The Transmission of Aggressiveness Across Generations: Biological, Contextual, and Social Learning Processes

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Abstract

A significant number of three-generation studies have now established that, when they grow up, children who are more aggressive tend to have children of their own who are more aggressive. The cross-generational continuity is undoubtedly the product of three factors: biological predispositions that are inherited by offspring, continuity in environment across generations, and social learning by the child. In this paper, we elaborate a model that takes into consideration all of these factors, and we apply it to data from a three-generation longitudinal study. The data show significant cross-generational continuity and, as the social learning model predicts, show that social cognitions mediate the relation between parent and child behavior.
Continuity of Aggressive Behavior within the Life-Span

Probably among the most consistently asked questions of prospective, longitudinal data is whether personality traits, behaviors, or other aspects of psychosocial functioning remain stable over the life course. The continuity of intellectual ability from childhood to adulthood is substantial, with correlations typically in the moderate range of effect (i.e., about .50). Research, including our own, on the development of aggression suggests that adult aggression and antisocial behavior are also predictable statistically from childhood aggression and antisocial behavior (Ensminger, Kellam, & Rubin, 1983; Farrington, 1989, 1995, 2003; Farrington, Ttofi, & Coid, 2009; Huesmann, Dubow, Boxer, 2009; Huesmann, Eron, Lefkowitz, & Walder, 1984; Huesmann & Moise, 1998; Kokko, Pulkkinen, Huesmann, Dubow, & Boxer, 2009; Lefkowitz, Eron, Walder, & Huesmann, 1977; Moffitt, 1990, 1993; Loeber & Dishion, 1983; Magnusson, Duner, & Zetterblom, 1975; Olweus, 1979; Pulkkinen, Lyyra, & Kokko, 2009; Robins & Ratcliff, 1980; Spivack, 1983), with our own most recent estimates of behavioral continuity approaching those for intellectual ability from age 8 to 48 (Huesmann et al., 2009).

Our own most recent estimates are based on the analysis of data from the Columbia County Longitudinal Study – a study of a cohort of 856 8-year-olds first evaluated in 1960, and then re-evaluated at age 19 in 1970-71, at age 30 in 1982, and at age 48 in 2000. Their parents were also interviewed in 1960, and 525 or their children were interviewed in 2000 providing data on three generations. We call the main sample the Generation 2 (G2) sample, and they have provided 40 years of data on continuity of aggression within the life span. As shown in Figures 1 and 2, when the continuity coefficients for 40 years are estimated with structural equation models that control for measurement error and method variance, we derive coefficients of .50 for males and .42 for females. The consequences of such continuity can be serious. As Kokko, Pulkkinen, Huesmann,
Dubow, and Boxer (2009) have recently shown with data from Finland and the USA, early aggressiveness is more predictive of physical aggression and lack of self-control in later middle-adulthood than it is of verbal aggression.

It is also valuable to note that the continuity correlations over time are as much due to low aggressive children staying low on aggression throughout the life course as they are due to high aggressive children staying high throughout the life course (Huesmann et al., 2009). To demonstrate this fact, we grouped participants based on age 8 peer-nominated aggression into “high” and “low” using both median and one-third splits and examined how many stayed in the same category over 40 years. For the full sample, 37% (52 of 141) of individuals who were “low” in third grade stayed “low” through late adolescence (age 19), through young adulthood (age 30), and into middle adulthood (age 48) on the composite measure of aggression. Of individuals who were “high” in third grade, 35% (31 of 89) stayed “high” through adolescence and into middle adulthood. In other words, continuity was as much due to low aggressives staying low as to high aggressives staying high. When we inspected these patterns by gender, interesting differences became evident. For males, 30% of those who were “low” in childhood stayed “low” through age 48. In contrast, 43% of females who were “low” in childhood stayed “low” into middle adulthood. The differences were more striking with regard to those classified as “high” on aggression. Among males, 53% of those who were “high” in childhood stayed “high” into middle adulthood. For females, only 13% who were “high” in childhood continued to be “high” into middle adulthood (χ² [1] = 14.97, p < .001).

