

Running Head: Ecology of Conduct Problems

Changing ecological determinants of conduct problems  
from early adolescence to early adulthood

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### Abstract

Changes in conduct problems from middle school through early adulthood were examined in a sample of 1191 African-American and White males and females. Predictors were selected from a number of ecological contexts to examine the relative contribution of family, peer, school, and neighborhood factors to conduct problems during the 7<sup>th</sup>, 8<sup>th</sup>, and 11<sup>th</sup> grade and across transitions in middle school, into high school, and into young adulthood. Almost all contexts made a unique contribution to conduct problems except for the neighborhood setting. The variables that had the most regular influences during each of these periods were Family Consistent Control, Family Discipline Harshness, and Negative Peers. Positive family and positive peer variables had less consistent relations to outcomes. School variables were more influential in middle school than later. Few gender or race differences were found in the patterning of predictors across time. Studies using only one or two settings as predictors of conduct problems, may provide a misleading picture of their impact by excluding other contextual influences.

Keywords: Conduct problems, ecology, adolescence, adulthood

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Developmental psychopathology is concerned with the continuities and discontinuities of mental health through the lifespan. Although conduct problems have shown major stabilities across developmental periods (Robins, 1966), there is evidence of discontinuities as well (Moffitt, Caspi, Harrington, & Milne, 2002; Sampson & Laub, 1993). There are developmental changes where youth with high levels of early conduct problems have lower levels in adulthood and, conversely, where youth with low levels of early externalizing behavior become delinquent (Maughan & Rutter, 1998). Moreover, the degree of continuity may vary, depending on the group studied. For example, Broidy, et al. (2003) found continuities for boys, but not for girls, in an analysis of data from six sites.

Whereas continuities in mental health status are generally attributed to the stability of individual biological and behavioral factors, discontinuities are more often explained by changes in experiential factors. The study of lifespan psychology is based on the premise that the important determinants of behavior are contextual factors (Baltes, 1979). From this perspective there is a strong belief that previous levels of competence or incompetence may have small relevance in the face of changing circumstance. Both continuities and discontinuities in individual behavior can be explained by social happenstance (Bandura, 1982; Lewis, 1997). Conversely, there are many examples of individual discontinuities, e.g., the hormonal changes associated with adolescence (Rieder & Coupey, 1999), and environmental continuities, e.g., high correlations between environmental risk scores measured in early childhood and adolescence (Sameroff, Seifer, Baldwin, & Baldwin, 1993). Contemporary views of development emphasize the interplay of individual and contextual characteristics over time, but the relative influence of these factors may vary during different developmental periods and for different groups of individuals.

In general, families, communities, cultures, and societies are relatively stable from birth to maturity. Despite recent increases in family dissolution, contact with biological parents and parenting practices of both fathers and mothers are relatively constant. Community variables related to resources and quality of schools are also stable, with families consistently living in either more or less affluent surroundings. But within these settings there are age-graded or developmental changes. Transitions to middle school (Eccles & Midgley, 1989) and high school (Felner, Primavera, & Cauce, 1981; Reyes, Gillock, & Kobus, 1994) would be points in development when there are major contextual changes in socializers, peer groups, and expectations (Ruble & Seidman, 1996). Yet during both of these school transitions the individual is still strongly embedded in the family of origin for financial and social support. Normatively, youth still live at home and spend large amounts of time in family activities. Parenting practices are also subject to life course change. As children reach adolescence, parents report more autonomy-giving and less restrictiveness in accord with the greater maturity of their offspring (Smetana, Crean, & Daddis, 2002).

The transition to early adulthood is an even larger contextual shift when individuals generally move out of the family residence and become increasingly self-supporting (Arnett, 2000; Sherrod, 1996). Engagement with the world of work or higher education increases the separation from the family of origin as individuals become part of new social institutions. During such transitions there are important discontinuities (Schulenberg, Bryant, & O'Malley, 2004, in press) where individuals can show increases in competence (Aseltine & Gore, 1993) or decreases (Bardone, Moffit, Caspi, Sickson, & Silva, 1996). These discontinuities are associated with changes in individuals' experience in the many social settings in which they participate (Schulenberg, Maggs, & Hurrelman, 1997).

Determinants of conduct problems are of concern because of their central role in mental health diagnoses of conduct disorder and antisocial behavior and judicial judgments of delinquency and criminality. With large proportions of youth engaged in violence and being incarcerated, there are major social and economic costs to conduct disorder. It is one of the most prevalent disorders in childhood (Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993) and this high rate continues into adulthood (Moran, 1999; Turner & Gil, 2002). The Centers for Disease Control and Prevention (2000) reported 36% of high school students had been in a physical fight in the preceding year and 17% had carried a weapon during the preceding 30 days. In the year 2000 alone, 1.7 million youth were arrested (Children's Defense Fund, 2002). To reduce such problems more generally, a clear picture of their determinants is necessary.

The current study is a longitudinal investigation of conduct problems in a sample of youth followed from middle school into early adulthood. By examining the quality of the family, school, peer group, and neighborhood during this time period we are able to examine changes in conduct problems across the transitions into middle school, high school, and early adulthood. Although these social settings have been examined in many studies, few have compared their influences simultaneously. In this report, the primary questions are whether the relative importance of these contexts remains constant across these three transitions or whether there is a shift in their influence at different periods of life. Using a social ecological model (Bronfenbrenner, 1979), we are able to broaden our understanding of the changing impact of a variety of settings on the development of conduct problems.

## **Families**

The view that the route to delinquency emanates from inadequate parenting has a long tradition (Glueck and Glueck, 1950). Inadequate supervision and discipline reflect poor quality

socialization that leads to delinquency (Gottfredson & Hirschi, 1990). Inadequate emotional ties to parents represent another route to conduct problems. Families that foster positive social bonds increase attachment to parents and decrease attachment to deviant peers (Hirschi, 1969).

Conceptualizations of parenting have oscillated over time from two-dimensional circumplex models where families were classified in terms of emotional climate and control (Schaefer, 1966) to typologies where specific combinations of these factors are considered to have qualitatively different effects on children (Baumrind, 1991) and back again to dimensional ones where parenting behaviors are found to have additive influences (Barber, 1997; Herman, Dornbusch, Herron, & Herting, 1997). Among the dimensions of parenting found to be relevant for child mental health have been warmth, control, effectiveness, consistency, neglect, and harshness of discipline. Although multiple dimensions of parenting have been shown to affect externalizing behavior (Galambos, Barker, & Almeida, 2003), many studies have focused on single dimensions in isolation, especially harsh parenting (Ackerman, Brown, & Izard, 2003; Bennet, Bendersky, & Lewis, 2002). Darling and Steinberg (1993) presented a hierarchical model of parenting style where the control dimension had to be interpreted in the context of the warmth and concern dimension.

The effect of coercive and harsh parenting on pre-school and elementary school age antisocial behavior was made particularly salient in the work of Patterson and his associates (Patterson, DeBaryshe, & Ramsey, 1989; Patterson, Reid, & Dishion, 1992). Harsh parenting was found to predict externalizing problems for children at age 4 (Bennet et al., 2002) and those who would continue to have high levels of externalizing behavior from first to third grade (Ackerman et al., 2003). Deater-Deckard, Dodge, Bates and Pettit (1996) placed punishment in a cultural context when they reported that the relation held-up for European-Americans, but it

was not found for African-American children during elementary school. African-American and lower-income youths were found to be more approving of spanking as a method of discipline and those who experienced more physical punishment short of abuse were more approving (Deater-Deckard, Lansford, Dodge, Pettit, & Bates, 2003). Parental monitoring and supervision have also been found to play a role in elementary school antisocial behavior (Dishion, Patterson, Stoolmiller, & Skinner, 1991). Loeber and Farrington (2000) included poor supervision, communication, and parent-child relations in their list of parental contributions to child delinquency.

