Delinquency and Recidivism: A Multicohort, Matched-Control Study of the Role of Early Adverse Experiences, Mental Health Problems, and Disabilities

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Abstract

The authors examined the role of early adverse experiences, mental health problems, and disabilities in the prediction of juvenile delinquency and recidivism, using a matched-control group design. The delinquent group comprised 99,602 youth, born between 1981 and 1988, whose cases had been processed by the South Carolina Department of Juvenile Justice. Records of 99,602 controls, matched by age, race, and gender were drawn from the records of the South Carolina Department of Education. Data on Child Protective Services, foster care, mental health referrals, and diagnoses as well as information about eligibility for free/reduced-price lunch were obtained from the South Carolina Budget and Control Board, Office of Research and Statistics. Logistic regression analyses showed that parental maltreatment and foster care made unique contributions to the prediction of membership in a delinquent sample. Presence of a public school classification of learning disability or emotional/behavioral disorder was also predictive of delinquent outcomes. A prearrest *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.) diagnosis relating to aggressive behavior (e.g., conduct disorder) was the strongest predictor of delinquency. Analyses conducted on the delinquent sample to predict recidivism showed a similar pattern, with an early mental health diagnosis of an aggressive disorder the strongest predictor of recidivism.

Keywords

Juvenile offending presents a continuous challenge nationwide. For example, in 2008, an estimated 2.11 million juveniles were arrested and juveniles accounted for 16% of all violent crime arrests and 26% of all property crime arrests. In the same year, courts processed 1,653,300 delinquency cases, an increase of 43% from 1985 (Puzzanchera, 2009). Gender and race differences were striking. The delinquency rate for males in 2008 was 2.5 times higher than the rate for females. In addition, delinquency rates involving Black youth increased from 25% in 1985 to 34% in 2008 and Black youth were twice as likely as White youth to be delinquent. Overall, more than 31 million youth were under juvenile court jurisdiction in 2008; 79% were between the ages of 10 and 15, 12% were age 16, and 9% were age 17 (Puzzanchera, Adams, & Sickmund, 2011).

Developmental models have been proposed to describe the childhood conditions and experiences that culminate in delinquent behavior (Dodge, Greenberg, Malone, & Conduct Problems Prevention Research Group, 2008; Patterson, DeBaryshe, & Ramey, 1989). Typically, these models emphasize a link between dispositional characteristics of the child (temperament, self-regulation) and aversive environmental conditions (e.g., harsh parenting, impoverished school experiences). Although the mechanisms accounting for the effects of child dispositional characteristics and adverse environment on later behavior are not always specified, an underlying assumption is that poorly regulated behaviors on the part of the child are shaped by parents, peers, and other socializing agents into coercive behavior patterns (Granic & Lamey, 2002; Granic & Patterson, 2011; Patterson, Littman, & Bricker, 1967).

Common to developmental models of delinquency is an emphasis on ineffective parenting, early child mental health

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problems (emotional or behavioral), and learning and emotional and behavioral disorders, which are related to school failure or risk for school failure (Steinberg, 2011). Empirical support for the role of these variables is strong. For example, with respect to parenting, there is much evidence that parental maltreatment places the child at increased risk of delinquency. Results from a recent survey conducted by the Administration for Children and Families (2008) showed that among young adults who as children had been referred to Child Protective Services (CPS), 16.7% had been arrested at least once in the previous 12 months; in fact, the annual arrest rate for this population was 480 per 1,000, more than 4 times the national rate for 18- to 24-year-olds. Furthermore, almost 50% of this population showed signs of mental health problems in early adulthood. Other studies also show that youth, and males in particular, who experience maltreatment are prone to a spectrum of adverse outcomes, including violent behavior and delinquency (Chen, Propp, deLara, & Corvo, 2011; Cicchetti & Manly, 2001; Crowley, Mikulich, Ehlers, Hall, & Whitmore, 2003; Maas, Herrenkohl, & Sousa, 2008; McGue & Iacono, 2005; Yu-Ling Chiu, Ryan, & Herz, 2011).

The second general factor, early mental health problems, is also well documented. It has been estimated that 40% to 70% of incarcerated youth experience mental health problems (Burrell & Warboys, 2000; Fazel, Doll, & Langstrom, 2008; C. A. Mallett, Stoddard, & Seck, 2009; Wasserman, McReynolds, Lucas, Fisher, & Santos, 2002). Recent studies indicate that between 15% and 20% of youth adjudicated delinquent have been diagnosed with either depression or dysthymia (Weiss & Garber, 2003), 13% to 30% with attention-deficit/hyperactivity disorder (ADHD), and 3% to 7% with bipolar disorder (C. Mallett, 2008; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002). In one recent study of detained youth (Teplin et al., 2002), 27% of boys and 84% of girls met criteria for a *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association [APA], 1994) diagnosis. Particularly important is the research linking adolescent antisocial behavior with poor self-regulation and emotional control (Gardner, Dishion, & Connell, 2008). In fact, there is now evidence of early, and detectable, biological correlates of aggressive behavior, including diminished response to fear arousing stimuli, low resting heart rate, and low levels of serotonin (Steinberg, 2011).

Finally, there is a body of evidence showing that school-related disabilities, including learning disabilities (LD) and emotional and behavioral disorders are strongly implicated in delinquency (Katsiyannis, Barrett, & Zhang, 2012; Smedly, Levinson, Barker, & DeAngelis, 2003; Zhang, Hsu, Katsiyannis, Barrett, & Ju, 2011). In fact, Zabel and Nigro (2001) report that among juvenile offenders with disabilities, 40% have LD and 46% have emotional/behavioral disabilities. Furthermore, it has been estimated that 30% to 50% of incarcerated youth have documented disabilities (Quinn, Rutherford, Leone, Osher, & Poirier, 2005; Rutherford, Bullis, Anderson, & Griller-Clark, 2002). It is important to recognize also that youth with learning and emotional/behavioral disabilities are more likely than typical youth to have experienced not only school failure but also family mobility and parental incarceration, factors that themselves have been linked to delinquency (Malmgren & Meisel, 2004; P. M. Sullivan & Knutson, 1998).