These results open the possibility that differential socialization of males and females places more pressure on females to reduce their aggression than it does on males. Early aggressiveness may also have more lasting serious consequences for males. For example, Huesmann, Eron, and Dubow (2002)
found that early aggressiveness was the most important predictor of males being arrested by the
time they were 30 years old among a large variety of contextual and personal variables assessed in
their Columbia County Longitudinal Study. The standardized odds ratio for age 8 aggression in
predicting “ever arrested by age 30” was a highly significant 1.45, $p < .01$.

Of course, even continuity coefficients as large as .5 and odds ratios approaching 1.5 still
mean that a substantial portion of adult aggressive and criminal behavior is not predictable from
childhood aggressive behavior and is probably related to context (Broidy et al., 2003; Sameroff,
Seifer, Baldwin, & Baldwin, 1993). Additionally, it seems to be only aggressive and antisocial
behavior that emerges early in life that has lasting negative consequences. As Moffitt (1993)
suggested, and a number of recent studies have confirmed, some aggressive and antisocial behavior
often emerges in adolescence and is relatively short lived. This kind of aggression seems to have
few long-term negative consequences, while life-course persistent aggression that begins in early
childhood has lasting detrimental consequences (Farrington et al., 2009; Huesmann et al., 2009;
Pulkkinen et al., 2009).

Similar findings regarding continuity have been reported in studies of other indicators of
adjustment over time. For example, Helson et al. (2002) demonstrated quadratic changes in various
indicators of personality functioning from early to late adulthood, in that certain attributes such as
dominance and independence peaked in middle adulthood. Werner (2002) summarized long-term
outcomes for children and adolescents with behavior disorders in the influential Island of Kauai
prospective study: by age 40, only one-third of those males and one-fifth of those females exhibited
continuing difficulties (e.g., financial, marital, substance use). However, far less is known about the
degree of continuity of positive psychosocial adjustment from childhood to adulthood, though this
appears to be an emergent concern of longitudinal research. As an example, with data from the
Jyväskylä Longitudinal Study, Pulkkinen and her colleagues have demonstrated that prosocial behavior in childhood predicted greater self-esteem and subjective well-being, and shorter-lived periods of unemployment in adulthood (Kokko & Pulkkinen, 2000; Pulkkinen et al., 2002). Flouri and Buchanan (2002) showed that good family relationships in childhood led to better marital adjustment.

Recent Studies of Intergenerational Continuity of Aggression

The discovery of strong continuity of aggression across the life-course has stimulated interest in the continuity of aggression and antisocial behavior across generations. While many studies have investigated parent-child relations statically, longitudinal cross-generational investigations of continuity and discontinuity in personality, behavior, and adjustment are relatively few and are limited primarily to examining contemporaneous or retrospective links between parent and child behavior. Several discussions of the intergenerational transmission of aggression have been published in the child development literature over the past decade (e.g., Constantino, 1996; MacEwen, 1994; Muller, Hunter, & Stollak, 1995). Those reviews indicated that most relevant studies have employed self-report, retrospective questionnaire data obtained from two generations. However, response bias problems cloud the interpretation of such findings. Three studies in a 1998 special issue of Developmental Psychology did use prospective methodology and multiple methods of measuring aggression (Cairns, Cairns, Xie, Leung, & Hearne, 1998; Capaldi & Clark, 1998; Serbin, Cooperman, Peters, Lehoux, Stack, & Schwartzman, 1998), and all reported modest to moderate cross-generational continuity. But, those studies included only two generations. Studies in that issue also reported cross-generational links in such behaviors as smoking (Chassin, Presson, Todd, Rose, & Sherman, 1998), teen pregnancy (Scaramella, Conger, Simons, & Whitbeck, 1998), partner violence (Capaldi & Clark, 1998), and academic competence (Cairns, Cairns, Xie, Leung, &
Hearne, 1998). More recently, four studies on cross-generational consistencies in parenting and in aggressive and antisocial behavior were published in a special issue of the *Journal of Abnormal Child Psychology* (Capaldi, Pears, Patterson, & Owen, 2003; Conger, Neppl, Kim, & Scaramella, 2003; Hops, Davis, Leeb, & Sheever, 2003; Thornberry, Freeman-Gallant, Lizotte, Krohn, & Smith, 2003; and see also Smith & Farrington, 2003).