The effects of parenting practices on conduct problems continue into adolescence but there has been a proliferation of parenting constructs differentiating the control aspects childrearing. Unilateral parental decision making and harsh punishment have been found to make independent contributions to increases in externalizing behavior (Lansford, Criss, Pettit, Dodge, & Bates (2003). Parental knowledge, defined as parent awareness of the whereabouts and activities of their adolescents, was reciprocally correlated with delinquent behavior. Between the ages of 14 and 18, parents with more knowledge had youth who decreased in delinquency and youth with greater delinquency had parents who decreased in their knowledge (Laird, Pettit, Bates, & Dodge, 2003). Moreover, the effects of parental control may be different when behavioral control (e.g., rule enforcement) and psychological control (e.g., disparagement) are considered separately. Galambos et al. (2003) found that between 12 and 15 years of age, behavioral control was related to decreases in externalizing problems, whereas psychological control was related to increases.

## Peers

Friends have an important impact on adolescent emotional functioning within the school and neighborhood setting. Peer rejection has been an important area of research and offered as one explanation for antisocial behavior (Haselager, Van Lieshout, Riksen-Walraven, Cillessen, & Hartup, 2002; Hektner, August, & Realmuto, 2000; Petras et al., 2004). However, the delinquent values of the peer group have also been considered to play an important role in the development of antisocial behavior. Patterson et al. (1989) proposed that antisocial peers have an amplifying effect on antisocial behavior. Others have found consistent relations between association with deviant peers and higher levels of conduct problems during adolescence (Elliott, & Menard, 1996; Keenan, Loeber, Zhang, Stouthamer-Loeber, & van Kammen, 1995).

Although most research in this domain has focused on the negative influence of peers on adolescents (Simons, Wu, Conger, & Lorenz, 1994), friendships may also exert positive effects (Brown, Lohr, & McClenahan, 1986). Both prosocial and antisocial aspects of friends have an impact on adolescent behavior (Brendgen, Vitaro, & Bukowski, 2000), but it is not clear whether this is a linear relation or whether the two ends of the dimension have independent effects. The common explanation for the influence of non-delinquent peers is that they don't have antisocial values and behaviors. However, non-delinquent peers may also have prosocial values for academic achievement and community involvement that offer an alternative life path to developing youth (Furstenberg., Cook, Eccles, Elder, & Sameroff, 1999).

## Schools

School is another ecological context that has an important impact on conduct problems and where there is an interdependence between the two. Most researchers have focused on the school difficulties of antisocial children (Dishion, French, & Patterson, 1995). There is a clear



association between school failure and delinquency (Bachman et al., 1991; Huizinga and Jakob-Chien, 1998). Adolescents with conduct disorder often experience limited educational attainment, are more likely to be retained in grades, have lower levels of achievement, and end school prematurely. They are characterized by teachers as uninterested in school, unenthusiastic toward academic pursuits, and careless in their work (Kazdin, 1995). On the positive side, feelings of academic competence, valuing of school, and higher grades have been found to predict diminished emotional distress over time (Eccles, Lord, & Roeser, 1994).

Another literature has emphasized the effects of school characteristics on youth problems. Students' valuation of school is determined in large part by the characteristics of the institution. Disenfranchisement from the school context produces a perception that students are not receiving emotional support from caring adults (Gottfredson & Hirschi, 1990). Kazdin (1995) synthesized work from a number of investigators (e.g., Loeber, 1990; Mrazek & Haggerty, 1994) to identify the school factors facilitating the development of antisocial behavior. His list included little emphasis on schoolwork, little time spent on lessons, infrequent use of praise and appreciation of schoolwork, little emphasis on individual responsibility of the students, poor working conditions for students, unavailability of the teacher to deal with children's problems, and low teacher expectancies.

Other investigators have suggested that more positive school experiences and a decreased incidence of school failure are associated with the degree to which students feel involved in the educational process and feel that their learning is linked to their effort, as opposed to their traits. Status-oriented schools, where students more often feel detached from the educational process and evaluated according to their performance rather than their effort, and ascribed characteristics, such as race and gender, contrast with mastery-oriented schools that focus on individual learning

processes and effort (Maehr & Midgley, 1991; Roeser, Eccles, & Sameroff, 1998). Similarly, Figueira-McDonough (1986) found that minor delinquency occurred more often in an environment dominated by competitive academic achievement, routine handling of discipline, and unpredictable supervision. Such environments were also more conservative and unlikely to have a gender-egalitarian orientation.

## **Neighborhoods**

The community context has been posited to have direct and indirect effects on antisocial behavior. Moreover, as children age, some suggest there is a shift from indirect effects during early school-age to direct effects during adolescence (Aber, 1994; Fraser, 1996; Leventhal & Brooks-Gunn, 2000). The earlier indirect effects are through family variables where availability or lack of social resources and supports promote or undermine parenting. The later direct effects are through lack of resources for the adolescent and young adult and the greater prevalence of antisocial peer groups as well as exposure to violence. Neighborhood disorganization provides greater access to delinquent groups that may lead youth to believe that antisocial behavior is acceptable (Sampson, Raudenbush, & Earls, 1997). Others have suggested that neighborhood effects operate through the increased poverty found in disorganized neighborhoods (Loeber et al., 1993). The route through poverty is further complicated because it is not clear whether it is neighborhood level or family level poverty that is the more important influence (Kupersmidt, Griesler, DeRosier, Patterson, & Davis, 1995). Sampson, Raudenbush, and Earls (1997) have placed these conditions within a psychological framework, finding that disorganization in high poverty neighborhoods operates through a reduced sense of shared efficacy among the area's inhabitants. Ingoldsby and Shaw (2002), after reviewing a large number of studies, suggested

that middle childhood may represent a critical developmental period during which children are at heightened risk for neighborhood-based effects on antisocial behavior problems.

### **Comparing Ecological Context Influences**

Since Bronfenbrenner (1979) broadened elements to be considered in a social ecology of development, there has been concern about the multiple influences of social settings and their interactions. In the delinquency domain most efforts have been directed at examining the relations between parents and peers (Elliott et al., 1985; Farrington et al., 1986). The most common view is that inept parenting causes an adolescent to affiliate with deviant peers; as a consequence of these associations, he or she acquires attitudes favorable to delinquent behavior (Sutherland, Cressey, & Luckenbill, 1992). Elliott and his colleagues (Elliott et al., 1985) pointed to deviant peers as the primary cause of delinquency but also to quality of parenting as exerting an indirect effect by increasing the connection with deviant peers (although the family effects often disappear after controlling for peer effects). Galambos, Barker, and Almeida (2003) argued that in seeking interactions between contexts a differentiated model of process within each context is necessary. Comparing the effects of different parenting aspects on externalizing behavior, they found that firm behavior control but not parental support was an important counterweight to the influence of deviant peers.

School and peer influences are also intertwined. Decisions to try hard in school or skip school are susceptible to peer influences that can contribute to educational consequences such as increased truancy and poor commitment to schoolwork among members of particular peer groups (Berndt & Keefe, 1995; Brown, 1990). Even effects of racial and gender discrimination on problem behavior can result from interactions between teacher and peer behavior (Wong, Eccles, & Sameroff, 2003).