Although there is substantial evidence that early and adverse familial experiences, preexisting child mental health problems, and learning and emotional/behavioral disabilities are implicated in later delinquent behavior, there have been no large-scale empirical studies that have looked at these variables at the same time to examine the magnitudes of their unique contributions to delinquent behavior. The purpose of this study was to examine simultaneously the influences of adverse parent–child experiences, including maltreatment and foster care, early mental health problems, including conduct-related disorders and diagnosed learning and emotional/behavioral disabilities on juvenile delinquency and recidivism.

In this study, we were able to obtain detailed background information on the early experiences of a sample of approximately 200,000 youth, approximately 100,000 youth with records of juvenile delinquency and a control group of 100,000 without histories of delinquency and matched on birth year, gender, and race. Using this large-scale database, we were able to link records on delinquency with records from other state agencies, thus allowing us to examine the relationships between measures of delinquent behavior and measures of important child personal and experiential variables, including mental health history, maltreatment and foster care, and special education diagnoses. To our knowledge, this is the first large-scale empirical study in which such linkages have been obtained and in which such relationships have been investigated. Another unique feature of this study was the matched-control group design. The availability of a nondelinquent control group enabled us to examine the relationships between selected early experience and personal variables and the presence or absence of delinquency itself. Furthermore, as indicated earlier, gender and race (as well as birth cohort) have generally been found to be implicated in delinquency (D. E. Barrett, Katsiyannis, & Zhang, 2006, 2010). By including a control group with the same proportions of individuals by gender, race, and birth cohort, we were in a better position to get a clear picture of the role of early adverse experiences, mental health problems, and disabilities, independent of these demographic factors.

Our study addressed four sets of research questions. First, we examined the extent to which we could predict membership in the delinquent group versus the nondelinquent control group on the basis of information about

mental health problems, early adverse family experiences, and special education classification. Second, we examined the role of these selected personal and early experience variables in predicting age of first arrest. Third, we examined the influences of the same independent variables on severity of first offense. Finally, we examined the role of these independent variables in predicting juvenile recidivism. In conducting each of these analyses, we did not hypothesize a stronger role for one set of predictors than another. However, we did expect that early (and diagnosed) mental health problems related to aggression and impulsivity would play a prominent role in prediction of delinquency outcomes, even with other family-related factors (maltreatment, foster care) and school-related factors (diagnosed learning and emotional/behavioral disorders [EBD]) statistically controlled.

Method

Source of Data

Data for this study were obtained from two sources, the South Carolina Department of Juvenile Justice (DJJ) and the South Carolina Budget and Control Board's Office of Research and Statistics (ORS). DJJ data comprised information on approximately 100,000 youth who had been born in the period of 1981–1988 and who had been involved in delinquent activity. We linked the DJJ data with data obtained from the ORS. The ORS houses data from all of the state agencies in South Carolina, including, but not limited to, the South Carolina Department of Education (SDE), the South Carolina Department of Social Services (DSS), the South Carolina Department of Mental Health (DMH), as well as the South Carolina DJJ. These linkages enabled us to examine environmental influences on delinquency and recidivism using data that were not available in the original DJJ file. In addition, using data from the SDE, we constructed a matched-control group of individuals who had not been involved in delinquency (described below). This enabled us to examine not only influences on recidivism but also factors predicting juvenile delinquency itself.

DJJ data. Data were drawn from the South Carolina DJJ Management Information System. The DJJ sample consists of all juveniles born between 1981 and 1988 whose cases were referred to the South Carolina DJJ on at least one occasion ("referral"). In South Carolina, cases are first processed at the family court level by DJJ. DJJ intake workers assess risk and needs and forward cases to the Solicitor's Office with advisory recommendations (e.g., diversion or prosecution). If the case is prosecuted, the juvenile may be committed to the custody of DJJ, given probation, or given another penalty, such as a school attendance order.

The 1981–1988 cohorts consisted of 99,602 individuals, of which 64,502 (65%) were male and 35,100 (35%) were female. The racial composition was 50,496 (51%) Black, 47,537 (48%) White, and 1,569 (2%) Other (Asian and Hispanic). The average age of the juveniles when they were first referred to the system was 14.47 years ($SD = 1.94$), and the mean total number of referrals per juvenile was 2.21 ($SD = 2.00$). Of the 99,602 juveniles, 54% had one referral only, 19% had two referrals, and 27% had three or more referrals. Social-demographic data were collected selectively and were available for approximately half of the sample. Despite this limitation, we summarize this information to clarify the nature of the sample.

Data on family living arrangements were available for 60% of the sample. Of this group 23% lived with both parents at the time of last referral, 45% lived with the natural mother only, 11% lived with the mother and a stepfather, and 21% lived in another living arrangement. Sixty-nine percent of the sample lived in families without the biological father present. Family income data were available for 53% of the sample. Of these families, 40% had an average income of more than US$20,000 at the time of the child's last referral, 33% had an income between US$10,000 and US$20,000 and 26% had incomes below US$10,000. School status data were available for 61% of the sample. Of this group, 71% were enrolled in a regular day school program at the time of last referral, with 2% enrolled but held back and 6% expelled, and 9% were enrolled in special education.

Individual data on delinquency history were aggregated for each participant in the sample. Data available for each participant included age at first offense, severity of first offense, age at second offense (if applicable), and severity of second offense. Data on dispositions (penalties) were also collected but not used in the present analysis. The determination of the seriousness of a crime was based on the coding scheme used by South Carolina. DJJ rates crimes on an ordinal scale, with rating levels ranging from 1 to 25 (1 represents *the least serious offense*). For analysis purposes, we further categorized offenses as low (Level I), moderate (Level II), high (Level III), and very high (Level IV) in severity. DJJ Severity Levels 1 and 1.5 (status offenses: truancy, running away) were assigned to the low severity category; Severity Levels 2 and 3 (misdemeanor offenses: simple assault and battery, criminal domestic violence) were assigned to the moderate severity category; Severity Levels 5 through 8 (nonviolent felony: grand larceny, carrying a weapon on school grounds) were assigned to the high severity category; and Severity Levels 8.5 through 25 (violent felony: assault and battery of a high and aggravated nature, sexual assault, armed robbery) were assigned to the highest severity level category.

