990. Gang problems spread to mid-sized and smaller cities from the mid 1980s through 1995 as well. Although there has been a slight reversal of the trend in less populated cities, the gang problem in larger cities remains stable.

With the rapid spread of gangs throughout the country, there has been an ever-increasing call for research to determine why individuals join gangs, the effects of gang membership on criminal behavior, why youth leave gangs once having joined, and the effects of gang membership on longer term life-course outcomes such as education and employment (Howell, 2000). Many of the more recent research efforts directed at answering these questions evidence a methodological shift from previous work on gangs. Earlier gang research either relied on observations of gang members during periods of membership or provided cross-sectional comparisons of gang members with non-gang members. More recent studies have introduced longitudinal panel designs to address questions concerning the reasons for and results of gang membership. The purpose of this paper is to examine the yield of longitudinal research on gangs in addressing these questions. Before doing so we briefly discuss the contributions of earlier research on gangs.

A. M. Liberman, *The Long View of Crime: A Synthesis of Longitudinal Research.*

Early Gang Research

Almost all of the early work on gangs targeted youth who were currently in a gang, interviewing them and observing their interactions within the gang structure (Bursik & Grasmick, 1995). These studies have provided a wealth of very rich descriptive information on the life of gang members. From these studies we have learned much about the structure of gangs, gang members' perceptions of why they joined gangs, their feelings toward other gang members, and their gang-related activities (Hughes, 2005).

Although the information from these studies has made significant contributions to our understanding of gangs and gang members, there are a number of methodological limitations with them. By focusing on youth after they had already joined a gang, the only information they offer on the reasons for joining is necessarily retrospective. Retrospective data have long been recognized as likely to be distorted (Yarrow, Campbell, & Burton, 1970) and can be influenced by the experience of gang membership itself. Limiting the focus of inquiry to current gang members also makes it difficult to determine the effect of membership on behavior. For example, it is not possible to determine if gang membership produces an increase in criminal behavior over pre-gang involvement in crime. Studies that follow gang members through the years in which they are gang members provide some information on this issue but even they cannot distinguish between a gang effect and an age effect. For example, an increase in criminal behavior over the years that youth are in a gang may be due to the fact that they are entering into the years when the prevalence of crime is at its peak rather than due to the effect of the gang.

Also, most of the early research did not follow gang members once they left the gang. Therefore, few studies could address the question of whether gang membership has an impact on future criminality. Nor could they examine the potential deleterious effect that gang membership has on life-course transitions and ultimately life chances. Some more recent qualitative studies of gang members have followed youth past the time when they were active gang members and have documented some of the adverse consequences of gang membership (Hagedorn, 1998; Moore, 1991).

Another common problem with early studies of gangs is the failure to include a comparison group of youth who do not join gangs. Many studies, especially observational ones, focus only on gang members and do not include subjects of similar age or background in order to determine if what is occurring in the lives of gang members is unique to them because of their membership or whether similar outcomes would occur to most youth who share similar background characteristics. Without such comparisons, it is impossible to determine if the gang is responsible for changes in behavior or other outcomes later in life (Hughes, 2005; Katz & Jackson-Jacobs, 2004).

Cross-sectional quantitative studies of gangs offer the advantage of including a comparison group with which to compare current gang members (e.g., Esbensen & Winfree, 1998; Klein, Gordon, & Maxson, 1986; Maxson, Whitlock, & Klein, 1997; Short & Strodtbeck, 1965). This study design allows researchers to directly contrast the characteristics and behavior of gang and non-gang youth at similar ages and

having similar background characteristics in order to determine how they differ. From these differences, inferences can be made regarding the causes of gang membership and the effect of gang membership on behavior.

A major problem with cross-sectional studies, however, is that the temporal order of the variables is indefinite and therefore causal inferences are, at best, risky. For example, if we find that gang members have significantly poorer relations with their parents than non-gang members, we do not know whether those poor relations were a cause of or risk factor for joining the gang or if they are a consequence of being in a gang.

Qualitative studies have provided rich descriptive information on a number of issues regarding the characteristics of gang members and the processes that take place in the gang. Cross-sectional quantitative studies have added to our knowledge by identifying relationships between gang membership and a number of potential risk factors for joining a gang. However, there are a number of questions that cannot be adequately studied with either methodology. In the next section, we describe those issues and suggest how longitudinal panel analyses provide the best alternative for addressing them.

Advantages of Longitudinal Designs

A longitudinal study, as the term is used in this review, selects a sample of respondents and follows them forward in time as they age. The ideal design for investigating the impact of gang membership on life-course development would have several key features. First, it would be based on a community sample representative of a clearly definable population. By focusing on a community sample, both gang members and non-members are represented to allow for inter-individual comparisons. Second, assessment of the sample should begin at ages that are prior to the typical onset of gang membership. Since gang membership is primarily a mid- to late-adolescent phenomenon, studies that start in late childhood or early adolescence are well-suited to this task. Third, the full sample would be followed for longer rather than shorter periods of time, hopefully across multiple developmental stages – e.g., childhood, adolescence, and emerging adulthood. Fourth, repeated measures would be taken across the follow-up period, at multiple points in time. Repeated measures allow for the assessment of intra-individual change as each person develops. Finally, the study would have a broad measurement space to allow for the assessment of antecedents, correlates, and consequences of gang membership.

With regard to the study of gang membership, longitudinal designs as just described, especially when compared to cross-sectional designs, enhance our ability to investigate a number of important substantive issues. In particular, we identify six issues that can be more fully and accurately studied with longitudinal data. They are:

1. *The Identification of Risk Factors*

   Identifying risk factors for gang membership is important for both theoretical and policy reasons. Theoretically, the accurate identification of risk factors

enhances our understanding of the origins of gang membership and helps structure more formal causal analyses. Practically, knowledge of major risk factors helps identify youth who may subsequently become gang members and aids in the development of intervention programs.

2. *Separating Facilitation and Selection Effects*
   There is a well-established relationship between gang membership and involvement in delinquent behavior, especially serious delinquency and violence. This association has been observed in cross-sectional and longitudinal studies and studies based on surveys, direct observations, and official records (Thornberry et al., 2003). What is less clear, however, is the causal direction of this relationship. Does gang membership facilitate involvement in crime or are individuals already involved in criminal behavior attracted to the gang?
3. *Tracing the Duration of Gang Membership*
   There is a commonsense notion that gang membership is a relatively stable phenomenon. That is, once an adolescent joins a street gang, he or she is likely to remain a gang member for quite a while. There is, however, relatively little research that follows representative samples of gang members over time to assess either this notion or the counter-notion, that gang membership is relatively fleeting.
4. *Separating Causes and Consequences*
   Much of the work that has compared family and peer relationships among gang members to those of non-members has treated those relationships as risk factors or potential causes. With cross-sectional data, however, there is no way to determine the causal order among these variables. The observed relationship could have been due either to parental and peer variables leading to gang membership or to gang membership increasing the association with deviant others and the deterioration of the bond between the youth and the parent.
5. *Establishing Short- and Long-term Consequences of Gang Membership*
   One important area of research that has been advanced by both qualitative and quantitative longitudinal studies of gangs is the impact that participation in a gang has on the life course and life chances of gang members. What gang members do while they are in a gang and the status of being a gang member appear to impact their future direction, but whether the impact of gang membership on this outcome is real or spurious is less well understood.
6. *Developmental Differences in Gang Membership*
   Developmental issues regarding gang membership and its impact on behavior and future outcomes have been largely unexplored. For example, we do not know if the risk factors for joining a gang differ for youth who join at different ages or if selection and facilitation effects are different at different ages.

A better understanding of these six issues has important theoretical and practical implications and, as we show in the following pages, these issues are more appropriately examined using longitudinal rather than cross-sectional study designs. The subsequent sections address these six issues, discussing first why longitudinal data are better suited for assessing them and then reviewing the results of longitudinal studies that have examined them. Some of these questions have been addressed

rather fully, while for other questions, research is still in its infancy. We obviously focus on the former in the ensuing sections.

Risk Factors for Gang Membership

In the epidemiological tradition, we define risk factors as "individual or environmental hazards that increase an individual's vulnerability to negative developmental outcomes" (Small & Luster, 1994, p. 182). In the present case, risk factors for gang membership are attributes that significantly increase the chances or probability that a person possessing those attributes will subsequently become a gang member. Risk factors, by definition therefore, occur prior to the onset of the outcome.