All four studies measured parenting by two generations (G1 and G2) and aggressive behavior in two generations (G2 and G3). The studies assessed the effects of: a) G1’s parenting on G2’s childhood, adolescent, and/or adult aggressive behavior, and on G2’s own parenting behavior; and, in turn, b) the effects of G2’s childhood, adolescent, and/or adult aggressive behavior and parenting on G3’s early childhood, adolescent, or young adult aggressive behavior. However, in many other respects the studies differ. They vary greatly in sample size. Three investigate “high risk” samples while one investigates a community samples. The ages at which assessments were made vary greatly across the studies, and the kinds of assessments and measures differ considerably. Nevertheless, the similarities of the findings across studies are more notable than are the differences.

Two of the four studies found significant intergenerational continuity of aggression. The two that did not report such continuity had the smallest sample sizes. All four studies also reported intergenerational continuity for some parenting factors, though there seems to be stronger evidence of it for females than for males. In the studies where gender differences could be tested, the intergenerational parenting correlations were higher for females. Additionally, Thornberry et al. (2003) found that longitudinal pathways from parenting by one generation to parenting in the next generation were more direct for females than for males. For females, there was a direct path
between G1 parenting and G2 parenting. For males, G1 parenting predicted G2 parenting indirectly, through its effects on G2 aggression.

There were significant effects from parenting in one generation to aggression in the next generation in all the studies, though some of the specific G1 to G2 or G2 to G3 effects were not significant. At the same time, in most of the studies, aggressive behavior in one generation was related to later parenting by that same generation. Taken together, these results suggest possible reciprocal mediation of parenting and aggression within and across generations. For example, Thornberry et al. (2003), using self-report questionnaire data, found a chain of relations for males from G1 parenting to G2 aggression to G2 parenting to G3 aggression. For females the pattern was similar though the link from G1 parenting to G2 aggression was not significant. Conger et al. (2003), using observational data, found both that G1 observed parenting had direct effects on G2 observed aggression and that G2 observed parenting had direct effects on G3 observed aggression. Hops et al., also using observations of parenting, obtained a fully mediated path from G1 parenting, to G2 aggression, to G2 parenting, and finally to G3 aggression. Capaldi et al. (2003) reported findings similar to those of the other studies, with an important methodological distinction: the use of multiple informants and sources of data, moving beyond the parent and child observational and questionnaire data employed in the other studies to include teacher reports and archival records. In their study, only the link between G2 parenting and G3 aggression was not significant.

A plausible conclusion that can be drawn from these similar results in the four studies is that parenting behavior and aggressive behavior seem to have reciprocal influences on each other. Within generations, aggression in youth is often followed by aggression-promoting parenting. Aggression-promoting parenting, in turn, seems to contribute to aggression in offspring. However, this conclusion might be attenuated by important considerations related to the theory upon which
these cross-generational investigations are based. In spite of increasing empirical attention, the processes by which patterns of positive or negative adjustment are transmitted from parents to children are not yet well understood or firmly established, and more research is needed to explicate cross-generational links and the theory explaining such links (Dubow et al., 2003; Rutter, 1998; Shaw, 2003).

**Psychological Processes Involved in Aggressive Behavior**

To begin with, in order to talk theoretically about the cross-generational transmission of aggression, we need a model for the psychological processes through which predisposing personal factors and precipitating situational factors interact to determine whether a person behaves aggressively. The model needs to include a representation of the enduring psychological structures the control and influence these processes. Such a model has been provided by Huesmann (1998) in his unified information processing model for social problem solving. This model is illustrated in Figure 3 from Huesmann and Kirwil (2007). In this model, the individual’s emotional state and encoded schemas about the world interact with situational cues to lead the individual to make attributions about the situation. These attributions change the individual’s emotional state and prime the activation of scripts for behaving. The scripts are filtered through a set of normative beliefs about appropriateness until a script is accepted and followed.