Ingoldsby and Shaw (2002) pointed out that the relative impact of parenting, neighborhood, and peer behavior may vary in different environments or at different points of development. Using a middle school sample, Gutman, Sameroff and Eccles (2002) found interactions between a combination of peer, school, neighborhood, and demographic variables and a number of parenting variables in predicting academic competence. The efforts that have been made to examine these multiple contexts during elementary school found moderating effects of parenting and neighborhood factors on early adolescent externalizing problems (Pettit, Bates, Dodge, & Meece, 1999). The sequencing of effects from these contexts was placed in a comprehensive transactional model for understanding the development of chronic conduct problems by Dodge and Pettit (2003) where individual differences affect parenting which affects school and peer involvement. Cook et al. (2002) compared summary scores of 7<sup>th</sup> grade peer, school, family, and neighborhood quality for predicting general competence at 8<sup>th</sup> grade, testing both direct and interactive effects. They found additive effects among the contexts, but there were no interactive effects. Each setting made an independent contribution. In this report, we explore the influence of these multiple contexts on the development of conduct problems during adolescence and early adulthood and contrast the social impact of the family, peer group, school, and neighborhood.

### **Research Questions**

Transitions in life offer opportunities to improve or worsen competence. Of special concern are changes in conduct problems related to the transition to middle school, high school, and early adulthood. Our questions relate to explanations of contemporary functioning and to the predictors of change from one developmental phase to the next. During these periods, we expect that youth change in their involvement in the family, peer group, school, and

neighborhood. However, to what extent do the relative influences of these contexts on concurrent behavior change from one period to another? And, to what extent do the relative influences change in the prediction of antisocial behavior in the next developmental period? We will examine the concurrent relations between contexts and behavior at the beginning of middle school (T1), the end of middle school (T2), and during high school (T3). We will then examine the predictive power of ecological variables from each period on conduct problems during the next period focusing on three transitions: the middle school transition from the beginning to the end of middle school (T1-T2), the high school transition from the end of middle school to high school (T2-T3), and the adult transition from high school to early adulthood (T3-T4).

## **Methods**

### **Participants**

The data reported here come from a study of primarily middle-class youth in Prince George's County Maryland, which is adjacent to and east of Washington, DC: the Maryland Adolescent Development in Context (MADIC) Study (Jodl, Michael, Malanchuk, Eccles, & Sameroff, 2001). The MADIC participants are a subsample of the Study of Adolescents in Multiple Contexts (SAMC; Cook, Herman, Phillips, & Settersten, 2002). In the SAMC, the researchers invited all 1990, 1991, and 1992 seventh-grade students in the county school district to participate in their study. They administered questionnaires in school to students whose parents gave their consent at the beginning of seventh-grade and at the end of the adolescents' eighth-grade. These questionnaires were used to assess adolescents' perceptions of their families, their friends, and their own beliefs, feelings, and behaviors.

Of the approximately 5000 students in the second SAMC cohort (1991), 1482 adolescents and their families also participated in the interviews and self-reports required for the

MADIC Study. These families were selected initially using a stratified sampling procedure designed to yield proportional representation of families from each of the 23 middle schools being studied; participation was voluntary at all waves. T1 MADIC data were collected from families when adolescents were at the beginning of the seventh grade (1991). The target youth and primary caregiver were interviewed at home and completed a self-administered questionnaire. T2 MADIC data were collected the summer following the adolescents' completion of eighth grade (1993). Because T1 data was collected at the beginning of the 7<sup>th</sup> grade and many of the questions, particularly the school scales, referred to their 6<sup>th</sup> grade experience, we are using the T1-T2 time period to represent the transition to middle school.

T3 data were collected after the eleventh grade (1996), and T4 data were collected approximately one year after the majority of adolescents graduated from high school (1998). Parents were not included in the T4 assessment. Except for the T1 and T2 SAMC measures of school climate and conduct problems, all of the data reported here are from the MADIC Study. In this report, we refer only to data from the 1181 Blacks and Whites who participated in at least two out of the four data waves. The small number of Latino (18), Asian (28), mixed-race (91), and "other" race (16) participants were excluded from these analyses. The 105 African-Americans and 43 European-Americans who participated in only one wave of data collection were also excluded.

Sixty-six percent of the remaining 1181 participants included in this report were African-American and 50% were female. The African- and European-American households were characterized by wide and similar ranges of income, occupational, and educational statuses for the duration of the study. When enrolled in the study in 1991, the racial gap in earnings for this sample was much lower than the national average. The median income was between \$40,000

and \$45,000 for Blacks and between \$50,000 and \$55,000 for Whites, with Blacks earning 81% of what Whites earned (compared to a national figure of 60% in 1990). Thirteen percent of Blacks and 15% of Whites earned more than \$75,000, and only 12% of Blacks and 5% of Whites earned less than \$20,000. The primary caregivers' average level of education was also similar across the two ethnic groups: At T1, 95% of Blacks and 97% of Whites had received a high school degree, and 53% of both Blacks and Whites had obtained some kind of college degree. This comparable socio-demographic background of Black and White residents offers a unique opportunity to study normative developmental experiences of Black and White adolescents across the full socioeconomic spectrum.

## **Procedures**

At T1, residents from the local area were recruited as interviewers and trained in a three-day workshop. The racial composition of the mostly female interviewers roughly matched that of the county at large (60% African American, 38% European-American, 2% Hispanic). Interviewers were paid per interview. As often as possible, race of interviewer was matched to race of primary caregiver. In order to ensure that interviewers were following the interview protocol accurately, approximately 15% of families were randomly selected and re-contacted by the study staff to verify that the interview had taken place and the interviewer had followed the guidelines for conducting the interviews. These verification calls revealed no problems with the interview staff. Similar procedures were used to obtain interviewers for subsequent waves.

At the beginning of the study, the interviewer phoned the household and asked to speak with the parent identified by the school, generally the mother. After describing the study and obtaining his or her agreement to participate, the interviewer asked this adult, "Out of the people living in this household, what is the name of the person who has the most responsibility for and

knows the most about (the target adolescent)?" The person named in response to this question was identified as the primary caregiver (7% were fathers, grandparents, and other relatives).

For T1, T2, and T3, following the initial phone contact, the remainder of the interviewing process took place in the home of the family. The primary caregiver and the target adolescent completed two questionnaires: one a face-to-face structured interview and the other a self-administered questionnaire. The primary caregiver was interviewed first and the adolescent second. Each face-to-face interview took one hour, and each self-administered booklet took 30 minutes to complete. T4 data were collected from a self-administered questionnaire that was mailed to all the target youth (primary caregivers were excluded from T4). Telephone follow-ups were used to gather information from those youth who failed to return their questionnaires. The target adolescent and primary caregiver were each given \$15 for their participation at each assessment.

In these analyses, because of the lack of parent information at T4, we will maintain consistency by using only youth data from the four waves. Moreover, only the young adult outcome data will be used from T4 because the major changes in social context across the young adult transition precluded parallel measures of the social settings.

### **Attrition and Missing Data**

Of the 1181 adolescents at T1, 943 (80%), 948 (80%), and 769 (65%) participated at T2, T3, and T4, respectively. Participants who had valid scores for all scales were included in the cross-sectional and longitudinal analyses of the original data. Chi-Square, *t*-test, and logistic regression analyses were performed to test for significant differences between participants who were used in the analyses and those who were not.



In general, missing data appear to be missing at random (MAR; Little & Rubin, 1987). That is, participants with missing data differ from those without missing data, but these differences are rarely predictable from variables used in this report and are predictable from other variables in our dataset. Using the Nagelkerke measure of the proportion of variance accounted for, the regression models account for between 8 and 20 percent of the variance in missingness. Although the specific variables that predict missingness vary across the different models implicated by our study variables, low levels of youth achievement tend to predict missingness in models associated with T1 and T2 whereas parent's report of poor neighborhood quality tends to predict missingness in models associated with T3 and T4.

We used similar analyses to examine differences between our sample of 1181 who participated in at least two waves of data collection and the 148 Blacks and Whites who dropped out of the study after T1. The only variable that uniquely predicted sample attrition was an academic achievement composite based on the math subtest of the Maryland Functional Achievement Test and school reported 7th grade GPA; lower levels of youth achievement predicted greater attrition.