Risk factors can be distinguished from other classes of concepts that also yield statistical associations with gang membership. These include causal variables which are also logically antecedent to gang membership but in addition to temporal order they exert a true causal impact. Risk factors are antecedent and may or may not be causal. Consequences are variables that occur after the onset of gang membership and may have been caused by gang membership. Correlates are variables that are contemporaneously related to gang membership but without temporal order being established. They merely co-occur with gang membership.

Causes, risk factors, correlates, and consequences will all yield a statistically significant association or correlation with gang membership. Thus, identifying risk factors, as opposed to any of these other types of variables, is less a matter of statistical analysis and more a matter of design.

Longitudinal designs with repeated measures are ideally suited to identifying risk factors. They follow the same people over time and first assess various individual and environmental hazards and then assess the onset of gang membership. With such a design it is relatively easy to see which earlier hazards are significantly related to later gang membership and which, therefore, can be considered risk factors.

In contrast, cross-sectional studies are severely challenged in their ability to identify risk factors. Since all data are collected simultaneously it is quite difficult to separate risk factors from correlates or consequences. For example, there is strong evidence in cross-sectional data that school failure is statistically associated with gang membership. Failure in school could lead youth to join gangs, that is, it would be a risk factor. But it is also plausible that gang membership leads to alienation from and failure in school, that is, school failure is a consequence of gang membership. Or, school failure and gang membership may be mere correlates, both generated by some common prior cause. Cross-sectional designs cannot logically distinguish among these possibilities.[1] Indeed, the very strong temporal dimension embedded in the definition of a risk factor suggests the superiority of longitudinal designs.

[1] Cross-sectional data can be used to assess whether a fairly limited subset of variables are risk factors for gang membership. Namely, they can assess the status of variables that cannot change over time (e.g., being adopted in childhood) or whose onset prior to gang membership can clearly be established (e.g., the age of school entry). Although there are these exceptions, cross-sectional designs generally do not provide strong assessments of risk factors.

Even though risk factors are not necessarily causal, to properly identify risk factors, as opposed to correlates, is important for several reasons. First, absent accurate information on true causes, focusing intervention strategies on powerful risk factors is probably the most productive approach we have. Second, identifying risk factors is important to help target scarce prevention resources toward youth who are most likely to become gang members.

Turning to the empirical literature, a number of cross-sectional studies have identified correlates of gang membership. That is, they have identified attributes on which gang members and non-members differ, but, because of the cross-sectional design, they cannot determine if those attributes are antecedents, correlates, or consequences of gang membership. Reviews of this literature can be found in Thornberry et al. (2003, pp. 57–61) and Klein and Maxson (2006, Chapter 4).

In general, correlational studies show that gang membership is associated with deficits in a number of developmental domains. Although results are not entirely consistent across studies, and each study examines an idiosyncratic set of variables, these domains include neighborhood characteristics, family sociodemographic characteristics, parent-child relations, school factors, peer relations, individual traits, and prior deviance. The central question before us now is: which of these correlates are true risk factors, that is, which occur prior to gang membership?

The two most comprehensive assessments of risk factors are presented by Hill, Howell, Hawkins, and Battin-Pearson (1999) using data from the Seattle Social Development Project and by Thornberry et al. (2003) using data from the Rochester Youth Development Study. We start with these studies.

Hill et al. (1999) examined risk factors measured at ages 10–12 as predictors of gang membership between ages 13 and 18. Risk factors were drawn from five domains: neighborhood, family, school, peers, and individual characteristics. They found that "[21] of the 25 constructs measured at ages 10–12 predicted joining a gang at ages 13 to 18. Predictors of gang membership were found in all of the measured domains" (Hill et al., 1999, p. 308). The most potent risk factors are neighborhood youth in trouble and availability of marijuana; family structure, especially living with one parent and other adults or with no parents; low achievement in elementary school or being identified as learning disabled; association with deviant peers; prior involvement in marijuana use or violence; and externalizing problem behaviors. Hill et al. (1999) also found that having multiple risk factors greatly increases the chances of joining a gang.

Thornberry et al. (2003) examined risk factors measured before age 14 on the probability of joining a gang between ages 14 and 17. Because of the relatively small number of female gang members available for this analysis, we concentrate on the results for males. The key findings are presented here in Table 1.

For the male participants in the Rochester study, gang members have significantly greater deficits as compared to non-members on 25 of the 40 measured risk factors. Risk is observed in all seven developmental domains. Although many antecedent variables are related to the odds of joining a gang, there are few variables that, independently, have a very large impact on gang membership. For example, there are only three variables in Table 1 that have an odds ratio of 3 or more: experiencing

Table 1 Risk factors for gang membership, Rochester Youth Development Study, males only

Risk Factors	Odds Ratios
Area Characteristics	
Percentage African American	1.59*
Percentage in Poverty	1.88**
Community Arrest Rate	1.79**
Neighborhood Disorganization	.95
Neighborhood Violence	.86
Neighborhood Drug Use	1.51*
Neighborhood Integration	.71
Family Sociodemographic Characteristics	
African American	2.28**
Hispanic	1.19
Parent Education	.53**
Family Disadvantage	1.39
Poverty Level Income	1.91**
Lives with Both Biological Parents	.47**
Family Transitions	1.42
Parent-Child Relations	
Attachment to Parent	1.02
Attachment to Child	.69*
Parental Involvement	.94
Parental Supervision	.53**
Positive Parenting	1.10
Report of Child Maltreatment	1.78*
Family Hostility	.77
School Factors	
Commitment to School	.64*
Attachment to Teacher	.48**
College Aspirations	1.09
Subject's College Expectations	.70
Parent's College Expectations for Subject	.64*
Math Score	.41**
Peer Relationships	
Delinquent Peers	1.97**
Early Dating	2.82**
Precocious Sexual Activity	1.58*
Unsupervised Time with Friends	1.41
Individual Characteristics	
Negative Life Events	3.25**
Depression	1.71**
Self-Esteem	.82
Externalizing Behaviors	1.98**
Delinquent Beliefs	2.15**
Early Delinquency	
General Delinquency	3.26**
Violent Delinquency	4.19**
Drug Use	2.49**
Age of Onset of General Delinquency	.78

*$p < .05$ (one-tailed test), **$p < .01$ (one-tailed test).
Source: Thornberry et al. (2003), Table 4.2. Reprinted with permission.

negative life events (OR=3.25), prior delinquency (OR=3.26), and prior violence (OR=4.19).

While gang membership is not strongly related to many individual risk factors, it is strongly related to the accumulation of risk. Figure 1 presents the core results, in this case including female gang members because sample size is less of an issue for these cumulative risk analyses. For both males and females as the number of developmental domains in which risk is experienced increases, so too does the probability of gang membership. Youth, at least in Rochester, appear able to ward off the negative consequences of risk in a few domains, but, after that, the chances of gang membership increase rapidly. Hill et al. (1999) report similar results concerning the impact of accumulated risk on gang membership for the Seattle sample.

Several other longitudinal studies have identified risk factors for gang membership. Huizinga and colleagues (Esbensen & Huizinga, 1993; Huizinga, Weiher, Espiritu, & Esbensen, 2003; Huizinga, Weiher, Menard, Espiritu, & Esbensen, 1988) examined this issue in the Denver Youth Survey. They found poor parental supervision, deviant peers, non-delinquent problem behaviors, and certain indicators of school attachment and performance to be related to later gang membership. In contrast, attachment to parents, self-esteem, and attitudes toward the future were not identified as risk factors. Huizinga et al.