ORS data. For all individuals in the DJJ sample and also for the matched-control group (described below), data from other state agencies (housed in the ORS) were made available. Files on each child in the DJJ file were linked with

files of the other state agencies using a probabilistic matching algorithm. In the ORS linkage system, once a match is identified, an ID number is assigned. The same ID is used for all subsequent episodes of services, regardless of data source or service provider. Additional information about the key linkage system is available on request.

For the present analyses, individual data in the DJJ files were linked with data for the same individuals from the DSS, the DMH, and the SDE. Data obtained from the DSS included information about foster care placements and whether an individual had ever been placed in the custody of CPS. For foster care, information about age, duration of placement, and number of placements was obtained. With respect to CPS, we obtained information about the reason for and timing of CPS. Data obtained from the DMH included information about age at first, second, and most recent referrals and primary diagnosis at each referral. Primary diagnoses were further categorized into seven major categories (described in "Analyses" section). Data from the SDE included information about the ages at which the student was eligible for free and/or reduced-price lunch and information about school-based diagnoses for LD and EBD. Because achievement data were not consistently collected before the year 2000 (at which time the youngest cohort was already 19 years of age), these data were not considered for this analysis. After separate files were constructed for each agency (DJJ, DMH, DSS, Department of Education [DOE]), files were merged to create a new master file for the DJJ sample.

Construction of a Matched-Control Group

In addition to obtaining data from DJJ, DSS, DMH, and SDE on the 99,602 participants in the delinquency cohorts, we wished to construct a control group of participants, participants who did not have a delinquency history but were similar to the delinquency group in age, gender, and race. The construction of such a group would enable us to examine factors related to the occurrence or nonoccurrence of delinquent behavior.

The control group was selected from the 1994–1999 "precode" files provided by SDE; these files include information on all children enrolled in public schools during those years. The SAS survey select procedure was used to identify a sample of 99,602 youth with the same proportions of birth years, sexes, and ethnicities as the DJJ cohort. The total number of participants in the control group was 99,602. For each individual in the control group, the same information as was obtained from DSS, DMH, and SDE for the delinquent sample was included in their files. After separate files were constructed for each agency (DJJ, DMH, DSS, SDE), files were merged to create a new master file for the nondelinquent (control) sample. The two master files, the DJJ (delinquency) file and the control

(nondelinquency) file, were then merged, resulting in a file containing data on a sample of 199,204 delinquent and nondelinquent youth.

Analyses

In our analyses, we used a series of logistic regression analyses to examine the individual and combined influences of selected categories of independent variables on juvenile delinquency and/or recidivism. Dependent variables, coded dichotomously, were considered in the following order: (a) presence or absence of delinquency, (b) age at first offense, (c) seriousness of first offense, and (d) presence or absence of recidivism.

The analysis of influences on delinquency (presence/absence) included participants in the entire sample. We first examined the simple (univariate) associations between delinquent status (delinquent group vs. control group) and each of the independent variables of interest. We then carried out the multivariable, logistic regression analysis. In the logistic regression analysis, we included four blocks of predictors, described below. It should be noted that in the analyses involving comparisons between delinquent and control group participants, race and gender were not considered because the groups had been constructed so that race and gender representation would be identical.

In predicting the variable delinquency (vs. control), we first examined the role of social-economic well-being. Because data on income were not available for the control group (and because such data were only partially available for the delinquent group), we included in the first block the variable "eligible for free or reduced lunch" (coded *yes* or *no*) as our measure.

The second block of predictors included two measures of family background/dysfunction, placement in foster care (*yes* or *no*) and placement in CPS (*yes* or *no*). The third set of predictors focused on childhood psychopathology. In constructing these variables, all *DSM-IV* diagnoses conferred by the DMH were assigned to one of seven categories. Category assignments were made by the first author, a licensed psychologist, in consultation with colleagues. The categories used were aggression and conduct problems; drug-related problems; attention and learning disorders, mental retardation, and other problems starting in childhood; mood and anxiety disorders; psychotic disorders; adjustment and milder disorders; and other serious disorders.

For the present analysis, participants were first scored for presence or absence (at any time in development) of a primary diagnosis involving aggression and conduct problems. The *DSM-IV* classifications that were used to define an aggressive behavior problem were Antisocial Personality Disorder (*DSM-IV* classification 301.7), Impulse Control Disorder (312.30), Conduct Disorders (312.81, 312.82, 312.89), Disruptive Behavior Disorder (312.9), Oppositional

Defiant Disorder (313.81), and Child or Adolescent Antisocial Behavior (V71.02). They were then scored for presence or absence of any other primary diagnosis (a disorder involving any other classification than those listed above). These two variables constituted the third block of predictor variables. The fourth set of variables included two measures of special education problems. Participants were first scored for presence or absence of a special education diagnosis of a LD. They were also scored for presence or absence of a classification of EBD.

The next sets of analyses followed the same pattern but only included participants in the DJJ (delinquent) group. We first examined the influences on age of first offense. For ease of interpretability (and based on theoretical and empirical considerations; see D. E. Barrett et al., 2010), we categorized participants as below 14 years or above 14 years of age at time of first offense. We entered predictor variables in five successive blocks (corresponding to the categories described previously): Demographics (gender, race), Socioeconomic Status (SES; free or reduced-price lunch), Parenting/Family problems (foster care, CPS), Psychopathology (aggression, other), and Special Education (LD, EBD). In considering race, because of the small number of participants whose ethnicity had not been recorded by DJJ as either White or Black (less than 1% of the sample), only participants whose ethnicity was White or Black were included.