We used two strategies in our analyses, one using the original data and another using an imputed set of data with all missing measures added to obtain a larger sample size. The original data set had a sufficient number of cases to test our hypotheses, but the imputed set permitted us to use a larger sample and to have more power in our analyses of subgroup differences. Data imputation methodology has undergone major advances from early techniques of listwise deletion, that tended to produce biased results from the reduced sample size, to substituting means, that tended to produce artificial stability of relations. Recent advances in data imputation have produced methodologies that utilize all available information to fill in missing data, in

addition to adding a random component to offset artificial stability (Schafer & Graham, 2002). Failing to include this uncertainty can result in underestimating variability in the data, producing less accurate parameter estimates and underestimated standard errors (Sinharay, Stern, & Russell, 2001). Although these advanced methodologies are not yet common in the developmental literature, we felt that they would be very appropriate for the current data set.

We examined each of our ecological models using both original and imputed data. Because the multiple imputation procedure adds a random element to each value, statisticians recommend calculating a number of sets of imputed data to check for consistency. Five sets of imputed data were generated for all participants with at least two waves of complete data (N=1181) using the sequential regression imputation method described by Raghunathan, Lepkowski, Van Hoewyk, and Solenberger (2001; cf. Allison, 2001; Schafer & Graham, 2002). The five sets of regression parameter estimates associated with each model were then combined using the SAS "MIANALYSIS" procedure. We found only a few substantive differences among the many comparisons in the analyses using the original versus imputed data, and these differences will be noted where applicable.

## **Measures**

The measures used in this paper were derived primarily from youth self-reports and are described below. Scale construction was guided by theoretical concerns, factor analyses, and item analyses. Means, standard deviations, and Cronbach's alpha reliability estimates for all of the original variables are presented in Table 1. Scale selection for T1, T2, and T3 was guided by our desire to measure the same constructs at each wave and to include variables from the neighborhood, school, peer, and family levels of the ecological model. Because target youth were no longer in school, and many no longer living at home, there were few parallel scales in

the T4 data. Only the T4 conduct problems measure is included in the transition to early adulthood analyses. Complete descriptions of all items and scales can be found at the following web site: <http://www.rcgd.isr.umich.edu/pgc>.

### ***Conduct Problem Outcome***

The primary conduct problem outcome variable used in this study was a combination of anger, physically aggressive behavior, and delinquency. Most literature in this area refers to antisocial behavior and to a smaller extent conduct disorder. We are using conduct problems as our outcome rather than an official diagnosis in our relatively low risk sample of primarily middle class families. A diagnosis of antisocial personality would have required criteria that were not assessed in our study. These unmeasured criteria include indicators of impulsivity, irresponsibility, and lack of remorse, in addition to a diagnosis of conduct disorder and being 18 years of age.

The same three self-report items related to participants' anger, adapted from the Symptoms Checklist 90-Revised (SCL-90-R; Derogatis, 1983; Derogatis, Rickels, & Rock, 1976), were used at each of the four waves of data collection: During the last month, including today, how often have you... (a) felt so angry that you wanted to smash or break something? (b) felt that you couldn't control your temper? and (c) felt so upset that you wanted to hit or hurt someone? Adolescents responded to each item using the following Likert-type scale: 1 = "almost never," 2 = "once in a while," 3 = "sometimes," 4 = "often," and 5 = "almost always."

Aggression, rule violation, and delinquency items included six aggressive behavior items that were based on the work of Elliott and his colleagues (Elliott, Huizinga, & Menard, 1989) and included in both the SAMC (Cook et al., 2002) and the MADIC study: In the past year, how often have you... (a) hit someone for what they said/did? (b) lied to your parents? (c) stolen from

a store? (d) been involved in a gang fight? (e) damaged public or private property for fun? and (f) stolen a motor vehicle? (1 = “never,” 2 = “once or twice,” 3 = “3 or 4 times,” 4 = “5 to 9 times,” 5 = “10 or more times”). The response scales were modified slightly when the items were carried over into MADICS for Waves 4 and 5 (e.g., 5 = “20 or more times”).

### ***Family***

**Consistent Control.** Our measure of family control at each time was a composite created from 21 (T1) and 19 (T2 & T3) items taken from scales used to measure the amount of decision-making autonomy parents granted youths, parent consistency in enforcing rules, and the extent to which parents monitored youths activities. Higher scores reflect greater family control.

**Autonomy** items, which were reversed prior to scaling, were both content general (e.g., In general, how do you and your parents currently arrive at decisions?) and content specific (e.g., In your family, how do you make most of the decisions about which friends you can spend time with?) and were scored on the following 5-point Likert-type scale: 1 = “my parents decide by themselves,” 2 = “my parents decide after discussing it with me,” 3 = “we decide after discussing it together,” 4 = “I decide after discussing it with my parents,” and 5 = “I decide all by myself” (cf. Epstein & McPartland, 1977). **Consistency** items (e.g., How often do your parents only keep rules when it suits them? How often do your parents punish you for doing something one day, but forget about it the next?), which were also reversed prior to scaling, were measured on 5-point Likert-type scales anchored by “almost never” (1) and “almost always” (5).

**Monitoring** items varied somewhat across waves. T1 items (e.g., How often do your parents know if you are home by the time you are supposed to be? – anchored by “almost never” and “almost always”) tended to refer more to parents’ general monitoring levels than the items used at T2 and T3 (e.g., How often do your parents TRY to find out where you go at night? How often

do your parents REALLY know where you go at night? – anchored by “never” and “always”) which focused more specifically on the distinction between parents monitoring efforts and successes.

**Positive Climate.** Our measures of family affective climate were composites created from 16 (T1 & T3) and 20 (T2) items taken from scales used to measure the quality of affective relationships, communication, and shared activities among family members. Some items differed in their anchor content and value ranges so items were standardized (and reversed, where necessary) before calculating scale scores; higher scores reflect a more positive affective climate. *Affective relationship* items included “How close do you feel to your parent?” – anchored by “not very close” (1) and “extremely close” (4) – and “How often can your family members talk to each other about the sadness they feel?” anchored by “almost never” (1) and “almost always” (5). *Communication* items included “Your parent and you talk about how things are going in your life” and “You talk with your parent about how things are going with your friends” which were scored using the following scale: 1 = “almost never,” 2 = “less than once a month,” 3 = “one to three times a month,” 4 = “about once a week,” 5 = “a few times a week,” and 6 = “almost every day.” *Shared activity* items included “How often do you work on something together around the house (with your immediate family)?” and “Your parent(s) spend enough time with you” (anchored by 1 = “almost never” and 5 = “almost always”).

**Discipline Harshness.** Our measure of family discipline harshness was a composite created from 20 (T1), 26 (T2), and 19 (T3) items taken from scales used to measure parents’ self-centeredness, rule enforcement style, and use of physical punishment. Items were standardized (and reversed, where necessary) before calculating scale scores so that items with different value ranges could be placed on similar scales; higher scores reflect a harsher discipline style. *Self-*

*centered* parenting items included “My parents want me to follow their directions even if I disagree with their reasons” and “Your (PARENT) doesn't like it when you question (his/her) decisions and rules” (anchored by 1 = “almost never” and 5 = “almost always”). **Rule enforcement** style items included “During the past month, how often did your parent yell at you?” and “During the past month, how often did your parent criticize you or your ideas?” (1 = “never,” 2 = “once or twice,” 3 = “three or four times,” 4 = “a couple of times a week,” 5 = “almost every day”). **Physical punishment** items included “When you break one of your parents’ important rules, how often do they physically punish you?” – anchored by almost never (1) and almost always (5) – and “During the last month, how often did your parent(s) hit, push, grab, or shove you?” (1 = “never,” 2 = “once or twice,” 3 = “three or four times,” 4 = “a couple of times a week,” 5 = “almost every day”).