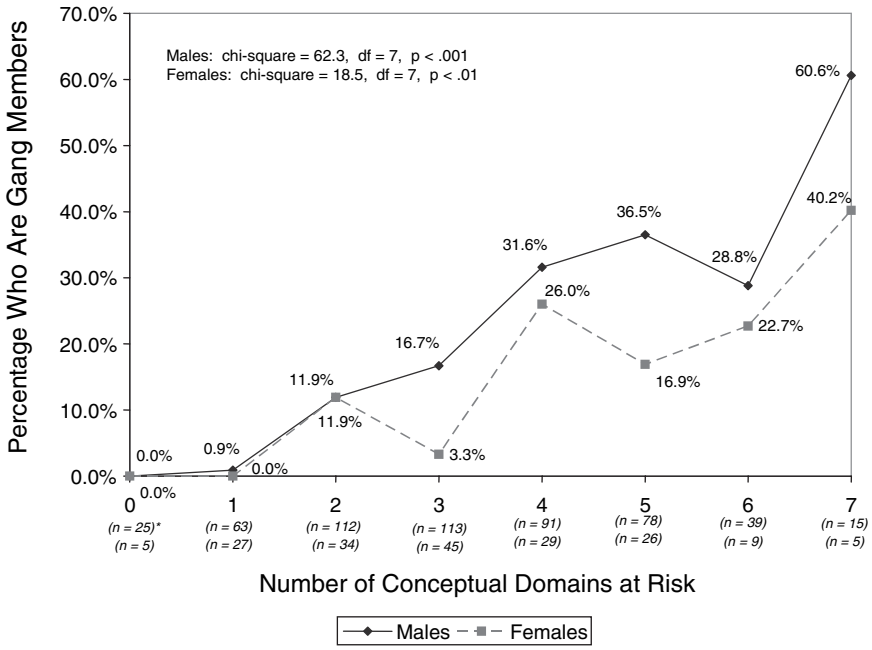


Figure 1 Cumulative risk for gang membership
Note: Top n is for males; bottom n is for females
Source: Thornberry et al. (2003), Fig. 4.2. Reprinted with permission.

(1988) also report that the accumulation of risk is strongly related to gang membership.

Two studies (Craig, Vitaro, Gagnon, & Tremblay, 2002; Gatti, Tremblay, Vitaro, & McDuff, 2005) use data from the Montreal Longitudinal and Experimental Study to examine risk factors. Among the variables significantly related to gang membership are: low parental supervision, deviant peers, commitment to school, and non-delinquent problem behaviors.

Lahey, Gordon, Loeber, Stouthamer-Loeber, and Farrington (1999) examined predictors of first gang entry for males in the Pittsburgh Youth Study. Their study was restricted to African American males because of the small number of White male gang members available for analysis. In bivariate relationships, gang membership is predicted by prior conduct disorder behaviors, self-reported delinquency, and associations with delinquent peers. Gang membership is not related to household income, household structure, neighborhood crime level, or parental supervision, however.

Walker-Barnes and Mason (2001) identified ninth-graders who joined a gang during the course of that academic year. Parental warmth, parental control or monitoring, and peer deviance were all related to gang membership in the expected direction. Walker-Barnes and Mason also examined differences by race and ethnicity. In general, the parenting variables had a somewhat stronger impact for African American youth than for White or Hispanic youth. In particular, "higher levels of behavioral control and lower levels of lax and psychological control were related to decreases in gang involvement for Blacks…" (Walker-Barnes & Mason, 2001, p. 1826).

Bjerregaard and Lizotte (1995) used the Rochester data to look specifically at the impact of earlier delinquency and gun ownership on the likelihood of being a gang member. They found that prior involvement in serious delinquency and street delinquency, but not more general forms of delinquency, increases the likelihood of later gang membership. They also found that owning guns for protection, but not for sporting purposes, increases the chances of joining a gang.

One of the most thorough reviews of the risk factor literature was conducted by Howell and Egley (2005). They identified risk factors in five major domains or ecological levels. The significant risk factors to emerge from their systematic review are presented in Table 2. These results highlight the multitude of risk factors in the backgrounds of gang members and the extensiveness of risk across domains. The core finding of accumulated risk is clearly evident in all the longitudinal studies included in their review.

Summary

Several general conclusions about the investigation of risk factors for gang membership appear warranted. First, there are only a relatively small number of longitudinal studies that have investigated this issue. There are even fewer studies that have used the same set of risk factors so there are few replicated results. Given the importance, both for theory and prevention, of understanding the antecedents of

Table 2 Risk factors for gang membership in prospective longitudinal studies*

Community/neighborhood risk factors
Availability/ perceived access to drugs (Hill et al., 1999)
Neighborhood youth in trouble (Hill et al., 1999)
Community arrest rate (Thornberry et al., 2003)
Feeling unsafe in the neighborhood (Kosterman et al., 1996)
Low neighborhood attachment (Hill et al., 1999)
Neighborhood residents in poverty or family poverty (Hill et al., 1999; Thornberry et al., 2003)
Availability of firearms (Bjerregaard & Lizotte, 1995; Lizotte et al., 2000; Lizotte et al., 1994; Thornberry et al., 2003)
Neighborhood disorganization (Thornberry, 1998; Thornberry et al., 2003)
Neighborhood drug use (Thornberry et al., 2003)

Family risk factors
Family structure (Hill et al., 1999**; Thornberry et al., 2003)
Family poverty (Hill et al., 1999; Thornberry et al., 2003)
Family transitions (Thornberry et al., 2003***)
Family financial stress (Eitle et al., 2004)
Sibling antisocial behavior (Hill et al., 1999)
Low attachment to parents/family (Eitle et al., 2004; Thornberry et al., 2003)
Child maltreatment (Thornberry et al., 2003)
Low parent education level (Thornberry et al., 2003)
Parent proviolent attitudes (Hill et al., 1999)
Family management: low parent supervision/control/monitoring (Hill et al., 1999; Lahey et al., 1999****; Thornberry et al., 2003)
Teenage fatherhood (Loeber, Farrington, Stouthamer-Loeber et al., 2003)

School risk factors
Low achievement in elementary school (Craig et al., 2002; Hill et al., 1999)
Negative labeling by teachers (as either bad or disturbed) (Esbensen et al., 1993)
Low academic aspirations (Bjerregaard & Smith, 1993; Hill et al., 1999; Thornberry, et al., 2003)
Low school attachment (Hill et al., 1999)
Low attachment to teachers (Thornberry et al., 2003)
Low parent college expectations for subject (Bjerregaard & Smith, 1993; Thornberry, et al., 2003)
Low degree of commitment to school (Thornberry et al., 2003)
Low math achievement test score (Thornberry et al., 2003)
Identified as learning disabled (Hill et al., 1999)

Peer group risk factors
Association with peers who engage in delinquency or other problem behaviors (Bjerregaard & Smith, 1993; Bjerregaard & Lizotte, 1995; Eitle et al., 2004; Hill et al., 1999; Lahey et al., 1999****)
Association with aggressive peers (Craig et al., 2002; Lahey et al., 1999****)

Individual risk factors
Violence involvement (Hill et al., 1999; Thornberry et al., 2003)
General delinquency involvement (Curry, 2000; Hill et al., 1999; Thornberry et al., 2003; Esbensen & Huizinga, 1993)
Aggression/fighting (Craig et al., 2002; Lahey et al., 1999****)
Conduct disorders (Lahey et al., 1999)
Externalizing behaviors (disruptive, antisocial, & other conduct disorders) (Craig et al., 2002; Hill et al., 1999)
Early dating (Thornberry et al., 2003)
Precocious sexual activity (Bjerregaard & Smith, 1993; Thornberry et al., 2003)
Antisocial/delinquent beliefs (Hill et al., 1999; Thornberry et al., 2003)
Hyperactive (Craig et al., 2002; Hill et al., 1999)
Alcohol/drug use (Thornberry et al., 2003; Bjerregaard & Smith, 1993; Thornberry et al., 1993; Hill et al., 1999)

Early marijuana use and early drinking (Hill et al., 1999)
Depression (Thornberry et al., 2003)
Life stressors (Eitle et al., 2004; Thornberry et al., 2003)
Poor refusal skills (Hill et al., 1999)

*Race/ethnicity and gender are excluded.
**The Social Development Research Group study compared three family structures: no parents in home, one parent only, and one parent plus other adults. The later structure was the strongest predictor.
***This risk factor predicted stability of gang membership.
****Significant effects were observed only in early adolescence.
Source: Howell & Egley (2005), Table 1. Reprinted with permission.

gang membership this is indeed unfortunate. One high priority for future study, and a relatively easy one given the bivariate nature of most risk factor analyses, would be more coordinated replication of these results across studies.

Second, that said, across the longitudinal analyses that have been conducted there are several risk factors that stand out as being of primary importance. They are involvement in prior delinquency and related problem behaviors, low parental supervision, and involvement in deviant peer networks. Less consistently, some aspects of poor school attachment and/or performance, and experiencing negative or stressful life events are also important.

