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The Apple Doesn't Fall Far from the Tree (or Does It?): Intergenerational Patterns of Antisocial Behavior—The American Society of Criminology 2008 Sutherland Address

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Abstract

There is a growing literature on intergenerational studies of antisocial behavior and a growing understanding of the unique contributions they are likely to make. At the same time, the field has yet to agree on core design features for intergenerational study. In this article I propose a set of defining design elements that all intergenerational studies should meet and I discuss the advantages of these studies for enhancing our understanding of the onset and course of delinquent careers. I then use data from the ongoing Rochester Intergenerational Study to illustrate these points and the potential yield of intergenerational studies. In particular, I examine intergenerational continuities in antisocial behavior and school disengagement, test the cycle of violence hypothesis to see if a history of maltreatment increases the likelihood of perpetration of maltreatment, and estimate a structural equation model to help identify mediating pathways that link parents and children with respect to antisocial behavior.

INTERGENERATIONAL STUDIES OF BEHAVIOR

My address focuses on intergenerational studies of antisocial behavior and discusses three interrelated topics with respect to them. The first is to describe what I think are the core design characteristics of intergenerational studies and to distinguish them from traditional longitudinal studies. The second topic is to discuss the advantages and potential yield of intergenerational study. And finally, I would like to illustrate the previous two points using data from the ongoing Rochester Intergenerational Study.

I think it is fair to say that there is a general lack of agreement about what constitutes an intergenerational study of behavior. When my colleagues and I were first beginning to design the intergenerational component of the Rochester study, I came across the following article: “The intergenerational transmission of aggression across three generations” (Dumas, Margolin, and John, 1994). It seemed to be exactly the type of study that we needed to review as we thought about design elements for our own study. Midway through that article, however, and actually many of the intergenerational articles I have read (e.g., Alexander, Moore, and Alexander, 1991; Farrington, 1993; Fuller et al., 2003) I was disappointed, for these studies relied entirely on a single reporter, the respondent in the

middle or parent generation. That person reported on their own aggression, their parent's aggression, and their child's aggression.

Obviously, there are many flaws with this type of design. First, the parents are reporting with imperfect knowledge on the aggressive behavior of their parents and of their children. Second, these studies have to rely on retrospective data for at least one generation, and often on retrospective data with a very long recall period. Third, the parent's current behavior can influence their views of their parent's and their child's behavior. For example, parents who are highly aggressive or who have serious alcohol problems may well project their behavior patterns onto their perceptions of behaviors in the other generations. If intergenerational studies are going to contribute to our understanding of the origins and course of antisocial behavior, they need to have greater conceptual and methodological integrity than this.

With that in mind, I think intergenerational studies of antisocial behavior should meet the following four design criteria. First, they should have prospective data on a G2 parent's and on a G3 child's involvement in antisocial behavior. Throughout this article I will use the notational system of Generation 1, or G1, to refer to the first or grandparent generation, G2 to refer to the middle or parent generation, and G3 to refer to the child generation. The G3 child is the focal participant in an intergenerational study and it is that child's behavior that we are attempting to explain.

Also, I will focus my comments on antisocial behavior but these design criteria apply to whatever the behavior of interest is in the intergenerational study. If the focus is on psychopathology or on school performance, then prospective data on G2 and G3 behaviors in those realms is required.

Second, the measures on each generation's involvement in antisocial behavior should be as independent as possible and, whenever possible, based on different reporters. Doing so minimizes the methodological problems identified earlier.

The third design criterion is the key defining element of an intergenerational study and the one that most clearly separates intergenerational studies from traditional longitudinal studies of behavior. In particular, there is a growing consensus (Cairns et al., 1998; Kaplan and Tolle, 2006; Patterson, 1998; Smith and Farrington, 2004) that intergenerational studies should have comparable measures of G2 and G3 antisocial behavior covering the same ages or the same developmental stages.

Fourth, intergenerational studies should also have prospective data on G2 life-course development to identify mediating processes to account both for intergenerational continuity and for intergenerational discontinuity in antisocial behavior.¹

¹Although the investigation of intergenerational discontinuity – that is, why parents and children are dissimilar with respect to antisocial behavior – is an equally important part of intergenerational inquiry, I will focus the rest of my comments entirely on the issue of continuity – that is, similarity across the generations.

INTERGENERATIONAL VERSUS LONGITUDINAL DESIGNS

These core design characteristics of intergenerational studies distinguish them from traditional longitudinal studies. Figure 1 presents an overview of the intergenerational relationships in antisocial behavior that can be examined based on three types of research designs. The first (Figure 1a) focuses on traditional longitudinal designs. These studies, such as the original Rochester Youth Development Study (Thornberry et al., Taking Stock, 2003) and its companion projects, the Pittsburgh Youth Study (Loeber et al., 2003) and the Denver Youth Survey (Huizinga et al., 2003), focus attention on the G1 and G2 generations. The focal participants are the members of the G2 generation and, when they enter the study, typically as adolescents, the researcher has control over their ages, and therefore, their birth cohorts. Members of the G1 or parent generation enter the study along with them and their ages range quite widely, covering a span of 20 or more years. The particular focus of longitudinal studies is on the *concurrent* relationship between the parent's adult antisocial behavior and the child's adolescent antisocial behavior. This is indicated by the path labeled A.