Within this model the (a) encoded cognitions represented by schemas about the world, (b) scripts for behavior, and (c) normative beliefs for filtering scripts, along with (d) the individual’s emotional predispositions are the long-term determinants of aggressiveness. More specifically, hostile attributional biases, e.g., “people are mean,” (Dodge, 1980) occur when hostility is emphasized by the “world schema” that an individual has acquired. Attributions influence emotions and the type of script that an individual will retrieve to deal with a social situation. Scripts (Abelson,
1981) can be viewed as cognitive programs that have been acquired over time and are stored in a person's memory and are used as guides for behavior and social problem solving. Not all scripts that occur to the child will be employed. Before acting out the script, the child reevaluates the appropriateness of the script in light of existing internalized social norms -- called normative beliefs (Huesmann, 1998; Huesmann & Guerra, 1997) -- and examines the likely consequences of the script. These normative beliefs and expectations about outcome must also have been acquired over time.

The focus on cognitive-information processes does not mean that emotions are unimportant. We view emotion regulation as an important influence on aggressive behavior that influences attributions, script selection, and evaluation of scripts. Emotion regulation has held a place of prominence in the study of behavioral development for some time, particularly with regard to developmental psychopathology (e.g., Cicchetti, Ackerman, & Izard, 1995; Frick & Morris, 2004; Shields, Ryan, & Cicchetti, 2001).

Processes for the Intergenerational Transmission of Aggression

Given this model, how can a tendency to behave in a characteristic manner (e.g., aggressively or non-aggressively) be transmitted from one person (e.g., a parent) to another (e.g., their child)? Our position is that there are four major processes that need to be considered. 1) Through the transmission of genes that influence social behavior; 2) By changes parents make in the child’s environment or through continuity in the parent’s and child’s environment; 3) Through children observing parents’ behaviors; and 4) Through conditioning of the children’s behavior in which the parent participates.

Genetic influences on aggression. Genetic influences are well established empirically. Individual differences in emotional arousal, neurotransmitter levels, perceptual biases, and other
characteristics relevant to aggression seem to have genetic influences. However, these seem to be predisposing influences rather than deterministic influences. Estimates from behavior genetics of low shared environmental variance depend on unlikely assumptions of genes being uncorrelated, non-interacting, and not influencing the environment of the individual. The weight of evidence suggests, rather, that bio-social interactions between genes and the environment are more likely influences (e.g., Caspi et al., 2002; 2003). Recently, biological-genetic influences and their interaction with social conditions have received a great deal of attention in accounting for cross-generational behavioral continuity. Studies by Caspi and colleagues (2002; 2003) have indicated that there are important childhood contextual-genetic interactions in the expression of social behavior. For example, those authors found that a gene that causes slightly lower monoamine oxidase only increases risk for aggression in a child who is exposed to high amounts of stress during childhood and adolescence. Similarly, the perinatal environment is now known to affect the risk for aggressive behavior (Raine, Brennan, & Mednick, 1994). Whatever their source, a variety of individual differences in neurophysiology, neurotransmitters, hormones, and heart rates correlate with individual differences in early aggressiveness (Dalton, 1977; Knoblich & King, 1992; Lewis et al., 1985; Olweus, Mattson, Schaling, & Loew, 1988; Raine & Jones, 1987). The evidence for some heritable predisposition to aggression from twin and adoption studies is impressive (Bouchard, 1984; Cloninger & Gottesman, 1987; Deater-Deckard & Plomin, 1999; DiLalla, 2002; Eley, Lichtenstein, & Stevenson, 1999; Loehlin, Willerman & Horn, 1985; Mednick, Gabrielli & Hutchings, 1984). Miles and Carey (1997) computed a meta-analysis of 24 genetically informative studies that included twin and adoption designs and found significant heritability estimates (in the .4 range) for self-report measures of aggression. In addition, a variety of adoption studies have revealed relations between children's aggressiveness or antisocial behavior and the aggressive or antisocial behavior of both their
natural and adoptive parents. Those studies, along with twin studies, suggest that there might be certain genetic factors that predispose some children to be more at risk for developing aggressive or antisocial behavior.