Third, there are several variables that are often proposed as risk factors for gang membership that enjoy little, if any, empirical support from longitudinal studies. They include family poverty and family structure, self-esteem, affective bonds with parents, and neighborhood crime. These findings remind us of the importance of basing theory and policy on empirically based observations and not supposition. They also remind us that not all aspects of a particular developmental domain need be equally related to an outcome. For example, in the area of the family, strong parental supervision and monitoring is consistently found to reduce gang membership, but affective ties are not related to gang membership. Zeroing in on the more central aspects, rather than adopting a blanket approach, is crucial for effective intervention.

Finally, as with many other problem behaviors, gang membership does not seem to be a product of a few central risk factors; none exerts a massive impact on the likelihood of being a gang member. But, the accumulation of risk is strongly related to the chances of becoming a gang member. Gang members have multiple deficits in multiple developmental domains, each one of which contributes in a small, but statistically significant, way to the chances of being a gang member.

Selection vs. Facilitation

As noted earlier, there is no dispute about the association of gang membership and high rates of criminal involvement: gang members have much higher rates of crime than non-members. There is a dispute, however, about the interpretation of this relationship. Thornberry et al. (1993) identified three general models that could account for the strong statistical association between gang membership and high rates of crime.

The first is a "kind of person" model they labeled the *selection model*. A selection model argues that adolescents with a strong propensity for delinquency and violence seek out or are recruited into street gangs. They are likely to engage in delinquency regardless of their status as a gang member. Indeed, the observed statistical relationship between gang membership and delinquency is spurious, caused by some prior common cause. This model is most consistent with control theories of delinquency, especially those presented by Hirschi (1969) and Gottfredson and Hirschi (1990).

The second model identified by Thornberry et al. (1993) is the *facilitation model*. This is a "kind of group" model. Gang members do not have a higher propensity for delinquency and violence than non-members and, absent joining a gang, would not have higher rates of delinquency. When they join a gang, however, the normative structure of the gang along with group processes and dynamics facilitates increased involvement in delinquency. In this case, the delinquency of gang members should increase during periods of gang membership and be lower both before and after that period. This model is most consistent with learning theories (Akers, 1998) and life-course theories (Thornberry & Krohn, 2003).

These two views are not logically contradictory and both processes can occur. Thornberry et al. (1993) labeled this mixed model the *enhancement model*. Adolescents who are already involved in delinquency are most apt to join a gang (selection) but, after joining, their delinquency is likely to increase significantly (facilitation).

Although the enhancement model is quite plausible, it is not as interesting as the other two since the contrast between the first two approaches yields opposing hypotheses. Under the selection model, gang members would have higher rates of delinquency than non-members before, during, and after periods of membership. Also, among gang members, intra-individual change would not be systematically related to gang membership; if the impact of gang membership on delinquency is truly spurious (Gottfredson & Hirschi, 1990) an individual's rate of offending should not change as a function of gang membership. In contrast, under the facilitation model, gang members would have higher rates of delinquency than non-members only during periods of membership; before and after the groups would not differ. Also, the facilitation model predicts that intra-individual change is systematically related to gang membership; if gang membership is truly causal, an individual's rate of offending should increase when they become a gang member and decrease after they leave the gang.

Fully testing these competing approaches is impossible absent a true experimental design. Nevertheless, longitudinal studies that follow individuals across time offer the strongest feasible approach to examining them. The essence of the contrasting hypotheses just presented is temporal; in one case (selection) there should be no intra-individual change in delinquency as a function of gang membership, in the other (facilitation) there should be. Longitudinal studies with repeated measures are designed to capture intra-individual change and therefore assess this type of hypothesis.

Longitudinal designs have another advantage in this regard. By following the same individuals across time, each respondent acts as his or her own control and helps bring stable attributes under control (Farrington, Ohlin, & Wilson, 1986). Cross-sectional designs are limited to cross-person analyses and therefore can only

statistically control for other variables. For example, if gang members have higher rates of delinquency than non-members that may be because males are more apt both to be gang members and to be delinquent. If an individual's delinquency increases during periods of membership and then declines, that cannot be because of being male; the individual was male before, during, and after being a gang member. In general, longitudinal designs help control for stable characteristics, although time-varying characteristics remain a threat to validity.

Finally, longitudinal studies that are based on community samples with both gang members and non-members followed over time strengthen our ability to test these hypotheses. In particular, they can compare the delinquency of gang members to non-members at the same point in time, relative to periods of active membership for the gang members. The selection model hypothesizes that the gang members will always have significantly higher rates of delinquency than non-members; the facilitation model hypothesizes that the gang members will have higher rates than non-members only during the period of their active membership.

In sum, longitudinal designs that follow individuals across time offer many advantages over cross-sectional designs for testing causal hypotheses. While not as definitive as those from a true experiment, longitudinal results are far superior to those from cross-sectional data.

Initial Studies

Early studies of the gang facilitation effect focused on relatively simple analytic strategies comparing rates of criminal involvement for gang members and non-members over time. For example, the first assessment of these models using longitudinal panel data (Thornberry et al., 1993) relied on the Rochester Youth Development Study to compare gang members to non-members at three consecutive years, from when the respondents were 15 years of age until they were 17 years of age. Two types of comparisons were made: across time and across group. The first examined whether the delinquency of gang members changed as a function of their active gang membership. The second analytic strategy compared the gang members to non-members at each annual time point. Thornberry et al. (1993) conducted the analysis for five outcomes: general delinquency, violence, property crimes, drug use, and drug sales. They were also able to examine transient gang members, those who were members for no more than a single year, and more stable gang members, those who were members during at least two of the years. The analysis was limited to male respondents.

The results are quite consistent with the facilitation model. Focusing on violent delinquency where the patterns are clearest, Thornberry et al. (1993) found that rates of violence increased when the boys joined the gang and decreased when they left it. Also, gang members had significantly higher rates than non-members typically only during periods of active membership. The same basic pattern was observed for general delinquency, drug use, and drug sales. The only exception was for property crimes where none of the hypothesized models applied: "...gang membership seems

to have little effect on the frequency of property crimes" (Thornberry et al., 1993, p. 80).

Bjerregaard and Lizotte (1995) also used data from the Rochester project to examine the impact of gang membership on patterns of gun ownership among members of the Rochester Youth Development Study. The analysis focused on later adolescence, roughly ages 16 to 18, and is limited to the male respondents because of the very low rate of gun ownership and use by adolescent females. The study distinguished between the ownership of guns for sporting purposes and for protection or illegal purposes.

Prior to joining a gang, gang members do not have significantly higher rates of protection gun ownership than non-members, nor are they more likely to engage in gun delinquency. Once in a gang, however, the rates of these two behaviors increase, only to fall after they leave the gang. For example, 30.9% of current gang members own a gun for protection as compared to 23.1% of future members and 13.2% of past members. Comparable percentages for gun delinquency are 13.6% versus 2.6% and 0%. These results, as well as multivariate logistic regressions, suggest that while there is a slight elevation in illegal gun involvement prior to membership, there is a substantial increase in involvement during the period of membership. Interestingly, there are no differences across the four groups – non-members, future, current, and past members – in terms of gun ownership for sporting purposes.

Empirical assessments of these competing conceptual models have also been conducted in several other longitudinal studies. Esbensen and Huizinga (1993) used data from the Denver Youth Survey and examined street offending, "serious crimes that occur on the street and are often of concern to citizens and policymakers, alike" (1993, p. 571). They were able to examine the impact of gang membership on behavior over a four-year period. Esbensen and Huizinga report results that are most consistent with the enhancement or mixed model. Involvement in street offending is considerably higher during periods of gang membership, than before or after. Nevertheless, gang members have a generally higher prevalence of street offending than the non-gang members, with some evidence of escalation in the year immediately prior to joining. Similar patterns were observed for serious offenses and illicit drug use, as well as when individual offending rates, instead of prevalence rates, are used as the indicator of delinquent involvement. Overall, in the Denver data there is some evidence of selection processes since prior delinquency is a risk factor for gang membership, but there is a stronger facilitation effect since the highest delinquency rates for the Denver gang members were observed during periods of active membership.

Hill et al. (1996) present data from the Seattle Social Development Project that are also generally consistent with the facilitation model. For gang members, violent delinquency is only slightly elevated in the year prior to active membership but once the adolescent joins the gang, violence increases substantially. After leaving the gang, rates of violence return to baseline. Interestingly, a somewhat different pattern is observed for drug sales in the Seattle sample. Involvement in drug sales increases substantially when adolescents become gang members but it remains high even after the individual leaves the gang. The latter pattern is not consistent with a selection model but it does suggest that the facilitative process of the gang may have

contemporaneous effects for some behaviors, e.g., violence, and both contemporaneous and lagged effects for others, e.g., drug sales.