### **Peers**

**Positive Peers.** Positive peer characteristics were measured using 6- (T2 & T3) and 7-item (T1) scales that included items like, “How many of the friends you spend most of your time with... think it is important to work hard on schoolwork? [or] ...like to discuss schoolwork/intellectual things with you?” (1 = “none of them,” 2 = “a few of them,” 3 = “about half of them,” 4 = “most of them,” 5 = “all of them”).

**Negative Peers.** Negative peer characteristics were measured using 9- (T1), 8- (T2), and 5-item (T3) scales that included items like, “How many of the friends you spend most of your time with... cheat on school tests? [or] ... put pressure on you to use drugs?” (1 = “none of them,” 2 = “a few of them,” 3 = “about half of them,” 4 = “most of them,” 5 = “all of them”). The items used in both the Positive and Negative Peer Characteristics scales were taken from

Eccles' Michigan Study of Adolescent Life Transitions (Eccles, Midgley, Wigfield, Buchanan, Reuman, Flanagan, & MacIver, 1993).

### **School**

School scales centered on two aspects of the youth's experience: the quality of the affective climate and respect for individual differences in race and competence. Our scales were derived from school context measures used by Maehr and Midgley (1991), Midgley et al. (2000), and Roeser et al. (1998).

**Positive Climate.** Positive affective climate is a general measure of the overall milieu at school and was measured using 9- (T1), 8- (T2), and 7-item (T3) scales that included items like, "At the school I go to now, the staff cares about students as individuals" (1 = "strongly agree," 2 = "agree," 3 = "neither agree nor disagree," 4 = "disagree" 5 = "strongly disagree") and "Think about this past school year. In your 8th grade school, how often was there racial tension between school staff members and students of different racial backgrounds?" (anchored by 1 = "almost never" and 5 = "almost always").

**Respect for Differences.** Status-oriented schools tend to treat students better or worse depending on their academic ability, sex, or race. Respect for differences is a more specific measure of the extent to which adolescents felt like they were being treated fairly and respected more for the quality of their school involvement than for their abilities and was measured using 10- (T1) and 5-item (T2 & T3) scales that included items like, "In this school, how many teachers show equal respect for students, regardless of color?" (anchored by 1 = "none," 3 = "about half," and 5 = "all") and "In your 8th grade school, how true is it that teachers treat students who get good grades better than other students" (1 = "not at all true at your school," 2 = "a little true," 3 = "somewhat true," 4 = "quite true," 5 = "very, very true"). All items for the T1

version of this scale were collected at the beginning of 7th grade as part of Cook et al. (2002) SAMC. Comparable T3 and T4 scales were included in the MADIC data.

### ***Neighborhood Quality***

Our measure of neighborhood quality consisted of a single 6-item scale administered only at T1. Scores on this variable at T2 and T3 were used only for families that lived in the same house as reported in T1. The scale included collective efficacy (Sampson et al., 1997) items like “You can count on people in your neighborhood to help you if you need it” and attachment items like “You want to get away from this neighborhood as soon as you can” (anchored by 1 = “strongly agree” and 5 = “strongly disagree”). If the family was in the same residence at T2 and T3, the T1 data were used. If the family moved at either T2 or T3, this variable was missing.

## **Results**

The first task was to examine the intercorrelations among our social context variables and conduct problem (CP) outcomes. All eight context variables were found to be significantly related to CP (see Table 2). The three family, two peer, two school, and one neighborhood variables at each age were individually related to contemporary CP at each of the school-age assessments, T1, T2, and T3. We found similar results when the correlations between the context variables at each wave were correlated with CP at the next wave of data, but to a smaller degree. All T1 variables were significantly correlated with T2 CP, all T2 context variables were significantly correlated with T3 CP, and all T3 context variables were significantly correlated with T4 CP.

The next task was to determine the relative importance of these context variables in predicting CP. Hierarchical linear regression analyses were performed to examine the contribution of family, peer, school, and neighborhood variables within each period and across



each transition. Three cross-sectional regressions were done using T1, T2, and then T3 data. This was followed by three longitudinal regressions using T1 context data to predict T2 CP for the middle school transition, T2 data to predict T3 CP for the high school transition, and T3 data to predict T4 CP for the young adult transition.

In each of the longitudinal regression analyses, prior CP was entered first, as a covariate, so that we could determine the amount of variance in CP change that was explained by the context variables. Sex and race were also entered as covariates in all six of these regression analyses. We included measures of parental income, education, and occupational status in preliminary models but dropped them from the analyses reported here because they explained no statistically significant amounts of unique variance in any of the final regression models.

### ***Cross-Sectional Analyses.***

In the cross-sectional analyses (see Table 3), relatively large amounts of variance in CP were explained by the context variables ( $R^2 = 34\%$ ,  $37\%$ , and  $36\%$  for T1, T2, and T3, respectively). At all three waves family, school, and peer, but not neighborhood variables had significant betas. Although the neighborhood variable had significant zero-order correlations with the CP outcomes, it did not contribute unique variance to the outcome when the other context variables were considered.

Similar patterns of relations were found within each of the three time periods with a few differences. In the family domain, all three variables were consistent contributors, except for Family Positive Climate that was not at T1. Negative Peers was significant for all waves, but Positive Peers had a unique influence only at T3, during high school. Respect for Differences was significant T1, borderline at T2, and not at T3, whereas positive school climate was significant only at T2.

### ***Transition Analyses.***

Regression analyses were performed to examine the relative predictive ability of the setting variables from one time period on the next. The longitudinal transition analyses produced results similar to the cross-sectional regressions (see Table 3), but with smaller percentages of variance explained once prior CP was taken into account ( $R^2 = 12\%$  for the T1-T2 transition, 5% for the T2-T3 transition, and 9% for the T3-T4 transition). Again, all the settings except for the neighborhood predicted change in CP across each of the three transitions.

Among the family setting variables, T1 Positive Climate predicted T2 CP, prior Consistent Control predicted T2 and T4 CP, and prior Discipline Harshness predicted T2 and T3 CP, and was borderline significant predicting T4. The effect of Family Positive Climate was an anomaly because the positive beta coefficient implied that more family warmth was associated with more CP. Because it had been negatively related in the correlation table (see Table 2) and had negative beta weights in the cross-sectional regressions, we assumed that this was a suppression effect in relation to the more influential harsh discipline variable. To test this we redid the longitudinal regression analyses using only the Family Positive Climate variable as a single predictor. Indeed, Family Positive Climate now had negative beta weights in predicting CP during all three transitions. We checked to see if Positive Climate interacted with either Discipline Harshness or Consistent Control in predicting later CP, but we found no interpretable relations.

In the peer domain there was a parallel anomalous effect of positive peers. The effect of Negative Peers was significant for the T1-T2 transition and was borderline for the T2-T3 and T3-T4 transitions. Positive Peers was a significant contributor only to the T3-T4 transition.

From the school variables, only Respect for Differences was significantly related to changes in CP and only for the T1-T2 transition. Less differential treatment was associated with fewer CP. School variables did not make a reliable contribution to the transition to young adulthood.

A major aspect of the transition to adulthood is the transition to independent living. A question of interest to us was whether there would be a different pattern of T3-high school setting variables on T4-young adulthood CP for those still living at home compared to those who were living away. These comparisons can be seen in Table 4. Interestingly, T3 family variables were more related to CP for those no longer living at home, where peer variables were more related to CP for those still at home.

### ***Gender and Race Analyses***

Race had a significant beta in only one of the six cross-sectional and longitudinal regression analyses (T1 cross-sectional), where being African-American was associated with higher levels of CP. For gender there were significant betas only in T2 cross-sectional analysis and the T1-T2 longitudinal analysis, males having more CP than females.