Recent studies also are now beginning to go beyond global estimates of the relative influences of genetic differences in accounting for phenotypic differences to look for the specific genes responsible. Polymorphisms of the monoamine oxidase (MAO) and serotonin transporter (5HT) genes have been targets of such studies because of their demonstrated links to personality and behavior (see Munafo et al., 2003, for a review). Strategies based on genome scans have proved disappointing in the search for loci that influence behavioral phenotypes, although investigations of polymorphisms of candidate genes have been surprisingly productive. Although methods are still developing for statistical discrimination of reliable signals from noise when many candidate genes are studied, effects from MAO and serotonin promoters have been confirmed and others are under study. For example, a recent paper by Young et al. (2002) showed that a dopamine transporter polymorphism might be a key risk marker for the expression of externalizing behavior in young children; Vandenbergh et al. (2002) showed links between dopamine transporters and smoking. Still, though there is a body of evidence underscoring the importance of several genes (particularly those implicating MAO), replication remains a critical task for genetic association studies. Such investigations can be particularly subject to problems such as low power, genetic heterogeneity, and sampling biases (Munafo et al., 2003).

**Intergenerational environmental continuity and change and their influences on continuity and change in aggression.** A large number of environmental influences on risk and resilience for aggression and violence have been identified. These include stress, poverty, abuse, parental rejection, peer behaviors, and religion, to name a few. To the extent that such environments are
perpetuated from parent to child, one can expect cross-generational continuity. To the extent that such environments change from parent to child, one can expect cross-generational discontinuity.

A major question in developmental research concerns how changes over time in the social contexts people inhabit affect development (Higgins & Parsons, 1983; Sameroff, 1983). One needs to understand whether the degree of continuity in positive and negative adjustment over time and across generations is related to the degree of continuity in contextual factors. Is there continuity in parenting practices from what the parent experienced from their parents to what their child experiences from them? Does continuity or change in socioeconomic status promote continuity and change in aggression? Many children have to cope with family changes: Their parents might divorce, get into trouble with the law, or lose their jobs. Evidence suggests that the stress engendered by these types of changes is a risk factor for children’s socio-emotional development (Brooks-Gunn & Peterson, 1991; Petersen & Spiga, 1982), thus increasing the likelihood of negative changes that might have long-term consequences. Our hypothesis is that similar discontinuities of a positive nature -- a substantial improvement in the family's financial situation, a significant improvement in the child's academic performance -- can turn trajectories of psychosocial adjustment upward toward greater success, achievement, and life satisfaction.

A second question in developmental research concerns the timing of exposure to contextual influences. What contexts at what points during childhood are most predictive of later outcomes? For example, Duncan (2002) has demonstrated that poverty experienced during the early childhood years had the strongest effects on the number of years of education the child attained by early adulthood. This suggests that the environment in which the parent lives and the child develops would be more important than the parent’s own early environment.
A third issue of great relevance is the extent to which the larger historical context surrounding individual development influences the trajectories taken by cohorts embedded in those circumstances. As an example, what is the differential impact of being an adolescent in a society that is at war as compared to the same society experiencing relative peace, and how might that impact be magnified by the institution of selective service?

These issues lead to a fourth broad contextual concern: major life transitions or “turning points” in individual development (Clausen, 1998; Rönka et al., 2002; Rutter, 1996). Turning points are positive or negative events, over which the individual may or may not have control, which significantly alter the life trajectory. According to Rutter (1996), an event can only be a turning point if it leads to an enduring, long-term modification of the trajectory. Thus, turning points cannot be assessed contemporaneously for their impact. Longitudinal data are necessary because oftentimes individuals do not recognize turning points in their lives until some time has passed for the individual to process the importance and meaningfulness of the event (Wheaton & Gotlib, 1997).

*Children observing parents’ behaviors.* The observation of parents’ behaviors by children can be expected to influence social behavior in general and aggressive behavior in particular through two quite different types of processes: short-term stimulating processes and long-term learning processes.