Zhang, Welte, and Wieczorek (1999) examined these issues in a set of regression models using data from the first two waves of the Buffalo Longitudinal Survey of Young Men. Support for the selection model was somewhat mixed: prior delinquency was related to gang membership but prior drug use was not. For both behaviors there is some support for the facilitation model, however. Current gang members report marginally higher levels of delinquency than non-members ($p < .055$) and significantly higher levels of drug use. Zhang et al. (1999) also found an interesting interaction between current gang membership and delinquency: "current gang membership had a relatively stronger effect on delinquency for youths who were classified in the low level of prior delinquency" (Zhang et al., 1999, p. 9). A similar interaction effect was observed for drug use. Thus, in the Buffalo data, the gang has a stronger impact on delinquency and drug use for those without a history of engaging in these behaviors as compared to those who had already initiated the behaviors.

Several analyses of this issue have been conducted using data from the Montreal Longitudinal and Experimental Study, an entirely French-speaking sample selected from low SES areas of Montreal (Tremblay, Vitaro, Nagin, Pagani, & Seguin, 2003). Early results were reported by Thornberry (1998) and Gatti, Vitaro, Tremblay, and McDuff (2002), but the fullest assessment is presented by Gatti et al. (2005). They examined the facilitation and selection effects at ages 14, 15, and 16 for four offense types – person offenses, property offenses, drug use, and drug sales – and for transient versus stable gang members.

For crimes against the person and for property crimes, the facilitation model appears to describe the behavior of the transient gang members while the enhancement model appears to describe the behavior of the stable gang members. The facilitative impact of the gang on property crimes in this Canadian sample differs from that found in Thornberry et al. (1993). Patterns of drug use and drug sales are somewhat less distinct in the Montreal sample. There is a tendency for the level of drug involvement to increase with the onset of gang membership. For example, in all of the six available comparisons (Gatti et al., 2005, Tables 6 and 7) drug sales and drug use increase during the first year of gang membership as compared to the prior year. Drug involvement remains high after periods of active membership, however, a finding similar to that reported by Hill et al. (1996).

Gatti et al. (2005) also examined the impact of current gang membership on a measure of total delinquency after they controlled for seven major risk factors for gang membership and delinquency, as well as current levels of delinquent friends. At all three ages current gang membership exerted a strong and significant impact on delinquency. Gatti et al. conclude that:

> The higher delinquency rates among gang members are largely linked to the experience of the gang itself, rather than to the social deficiencies that characterize its members, and that the apparent effect exerted by the gang is specific and goes beyond simply having delinquent friends.

Gordon et al. (2004) used data from the Pittsburgh Youth Study to examine these issues. They found stronger support for a selection effect than most of the other

longitudinal studies. But even for this sample there are noticeable facilitation effects: "...we replicate prior findings of a substantial increase in drug selling, drug use, violent delinquency and property delinquency when boys are active gang members" (p. 78). They also report that these forms of delinquency decline after the boys leave the gang. Overall, the pattern of the Pittsburgh results is most consistent with an enhancement model.

The first European study using longitudinal data to examine these issues was conducted by Bendixen, Endresen, and Olweus (2006) using a sample from Bergen, Norway (see Olweus, 1993, for a general description). Bendixen et al. (2006) analyzed general antisocial behavior and violence at three time periods covering ages 13 to 16. They also examined the extent to which gang effects differed by gender.

For general antisocial behavior, which covered relatively minor acts of delinquency that focused on theft and vandalism, the Norwegian data are most consistent with the enhancement model. There are moderate-sized selection effects since gang members have higher rates of antisocial behavior than non-members prior to joining the gang. There are also moderate-sized facilitation effects as antisocial behavior for gang members is highest during periods of active membership. In all comparisons, antisocial behavior increases in the year of joining a gang and decreases the year after leaving the gang (Bendixen et al., 2006, Table 2). For violent delinquency, Bendixen et al. (2006) report a small selection effect and a large facilitation effect.

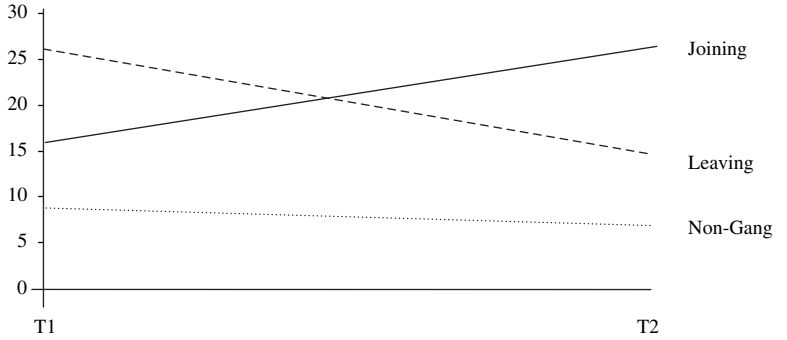
The size of the gang facilitation effect can be seen in Figure 2 reprinted from Bendixen et al. (2006). There is relatively little change in either general delinquency or violence from one time period to the next for the non-members. For the gang members however, there are substantial changes evident as a function of membership status. When an adolescent joined a gang, delinquency and violence increased substantially; when an adolescent left a gang, these behaviors declined substantially.

In the cross-time models just summarized, Bendixen et al. (2006) also included a time-by-sex interaction term. In general, the facilitative effect of gang membership on behavior was stronger for boys than for girls.

More Recent Investigations

Following these initial investigations, researchers have begun to use more sophisticated analytic strategies to see if the facilitation effect generally noted in those studies holds up under closer scrutiny. Thornberry et al. (2003) provide a more comprehensive investigation of these issues than in their original analysis (Thornberry et al., 1993). First, they examined the interplay of gang membership and delinquency across four, instead of three, years. Second, they held six major risk factors for delinquency, including prior delinquency, constant in multivariate models. Finally, they estimated a random effects model, which also included the six risk factors, to control for unmeasured population heterogeneity. All of these analyses suggest a strong facilitation effect and a rather modest selection effect:

a. General Delinquency



b. Violent Delinquency

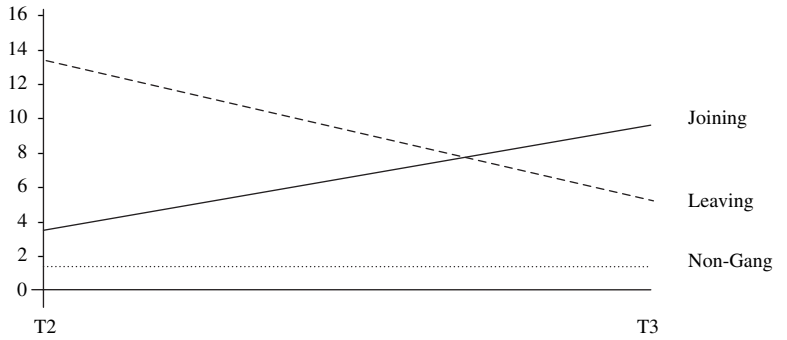


Figure 2 The impact of joining and leaving a gang on a) general delinquency and b) violent delinquency; Bergen, Norway Study
Source: Bendixen et al. (2006)

> Net of the impact of family poverty, parental supervision, commitment to school, association with delinquent peers, negative life events, prior deviance, and unobserved population heterogeneity, [current gang membership is] statistically significant in predicting general delinquency, violence, drug use, and drug sales in all equations.

Hall, Thornberry, and Lizotte (2006) used the Rochester data to examine whether the impact of gang membership varies by level of neighborhood social disorganization. That is, does gang membership have a greater effect on delinquent behaviors for youth residing in areas with below-average levels of disorganization or for youth residing in more highly disorganized areas?

Given the lack of prior research on this question, Hall et al. (2006) point out that any of three models is possible. First, the gang facilitation effect could be greater in disorganized areas because of the lower levels of social control and

protective factors in those areas. Second, the effect could be greater in more organized areas because youth from these areas are exposed to fewer risk factors in general so the impact of the gang may be more pronounced. Third, the potency of the gang effect may influence delinquency regardless of the level of area disorganization.

For general delinquency, violent delinquency, drug use, and drug sales, the results clearly supported the third, or null model. Of the 16 gang membership-by-neighborhood interaction terms (4 offense types x 4 years), 12 are not statistically significant and the other four are inconsistent, one supporting the first model and three supporting the second. Hall et al. (2006) conclude: "Overall, gang membership facilitates problem behaviors in both neighborhood contexts and does so at a similar magnitude" (p. 59).