To determine if there was a difference in the patterning of ecological influences for different genders or races, we ran four separate cross-sectional and longitudinal regressions for Black and White, male and female subgroups (see Tables 5 and 6). We looked for patterns in the results where there were consistent differences based on gender or race within a single analysis or where a subgroup was consistently different in several analyses. We will not discuss here occasions when one of the four groups was different in only one analysis because of the possibility of a random finding among the many comparisons.

**Cross-Sectional Regression Analyses** (see Table 5). In the whole sample analyses among the family variables, Consistent Control and Discipline harshness were significant at all three time periods, and Positive Climate at T2 and T3. In the race/gender analyses the same results were found for all subgroups except for T3 where the three family variables were significant for Black males and females only. It must be noted that the magnitude of the betas were similar in the White subsamples but not significant owing to the smaller size of these two groups. Because Deater-Deckard et al. (1996) had reported stronger effects of harsh punishment on Whites than African-American school age children we redid our whole sample analyses including a race by Discipline Harshness interaction term. The interaction was not significant in any of our analyses.

Negative Peers had been significant at all time periods in the whole sample analyses but Positive Peers only at T3. These patterns were reflected in the subgroup analyses, with the exceptions that Negative Peers was not a reliable contributor for females at T2 and Positive Peers only significant for White females at T2 and T3. The school and neighborhood variables showed the same pattern in the subgroups as in the whole sample analysis.

**Longitudinal Regression Analyses** (see Table 6). For the four subgroups the amount of explained variance ( $R^2$ ) in CP change across each transition ranged from 6-14% in the T1-T2 transition, 5-10% in the T2-T3 transition, and 6-13% in the T3-T4 transition. No subgroup had either the highest or lowest  $R^2$  consistently across the three transitions.

Among the family variables, where Discipline Harshness was significant or borderline in the whole sample analyses for all transitions, it had inconsistent effects in the subgroup analyses. It predicted CP for Black females in the T1-T2 transition, Black and White males in the T2-T3

transition, and Black males in the T3-T4 transition. The other family variables had no consistent effects in the subgroups analyses.

Neither of the peer variables made significant contributions in the longitudinal regressions. Respect for Differences was significant for all subgroups in the T1-T2 transition as it had been in the whole sample analysis. There were no neighborhood effects.

### **Discussion**

The social ecology of development contributes to the mental health of youth during middle school, high school, and young adulthood. Much prior research has centered on the relation between single settings and conduct problems. Because the family, peer group, school, and neighborhood have all been shown to predict antisocial behavior, studies that focus on one or another of these exaggerate the importance of the targeted independent variable. By including most of the individual's social contexts in the same study, we found that almost all are influential during each developmental period and each makes a unique contribution to an individual's conduct problems. The one exception in our data was our neighborhood variable. Although it was correlated with conduct problems when taken alone, it did not contribute to the explanation of individual differences when the other setting variables were included in the predictive equations.

Our sample is unique in that we are able to disentangle the effects of race and socioeconomic status that are confounded in much of the literature. By comparing African-American and European-American families from a full range of socioeconomic backgrounds, we can determine if developmental differences are more related to race than contextual factors.

Our major research question was whether the pattern of relations between the settings of the social ecology and conduct problems changed across developmental periods. We addressed

this question using two strategies, a cross-sectional one in which we examined contemporary relations between independent and dependent variables, and a longitudinal one in which we examined the relation between prior context variables and later conduct problems while controlling for prior level of conduct problems. We had comparable measures of family, peer, school, and neighborhood variables for the first three waves of data collected during the 7<sup>th</sup>, 8<sup>th</sup>, and 11<sup>th</sup> grade. We did not have analogous context information at the last, age 19-20, assessment when the participants were no longer in school, and many were living away from their parents. As a consequence we were not able to do a cross-sectional analysis of contextual effects on young adult behavior. We were able to use the conduct problems score from the last assessment as a longitudinal outcome for analyses of the young adult transition.

### ***Social Ecology of Conduct Problems***

Our major conclusion is that there are many routes to conduct problems. The three cross-sectional regression analyses revealed contributors from each ecological setting at 7<sup>th</sup> grade, 8<sup>th</sup> grade, and 11<sup>th</sup> grade. The variables that had the most consistent influences during each of these periods were Consistent Control, Discipline Harshness, and Negative Peers. Positive family and positive peer variables had less consistent relations to outcomes. Family Positive Climate was a reliable predictor in 8<sup>th</sup> and 11<sup>th</sup> grade and Positive Peers only during high school.

An important result is that having negative peers is not the opposite of having positive peers. This is in accord with previous findings (Brendgen et al., 2000; Brown et al., 1986) that both prosocial and antisocial aspects of friends have an impact. The prosocial values of non-delinquent peers may offer an alternative life path (Furstenberg et al., 1999), but in our data the independent effect does not appear until high school. During middle school the peer variable

appears to be a single dimension, and it is not until later that there are non-linear relations between the negative and positive poles.

The Respect for Differences school variable was uniquely related to conduct problems at the two middle school assessments but not during high school. Perhaps middle school is a period when emerging aspects of self-identity are being established so that differential treatment is highly salient (Roeser et al, 1998), whereas in high school one's sense of competence around these issues has become more stable so that how the school treats you is less influential than the way you experience the emotional climate.

Negative influences from family and peer groups could possibly dominate during middle school, and perhaps earlier, but become somewhat balanced by positive influences as the child passes into later adolescence and high school. Another possibility is that if the outcome was more positive, like well-being, we would find stronger relations to the positive context variables. With our focus on a more antisocial outcome, there were more consistent relations to the more negative aspects of the social ecology including harsh punishment, association with negative peers, and a school with differential respect for sex-, race-, and ability-based groups.

The power of family harshness and control, although significant at each age, seemed to diminish with time where the influence of the peer variables remained constant (negative peers) or increased (positive peers). This finding is consistent with the idea that family variables may set the stage for youth involvement with prosocial and antisocial peers, but then the peer variables come to dominate. Family conflict would put youth on the path to negative peers and family warmth to positive peers.

Many studies of delinquency focus on neighborhood disorganization as an explanation, but Sampson et al. (1997) posited that collective efficacy was an important mediating variable.

We measured neighborhood perceptions in this study and found no unique contribution to our outcomes. It is possible that our sample of families was too affluent for these variables to be predictive. Neighborhood disorganization would characterize very few of the census tracts where they lived. Perhaps if we had used a population skewed toward impoverishment we would have found greater neighborhood influences, but if we had studied such a sample we would have lost our ability to disentangle race and social class influences.

### ***Transitions***

The problem with cross-sectional research is that it is not clear whether the concurrent predictors of conduct problems would also predict change in behavior from one developmental period to the next. We were concerned with three transitions—into middle school, into high school, and into young adulthood. We examined the prediction question by using longitudinal data in our analyses, seeking to determine the contributors to later conduct problems taking into account current conduct problems. In such analyses, much smaller amounts of additional variance are explained once prior conduct problems are taken into account. However, we did find significant family, peer, and school predictors of change, especially family consistency of control and harshness of discipline, negative peers earlier and positive peers later, and school respect for differences. As in the cross-sectional analyses, we were able to show that during each developmental period future conduct problems were multiply determined.

We tried to identify variables that were unique to a specific transition. Our question was whether the factors that predicted middle school, high school, and young adult transitions were different. In general, the answer seems to be no. Negative Peers was significant for T1-T2 and borderline for T2-T3 and T3-T4 transitions. Among the family variables Consistent Control was significant for the T1-T2 and the T3-T4 transitions, and Discipline Harshness was significant for



the T1-T2, T2-T3, and borderline for the T3-T4 transition. Laird, et al. (2003) found similar results where parent knowledge about their adolescent's whereabouts and activities, components of our Consistent Control measure, predicted both concurrent and future delinquent behavior.