Intergenerational designs shift the focus of the research in two important ways as represented in Figure 1b. First, attention shifts from the G1 and G2 generations to the G2 and G3 generations. The focal participants are the children in the third generation and it is their antisocial behavior that we are attempting to explain. As with traditional longitudinal studies, however, intergenerational studies can also examine the concurrent impact of the G2 parent's adult antisocial behavior on the G3 child's adolescent antisocial behavior. Second, intergenerational studies can uniquely estimate Path B, the impact of a parent's adolescent antisocial behavior on their child's adolescent antisocial behavior. This *intergenerational* relationship, separated by some 20 to 25 years, has the potential to greatly expand our understanding of the onset and course of the child's antisocial behavior. In addition, as indicated in Figure 1c, intergenerational studies can be extended to other developmental stages. For example, they can examine the impact of G2's adolescent antisocial behavior on G3's childhood onset of antisocial behavior. More generally, intergenerational studies can look at relationships between G2 and G3 at various and clearly defined developmental stages.

I do not mean to imply in any way that the results from longitudinal studies, as illustrated in Figure 1a, are unimportant in explaining antisocial behavior. A parent's adult antisocial behavior has important direct and indirect effects on their child's antisocial behavior. For example, it influences the overall family environment in which the child is raised, it directly models the behavior of interest for the child, and it reduces effective parenting behaviors (Belsky, 1993) which, in turn, have strong and proximal impacts on the child (Capaldi et al., 2003; Conger et al., 2003). Although all of those concurrent relationships are important, results about Path A do not inform us about the direction, significance, or magnitude of either Path B or Path C. Indeed, if we only have data on Path A we may well underestimate the true intergenerational effect since we are assessing the parent's antisocial behavior well into their adult years when its prevalence and frequency drop precipitously and when there is less variability in the behavior. As a result, it is quite possible that this relationship will be weaker than the total intergenerational effect. In fact, findings from several intergenerational

studies are consistent with this contention (Huesmann et al., 1984; Thornberry, Krohn, and Freeman-Gallant, 2006; Wu and Kandel, 1995), as are findings that I will present below.

Moreover, focusing on Path B draws our attention to new and different pathways that link parents and children with respect to antisocial behavior. The mediators of this linkage (Path B), which is separated by some 20 to 25 years, are likely to be quite different from the mediators associated with concurrent similarity in behavior across the generations (Path A). Intergenerational mediators focus attention on long-term developmental processes in addition to the more immediate family context (Thornberry, 2005). Identifying these mediators can offer new and different insights into the origins of antisocial behavior that complement those of traditional longitudinal studies. The results of these studies will also lead to new, and earlier, approaches to prevention. Indeed, they have the potential of identifying prevention targets that exist even before the child is born.

In sum, there are four defining design features for intergenerational study. They include: prospective data on G2 and G3 antisocial behavior; independent measures in each generation; measures of antisocial behavior at comparable ages or developmental stages; and data on long-term mediating processes. Studies with these features differ from traditional longitudinal studies and, therefore, their results enable us to extend our understanding of the origins and course of antisocial behavior.

ADDITIONAL DESIGN ELEMENTS

In addition to these core elements, there are several other design features that greatly enhance both the power and the scope of intergenerational studies. The first of these is having prospective data on G1's behavior and parenting practices. To this point I have focused entirely on the G2 and G3 generations. The G1 grandparents, however, also contribute substantially to our understanding of intergenerational processes. Figure 2 presents a very simplified view of grandparental influences. The right hand, vertical portion represents the types of relationships that can be investigated in longitudinal studies. For example we can examine how G2 parenting behaviors influence G3 antisocial behavior and we can investigate how concurrent factors, represented here by G2 depression, influence those parenting behaviors. That type of analysis, of course, can be extended to other influences on parenting behaviors such as financial stress, ongoing substance use, marital conflict, and so forth. Substantial research (Belsky, 1993; Conger et al., 1992; Downey and Coyne, 1993; Patterson, Reid, and Dishion, 1992) demonstrates how these stressors influence parenting behaviors.

While we know that parenting styles have a major influence on a child's antisocial behavior, we know relatively little about the origins of parenting styles from longitudinal studies (Belsky, 1984; 1993). By incorporating information on G1 behavior patterns, however, we can greatly extend our investigation of these issues. As represented in Figure 2 for example, we can examine how parenting styles are reproduced across the generations. That is, we can examine the extent to which G2's parenting style exhibited towards G3 reflects the parenting styles to which G2 parents were exposed when they themselves were children. Moreover, if we can examine the reproduction of parenting styles across the G1 and G2 generations we can also examine other important influences on G3's antisocial behavior. They include the

reproduction of poverty and structural adversity, school performance, psychopathology, marital conflict, and many other factors. Intergenerational studies can examine both direct and indirect effects from G1 to G2. Indirect effects are illustrated in Figure 2 by the inclusion of G2 adolescent antisocial behavior. All of these relationships enhance our understanding of the G3 child's antisocial behavior by fleshing out our understanding of the origins of what we know to be powerful, proximal causes of that behavior.

A second design characteristic that greatly extends the power and scope of intergenerational studies is to have a G2 sample that includes both mothers and fathers. What we know about father effects, relative to what we know about mother effects, in explaining a child's antisocial behavior is miniscule (Phares and Compas, 1992; Phares et al., 2005). G2 samples that include both mothers and fathers can therefore contribute to our investigation and understanding of how fathers affect their children. Moreover, since the G2 fathers and mothers in an intergenerational study are drawn from the same population and followed over time in identical ways, intergenerational studies that include both G2 mothers and fathers can uniquely enable direct comparisons of the similarities and differences in the ways in which fathers and mothers impact their children.