In the short run, when children see their parents behave aggressively, schemas, scripts, and normative beliefs associated with aggression would be primed in the children’s minds. In addition, emotions associated with the behavior would be aroused in the child, e.g., anger might be stimulated. These alone would lead to short-term increases in the risk of aggressive behavior; however, in addition, as children generally identify with their parents, they are likely to mimic
behaviors almost immediately. All of these make it more likely that a child will behave aggressively after the child has observed the parents behaving aggressively.

However, the more important observational processes for the intergenerational transmission of aggression are probably the long-term observational learning processes involving parent and child. As mentioned above, children generally identify with their parents very strongly. Consequently, they tend to encode into their repertoire of scripts the scripts they see their parents using, they tend to adopt the world schemas they perceive their parents to be holding, and they tend to accept the normative beliefs of their parents about the appropriateness of social behavior. For a long time, children’s imitation of parents’ behaviors was thought to be a relatively low level childish form of behavior. “But recent work across a variety of sciences argues that imitation is a rare ability fundamentally linked to characteristically human forms of intelligence, in particular to language, culture, and the ability to understand other minds” (Hurley & Chater, 2005). Imitation of parents’ behaviors appears to be innate and occurs automatically in very young primate infants (Meltzoff & Moore, 1977). Specific “mirror neurons” seem to organize imitation in primate brains (Galese et al., 1996). However, recent work suggests that imitation goes far beyond the copying of specific sequences of behaviors to the encoding of social cognitions fundamental to the control of social behavior (Meltzoff, 2007).

These observational learning processes also are involved in the development of emotion regulation. Eisenberg and colleagues (Eisenberg, Cumberland, & Spinrad, 1998) described three processes by which emotion socialization leads to social competence. First, through everyday family interactions, children display a wide range of both positive and negative emotions, thus providing parents with numerous opportunities to react in both positive (e.g., encouraging) and negative (e.g., punishing) ways. Second, when parents discuss various aspects of emotion (e.g.,
causes and consequences, emotional experience and regulation) with their children, they serve as models for understanding and coping with emotion. A child who receives a high degree of emotion knowledge from his or her parents should be better equipped to contend with emotionally charged events. Third, family emotional expressivity relates in important ways to children’s social competence. Through observation, children can learn positive (e.g., smiling) or negative (e.g., yelling) modes of expressing emotions, as well as heuristics for interpreting the emotions of others. This model of emotion socialization suggests individual and cross-generational continuity of emotional regulation and, in turn, social behaviors, as well as taking into account potential moderating influences of contextual or individual factors.

*Conditioning of children’s behaviors to be similar to or different from parents.* Of course, observational learning is not the only learning process crucial to intergenerational transmission of aggressive tendencies. As Patterson (1982) has demonstrated, parents may even unintentionally operantly condition their children to behave aggressively. Through coercive family interactions they may unintentionally reinforce their children for behaving aggressively. They may also deliberately and directly reinforce their children for being aggressive if the parents believe aggression is appropriate.

Parents who harshly punish and abuse their children may also classically condition them to experience anger responses to stimuli that might seem benign to others, e.g., persons of authority. They may classically condition alienation from society in this way and make appropriate socialization of the child by others in the child’s environment very difficult.

*Theoretical Approach to Examining Intergenerational Continuity in the Columbia County Longitudinal Study*
In light of these theoretical ideas, we have begun to examine the relations across generations in aggressive behavior and related constructs using our 40 years of data from the Columbia County Longitudinal Study which was described above.

A diagram of the general structural model we are employing is shown in Figure 3. In this model, we draw hypothetical paths representing a number of different possible intergenerational effects. Probably the most common view taken of cross-generational continuity in the contemporary research literature (cf. the recent special issue of the *Journal of Abnormal Child Psychology*) is a parent-effects model in line with Baumrind’s (e.g., 1971) theoretical notion that child behavior construed broadly is the “effect” of parent behavior. This view is represented in the figure via the solid paths numbered 1 through 5 linking the older generation’s behavior to the younger generation’s behavior. Significant prediction coefficients obtained for those paths via latent variable modeling (where the boxes represent measurement models of aggression) would indicate cross-generational continuity in aggression. However, by comparing the size and strength of parent-to-child effects within generational pairs over two time points (e.g., comparing path 1 to path 2, or path 3 to path 4) using appropriately aged subsamples, we can examine the important developmental question of “at what age is a parent’s behavior most predictive of a child’s functioning?” Based on social learning/social cognitive theory (cf. Huesmann, 1998), we expect that a parent’s aggression when their child is very young should be more strongly related longitudinally than contemporaneously to their child’s aggression (i.e., path 4 > path 3). Of course, in the CCLS, the age range for G3 in 2000 was 4-34, so we would test that hypothesis with families where G3 was below age 8 in 1981.