We then examined influences on seriousness of first offense. The outcome variable was a dichotomously scored variable: felony versus nonfelony (misdemeanor or status offense). The order of entry of variables was the same as for the prediction of age at first offense, except that now a sixth block was added to include the variable age at first offense. To increase the sensitivity of our analysis, age was included as a continuous variable.

Finally, we examined influences on recidivism. The dependent variable was presence or absence of a second offense. The order of entry of variables was the same as for the prediction of first offense, except that now a second variable was added to the sixth block of predictors; the sixth block now included the variable severity of first offense (felony vs. nonfelony) as well as age at first offense. To ensure that we did not include individuals who could not have committed a second offense because they were presently incarcerated, we excluded the small number of youth ($n = 1,135$; 0.6% of offenders) who had been incarcerated for the first offense.

We also conducted two supplementary analyses. To control for the possibility that diagnosed mental health problems were a result of a DJJ referral (rather than a possible causal influence), we repeated the analyses for prediction of delinquency and prediction of recidivism, this time excluding all members of the DJJ sample whose date of first mental health referral occurred only after their first arrest (approximately 15% of the DJJ sample.) Thus, we included in these analyses only the 85% of the DJJ sample who had either not been referred for mental health services or whose first mental health evaluation predated their first arrest.

Results

Prediction of Delinquency

We first examined the simple associations between delinquent group membership and presence or absence of each of the predictor variables that would be included in the logistic regression analysis. Results are shown in Table 1, which reports the obtained and expected frequencies for each risk factor for the delinquent group versus the control group and the phi coefficient indicating the degree of association between delinquent group membership and presence or absence of that risk factor. As shown in Table 1, delinquent group participants were more likely than control group participants to have been on free or reduced-price lunch (61.5% versus 50.7%), been in foster care (5.3%, 0.8%), been in CPS (12.3%, 2.8%), had a *DSM-IV* diagnosis for an aggressive disorder (14.5%, 1.3%), had another *DSM-IV* diagnosis (25.6%, 6.9%), been diagnosed as EBD (5.6%, 1.4%), or been diagnosed as LD (16.7%, 10.6%).

The results of the logistic regression analysis are shown in Table 2. There were significant effects for all variables; that is, all logistic regression coefficients remained significant when all predictors were in the equation. First, there was a significant effect for free lunch; $\chi^2(1, N = 199,204) = 444.06$, $p < .001$. Youth eligible for free lunch at any time in their school careers were approximately 20% more likely to be in the delinquent group than those who did not qualify for free lunch. There were significant effects for foster care and maltreatment, $\chi^2 = 46.46$, $p < .001$ and $\chi^2 = 1426.04$, $p < .001$, respectively. Presence of either foster care or maltreatment increased the odds of delinquency, with adjusted odds ratios (AOR) of 1.35 and 2.54, respectively. A *DSM-IV* diagnosis involving aggression or impulse control made the strongest independent contribution to the equation; $\chi^2 = 5330$, $p < .001$, resulting in an AOR of 9.36. Presence of any other *DSM-IV* diagnosis also significantly improved prediction with $\chi^2 = 5761.65$, $p < .001$; AOR = 3.24. Finally, with all other variables in the equation, special education diagnoses significantly contributed to prediction; $\chi^2 = 296.70$, $p < .001$ and $\chi^2 = 271.51$, $p < .001$ for EBD and LD, respectively. Odds ratios were 1.78 for EBD and 1.27 for LD. The total adjusted R^2 was .18; model $\chi^2(7, N = 199,204) = 634.02$, $p < .001$.

Variables Predicting Age of First Offense and Severity of First Offense

Age of first offense. We examined the variables predicting age at first referral for participants in the DJJ sample. There

Table 1. Simple Comparisons Between Delinquent and Control Groups on Variables Included in Logistic Regression.

Predictor variable	Delinquent group		Control group		Phi coefficient
	Actual	Expected	Actual	Expected	
Free lunch					.110**
No	38,311	43,728.5	49,146	43728.5	
Yes	61,291	55,871.5	50,456	55871.5	
Foster care					.130**
No	94,334	96,564	98,794		
Yes	5,268	3,038	808	3,038	
Maltreatment (CPS)					.181**
No	87,374	92,116	96,858	92,116	
Yes	12,228	7,486	2,744	7,486	
DSM-IV aggression					.246**
No	85,159	91,755	98,351	91,755	
Yes	14,443	7,847	1,251	7,847	
DSM-IV other					.253**
No	74,123	83,423.5	97,724	83,423.5	
Yes	25,479	16,178.5	6,878	16,178.5	
Emotional-behavioral disorder					.115**
No	93,987	96,094	98,201	96,094	
Yes	5,615	3,508	1,401	3,508	
Learning disability					.089**
No	89,085	86,033	82,981	86,033	
Yes	16,621	13,569	10,517	13,569	

Note. CPS = child protective services. *DSM-IV = Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994).
**$p < .001$.

Table 2. Logistic Regression Analysis for Prediction of Delinquent Status ($N = 96,565$).

Block	Variable	R^2 block	B	AOR_E	AOR_F
1	Free lunch	.02**	0.21	1.56**	1.23**
2	Foster care		0.30	2.77**	1.35**
	Maltreatment (child protective services)	.06**	0.93	3.59**	2.54**
3	*DSM-IV* aggression		2.24	9.90**	9.36**
	DSM-IV other	.17**	1.17	3.42**	3.24**
4	Emotional-behavioral disorder		0.58	1.78**	1.78**
	Learning disability	.18**	0.24	1.27**	1.23**

Note. DSM-IV = Diagnostic and Statistical Manual of Mental Disorders (4th ed.; *DSM-IV*; American Psychiatric Association, 1994). R^2 block refers to Nagelkerke's R^2 following this step in the equation and including the constant. Significance level for R^2 block is based on the change in the log likelihood of the outcome. Significance level for the Wald statistic is based on the final logistic regression equation. B refers to the logistic regression coefficient in the final equation. AOR_F refers to the adjusted odds ratio in the final equation. AOR_E refers to the adjusted odds ratio at the initial time of entry.
**$p < .001$.