Third, it is also important for intergenerational studies to have prospective data on the G3 child's other primary caregiver. Intergenerational studies have a curious quality of often operating as if each child only had one parent, the respondent in the initial longitudinal study. Obviously there are two parents and incorporating that other caregiver into the intergenerational study helps us both to identify concurrent influences on the child's behavior and to interpret better the additional contribution from intergenerational influences.

Finally, intergenerational studies are strengthened by a comprehensive measurement approach including both environmental and genetic risk factors. There is considerable evidence of heritability for antisocial behavior (Jacobsen et al., 2001; Simonoff, 2001) and heritability estimates average about 40% to 50% (Miles and Carey, 1987; Rhee and Waldman, 2002). The Rochester Study began collecting DNA from the intergenerational study participants in October 2008. This will allow us to investigate both genetic main effects as well as gene-by-environment interactions in our study of G3's antisocial behavior. Adding genetics to our extensive life-course information on G2 and G3 development will ultimately enable a very comprehensive assessment of intergenerational linkages. Since the genetic analyses are several years away, however, the remainder of this article focuses entirely on environmental relationships and how the social environment helps mediate intergenerational linkages.

ILLUSTRATIONS FROM THE ROCHESTER INTERGENERATIONAL STUDY

To this point I have described the basic design features of intergenerational studies and discussed their potential to contribute to our understanding of antisocial behavior. In the second part of my address I would like to illustrate these points using data from the Rochester Intergenerational Study. As is true of all intergenerational studies, the Rochester study emerged as an add-on to an existing longitudinal study. Indeed, I do not know of a

single intergenerational study of behavior that was designed to be an intergenerational study from the outset; they seem inevitably to be additions to initial longitudinal studies.

The original Rochester Youth Development Study began in 1988. Its core design is summarized in the left-hand portion of Figure 3. We began with a sample of 1,000 seventh and eighth graders from the Rochester, New York public schools. They averaged 14 years of age and are now referred to as the G2 or the parent generation. Of the original sample 73% were males and 27% were females which enhances our ability to examine father effects. The full panel has been followed forward until the age of 31 with 80% retention. In addition, up until the time G2 was 23 years of age, we also interviewed one of their parents, now referred to as G1. In fact, 85% of the G1 respondents were the child's biological mother and another 10% were stepmothers, illustrating my earlier point that most studies, including our own, overwhelmingly have data on maternal effects. In addition to the interviews that were conducted at regular intervals, we also collected information from schools, police, child protective services, and other official agencies. Details of the Rochester study design are presented in Thornberry, Freeman-Gallant, et al. (2003) and Thornberry et al. (Gangs and Delinquency, 2003).

The Rochester Intergenerational Study, described in the right-hand portion of Figure 3, began in 1999. The focal participants are the oldest biological children of the initial G2 participants. In Year 1, 1999, they ranged in age from 2 to 13, with an average age of 6. At that point, 371 children and their families enrolled in the study. In each subsequent year we identified additional first-born children and enrolled them in the study as they turned 2. In 2010, the end of our current funding cycle, there will be 520 G3 children in the study, ranging in age from 2 to 24 with an average age of 15. Importantly, therefore, they will overlap in age with the age of the G2 parents when they were first assessed as part of the original Rochester study.

The intergenerational study annually assesses the G2 parents (the original adolescent participants in the Rochester Study). They have been followed forward to the age of 36 in the intergenerational study. For each G3 child we also include their other primary caregiver (OCG). In the case of G2 fathers that is almost invariably (93%) the child's biological mother. In the case of G2 mothers, however, the relationship of the other caregiver to the child varies. The primary categories are grandmothers (47%), biological fathers (31%), stepfathers (6%), aunts (7%), and others (9%). We also interview all G3 children 8 years and older and at younger ages conducted videotaped observations of G3 interacting with G2 and with OCG. We also collect data from schools including teacher reports, and from police, child protective services, and other agencies. These two prospective designs, the original longitudinal study and the current intergenerational study, allow us to address in detail the types of issues I identified earlier. In fact, I would like to use these data to address four topics that bear on the issues raised earlier.

INTERGENERATIONAL CONTINUITY IN ANTISOCIAL BEHAVIOR

The first topic concerns intergenerational continuity in drug use and antisocial behavior. The central question is whether a parent's adolescent involvement in antisocial behavior is significantly related to their child's later involvement in antisocial behavior. Figure 4

presents the core model to be investigated, estimating what I identified earlier as Paths A and B. The model also includes an intragenerational stability effect for G2, from adolescence to adulthood. The indicator of the G3 child's antisocial behavior is a measure of externalizing behavior problems based on maternal reports on the Child Behavior Checklist (CBCL) (Achenbach, 1991a) when the child was between 8 and 9 years of age.²

I will test this model separately for G2 mothers and for G2 fathers. In addition, for the G2 fathers I will examine the moderating effect of ongoing contact with G3. Among the G2 fathers approximately 25% live with their G3 child and 75% do not. The non-resident fathers have widely varying degrees of contact with the child; some see the child on a daily basis and others quite literally never see the child. This allows us to investigate whether ongoing contact is an important moderating influence on the level of intergenerational continuity. This question cannot be addressed for the G2 mothers since virtually all of them (95%) live with and are the primary caregivers for the child.