One alternative view of cross-generational continuity, that emphasizes the continuity of contextual factors, would be that the best predictor of a child’s behavior is the parent’s behavior *at the same developmental period in the parent’s life*. This view is represented partially by the dashed
paths lettered A through C. For example, path B represents similarity between G2 and G3 when most members of each sample are children (in 1960, G2 participants were age 8; in 1981, we have data on 157 G3 participants, modal age 8); path C represents similarity between G2 and G3 when most members of each sample are children (in 1970, G2 participants were age 19; in 2000, we have data on 278 G3 participants in the 15-22 year-old age range).

Preliminary Analysis of Intergenerational Continuity in the Columbia County Longitudinal Study

Though the data set with the four waves of data is still being processed, we have conducted some preliminary analyses to gain an initial perspective on the intergenerational continuity of aggression in our sample and on the likely processes suggested by the observed relations. A central feature of our approach to measuring intergenerational continuity in aggression is the use of latent variable measurement modeling. As described above, this is the approach we have used to assess continuity of aggression within the life span. The indicators we used in that analysis of four waves of data were: peer-nominations at age 8 and 19, severe physical aggression at ages 19, 30, and 48, and aggressive personality at ages 19, 30, and 48. For our preliminary analyses, we use the same measures for the G3 children.

In Table 1, the intergenerational correlations are shown from G2 to G3 for these manifest variables. Although the differences are not large, an inspection of the correlations suggests that the strongest relations are between the parent’s aggression when the parent is age 30 (when the child was quite young) and the child’s aggression 18 years later when the child is somewhere between 14 and 26 years old. These specific relations are illustrated in more detail in Figure 3 which displays the mean aggression scores for the children when their parents are 48. The aggression scores are divided up for parents who score low, medium, or high on aggression at age 30. The effects are significant. Parents
who are high on aggression at age 30 have children who are high on the same kind of aggression 18 years later.

These relations are represented with a two generational structural model for continuity of aggression in the left panel of Figure 4. The model assumes that the only path from generation G2 to generation G3 is the path from the aggression of the G2 parent at age 30 to the aggression of the child 18 years later. The model fits the data adequately with a non-significant Chi-square statistic and reasonable other goodness-of-fit statistics. The path from G2 aggression at age 30 to G3 aggression 18 years later is a highly significant and large effect. We next expanded the model to incorporate all three generations we had studied. The results are shown in the right panel of Figure 4. Unfortunately, the only good measure of G1’s aggression that we have is the individual’s tendency to hit G2 when G2 was age 8. This measure is related to G2’s aggression, but it represents more than just G1’s aggressive tendencies. In any case, the model is not a very good fit to the data with a highly significant Chi-square statistic and not very adequate “goodness-of-fit” statistics.

These results indicate high continuity of aggression over generations, but by themselves they do not help us much in distinguishing between the alternative processes we have proposed for how such continuity may come about. The results do suggest that the parent’s aggressiveness when the child is very young is very important, but more complex models need to be evaluated before one
can know whether the parent’s aggressiveness at other times is also important and what the most likely processes of transmission are.