Several studies have used the trajectory models developed by Nagin (1999; Nagin & Land, 1993; see Piquero, this volume) to examine the gang facilitation effect. These models, by tracing different trajectories of behavior over time, allow analysis to focus on relatively homogeneous offending groups thereby providing "a statistical basis to control for persistent unobserved individual differences that predispose individuals to follow a specific trajectory" (Lacourse, Nagin, Tremblay, Vitaro, & Claes, 2003, pp. 185 and 186). Lacourse et al. (2003) used the same Montreal data analyzed by Gatti et al. (2005). In this study, however, they started by identifying developmental trajectories of gang membership over a seven-year period covering ages 11 to 17.[2] Three trajectory groups emerged: adolescents who were never a gang member during this time (74% of the sample); a childhood onset group (13%) where the probability of gang membership was high from 11 to 14 and then dropped off; and, an adolescent onset group (13%) where the probability of gang membership was low at 11 and 12 and then escalated considerably to a peak at ages 15 and 16.

To test the gang facilitation effect they first hypothesized that patterns of violent delinquency should track the gang trajectories. That is exactly what they observed (Lacourse et al., 2003, pp. 190 and 191). For each gang trajectory group, violence is elevated at precisely the ages when gang membership is most prevalent.

Lacourse et al. (2003) then examined whether movement into and out of a gang was associated with increases and decreases in violence as the facilitation model predicts. Importantly, they conducted this analysis within trajectory groups to further control for unobserved heterogeneity. At all ages for all trajectory groups, the results are consistent with the facilitation model: "Transitions into a [gang] are associated with increased violent behaviors, and transition out of a [gang] is associated with decreased violent behaviors" (Lacourse et al., 2003, p. 193). For the

[2] Gang membership is based on the responses to the following question: "... were you part of a group or a gang that did reprehensible acts." This is the same measure Gatti et al. (2005) and Thornberry (1998) used in their analyses of gang effects in the Montreal data. Although Lacourse et al. (2003) refer to this as "delinquent group membership," to be consistent with the other studies that used this measure we refer to trajectories of gang membership.

trajectory group with childhood onset there is some evidence of a selection effect and Lacourse et al. (2003) conclude that the enhancement model is most descriptive of their behavior but that the facilitation model is most descriptive of those who join gangs in adolescence.

In an interesting analytic reversal, Hill, Chung, Guo, and Hawkins (2002) first estimated trajectories of violent behavior from ages 13 to 18 and then examined whether gang membership facilitates violence within trajectory groups. They identified four groups characterized by different patterns of violence: non-offenders, desistors, late escalators, and chronics. They then entered gang membership as a time-varying covariate to see if, within trajectory groups, violence changed as a function of active gang membership. For the three offending trajectories, but not the non-offending group, violence increased when the youth joined the gang and decreased when they left the gang. This held at all time points and for both transient and stable members.

The facilitative effect of gang membership was stronger for the desistor and late escalator groups than it was for the chronic offender group. Indeed, in the year(s) they were active members, the members of the first two groups have rates of violent delinquency that were as high as those of the chronic offender group. In the other years, their non-active years, they were considerably lower.

Haviland and Nagin (2005) present the most sophisticated analysis to date of the selection and facilitation models. In an effort to increase the confidence we can place in causal inferences drawn from longitudinal survey data, they combined two recent advances in statistical modeling. The first is the trajectory method developed by Nagin (1999) that creates groups or classes of adolescents who are relatively homogeneous with respect to violent offending. The second are propensity or balance models (Rosenbaum, 2002; Rosenbaum & Rubin, 1983) that create as much balance as possible on covariates, including lagged measures of the outcome, between those who experience a "treatment" and those who do not. The uniqueness of the Haviland and Nagin (2005) approach is that the balancing scores are applied within the relatively homogeneous trajectory groups to minimize differences on the lagged outcome (and other covariates) between the treated and the untreated. This approach provides a much better approximation of experimental conditions than traditional methods for analyzing longitudinal data.

Haviland and Nagin used the Montreal data (Tremblay et al., 2003) in their investigation. They estimated trajectories of violent delinquency from ages 11 to 13 and then observed the impact of joining a gang at age 14, the "treatment", on subsequent violence. Within trajectory groups there is little if any evidence of selection effects. That is, the gang members do not differ from non-members on prior violence. There is, however, evidence of a facilitation effect in all three trajectory groups; adolescents who join a gang experience significant increases in subsequent violence. Interestingly, "for individuals in the chronic trajectory, who were already heavily engaged in violent delinquency, the point estimate for the increase is more than twice as large as that for low and declining trajectories" (Haviland & Nagin, 2005, p. 14). This is the opposite interaction to that reported by Zhang et al. (1999) and by Hill et al. (2002).

Summary

Since Thornberry et al. (1993) introduced the gang facilitation model, several longitudinal studies have examined it. They have used different data sets covering different sites, time periods, and countries, different measures of gang membership, different analytic strategies, and samples with different characteristics. Despite these differences, the uniformity of results is impressive.

First, there is no evidence that is supportive of a pure selection model as suggested by control theories (e.g., Gottfredson & Hirschi, 1990; Hirschi, 1969). That is, no study finds that gang members have uniformly higher rates of delinquency and related problem behaviors as compared to non-members.

Second, all studies find that delinquency varies as a function of gang membership status, a result consistent with a gang facilitation effect. That is, delinquency almost universally increases when adolescents join a gang and the greatest differences between gang members and non-members are observed during the gang members' period of membership. Also, delinquency typically declines after the member leaves the gang, with the exception of drug sales which appears to remain elevated.

Third, some studies (e.g., Esbensen & Huizinga, 1993; Zhang et al., 1999) also find evidence of a selection effect in addition to the facilitation effect. This pattern of results is most consistent with the enhancement or mixed model.

Overall, perhaps the safest conclusion to draw is that there is a minor selection effect, a major facilitation effect, and no evidence consistent with a pure selection model. The weight of the evidence suggests that street gangs do facilitate or elicit increased involvement in delinquency, violence, and drugs. There is no evidence to the contrary and abundant evidence in support of this view. These results greatly expand our understanding of the interplay between street gangs and delinquency, an expansion in knowledge that would not have been possible without longitudinal data on gang members and non-members.

The Duration of Gang Membership

There is a general notion that once youth join a street gang they remain members for relatively long periods of time. In part, this view has been generated by popular culture and the mass media. For example, the lyrics in *West Side Story* claim that:

> Once you're a Jet, you're a Jet all the way,
> From your first cigarette to your last dyin' day.

In part this view is also generated by observational research that often focuses on traditional gangs in large cities with a long history of street gangs, like Chicago and Los Angeles (Thornberry & Porter, 2001). While the implied stability may be reflective of gang membership at the extreme end of the gang distribution, it may or may not represent the full range of street gangs.

Longitudinal studies, especially those based on community samples, are ideally suited for an examination of this issue. First, if the sample is representative of its locale, the gangs that the respondents belong to will be representative of the gangs that are found in that locale. Second, since the respondents are followed over time with repeated assessments of their gang involvement, direct estimates of the stability or the fluidity of gang membership can be obtained. Related issues, such as whether gang members join, leave, and re-join a gang or whether they move from one gang to another, can also be measured.

Thornberry et al. (2003) found that gang membership is quite fluid and transitory. Half of the male (50.4%) and two-thirds of the female gang members (66.0%) report being members of the gang for one year or less. In contrast, only 21.6% of the boys and 5.0% of the girls report being a gang member for 3 or 4 years. Moreover, very few of the gang members report joining a gang, leaving it, and then re-joining it or another gang. The predominant pattern is to join a gang, stay for a while (typically less than a year), and then leave the gang world. At least this is the pattern in Rochester.

Esbensen and Huizinga (1993) report very similar patterns in Denver. Over a four year period they found that of the 90 youths who reported being a member of a gang, 67% were members for only one year while only 3 percent belonged for all four years. Interestingly, when asked what role they expected to have in the gang in the near future, 60% reported that they would not want to be a member of the gang in the future.

The findings from the Pittsburgh Youth Study confirm the general patterns observed in both Rochester and Denver. Gordon et al. (2004) report 48% of the male gang members were in a gang for only one wave of data collection and 25% for only two waves of data collection.