I have divided the G2 fathers into two categories. The first, called supervisory fathers, either live with the child or supervise the child at least once a month. Non-supervisory fathers are non-resident fathers who supervise the child less frequently. This criterion was selected since seeing a child monthly is a threshold at which contact with nonresident fathers affects child behavior (Furstenberg, Morgan, and Allison, 1987; King and Heard, 1999). Also, I rely on maternal reports of the father's contact to reduce reliance on a single reporter.

The results for the three types of parents are presented in Figure 5. For the G2 mothers (Figure 5a) we see a marginally significant intragenerational stability effect from adolescence to adulthood. Their adult antisocial behavior drops off precipitously during the mid-20s when this was measured, accounting for the marginal effect. More importantly, we see significant effects on the G3 child's externalizing behavior problems both from the mother's adult antisocial behavior (Path A) and from her adolescent antisocial behavior (Path B). Thus, adding information about Path B is not merely redundant to information gained from the concurrent relationship, Path A. Each adds independent information to our understanding of the onset and course of the child's antisocial behavior.

Turning our attention to the supervisory fathers (Figure 5b) we see a different pattern. First, there is a strong intragenerational stability effect. Second, the concurrent relationship between the supervisory father's adult antisocial behavior and the child's externalizing behavior problems is not significant. Their adolescent antisocial behavior, however, is a significant influence on the child's externalizing behavior problems. If we were limited to traditional longitudinal data, represented by Path A, we would erroneously conclude that maternal antisocial behavior is an important influence on the child's antisocial behavior but that the father's antisocial behavior is not. However, the father's behavior is quite important, but it is their *earlier* involvement in antisocial behavior during adolescence (Path B), that creates risk for their child's antisocial behavior.

²I use maternal reports because, as the child's primary caregiver, the mothers are the most knowledgeable reporter of the child's behavior at these ages. Thus there is a common reporter of G2 and G3 behaviors in the families of G2 mothers. That is obviously not the case in the families of G2 fathers.

Finally, Figure 5c presents data for non-supervisory fathers. Here, as with the supervisory fathers, we see a robust intragenerational stability effect. However, neither the father's adolescent nor adult antisocial behavior is significantly related to the child's behavior and both coefficients are near zero. So, while their own antisocial behavior is quite stable over the life-course, it is basically irrelevant with respect to their child's behavior. This pattern of null findings with respect to intergenerational continuity for non-supervisory fathers has also been observed in every other investigation of this issue in the Rochester study (e.g., (Thornberry, 2005; Thornberry, Freeman-Gallant, and Lovegrove, 2009; In press). In the concluding section I will return to a brief discussion of the implications of this finding. First, however, I would like to introduce the impact of the G1 grandmother on the grandchild's behavior.

Throughout the early phases of the original Rochester study we collected information on the grandparent's substance use, including frequent alcohol use and marijuana use. This information covers their adult years, when their G2 child was between 14 and 23 years of age. Recall that virtually all of the G1 respondents were mothers so this measure, in essence, refers to the grandmother's substance use. Figure 6 presents information on the impact of G1 substance use on G3 substance use. Given the ages of the G3 participants when this analysis was conducted, a median of 10 years of age, the G3 self-reported measure reflects very early onset of use.

The results are quite consistent with the strong moderating effect of ongoing contact that we saw for the G2 fathers. The adult substance use of the non-supervisory grandmothers is irrelevant with respect to G3 substance use (Figure 6). In this case, only 3% of the grandchildren of non-substance using grandmothers report an early onset of substance use as compared to 4% of the children of substance using grandmothers. In contrast, however, for the supervisory grandmothers, those who have ongoing contact with G3 and typically are a major caregiver for the child, their substance use matters greatly. In that case, 4% of the grandchildren report an early onset of substance use if the grandmother was not a substance user but 21% of the grandchildren report an early onset of substance use if the grandmother was a substance user. Again, ongoing contact with the child is quite important for the intergenerational transfer of risk.³

Overall, with respect to Topic 1, we see evidence of intergenerational continuity in antisocial behavior between the G3 child and G2 mothers, G2 supervisory fathers, and G1 supervisory grandmothers. In contrast, we do not see significant levels of intergenerational continuity for G2 fathers who have infrequent contact with their children or for G1 grandmothers who have infrequent contact with their grandchildren. The theoretical and policy implications of these findings are discussed below.

SCHOOL DISENGAGEMENT

In addition to examining continuity with respect to antisocial behavior we have also begun to examine similarities across generations with respect to performance in prosocial arenas such as school. There is actually surprisingly little information about how a parent's

³See Thornberry, Krohn, and Freeman-Gallant (2006) for a fuller presentation and discussion of these results.

educational career, as opposed to their level of educational attainment, influences their child's educational career. Indeed, we have only identified three intergenerational studies that focused on educational performance (Cairns et al., 1998; Kaplan, Kaplan, and Liu, 2000; Serbin et al., 1998).

To illustrate our work in this area I will focus on the issue of school disengagement – the process by which some students become alienated from and less engaged in school. The measure of G2 disengagement comes from the Rochester City School District records taken from the middle school years and is based on indicators of GPA, standardized test scores, attendance, failing core subjects, suspensions, and grade retention. I created a simple count variable ranging from 0 to 5 indicating the student's level of risk. The central research question is whether school disengagement measured as early as the middle school years is related to subsequent negative outcomes for that individual and his or her children.