were significant effects for all variables; that is, all logistic regression coefficients remained significant when all predictors were in the equation. First, there were significant effects for gender and race with males and black youth more likely to commit crimes before the age of 14 than females and white youth; $\chi^2(1, N = 97,734) = 473.67, p <$ .001 and $\chi^2 = 879.72, p < .001$, respectively. Free lunch was also predictive of earlier offending; $\chi^2 = 176.36, p < .001$. Presence of either foster care or maltreatment increased the odds of early offending; $\chi^2 = 20.13, p < .001$ and $\chi^2 = 373.14, p < .001$, respectively. In addition, both presence of a *DSM-IV* diagnosis involving aggression or impulse

control ($\chi^2 = 600.48$, $p < .001$) and presence of any other *DSM-IV* diagnosis ($\chi^2 = 89.41$, $p < .001$) increased the odds of early offending. Finally, with all other variables in the equation, special education diagnoses contributed significantly to prediction; $\chi^2 = 337.19$, $p < .001$ and $\chi^2 = 20.07$, $p < .001$ for EBD and LD, respectively. The magnitude of the AOR for LD (.58 for predicting older age of first referral) was the highest of any in the equation; youth with a diagnosis of a LD were almost twice as likely to commit their first offense before age 14 than youth without this diagnosis. The total adjusted R^2 was .07; model $\chi^2(9, N = 97.734) = 634.02$, $p < .001$.

Felony versus misdemeanor. We examined the variables predicting felony versus misdemeanor (on first referral) for participants in the DJJ sample. There were significant effects for gender and race with males and black youth more likely to commit crimes at the felony level than females and white youth; $\chi^2(1, N = 97,673) = 2572.40$, $p < .001$ and $\chi^2 = 125.51$, $p < .001$, respectively. The AOR of .35 for gender shows that males were approximately three times more likely than females to commit a crime at a felony level, all other variables in the equation held constant. Mental health diagnoses were significantly related to the severity of the offense, with youth with either a diagnosis relating to aggressive behavior or any other diagnosis more likely to be referred for serious crimes; $\chi^2 = 183.04$, $p < .001$ and $\chi^2 = 54.90$, $p < .001$, respectively. Finally, youth with a classification of an EBD were more likely to commit felony-level crimes; $\chi^2 = 16.59$, $p < .001$. There was a tendency for youth who had been maltreated to commit less serious crimes ($\chi^2 = 12.11$, $p = .001$) and for youth with LD to commit more serious crimes ($\chi^2 = 12.11$, $p = .002$); however, adjusted odds ratios were of low magnitude (.90 and 1.07, respectively). None of the other variables (free lunch, foster care, age at first offense) made unique contributions to the equation. The total adjusted R^2 was .06; model $\chi^2(10, N = 97,673) = 3725.07$, $p < .001$.

Predicting Recidivism

We examined the variables predicting the presence of a second offense. Results are shown in Table 3. There was a significant effect for gender with males more likely than females to commit a second offense; $\chi^2(1, N = 96,565) = 363.43$, $p < .001$. There was also an effect for free lunch with youth qualifying for free lunch more likely to commit a second offense; $\chi^2 = 947.70$, $p < .001$. While the effect for foster care was not significant, there was a significant effect for maltreatment; $\chi^2 = 335.01$, $p < .001$. Youth who had been in CPS were approximately 50% more likely than those who had not been in CPS to commit a second crime. Mental health diagnosis was significantly related to the likelihood of a second offense, with youth with either a diagnosis relating to aggressive behavior or any other diagnosis

more likely to be referred for a second offense; $\chi^2 = 3119.36$, $p < .001$ and $\chi^2 = 1545.63$, $p < .001$, respectively. The values for AOR show that youth with mental health diagnoses relating to aggressive behavior were more than three times more likely to commit a second offense than other first offenders and that youth with another mental health diagnosis were almost twice as likely as nondiagnosed youth to commit a second offense. Youth with a classification of an EBD or a LD were more likely to commit a second offense than youth without these special education classifications; $\chi^2 = 99.43$, $p < .001$ and $\chi^2 = 24.68$, $p < .001$, respectively. Finally, there was a significant relationship between age of first offense and recidivism; $\chi^2 = 5296.87$, $p < .001$. The AOR of .74 shows that for each year of reduced age of first offense, the odds of a second offense increase by approximately 25%. There was a tendency for youth who had committed misdemeanor level crimes to commit more second offenses ($\chi^2 = 8.456$, $p = .003$). Foster care was unrelated to recidivism. The total adjusted R^2 was .24; model $\chi^2(11, N = 97,565) = 5977.56$, $p < .001$.

Supplementary Analyses: Findings From a Select Sample

Findings from the supplementary analyses paralleled those for the larger sample. In predicting membership in the delinquent sample, when we excluded persons whose first mental health referral occurred only after their first DJJ referral, all variables that were significant in the earlier analysis (reported in Table 2) remained significant. Adjusted odds ratios for larger sample ($n = 199,204$) and restricted sample ($n = 183,918$) analyses respectively were as follows: Free lunch 1.23, 1.23; Foster Care 1.35, 1.54; Maltreatment 2.54, 2.65; *DSM-IV* Aggressive 9.36, 5.69; *DSM-IV* Other 3.24, 1.74; EBD 1.78, 1.99; and LD 1.27, 1.32. Thus, *DSM-IV* mental health diagnoses remained the strongest predictors of delinquent status, even though the AORs were reduced. The final value of R^2 was .10, $p < .001$.

In predicting recidivism, when we excluded persons whose first mental health referral occurred only after their first DJJ referral, all variables which were significant in the earlier analysis (reported in Table 3) remained significant with the exception of severity of first offense. In addition, foster care, nonsignificant in the earlier analysis, now became significant. Adjusted odds ratios for larger sample ($n = 96,565$) and restricted sample ($n = 81,988$) analyses respectively were as follows: Gender .74, .75; Race 1.04, 1.04; Free lunch 1.62, 1.69; Foster Care 1.06, 1.13; Maltreatment 1.60, 1.63; *DSM-IV* Aggressive 3.49, 2.48; *DSM-IV* Other 1.99, 1.76; EBD 1.41, 1.52; LD 1.10, 1.13 and Age at first referral .74, .75. Again, *DSM-IV* mental health diagnoses remained the strongest predictors of delinquent status, even though the AORs were reduced. The final value of R^2 was .18, $p < .001$.