The two variables that did show differential effects were school Respect for Differences and Positive Peers. Respect for differences was only significant in the T1-T2 analysis and Positive Peers only for T3-T4, the transition to young adulthood. When we unpacked the T3-T4 transition into subgroups either living at home or away, the Positive Peer variable was only significant for those still at home. The transition out of the home may provide these young adults with the opportunity to be influenced by new circumstances such that prior association with positive or negative peers had minimal long-term effects on conduct problems. The effects of school climate and educational philosophy appear to diminish as the participants aged. In the cross-sectional analyses, they only made contributions at T1 and T2 during middle school, and only for the T1-T2 transition analysis.

These longitudinal analyses support our conclusion from the cross-sectional data that positive influences make a more independent contribution to the conduct problem outcome as the youth get older and move into adulthood. Because of the high stability in behavior and context across time, it is often difficult to find enough change to explain. In our case, we were able to predict significant amounts of variance in the positive and negative changes in conduct problems using social factors from a number of contextual settings.

### ***Race and Gender***

Although problem behavior is seen as a characteristic of males, there were was a gender effect only in the two whole sample regressions with 8<sup>th</sup> grade conduct as an outcome—the T1-T2 longitudinal analyses and the T2 cross-sectional one. When Brendgen et al. (2000) compared

school age boys' and girls' patterns of intercorrelations between positive and negative peer characteristics and delinquent behavior, they were similar. There was also a similarity in the patterning of peer and family variables for predicting conduct problems. Ackerman et al. (2003), studying harsh discipline and externalizing behavior in children from age 7 to 9, and Compton, Snyder, Schrepferman, Bank, and Shortt, (2003), measuring family coercion at age 10 and antisocial behavior at age 20, both reported that there were similar relations for both boys and girls.

In our subgroup longitudinal analyses of the effects of harsh discipline in our somewhat older middle-school through young adult sample, there were some small gender differences. Both African- and European-American males showed stronger effects in the T2-T3 and T3-T4 transitions.

Another question we had was whether the patterns of relations between ecological predictors and conduct problems would vary by race. In our predominantly middle class sample, race was associated with the outcome only in one of the six regression analyses. There has been data (Deater-Deckard et al., 1996) showing that harsh punishment had different effects on African- and European-American children's problem behavior. We did not find this difference. There was no significant interaction between race and harshness in any of our regressions. However, there are many differences between the two studies. Deater-Deckard et al. (1996) used mothers' reports of discipline during kindergarten through 3<sup>rd</sup> grade. We used youth reports of discipline during middle and high school. The two samples were comparable in social class but whereas our sample is 66% Black, Deater-Deckard et al.'s was 17%. In addition, their outcome was based on teacher, peer, and parent reports, whereas ours was a self-report. Clearly, further investigation of this issue needs to explore racial/ethnic differences across the whole school age span using both self and other reports of context and outcome variables.

### ***Limitations***

There are several methodological and analytic strategies that would increase the impact of studies such as ours. Among these are the use of multiple informants, other measures of context, a sample at higher risk for conduct problems, and analysis of mediator and moderator effects among predictors and outcomes. Our analyses were based exclusively on youth reports to maintain consistency across the four data points, particularly because the young adult assessment involved only a single informant. Clearly, the use of multiple informants would have given greater reliability to our assessments of predictors and outcomes (Patterson et al. 1989). In ongoing analyses focused on the middle school and high school waves, we are engaged in examining the different predictive efficiency of separate and combined reports of primary caregiver and target youth. Although most studies, especially of younger children, do make more use of mother reports, there may be an equal necessity of obtaining father reports or at least specific youth perceptions of mother and father behavior. Chang, Schwartz, Dodge, and McBride-Chang (2003) reported that harsh punishment had different effects if it came from the father or the mother and Deater-Deckard and Dodge (1997) found that when the parent and child were of the same gender the effects were stronger.

The major import of this study was the finding that many social contexts influenced conduct problems. However, we were selective in the choice of variables within contexts for both practical and theoretical reasons. It may be that other context variables would have more powerful or clearer connections to conduct problems. Within the family domain, marital conflict has been found to be an important predictor (Chriss, Pettit, Bates, Dodge, & Lapp, 2002). Within the peer domain, many studies have found rejection to have powerful consequences (Haselager et al., 2002; Hektner et al., 2000, Petras et al., 2004). Our school variables were

concerned with the students' perception of the emotional climate and educational philosophy, but youth experiences of discrimination from both students and teachers (Wong et al., 2003) may have a connection with our outcome. Census tract data and measures of neighborhood disorganization would augment our more subjective neighborhood perception measure, but may not add predictive efficiency because of our finding that SES was not a contributor to conduct problems in this relatively low risk sample.

In our study, we focused on the developmental predictors of a normative range of interpersonal aggression and delinquent acts and, especially, whether the pattern of predictors changed over time. If one wanted to study the etiology of mental health diagnoses of conduct disorder and antisocial behavior or judicial judgments of delinquency and criminality, one would want a sample where there would be a large enough group of diagnosed problem individuals. In these cases, one would seek high-risk samples, primarily from lower SES backgrounds, living in areas with high rates of crime. From the perspective of developmental psychopathology, there is utility in studying representative samples to identify contributors to the extremes of behavioral dimensions such as aggression. But there is also utility in studying extreme cases to discover factors that may be important in a more normative sample. Studies of differences between life-course persistent and adolescent-limited antisocial behavior would be an example of such analyses (Moffitt, 1993; Moffitt et al., 2002).

We have highlighted the pattern of ecological contextual influences on conduct problems from middle school to young adulthood, but did not report on interactions among contextual variables nor between settings and problem behavior, even though they are difficult to detect in community samples (McClelland & Judd, 1993). Obviously, it would be important to know if variables within or across settings would offset or exacerbate each other. These are important

questions that we are concerned with in ongoing analyses of these data. Using the 7<sup>th</sup> grade data from the PGC study, Gutman et al. (2002) found interactions between a measure of socioeconomic risk and two parenting variables. Parent discipline and non-democratic decision making were protective factors for school competence for high risk youth.

Other investigators have found moderator interactions among variables in the same setting, for example, Deater-Deckard and Dodge (1997) reported that parent warmth interacted with harshness; and in different settings, for example, Galambos et al. (2003) found parent firm control interacted with deviant peer effects. The most empirical complexity, but theoretical coherence, is captured in Dodge and Pettit's (2003) transaction model involving the interplay of individual and setting variables across childhood. In this report we have dealt with a unidirectional model from context variables to individual, with occasional controls for prior individual behavior. We have not focused at all on the reciprocal or linear effects of youth characteristics on contextual factors, an important part of any comprehensive developmental model of conduct and antisocial problems.

Given these caveats and needed extensions of our analyses that need to temper our results, we are led to conclude from the analyses reported here that research in the area of conduct problems must include attention to the multiple contexts in which development occurs. Dodge and Pettit (2003) emphasize that conduct problems are multi-determined and that no single variable will fully or adequately explain the developmental outcome. They framed this conclusion in terms of equifinality (Cicchetti, 1993), where roads beginning in disparate parts of the social ecology all lead to the same problematic outcome. Finally, we note that our data have implications for society's effort to reduce conduct problems. Because no single influence fully

explains problem behavior, by extension, no single intervention will be able to eliminate conduct disorder.

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Table 1. Means, standard deviations (SD), and reliability coefficients (Alpha) for T1, T2, T3, and T4 scales.