I begin by examining the impact of school disengagement on G2's subsequent life-course development, first disorderly transitions to adulthood – dropout status and teen parenthood – and second adjustment to adult roles measured at age 31 – total years of education, welfare receipt, and unemployment. Controlling for race/ethnicity, neighborhood arrest rate, gender, and family SES, we see significant and strong relationships between school disengagement and each of these outcomes (Table 1). First, as school disengagement increases so too do disorderly transitions from adolescence to adulthood. Of the students with a risk score of zero only 6% drop out of high school but of those with a score of five 87% do. Similarly, the rate of teen parenthood increases from 13% to 41% as we move from a score of zero to a score of five. The negative consequences of school disengagement during middle school also persist to age 31. At that point students with a score of five complete an average of 3 years less formal education (10.9 years) as compared to those with a score of zero (14.0 years). There are also strong and significant effects on unemployment and on receiving welfare.

Table 2 looks at intergenerational consequences of school disengagement, starting with two measures of G2 parenting behaviors that can affect the G3 child's performance and behavior at school. Again, we see significant relationships. For example, as the number of G2 middle school risk factors increases so to does the amount of time per day that G3 spends watching TV or playing video games. In fact, it increases by almost an hour per day from 2.2 hours for the lowest to 3.1 hours for the highest levels of risk. In addition, early levels of school disengagement adversely impact G2's involvement in their child's schooling when they become a parent. For example, they are significantly less likely to volunteer at G3's school.

Finally, G2's school disengagement ripples across to the next generation. Their children exhibit significantly higher levels of behavior problems in school as indicated by teacher reports. At higher levels of G2 school disengagement, the children exhibit significantly higher levels of attention deficit, hyperactivity disorder (ADHD) in the school setting (Conners, 1997). When the G2 parent had a risk score of zero the mean G3 ADHD score (on a 5-point scale) was 1.71, but when they had a risk score of five it was 2.50. The G3 children also had higher scores on the teacher reports on the Child Behavior Checklist measures (Achenbach, 1991b) of delinquency and of withdrawn behavior as the parent's

school disengagement increased. Those relationships are observed holding constant the same control variables as above, plus G3 gender, G3 age at the time of the survey, and G3 birth year.

Overall, we see that low prosocial competency in the educational domain, measured as early as the middle school years, has long-term negative consequences for the individual, influencing both their own adjustment to central adult roles and the style of parenting they present to their children with respect to educational performance. In addition, G2 school disengagement also has intergenerational consequences that ripple across to early manifestations of school problems by their G3 children.

INTERGENERATIONAL CONTINUITY IN PARENTING

The third topic I would like to discuss, intergenerational continuity in parenting behaviors, focuses on an extreme form of ineffective parenting – child maltreatment – and examines the cycle of violence hypothesis that states that “...abused children become abusers and victims of violence become violent offenders” (Widom, 1989: 160). There is substantial evidence that maltreatment leads to subsequent involvement in violence, delinquency, drug use, and other problem behaviors (Dodge, Bates, and Pettit, 1990; Ireland and Widom, 1994; Mersky and Reynolds, 2007; Widom, 1989). Although commonly assumed, there is very little valid scientific evidence for the other aspect of the cycle of violence hypothesis – that is, that abused children become abusers. In other words, we have much less information about the extent to which parenting styles that include very harsh, inappropriate parenting are reproduced across generations.

Recently, Ertem, Leventhal, and Dobbs (2000) reviewed the literature on intergenerational continuity in physical abuse and established 8 design criteria for adequately assessing the cycle of violence hypothesis. Only one study, by Egeland et al. (1988), met all 8 criteria and one, by Widom (1989), met 6 of the 8. Interestingly, these two studies reached opposite conclusions. Egeland et al. found support for the reproduction of maltreatment while Widom did not. The other studies reviewed by Ertem et al. (2000) were substantially weaker methodologically. Moreover, when their review is updated to the present and expanded to include all types of maltreatment, not just physical abuse, these conclusions do not change (Thornberry, 2008).

Using data on maltreatment from the Rochester study allows us to test more rigorously the cycle of violence hypothesis. In the original study we collected information on all substantiated cases of maltreatment, including physical abuse, sexual abuse, and neglect, for the G2 participants from birth through age 17. Thus we have complete histories of exposure to maltreatment victimization. In the Rochester Intergenerational Study we have collected data on the perpetration of maltreatment by the G2 parents between the ages of 18 and 30. In combination, therefore, we have long-term coverage of their experiences with maltreatment, both as victims and as perpetrators. The Rochester design meets all 8 criteria established by Ertem et al. (2000), enabling a strong examination of the cycle of violence hypothesis.

The following analysis includes only supervisory parents. That is, for this analysis I combined the G2 mothers and the G2 supervisory fathers as defined earlier. These parents

live with at least one child (not necessarily the G3 focal child) and therefore have the opportunity to become a perpetrator of maltreatment.

Maltreatment is a relatively rare event and therefore cell sizes are somewhat small. Because of that, while I control for the impact of 4 variables – G2 adolescent delinquency, G2 race/ethnicity, G1 education, and G1 poverty – I do so in separate equations rather than include all four variables in the same multivariate equation. I begin by examining the impact of G2 maltreatment victimization, from birth through age 17, on the likelihood of perpetrating maltreatment from age 18 to 30 (Table 3). In this case we see significant effects across the equations. All the odds ratios associated with exposure to maltreatment victimization are significant ($p < .001$), ranging from 3.3 to 3.6, providing general support for the cycle of violence hypothesis.