The lack of stability in gang membership among youth in the Rochester, Denver, and Pittsburgh studies may be because all three research sites are characterized as emerging gang cities. That is, these cities did not have a long-standing tradition of gang behavior; rather the gang problem became recognized in the 1980s around the time that the three studies began. However, studies that have been done in more traditional gang cities also report that gang membership is a relatively temporary phenomenon among a majority of youth who participate in a gang (Hagedorn, 1998; Klein, 1971; Short & Strodtbeck, 1965; Vigil, 1988; Yablonsky, 1962).

Short- and Long-Term Consequences of Gang Membership

Over the past thirty years there has been an increasing recognition that behavior is constantly evolving as actors age (Baltes, 1987; Baltes & Brim, 1982). Behavior initiated during adolescence can have important consequences for successful entry into adult roles and responsibilities. The way actors navigate the transition to adulthood can, in turn, have an important and longlasting impact on their life chances. The life-course perspective recognizes that as people move along trajectories, they make (or fail to make) transitions such as completing their education, getting married, or

finding a job (see Siennick & Osgood, this volume). The success in making those transitions, for example, in completing one's education, is likely to have a significant impact on life chances. Disruption in or failure to complete major transitions will adversely affect subsequent development.

There is a growing body of research that finds that involvement in delinquent or drug-using behavior increases disruption in transitions along a number of important trajectories. Adolescents involved in delinquent behavior are more likely to drop out of school (Fagan & Pabon, 1990; Kaplan & Liu, 1994; Krohn, Thornberry, Collins-Hall, & Lizotte, 1995; Mensch & Kandel, 1988), to become pregnant or impregnate someone else or become a teenage parent (Newcomb & Bentler, 1988; Smith, 1997; Thornberry, Smith, & Howard, 1997), and to be unemployed in their early adult years (Caspi, Wright, Moffitt, & Silva, 1998; Kandel, Chen, & Gill, 1995; Kandel, Davies, Karus, & Yamaguchi, 1986; Newcomb & Bentler, 1988). Since gang members are typically more involved in delinquent activities than non-gang members, it is reasonable to expect that being a member of a gang during adolescence will be associated with disrupted transitions from adolescence to adulthood and, ultimately, will adversely impact life chances. But there is relatively little direct evidence about the extent to which gang membership itself, over and above delinquent behavior, contributes to disorder in the life course.

To adequately examine the impact of gang membership on subsequent life-course transitions, it is necessary to follow former gang members over time and to compare them with non-gang members over that same period of time. Longitudinal panel studies are well suited to this task. They can determine if gang members, as opposed to similarly situated non-gang members, are more likely to have disorderly transitions such as dropping out of school and teenage parenthood. They can also examine the impact of such disorderly transitions on longer-term outcomes and determine if disorderly transitions mediate the relationship between gang membership and problematic outcomes in young adulthood. And, they can examine these issues controlling for levels of offending.

An added benefit of longitudinal studies that collect information at regular and relatively short intervals (e.g., one year or less) is their ability to identify short-term and more stable gang membership. Stability in gang membership may be expected to reflect greater commitment to the gang and the behavior and values represented therein. Hence, stable gang membership is expected to have an even greater impact on the life course than is short-term gang membership.

This issue is arguably one of the most important ones for gang researchers to address because of the long-term implications of the answers found. Yet, there has been surprisingly little research on the impact of gang membership on life-course transitions. As early as 1971 Malcolm Klein observed, "Though the need is great, there has been no careful study of gang members as they move on into adult status" (1971, p. 136), a sentiment echoed by Hagedorn (1998) and Decker and Lauritsen (1996). Even as late as 2001, Levitt and Venkatesh stated that, "Little is known, however, about the long-run impact of adolescent street gang involvement on adult outcomes" (2001a, p. 1).

Some information about the impact of gang membership on life-course transitions has been generated by ethnographic studies that incorporated interviews in the

design. For example, Hagedorn (1998) reinterviewed a sample of gang members originally studied as adolescents when they were in their early 20s. Of all male gang members, only a third had a high school diploma and about the same number were working. The rate of high school graduation for female gang members was about the same as male gang members. Almost all of the young women were mothers (88%) by their early 20s, with about 58% on welfare.

Moore (1991) found similar results in her ethnographic study. Only 40% of former gang members were employed as young adults. Female gang members had high rates of early parenthood and were more likely to be responsible for raising those children than were male gang members. Neither Hagedorn nor Moore had comparison groups; therefore, they could not control for factors other than gang membership that might have caused these outcomes.

Levitt and Venkatesh (2001a,b) present data that suggests that gang membership might not have a direct effect on some problematic outcomes once other background characteristics are controlled. In 1990 they began an ethnographic study on a sample of 118 youths aged 16–26 that resided in one public housing complex in a disadvantaged neighborhood of Chicago. Of the 118 youth in the sample, 38 were active gang participants. Ten years later, they interviewed 94 of the original sample. In their initial study (2001a), they found that gang members obtained less education, had higher rates of arrest and incarceration, and earned a greater percentage of income from illegal sources than did non-gang members. However, once background factors such as GPA and drug use among their guardians were controlled, the effect of gang membership was not a significant predictor of high school graduation, being currently employed, or being currently incarcerated. Gang membership remained a significant predictor of ever having been incarcerated and the percentage of income from illegal sources. Levitt and Venkatesh (2001b) also report that once controlling for years of education and years incarcerated as well as a number of additional background variables, the effect of gang membership on illegal income is not significant. These findings suggest that gang membership is indirectly related to negative outcomes because membership results in less education and more years of being incarcerated which, in turn, affect the source of income in young adulthood. In spite of their limited sample size, their findings are suggestive of an important impact of gang membership.

Thornberry et al. (2003) provide the most extensive examination of the impact of gang membership on life-course transitions, following the sample in the Rochester Study from age 13 through age 22. Prospectively, they examined whether those youth who were gang members at any time during the teenage years were more likely to experience problematic transitions to adulthood including dropping out of school, early nest-leaving, early pregnancy, teenage parenthood, unstable employment (as young adults), cohabitation, and being arrested in young adulthood than were those youth who did not join a gang.

For males, Thornberry et al. (2003) distinguished between short-term gang members and stable gang members. Short-term members were more likely to impregnate a girl and to cohabit than were non-members. Stable gang members were more likely to drop out of school, impregnate a girl, be a teenage parent, experience unstable employment, and cohabit than were non-members. Because of the limited time in a

gang for most females, it was not possible to differentiate between short-term and stable gang members. However, being a gang member was significantly related to all of the problematic transitions except for cohabitation. For both males and females, gang membership was also significantly related to a variable measuring the total number of problematic transitions experienced.

Thornberry et al. (2003) examined whether controlling for eight background variables, including prior delinquency, would eliminate the significant relationship between gang membership and each of the transitions. For males, stable gang membership remained significant for all the problematic transitions except for early nest-leaving. For females, gang membership was significantly related to early pregnancy, teenage parenthood, and unstable employment even after controlling for the other eight variables.

Finally, they examined whether gang membership in adolescence increased the probability of being arrested as a young adult. For males, they found that stable gang membership was significantly related to adult arrests even after controlling for the mean number of problematic transitions and the other eight control variables. Gang membership remained a significant predictor of female adult arrests as well.

In the first investigation of long-term consequences of gang membership, Krohn, Lizotte, Thornberry, Hall, and Chu (2006) examined the impact of adolescent gang membership on several outcomes at age 30. They used the male gang members of the Rochester sample and compared non-members to short-term and stable gang members.

The bivariate results indicate that stable gang members have significantly higher rates of unemployment and welfare receipt than either the non-members or the short-term members. Interestingly, the latter two groups are not significantly different from one another. In terms of criminal outcomes, both the short-term and stable gang members have significantly higher rates of self-reported crime, carrying a weapon, and being arrested. Multivariate models suggest that for employment and welfare the impact of adolescent gang membership is indirect, mediated by dropping out of school and unstable employment during the person's early 20s. For crime and arrest, the impact tends to be mediated by earlier delinquency. Interestingly, the impact of gang membership on weapons carrying is largely unmediated by these variables.

The results from the Rochester Study, along with results from ethnographic research, make a convincing case for the serious consequences of being a gang member on life-course transitions. With the increasing availability of longitudinal data, these analyses can be replicated to determine if these relationships hold for other research sites.