Data Wave	T1-7 <sup>th</sup> Grade		T2-8 <sup>th</sup> Grade		T3-11 <sup>th</sup> Grade		T4-Yg. Adult	
	Mean (SD)	Alpha	Mean (SD)	Alpha	Mean (SD)	Alpha	Mean (SD)	Alpha
Conduct Problems	1.79 (.57)	.74	1.88 (.68)	.79	0.98 (.61)	.77	0.87 (.50)	.73
Family Consistent Control	3.88 (.38)	.79	3.51 (.53)	.77	3.25 (.54)	.80		
Family Positive Climate	3.43 (.65)	.86	3.58 (.56)	.86	3.63 (.57)	.84		
Family Discipline Harshness	2.64 (.51)	.79	2.45 (.57)	.88	2.38 (.62)	.87		
Peer Positive Characteristics	3.56 (.61)	.74	3.21 (.67)	.74	3.21 (.74)	.81		
Peer Negative Characteristics	1.37 (.32)	.78	1.64 (.57)	.82	1.80 (.55)	.62		
School Respect for Differences	3.53 (.63)	.86	3.43 (.86)	.77	3.24 (.85)	.78		
School Positive Climate	3.52 (.55)	.75	3.76 (.64)	.74	3.42 (.66)	.77		
Neighborhood Positive Quality	3.65 (.55)	.63	3.67 (.55)	.63	3.70 (.54)	.61		



Table 2. Cross-sectional and longitudinal correlations between contextual predictors and conduct problem outcome. (Cross-sectional are same wave context scales and conduct problems, longitudinal are same wave context scales and next wave conduct problems.)

	<u>Cross-Sectional</u>			<u>Longitudinal</u>		
	<u>T1</u>	<u>T2</u>	<u>T3</u>	<u>T1-T2</u>	<u>T2-T3</u>	<u>T3-T4</u>
Family Consistent Control	-.28	-.34	-.31	-.22	-.19	-.22
Family Positive Climate	-.23	-.34	-.35	-.08	-.20	-.14
Family Discipline Harshness	.41	.27	.31	.28	.22	.24
Peer Positive Characteristics	-.22	-.26	-.31	-.11	-.17	-.28
Peer Negative Characteristics	.43	.43	.45	.30	.27	.34
School Respect for Differences	-.28	-.38	-.20	-.33	-.17	-.21
School Positive Climate	-.23	-.45	-.34	-.19	-.26	-.24
Neighborhood Positive Quality	-.25	-.24	-.16	-.21	-.15	-.16

Correlations >.07 significant at  $p < .01$ , >.10 significant at  $p < .001$

Table 3. Beta weights from final equations for cross-sectional and longitudinal regression analyses for whole sample with context variables as predictors and conduct problems as the outcome.

	<u>Cross-Sectional</u>			<u>Longitudinal</u>		
	<u>T1</u>	<u>T2</u>	<u>T3</u>	<u>T1-T2</u>	<u>T2-T3</u>	<u>T3-T4</u>
Gender	.03	.07*	-.03	-.08**	.04	.09
Race	.06*	-.05	.02	.08	.01	.09
Prior Conduct Problems				.33***	.18***	.32***
Family Consistent Control	-.22***	-.17***	-.12**	-.10**	-.05	-.07*
Family Positive Climate	-.03	-.07*	-.13**	.08*	-.05	.05
Family Discipline Harshness	.31***	.16***	.17**	.09**	.12***	.08†
Peer Positive Characteristics	.04	-.04	-.13*	.03	.02	-.10*
Peer Negative Characteristics	.24***	.19***	.30***	.08*	.09†	.08†
School Respect for Differences	-.10***	-.07†	-.03	-.18***	-.01	-.04
School Positive Climate	-.04	-.20***	-.10	.00	-.06	-.03
Neighborhood Positive Quality	-.04	-.05	-.01	.05	-.02	-.03
R-square	.35	.34	.33	.29	.15	.26

† p<.10, \* p<.05, \*\*p<.01, \*\*\*p<.001

Table 4. Beta weights from final regression equations for T3-T4 longitudinal analyses for individuals living at home or away with high school context variables as predictors and young adult conduct problems as the outcome.

	<u>Home</u>	<u>Away</u>
N	393	372
Gender	.01	-.10
Race	-.09	-.16**
Prior Conduct Problems	.17*	.46***
Family Consistent Control	-.07	-.14*
Family Positive Climate	-.08	.10
Family Discipline Harshness	-.10	.09
Peer Positive Characteristics	-.16*	-.03
Peer Negative Characteristics	.16*	.06
School Respect for Differences	-.07	-.11
School Positive Climate	-.04	-.01
Neighborhood Positive Quality	-.05	-.01
R-square	.23	.43

\*  $p < .05$ , \*\* $p < .10$ , \*\*\* $p < .001$





Table 5. Beta weights from final regression equations for cross-sectional analyses of race by sex subsamples with context variables as predictors and conduct problems as the outcome. (N's for subgroups of Black males, Black females, White males, and White females were 402, 372, 189, and 218, respectively)

	T1				T2				T3			
	Black		White		Black		White		Black		White	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Family Consistent Control	-.25***	-.26***	-.11	-.14***	-.12*	-.14*	-.31*	-.21*	-.12*	-.13*	-.15	-.08
Family Positive Climate	-.08	.02	.01	-.04	-.08	-.15***	.01	.07	-.14*	-.13**	-.02	-.10
Family Discipline Harshness	.31***	.34***	.28***	.26***	.13*	.19***	.21**	.11	.13*	.19***	.19	.21
Peer Positive Characteristics	.07	.06	-.02	-.07	.02	-.02	-.03	-.16*	-.04	-.13	-.22	-.16*
Peer Negative Characteristics	.27***	.16**	.29***	.28**	.19***	.09	.38***	.21	.33***	.32***	.20**	.23**
School Respect for Differences	-.08	-.14**	-.10	-.09	-.10	-.01	-.17	-.02	.05	.03	-.27	-.13
School Positive Climate	.02	-.06	-.16*	-.04	-.20***	-.19*	-.20***	-.18	-.19	-.15	-.03	.01
Neighborhood Positive Quality	-.02	-.07	-.04	-.01	.00	-.05	-.05	-.17	-.02	-.01	-.05	.02

\* p<.05, \*\*p<.10, \*\*\*p<.001

Table 6. Beta weights from final regression equations for longitudinal analyses of race by sex subsamples with context variables as predictors and conduct problems as the outcome. (N's for subgroups of Black males, Black females, White males, and White females were 402, 372, 189, and 218, respectively)

	T1-T2				T2-T3				T3-T4			
	Black		White		Black		White		Black		White	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Prior Conduct Problems	.34***	.29***	.36***	.33***	.16**	.17*	.25*	.22*	.33*	.22*	.42*	.39*
Family Consistent Control	-.11	-.13*	-.12	-.03	-.10	.02	-.10	-.06	-.09	-.04	-.06	-.07
Family Positive Climate	.08	.06	.06	.14	-.06	-.09	.15	-.06	-.04	.09	.07	.04
Family Discipline Harshness	.06	.15**	.00	.09	.14*	.09	.25*	.08	.12*	.07	.14	.03
Peer Positive Characteristics	.03	.04	.05	-.07	.02	-.06	.09	.06	-.09	-.08	-.07	-.10
Peer Negative Characteristics	.08	.01	.11	.11	.10	.05	-.06	.13	.01	.09	.19	.15
School Respect for Differences	-.14*	-.12*	-.36**	-.17**	.05	-.05	-.11	.00	-.04	-.03	-.02	-.07
School Positive Climate	.01	-.02	-.01	.01	-.09	-.03	-.09	.00	-.08	-.04	-.01	.03
Neighborhood Positive Quality	.03	-.04	.01	-.18	-.03	.00	-.14	.03	.01	-.06	-.06	-.07

\* p<.05, \*\*p<.10, \*\*\*p<.001