In our previous investigations of the impact of maltreatment on subsequent outcomes we have noticed strong developmentally specific effects (e.g., Ireland, Smith, and Thornberry, 2002; Smith et al., 2008; Thornberry, Ireland, and Smith, 2001). In general, we find that childhood-limited maltreatment – that is, maltreatment that occurs only from birth through age 11 – is weakly and inconsistently related to outcomes during adolescence and early adulthood. Indeed, most of those relationships are not statistically significant. In contrast, adolescent maltreatment – that is, maltreatment that occurs between ages 12 and 17 or maltreatment that occurs both in childhood and in adolescence – is strongly and persistently related to negative outcomes such as delinquency, violence, drug use, and other problem behaviors. The question now is whether the intergenerational reproduction of maltreatment is also developmentally specific.

The data presented in Table 4 indicate that it is. First, childhood-limited maltreatment (the top panel of Table 4) is not significantly related to the perpetration of maltreatment when the individual becomes an adult. The odds ratios vary from 1.7 to 1.9 and none are statistically significant. In contrast, the odds ratios associated with adolescent maltreatment are quite strong, varying between 5.2 and 6.1, and all are statistically significant.

As with our other examinations of maltreatment in the Rochester study, we see developmentally specific effects. Childhood-limited maltreatment is not a significant predictor of the perpetration of maltreatment, at least to the age of 30. Maltreatment that occurs during adolescence, however, is strongly related to the subsequent perpetration of maltreatment. These results highlight the value of having truly long-term longitudinal data to investigate life-course development. In this case, having complete histories of G2 maltreatment victimization allows us to identify the very strong impact that adolescent victimization has on subsequent behavior. These results are, I believe, the strongest evidence to date testing the cycle of violence hypothesis. Maltreatment victimization – at least that which occurs during adolescence – appears to be a significant risk factor for the subsequent perpetration of maltreatment.

MEDIATING PROCESSES OF INTERGENERATIONAL CONTINUITY

The fourth, and final, topic concerns mediating pathways for intergenerational continuity in antisocial behavior. Although I have not presented the full conceptual model of

intergenerational continuity that is being tested in the Rochester Intergenerational Study (see Thornberry, 2005), I would like to illustrate our life-course approach by estimating a small portion of that model.⁴ As indicated in Figure 7, this model includes a direct path from G2 adolescent antisocial behavior, indicated by self-reported drug use and delinquency, to G3 externalizing behaviors at ages 10 and 11, based on maternal reports. This is equivalent to Path B presented earlier in Figure 1. In this model, however, the intergenerational linkage is expected to be mediated by subsequent aspects of G2's life course. First, adolescent antisocial behavior is expected to be associated with a younger age of parenthood – that is, the parent's age when the G3 child was born. It is also expected to lead to higher levels of subsequent stress for the young parent. In this case, I examine stress that comes from the parenting role itself as indicated by such items as feeling overwhelmed by being a parent, that the parenting role is less satisfying than anticipated, and that parenting interferes with other aspects of one's life. It is surprising how infrequently parenting stress is examined in the intergenerational literature. The most powerful and proximal mediator of intergenerational continuity is expected to be the parenting style that the G2 parent provides to the G3 child. In this analysis, effective parenting is measured with two indicators, strong attachment to the child and consistent discipline provided to the child. In addition, effective parenting is expected to be diminished by adolescent antisocial behavior, an early age at first birth, and high levels of parenting stress. Finally, effective parenting styles are expected to reduce the likelihood that the G3 child will engage in antisocial behavior. The model is tested separately for G2 mothers and G2 supervisory fathers.

The results for G2 mothers are presented in Figure 8a. First, when the mediating processes are included in the model, the earlier significant bivariate relationship between G2 adolescent antisocial behavior and G3 antisocial behavior is no longer significant. Second, as anticipated, effective parenting style by the G2 mother is the central mediating process in accounting for intergenerational similarity in behavior. The mother's earlier adolescent antisocial behavior reduces effective parenting styles, as does an earlier age at first birth and high levels of parenting stress. In turn, effective parenting has a sizeable impact on the child's antisocial behavior. The more effective the parenting is, as represented by attachment and consistent discipline, the less apt the child is to engage in externalizing behavior problems.

A slightly different picture emerges for the G2 supervisory fathers (Figure 8b). In this case, their adolescent antisocial behavior has a more pervasive influence on their later life-course development. Adolescent antisocial behavior is associated with a younger age at first birth, with increased levels of parenting stress, and with reduced effectiveness of parenting. Parenting stress also reduces effective parenting and both effective parenting and age at first birth are negatively related to the child's externalizing behavior problems.

Overall, the results from this rather simple mediating model are consistent with our general conceptual model of intergenerational continuity (Thornberry, 2005). G2 adolescent antisocial behavior leads to disorderly transitions, here represented by an earlier age at first

⁴A similar model is tested in Thornberry, Freeman-Gallant, and Lovegrove (In press) but here the analysis is extended to somewhat older ages for G3 and, as a result, has a larger sample size.

birth, to higher levels of later stress, here represented by parenting stress, and to less effective parenting styles, here represented by attachment and consistency of discipline. In turn, these influences mediate the impact of G2 adolescent antisocial behavior on G3 antisocial behavior at ages 10 and 11 and help to explain the onset of G3 antisocial behavior. While the specific pathways vary somewhat for G2 mothers and G2 supervisory fathers, the general life-course perspective appears to apply to both.