Table 3. Logistic Regression Analysis for Prediction of Recidivism (*N* = 96,565).

Block	Variable	R^2 block	B	AOR$_E$	AOR$_F$
1	Gender		−0.30	0.72**	0.74**
	Race	.01**	0.04	1.34**	1.04**
2	Free lunch	.05**	0.48	2.05**	1.62**
3	Foster care		0.06	1.69**	1.06**
	Maltreatment (child protective services)	.08**	0.47	2.22**	1.60**
4	*DSM-IV* aggression		1.25	3.86**	3.49**
	DSM-IV other	.17**	0.69	2.09**	1.99**
5	Emotional-behavioral disorder		0.34	1.62**	1.41**
	Learning disability	.17**	0.10	1.12**	1.10**
6	Age at first referral		−0.23	0.74**	0.74**
	Severity at first referral	.24**	−0.05	0.95*	0.95*

Note. DSM-IV = Diagnostic and Statistical Manual of Mental Disorders (4th ed.; *DSM-IV*; American Psychiatric Association, 1994). R^2 block refers to Nagelkerke's R^2 following this step in the equation and including the constant. Significance level for R^2 block is based on the change in the log likelihood of the outcome. Significance level for the Wald statistic is based on the final logistic regression equation. B refers to the logistic regression coefficient in the final equation. AOR$_F$ refers to the adjusted odds ratio in the final equation. AOR$_E$ refers to the adjusted odds ratio at the initial time of entry.
*p < .01. **p < .001.

Summary of Findings

When race and gender are held constant using a matched-control design a number of early experiential and personal variables make unique contributions to the prediction of delinquency. Poverty (as indexed by free or reduced-price lunch eligibility), parental maltreatment, and foster care all predict membership in a delinquent sample. In addition, the presence of a *DSM-IV* diagnosis bears a strong relationship to delinquency, particularly when the diagnosis is based on a pattern of aggression or impulsivity. Finally, even with mental health classifications held constant, presence of a public school classification of LD or EBD is also predictive of delinquent outcomes.

Although we were only able to account for a small percentage of the variance in age of first referral, a pattern of significant predictors emerged. All of the variables that helped account for presence/absence of delinquency also predicted the timing of offending. Free lunch eligibility, foster care, parental maltreatment, a *DSM-IV* diagnosis, and a designation as having a learning or emotional/behavioral disability were all related to earlier offending. In addition, males and black youth committed their first juvenile offenses significantly earlier than female and white youth. With respect to predicting seriousness of first offense (felony vs. misdemeanor), males, youth with a *DSM-IV* diagnosis (particularly for aggressive behavior), and youth identified by schools as having EBDs showed increased odds of committing a felony-level first offense.

The predictor variables included in our analyses accounted for almost 25% of the variance in recidivism. As was the case with the preceding analyses, mental health problems played an important role, with the presence of a *DSM-IV* diagnosis for an aggressive disorder the strongest predictor of recidivism. Child maltreatment significantly increased the odds of a second referral as did free lunch eligibility, presence of a LD or EBD and male gender. Finally, age of first referral made a strong contribution to prediction of recidivism, with those committing crimes at young ages more likely to recidivate.

Because of the possibility that the predictive power of mental health classifications may have been overestimated by a reverse causal effect (such that mental health referrals resulted from the youth's arrest and subsequent DJJ processing), data were reanalyzed excluding those participants whose first mental health referral occurred later than their first arrest. Results of the analyses paralleled those conducted on the larger sample, with *DSM-IV* diagnoses the strongest predictors of both delinquency and recidivism.

Discussion

The present study shows the substantial role that preexisting mental health problems, particularly with aggression, play in delinquency and recidivism. The results also show that even with such personal characteristics controlled, early adverse experiences in the family including child maltreatment and school-related learning and emotional problems contribute to the prediction of delinquency and recidivism.

Theoretical Implications

One possible interpretive issue concerns the role of serious behavior problems in leading to a mental health referral.

Specifically, one might argue that child mental health referrals do not explain antisocial behavior; rather they occur only when a serious behavioral problem has already occurred. It is true that mental health status (as indicated by a *DSM-IV* diagnosis) is a judgment that is usually made only after a behavioral problem is identified. But it is also true that all of the *DSM-IV* classifications which were used to define an aggressive or conduct disorder assume some type of predisposition (biological and/or temperamental) toward deviant behavior; see for example, the discussion of Conduct Disorder in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; APA, 2000, p. 96). Furthermore, in our sample of delinquent youth, in 85% of cases where there was a mental health referral, the mental health referral preceded the first arrest as a juvenile; in only 15% of cases did the first DJJ referral occur before the first mental health referral. When the latter 15% of cases was excluded from further analyses, mental health problems—and in particular aggression—continued to be the strongest predictor of delinquency and recidivism. Thus, we contend that preexisting psychological characteristics are the strongest predictors of delinquent behavior. Recent research on the biological bases of chronic conduct problems (e.g., lower basal autonomic arousal, low serotonin, poor self-regulation, adverse prenatal events) supports this view (Dodge & Pettit, 2003; Steinberg, 2011).

Findings on the role of early child rearing experiences and, in particular, parental maltreatment of the child also raise interpretive concerns. Current systems models of delinquent behavior (Granic & Patterson, 2011) are dynamic in nature; it may be difficult to separate parental predispositions (e.g., impatience and impulsivity in responding to a child) from the conditions ("setting events") that bring them to light. Still, a reasonable assumption is that not all parents respond to specific child behaviors in the same way. Parents who abuse and/or neglect children differ from typical parents in empathy and self-understanding, and, in our view, it is these parental deficits which are likely implicated in the child's development. Different theoretical frameworks have explicated the link between coercive (or even insensitive) parenting and the development of aberrant behavior patterns in the child (H. S. Sullivan, 1953; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000). The present study supports the view that early parental rejection is implicated in later child and adolescent behavioral disorders.