Future Directions: Examining Developmental Differences

Of the topics we identified in the introduction that could best be addressed with longitudinal data, one has received virtually no empirical attention, namely, the impact of developmental stage on the causes and consequences of gang membership.

Theoretical approaches have increasingly emphasized that the cause of crime may vary depending on the age at which one is trying to account for it (e.g., Farrington, 2005; Moffitt, 1993; Thornberry, 1987; Thornberry & Krohn, 2005). For example, the role of the family appears to be more important for youth at earlier stages of development rather than in the later adolescent years. Is this also true for gang membership? Or, relatedly, do the self-reported reasons for joining a gang change depending on the age of new members? For example, it may be that younger teenagers are more apt to join because of the influence of a friend or older family member whereas those who join at an older age may be seeking the thrill of engaging in dangerous behavior, looking to profit from their membership, or simply trying to protect themselves.

Moreover, developmental stage can have important implications for the impact of antisocial behavior on the persistence and seriousness of future criminal behavior (Krohn, Thornberry, Rivera, & LeBlanc, 2001; Loeber & Farrington, 2001; Moffitt, 1993). Several theories suggest that there are distinct differences among offenders who start offending at different ages. Moffitt (1993) and Patterson, Capaldi, and Ban (1991) offer typological models of early and late starters. Early-starter or life-course persistent offenders begin antisocial behavior at young ages and their criminal careers are hypothesized to be more persistent, involving serious criminal behaviors. Late-starter or adolescence-limited offenders begin at an "age-normative" stage during their early teenage years. Their behavior is hypothesized to be less serious and they mature out of criminal behavior as they enter their young adult years. Life-course theories, like Thornberry and Krohn (2005) and Sampson and Laub (1993), offer a more age-graded approach. While there is a positive association between earlier onset and the duration of careers, the link between early onset and persistence is not inevitable as portrayed in the typological theories; persistence is largely produced by later patterns of life-course development.

These developmental distinctions regarding age of onset raise interesting questions when applied to gang membership. Are those who start offending early more likely to become gang members? Given the prediction that they are more likely to commit serious crimes and given that gang members are also more likely to commit serious crimes, it is reasonable to anticipate that those who start offending earlier are more likely to become gang members. It is also reasonable to expect that they will commit crime over a longer period of time. This should be true even if the level of their participation in crime is reduced when they leave the gang. A corollary of this hypothesis would be that early-onset offenders who join the gang would be more likely to be stable gang members, who are more likely to have adverse outcomes than non-stable gang members (Thornberry et al., 2003).

There may also be an association between gang membership and the longer duration of careers for those who start offending earlier. Not all early starters persist (Thornberry & Krohn, 2005) and if duration is produced by later life-course experiences, gang membership may be a particularly salient experience. If earlier-onset offenders are, in fact, more likely to join gangs, and if gangs really do facilitate delinquency (Thornberry et al., 2003), then one reason some earlier-onset offenders are more persistent may be because they become involved in gangs. That is, the gang experience enhances their other deficits to help perpetuate their careers.

It is also interesting to contemplate the impact of the age at which youth join gangs on subsequent behavior and life chances. On the one hand, joining at a younger rather than later age may have the same impact that early offending has on subsequent behavior, increasing the probability of a criminal career that is of longer duration and involves more serious criminal behavior. Also, joining at a young age may increase the probability of being in the gang for a longer duration, which we know will embed youth in a criminal career.

On the other hand, joining a gang at a younger age may be more transitory in nature and as youth become more mature, they may realize that gang membership is not in their interest. That is, joining at a younger age may actually lead to more instability in gang membership and hence less embeddedness in a criminal career. Joining in later teenage years may represent a more deliberate choice on the youth's part that involves greater commitment to the gang and the behaviors that are part of gang life.

We know of no research that specifically looks at these alternative possibilities. However, based on research on the age of onset of criminal behavior and research on the importance of considering developmental stages, we think this is an important question that should be addressed with longitudinal data. Developmental insights have improved our understanding of delinquent behavior and of effective interventions, and they are likely to do so for the study of gang membership as well. This should be a high priority for future longitudinal investigations.

Conclusion and Policy Implications

Youth gangs continue to be a serious problem in the United States. Over the past twenty years they have proliferated to new cities, grown in numbers, and increased the level of violence. The scientific community has responded to this crisis with an ever-increasing number of studies focusing on gangs. Along with a continuation of the very strong qualitative research tradition on youth gangs, a growing number of quantitative longitudinal panel studies have examined issues ranging from the risk factors involved in joining a gang to the long-term consequences of gang involvement in young adulthood. These studies complement what we have learned from the qualitative research tradition and offer certain methodological advantages over those studies.

We have identified a number of those methodological advantages including the inclusion of a community sample allowing for a comparison of gang members and non-gang members, the prospective identification of risk factors for joining a gang, the ability to identify intra-individual change in behavior as each person develops, and the focus on the consequences of gang membership into early adulthood. These features of longitudinal panel studies allow for examination of both the impact of life-course events on gang membership and the impact of gang membership on life-course events and outcomes. Qualitative gang research typically does not follow gang members over extended periods of time because of the time and cost involved and cannot compare what happens to gang members versus non-members.

Although longitudinal studies of gang members have these advantages, they also have serious limitations. They focus on individual development and do not study gangs as the unit of analysis, following the group over time. They also do not take neighborhood context and organization into full account. Moreover, most longitudinal studies have been conducted in emergent gang cities where gang structures are primarily of the compressed type (Klein & Maxson, 2006).

Nevertheless, these studies have added to our understanding of gangs. The question that has received the most attention is whether the high rate of delinquent behavior among gang members is due to gangs selecting highly delinquent individuals who continue to commit crime at a high rate, or due to gangs facilitating higher rates of delinquency. Based on the findings from this research, there is little support for a pure selection model. Rather, it appears clear that gangs facilitate delinquent behavior. These findings, which have important theoretical and practical implications, could only have been determined by having data on gang members and non-members before, during, and after periods of gang membership.

Longitudinal research can substantially improve our understanding of why some youth join gangs while others do not. The few studies that have examined this issue have identified a number of risk factors and, as importantly, identified theoretically plausible factors that are not prospectively related to gang membership. The most striking finding from these risk factor studies concerns the accumulation of risk; gang members have serious deficits in multiple developmental domains. Understanding these multiple risk factors is essential for programs designed to prevent gang membership.

From the longitudinal research studies, we are also beginning to appreciate the collateral damage that gang membership has on a person's life course and life chances. Gang membership is related not only to elevated crime rates but to a number of problematic transitions in the life course that decrease the likelihood of success in the conventional arena. The research on this issue is very limited and these early findings need to be confirmed. In addition, several longitudinal studies continue to follow their samples well beyond the very early adult years, providing an opportunity to examine the long-term impact of gang membership.

Policy Implications

The policy implications of this research raise an interesting conundrum. Gang members commit the lion's share of serious delinquency and the gang itself appears to elicit that behavior. Gang membership also creates serious disruption in the life course, which imposes substantial individual and societal cost. It seems abundantly clear that preventing gang membership and reducing its consequences are fundamentally important policy objectives.

However, at the present time, no known gang reduction program – either prevention, intervention, or suppression – has acceptable scientific evidence of its effectiveness (for reviews, see Klein & Maxson, 2006; Thornberry et al., 2003). Thus, in the arena in which we need the most help, we have the fewest resources.

In light of this, we offer the following suggestions:[3] First, some evidence-based programs have been shown to reduce delinquency and violence for serious offenders. The Blueprints Program (Elliott & Mihalic, 2004) offers a compendium of effective programs that meet stringent evaluation criteria. Until effective gang-focused programs are developed, we recommend a more indirect approach; use gang membership as a marker to enroll gang members in these programs.

Second, we should encourage the developers of those effective programs to collaborate with gang experts in order to tailor the most appropriate programs to the specific needs of gang members. We must recognize these as new programs, however, and evaluate them rigorously.

Third, we should identify the most promising direct gang intervention programs and implement them under controlled conditions with careful evaluations. Some of them may well work, but we often do not know if they do because of poor evaluations. Again, better evaluations are the key to progress.

The longitudinal studies have pointed to the centrality of street gangs and gang members in understanding the origins of serious delinquency. We must now take that knowledge base and use it to develop more targeted and effective interventions.

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[3] A fuller discussion of these issues can be found in Thornberry et al. (2003: Chapter 10; see also, Klein & Maxson, 2006).

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