These findings add to a number of others based on the Rochester Intergenerational Study that begin to identify important mediating processes that link adjacent generations with respect to antisocial behavior. Those studies (Thornberry, 2005; Thornberry, Freeman-Gallant, et al., 2003; Thornberry, Freeman-Gallant, and Lovegrove, 2009; In press) examined different indicators of G2 adolescent antisocial behavior; varying sources of stress such as depression, financial stress, exposure to negative life events, and parenting stress; and different aspects of parenting sometimes based on interview data and sometimes based on observational data. In all cases the results suggest that disorderly transitions, high levels of stress, and ineffective parenting styles, all help to account for observed levels of intergenerational continuity in antisocial behavior.

CONCLUSION

The basic premise of this article is that intergenerational studies offer new insights into the origins of a child's antisocial behavior and extend the understanding we have of that behavior that is based on longitudinal studies. These results from the Rochester Intergenerational Study, I believe, are consistent with this premise.

First, we have seen evidence of intergenerational continuity in antisocial behavior across adjacent generations. In this regard, we might well conclude that the apple doesn't fall far from the tree; parents and children are similar with respect to antisocial behavior. In other words, we have seen empirical evidence consistent with my earlier contention that it is important to have information on Path B, the association between a parent's adolescent antisocial behavior and a child's adolescent antisocial behavior. That path is significant both for G2 mothers and G2 supervisory fathers and it is not redundant to information gained from Path A. Indeed, if we are limited to information from Path A, the path typically addressed in longitudinal studies, we run the risk of substantially underestimating the impact of father's antisocial behavior on that of their children.

Second, in addition, however, we also saw the very strong moderating influence that ongoing contact and involvement with the child has in accounting for intergenerational similarities in behavior, both from the grandmother to the grandchild and from the father to the child. When contact is ongoing, antisocial behavior in the earlier generation increases involvement in antisocial behavior by the later generation; when contact is low, however, there is no transfer of risk, at least at these ages. In this case, the apple may not land very close to the tree at all. These results have interesting implications. With respect to theory they are not very consistent with purely genetic models of transmission. They suggest that the social environment, either directly or in interaction with genetic risk, plays a vital role in our understanding of the origins and course of antisocial behavior. With respect to policy,

these findings are not at all consistent with strong family preservation models that argue for continuing paternal involvement in a child's life. These results and others (Jaffee et al., 2003) strongly imply that who the father is and what he does is crucial for understanding his impact on the child's behavior and the wisdom of uniting them.

Third, intergenerational studies also inform our understanding of the origins of parenting styles and behaviors. We know that parenting styles have a powerful impact on a child's development, including their involvement in antisocial behavior (Patterson, Reid, and Dishion, 1992). Parenting styles do not arise, *de novo*, with the birth of one's children, however. They have deep intergenerational and developmental roots. To some extent parenting behaviors are reproduced across the generations, as we saw with respect to maltreatment; to some extent parenting styles are influenced by the parent's adolescent development as we saw with respect to their own adolescent antisocial behavior and level of school disengagement measured as early as the middle school years. Intergenerational studies have a unique advantage of not only investigating the concurrent impact of parenting styles and family influences on a child's behavior, but also identifying the origins of those parenting styles and family influences. By examining these issues intergenerational studies greatly expand our window into the causes of antisocial behavior. They identify forces that influence the child's behavior, and therefore targets for preventative services, that exist well before the child's birth. By focusing on these issues, intergenerational studies have the potential to expand our understanding of both the onset and course of an individual's antisocial career.

CODA

Lastly, I would like to close on a brief personal note. I always felt very fortunate that when I began my career at the University of Pennsylvania I was able to work on the Philadelphia Birth Cohort Studies with Marvin Wolfgang and Thorsten Sellin. At that time, longitudinal studies were just emerging as the dominant research design in criminology, leading to what we know now as developmental, life-course criminology. I was there at the beginning and have been privileged to work in that area as it grew both in sophistication and in scientific yield. I feel now that my career has come full circle as we begin to launch intergenerational studies in earnest. They are in much the same posture as longitudinal studies were in the late 1960s, full of promise and challenges, and with the potential to dramatically improve our understanding of the origins and course of delinquent careers. So, in closing, I would like to note how lucky I am, some 40 years later, to once again "be there at the beginning."

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Many people have helped me to this point in my life and I would like to thank, first, my mentors Thorsten Sellin and Marvin Wolfgang of the University of Pennsylvania. Both are previous recipients of this Award and, indeed, Thorsten was the very first Sutherland Award winner in 1960. It is quite special to join Thorsten and Marvin, both of whom were so supportive of me and who taught me so much.

I also realize that I am receiving this Award primarily for my work with the Rochester Youth Development Study. That is truly a collective effort and I would like to thank my colleagues and friends who work with me on the Rochester project. They include my longtime co-Principal Investigators and colleagues, Marvin Krohn and Alan Lizotte, and more recently Carolyn Smith and Tim Ireland. I would also like to recognize the senior staff of the project Marilyn Hubbard, Adrienne Freeman-Gallant, and, more recently, Rebekah Chu. Without their hard work and untold contributions I would literally not be standing before you this evening.