Results relating to LD and emotional and behavioral disorders should also be viewed carefully. Because school-related disabilities and school failure (which we were unable to directly assess in this study) are closely linked, it is difficult to determine whether it is the condition of having a disability or the behavioral results of having a disability (adverse school experiences) which accounts for the significant role of disabilities in predicting delinquency and recidivism. The present study cannot address this interpretive question. Still, the results provide clear evidence that school-related disabilities play an important role in accounting for juvenile delinquency and recidivism, even when the effects of these disabilities are considered separately from other family and psychological problems.

Policy Implications

Perhaps the most compelling finding in the present study is the disproportionate role of preexisting mental health problems and, in particular, conduct-related disorders, in delinquency and recidivism. It is tempting to conclude from these results that prevention and control of delinquency is an even more intractable problem than might be assumed, since even when poverty, parental maltreatment, and learning problems are statistically held constant, youth who are prone to mental and emotional disorders are much more likely to become delinquent (and more likely to recidivate) than those who are not so disposed.

But it is important to recognize that mental health problems do not occur in a vacuum. In our study, there were low to moderate associations between all predictor variables. For example, presence of a *DSM-IV* diagnosis involving a conduct or aggression problem was also associated with presence of poverty (free or reduced-price lunch), experience in foster care, referral to CPS for maltreatment, LD and EBD, and the presence of another *DSM-IV* diagnosis (not related to aggression) at some time before adulthood. What this means is that it is always possible that (a) the types of psychological dispositions that culminate in mental health referrals for aggressive/conduct disorders only manifest themselves in overt behavioral problems under certain conditions (and not others) and (b) controlling certain features of the child's environment (health, safety, family relationships, school) might result in the suppression of antisocial behaviors. For example, with respect to the present findings, it may be that for some of the youth in the sample, behavioral patterns in the child which resulted in a mental health referral for an aggressive behavior problem were aggravated by interactions with parents who had not themselves developed the ability to regulate their emotions. Conversely, it may be that early intervention focusing on changing parental interactions with the child might have helped prevent later child behavioral problems.

Our view is consistent with a developmental science perspective (Cairns, 2000). Developmental science recognizes the interrelatedness of multiple influences, both external (e.g., parents, peers, culture) and internal (e.g., cognitive, neurobiological), on individual development. Furthermore, developmental science emphasizes that successful individual functioning involves the organization and alignment of multiple systems that contribute to individual development (Farmer & Farmer, 2001). Thus, a developmental science perspective suggests the need for

comprehensive, multisystemic approaches to prevention and treatment, approaches which focus simultaneously on multiple levels of the child's environment and which utilize and coordinate different community resources and agencies as necessary. In short, critical to any intervention is the recognition that the child's experiences in the family, psychological and behavioral health and future educational attainment are likely to be closely interrelated (Atkins, Hoagwood, Kutash, & Seidman, 2010).

Interventions for preventing aggressive behavior should begin with families, include all important members of the family system, and start before problem behavior patterns become so rigid and automatized that they are resistant to change. Interventions that focus on the reconfiguration of family interaction patterns, for example, Parent Management Training (Forgatch & DeGarmo, 1999), have been very successful in reducing antisocial behaviors among otherwise aggressive children. For youth approaching adolescence, interventions focusing on parent and child skill-building have demonstrated success, particularly for youth who evidence a genetic predisposition toward aggression based on DNA analyses for a functional polymorphism in a gene associated with high risk behavior (Brody, Beach, Philibert, Chen, & Murry, 2009). Furthermore, intensive aftercare programs may be helpful in addressing the needs of chronic juvenile offenders through balanced supervision and services (Altschuler & Armstrong, 1994; Nissen, 2011).

In addition, school-based early intervention and prevention efforts should be implemented to address the needs of youth at risk for behavioral and academic challenges. Early onset of antisocial behaviors is a powerful predictor that challenges for many of these children will persist in later years (Briggs-Gowen, Carter, & Skuban, 2001; Loeber & Farrington, 1998; Maag & Katsiyannis, 2010). The need for early intervening services is clearly articulated and emphasized in both the Individuals with Disabilities Education Improvement Act (IDEA) 2004 and No Child Left Behind Act of 2001. Two important, systemwide initiatives include the Response to Intervention (RTI) framework and Positive Behavioral Intervention Supports (PBIS). RTI involves a multitier prevention system intended to address academic related challenges through the implementation of evidence-based instructional practices and monitoring of the student's progress. PBIS aims for a schoolwide system of tiered preventative interventions focusing on providing a positive school environment through improved systems and procedures. Key elements of PBIS include data-based decision making, progress monitoring, evidence-based interventions, and fidelity of implementation (Domitrovich et al., 2010; Horner, Sugai, & Anderson, 2010; PBIS, 2012). With increasing empirical support of its effectiveness, PBIS has been shown to improve discipline, reinforcement, and data management systems (S. Barrett,

Bradshaw, & Lewis-Palmer, 2008; C. P. Bradshaw, Koth, Thornton, & Leaf, 2009). When implemented with fidelity, PBIS can positively alter the overall organization health, the staff affiliation, and the academic emphasis of a school (C. P. Bradshaw et al., 2009; C. P. Bradshaw, Koth, Bevans, Ialongo, & Leaf, 2008; C. Bradshaw, Mitchell, & Leaf, 2010). There is also emerging literature regarding the implementation of PBIS in alternative and juvenile justice settings (Farkas et al., 2011; Jolivette & Nelson, 2010; Nelson, Jolivette, Leone, & Mathur, 2010; Nelson, Sprague, Jolivette, Smith, & Tobin, 2009). While some individually targeted interventions including training in behavioral strategies, social skills training and peer mediation have proven effective (Wilson & Lipsey, 2007), combining universal and individually targeted interventions for at-risk populations appears to be the most promising approach (Domitrovich et al., 2010; Metzler et al., 2008).