Summary

We have proposed a model for intergenerational transmission of aggression and related social behaviors that emphasizes four processes: 1) Through the transmission of genes that influence social behavior; 2) By changes parents make in the child’s environment or through continuity in the parent’s and child’s environment; 3) Through children observing parents’ behaviors; and 4) Through conditioning of the children’s behavior in which the parent participates. Potentially, data from longitudinal studies such as the Columbia County Study can be used to discriminate among these hypothesized processes. Initial analyses of our data from this project confirm that there is indeed significant cross-generational continuity. A disattenuated continuity coefficient of .81 was estimated from our preliminary data. The data also suggest that the parents’ behaviors when the children are very young are particularly important. However, more complex models need to be tested to evaluate the relative importance of genetic or very early childhood predispositions, continuity in context, and learning processes in affecting intergenerational continuity and change in aggressive behavior.
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Table 1

Correlations of Aggression between Generation G2 and Generation G3

<table>
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<tr>
<th>Parent Aggression Measure</th>
<th>All Children</th>
<th>Age 14-26</th>
<th>All Children</th>
<th>Age 14-26</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aggressive Personality</td>
<td>Severe Physical Aggression</td>
<td></td>
<td></td>
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<tr>
<td>Age 8</td>
<td></td>
<td></td>
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<tr>
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<td>.27**</td>
<td>0.06</td>
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<td>.11*</td>
<td>.12*</td>
<td>.13*</td>
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<tr>
<td>Aggressive Personality</td>
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<td>.16**</td>
<td>0.05</td>
<td>0.07</td>
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<tr>
<td>Severe Physical Aggression</td>
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<td>.16*</td>
<td>0.09</td>
<td>.12*</td>
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<tr>
<td>Age 30</td>
<td></td>
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<td>.22**</td>
<td>.14**</td>
<td>.23**</td>
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<tr>
<td>Severe Physical Aggression</td>
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<td>.33**</td>
<td>0.12</td>
<td>.24**</td>
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<tr>
<td>Age 48</td>
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<td>.20**</td>
<td>.18**</td>
<td>.28**</td>
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<tr>
<td>Severe Physical Aggression</td>
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<td>.19**</td>
<td>.26**</td>
<td>.25**</td>
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*p < .05   **p < .01   ***P < .001
Figure Captions

Figure 1. The continuity of trait aggression over 40 years for 268 males and 255 females estimated by a structural equation model. (Reprinted from Huesmann et al., 2009)

Figure 2. General model of cross-generational continuity in the Columbia County Longitudinal Study

Figure 3. In the left panel the relation between parents’ age 30 Severe Physical Aggression and their children’s Severe Physical Aggression 18 Years Later (Children Ages 14-26). In the right panel the relation Between parents’ Age 30 Aggressive Personality and their children’s Aggressive Personality 18 years later (Children Ages 14-26).

Figure 4. In the left panel, the continuity of aggression over 40 years across 2 generations. In the right panel, the continuity of aggression over 40 years across 3 generations. All subjects (N = 445).
40-Year Continuity-Coefficient = .50

Chi-Sq(16) = 24.16,  p>.08,  RMSE = .047,  GFI = .977

# indicates coefficient was fixed at value calculated from Wave 123 data (Huesmann et al., 1984).
All other printed coefficients are significant at p < .0001

40-Year Continuity-Coefficient = .42

Chi-Sq(16) = 20.77,  p>.18,  RMSE = .030,  GFI = .979

# indicates coefficient was fixed at value calculated from Wave 123 data (Huesmann et al., 1984).
All other printed coefficients are significant at p < .0001
The Relation Between Parents’ Age 30 Severe Physical Aggression and Their Children’s Severe Physical Aggression 18 Years Later (Children Ages 14-26)

F(1, 121) = 7.41, p < .01
F(1, 108) = 3.29, p< .08

The Relation Between Parents’ Age 30 Aggressive Personality and Their Children’s Aggressive Personality 18 years Later (Children Ages 14-26)

F(2, 117) = 3.64, p< .05
F(2, 101) = 3.10, p < .05
Continuity of Aggression over 40 Years Across 2 Generations
ALL Subjects (N=445)

Chi-Sq(34) = 39.2, p>.24, RMSE = .038, GFI = .98

### Correlated errors were specified within and across generations

Continuity of Aggression over 40 Years Across 3 Generations
ALL Subjects (N=445)

Chi-Sq(46) = 189.8, p<.001, RMSE = .058, GFI = .94

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***p<.001
## indicates coefficient was fixed at value calculated within generation
Correlated errors were specified within and across generations