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Biography

Terence P. Thornberry is Director of the Problem Behavior Program at the Institute of Behavioral Science and Professor of Sociology, University of Colorado. He also directs the Rochester Youth Development Study, a three-generation panel study begun in 1986 to examine the causes and consequences of delinquency and other antisocial behaviors. His research examines the development of delinquency and crime over the life course, the consequences of maltreatment, and intergenerational continuity in antisocial behavior.

a. Longitudinal Design:

b. Intergenerational Design:

c. Intergenerational Extension:

Figure 1.
Intergenerational Relationships for Antisocial Behavior based on Longitudinal and
Intergenerational Designs

Figure 2.
Grandparental Influences in Intergenerational Designs

Figure 3.
Rochester Intergenerational Study Research Design

Figure 4.
Intergenerational Model of Continuity in Antisocial Behavior

a. G2 Mothers:

b. G2 Supervisory Fathers:

c. G2 Non-Supervisory Fathers:

Figure 5.

The Relationship between G2 Antisocial Behavior and G3 Antisocial Behavior, by G2 Gender and Contact with G3

* $p < .05$; + $p < .10$.

Figure 6.

The Relationship between G1 Adult Substance Use and G3 Early Onset Substance Use
 $n = 293$; $X^2 = 20.7$; $df = 3$; $p < .001$.

Figure 7.
Mediating Processes of Intergenerational Continuity

a. Mothers Only (standardized coefficients)

CFI = .98; $\chi^2/df = 1.7$; RMSEA = .07; * $p < .05$.

b. Supervisory Fathers Only (standardized coefficients)

CFI = .97; $\chi^2/df = 1.8$; RMSEA = .07; * $p < .05$.

Figure 8.

Mediating Model for Intergenerational Continuity in Antisocial Behavior

Table 1

Impact of G2 School Disengagement on G2 Life-Course Outcomes

	Number of G2 Middle School Risk Factors					
	0	1	2	3	4	5
G2 Young Adult Disorderly Transitions						
High school dropout (binary) (n = 824)	0.06	0.16	0.36	0.59	0.74	0.87
Teen parent (binary) (n = 970)	0.13	0.14	0.27	0.36	0.43	0.41
G2 Adult Adjustment at Age 31						
Unemployment (binary) (n = 748)	0.04	0.06	0.10	0.13	0.18	0.23
Welfare receipt (binary) (n = 747)	0.16	0.22	0.34	0.48	0.38	0.56
Total years of education (n = 765)	14.01	12.95	12.55	11.75	11.55	10.85

NOTES: Controlling for race/ethnicity, neighborhood arrest rate, gender, and family SES.
The means presented are unadjusted for the covariates; the significance is from the multivariate model.
All relationships are significant at $p < .05$.

Table 2

Impact of G2 School Disengagement on G2 Parenting and G3 Outcomes

	Number of G2 Middle School Risk Factors					
	0	1	2	3	4	5
G2 Parenting Behaviors^a						
Volunteered at school (binary) (n = 395)	0.83	0.61	0.57	0.55	0.55	0.51
Hours/day child watches TV or plays video games (n = 266)	2.17	2.08	2.36	2.65	2.87	3.05
G3 School Behaviors^b (Teacher Ratings)						
ADHD (n = 348)	1.71	1.94	2.08	2.07	2.42	2.50
CBCL delinquency (n = 350)	0.17	0.17	0.23	0.27	0.32	0.42
CBCL withdrawn (n = 349)	0.22	0.19	0.37	0.41	0.36	0.42

^aControlling for race/ethnicity, neighborhood arrest rate, gender, and family SES.

^bControlling for race/ethnicity, neighborhood arrest rate, gender, family SES, G3 gender, G3 age at survey, and G3 birth year.

NOTES: The means presented are unadjusted for the covariates; the significance is from the multivariate model.

All relationships are significant at $p < .05$.

Table 3

Impact of G2 Maltreatment Victimization (Ages 0–17) on G2 Perpetration of Maltreatment (Ages 18–30),
Supervisory Parents Only

	<u>Odd Ratios Predicting Perpetration of Maltreatment</u>			
Maltreatment Victimization	3.3***	3.4***	3.4***	3.6***
G2 adolescent delinquency (prevalence)	2.9*			
G2 African American		1.9		
G1 education			1.5	
G1 poverty				1.1
Chi-square	19.2***	16.5***	15.7***	14.3***

n = 390

*
p < .05;

**
p < .01;

p < .001.

Table 4

Impact of Developmentally Specific Measures of G2 Maltreatment Victimization on G2 Perpetration of Maltreatment (Ages 18–30), Supervisory Parents Only

	<u>Odd Ratios Predicting Perpetration of Maltreatment</u>			
Childhood-Limited Maltreatment Victimization (Ages 0–11)	1.7	1.8	1.9	1.8
G2 adolescent delinquency (prevalence)	3.2			
G2 African American		1.7		
G1 education			1.5	
G1 poverty				1.2
Chi-square	6.2	3.1	2.8	1.6
Adolescent Maltreatment Victimization (Ages 12–17)	5.2***	5.2***	5.5***	6.1***
G2 adolescent delinquency (prevalence)	3.8*			
G2 African American		2.4*		
G1 education			1.3	
G1 poverty				1.0
Chi-square	24.1***	21.4***	18.5***	18.9***

n = 390

*
p < .05;

**
p < .01;

p < .001.