Special education diagnoses significantly contribute to the prediction of delinquency and delinquency patterns (see also Zhang et al., 2011). In the present study, youth with a diagnosis of EBD or LD were more likely to commit delinquent offenses than those without disabilities; those with LD were almost twice as likely to commit their first offense before age 14 as youth without this diagnosis; youth with LD were more likely to commit more serious crimes; and youth with EBD or LD were more likely to commit a second offense than youth without these special education classifications. These findings should direct our attention to the needs of youth with disabilities. We contend that it is the responsibility of special education programs to not only help students with disabilities to stay out of trouble; it is also a responsibility to help students learn to engage meaningfully in academic and vocation-related activities. There is evidence that many students with disabilities, in addition to having difficulties with academic performance, may experience difficulties in social information processing and decision making (Katsiyannis et al., 2012), problems that can also contribute to the youth's involvement in delinquent behaviors. Innovative educational intervention programs are needed to better address these concerns. For example, self-determination programs may need to be introduced to teach youth how to make appropriate choices and decisions. Also important in helping youth with disabilities prepare for adulthood responsibilities (and avoid delinquent behavior) are help in goal setting, job placements, and related support services during periods of transition (Bullis & Yovanoff, 2006).

The same considerations apply to youth with disabilities who are incarcerated. In fact, there is evidence that youth attending school or working six months to 12 months after release are less likely than others to return to the facility (Bullis, Yovanoff, Mueller, & Havel, 2002). It should be noted that the needs of incarcerated youth with disabilities as required by the Individuals with Disabilities Act are not

always addressed (Morrison & Epps, 2002; Twomey, 2008). This problem appears to be persistent given the number of class actions filed before the courts on behalf of juveniles with disabilities over the last three decades (Twomey, 2008; see also, *Alexander v. Boyd*, 1995; *Andre v. Sobol*, 1991).

Limitations and Need for Further Research

There are several limitations to the present study that underscore the need for caution in interpreting the findings and the need for further research on delinquency and recidivism. The first limitation is that the sample for the present study was drawn from youth in South Carolina and that the sample might not be representative of a national sample. For example, the percentage of youth who are referred for CPS in South Carolina is relatively low, 40 per 1,000 children (U.S. Department of Health and Human Services, 2011); in states in which the percentage is higher, greater variability might result in stronger associations with outcome variables. Second, in the present study we did not include in our analyses information about the timing of foster care and CPS actions. Thus, we were not able to determine, for example, whether foster care or CPS placements in infancy were more deleterious than those occurring in early childhood. Further research will be needed to examine more clearly the role of the timing of early adverse experiences. Finally, in the present study we did not include youth who were of ethnic backgrounds other than White and African American. As the United States becomes increasingly heterogeneous with regard to national origin and ethnicity, different background and personality variables could begin to assume different weights in predicting delinquency and/or recidivism. Research on more recent cohorts from nationally representative samples might better address this issue.

Conclusion

The present study provides powerful support for the role of early adverse experiences in the family and preexisting mental health problems in predicting juvenile delinquency, age of first delinquent activity, severity of first offenses and juvenile recidivism. Along with other social-economic and behavioral risk factors including poverty and school-related disabilities, these factors help to better account for individual differences in the likelihood of serious antisocial behavior. The results of the study provide justification for continued attention to well-integrated, multisystemic programs of services for youth at risk for delinquent behavior. A focus on early family intervention, skill-building programs for youth and their families, and community supports could be a most effective approach in the effort to improve the developmental and behavioral outcomes for children and youth.

References

Administration for Children and Families. (2008). *Adolescents involved with child welfare: A transition to adulthood*. Washington, DC: Author.

Alexander, S. v. Boyd, 22 IDELR 139 (D.S.C. 1995).

Altschuler, D. M., & Armstrong, T. L. (1994). *Intensive aftercare for high-risk juvenile offenders: A community care model: Summary*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.

Andre v. Sobol, No. 84–3114.(S.D.N.Y. 1991).

Atkins, M. S., Hoagwood, K. E., Kutash, K., & Seidman, E. (2010). Toward the integration of education and mental health in schools. *Administration and Policy in Mental Health and Mental Health Services Research*, *37*, 40–47.

Barrett, D. E., Katsiyannis, A., & Zhang, D. (2006). Predictors of offense severity, prosecution, incarceration and repeat violations for adolescent male and female offenders. *Journal of Child and Family Studies*, *15*, 708–718.

Barrett, D. E., Katsiyannis, A., & Zhang, D. (2010). Predictors of offense severity, adjudication, incarceration and repeat referrals for juvenile offenders: A multi-cohort replication study. *Remedial and Special Education*, *31*, 261–275.

Barrett, S., Bradshaw, C., & Lewis-Palmer, T. (2008). Maryland statewide PBIS initiative: Systems, evaluation, and next steps. *Journal of Positive Behavior Interventions*, *10*, 105–114.

Bradshaw, C., Mitchell, M., & Leaf, P. (2010). Examining the effects of school-wide positive behavioral interventions and supports on student outcomes: Results from a randomized controlled effectiveness trial in elementary schools. *Journal of Positive Behavior Interventions*, *12*, 133–148.

Bradshaw, C. P., Koth, C. W., Bevans, K. B., Ialongo, N., & Leaf, P. J. (2008). The impact of school-wide positive behavioral interventions and supports (PBIS) on the organizational health of elementary schools. *School Psychology Quarterly*, *23*, 462–473.

Bradshaw, C. P., Koth, C. W., Thornton, L. A., & Leaf, P. J. (2009). Altering school climate through school-wide positive behavioral

interventions and supports: Findings from a group-randomized effectiveness trial. *Prevention Science*, *10*, 100–115.

Briggs-Gowen, M. J., Carter, A. S., & Skuban, E. M. (2001). Prevalence of social-emotional and behavioral problems in a community sample of 1- and 2-year-old children. *Journal of American Academy of Child & Adolescent Psychiatry*, *40*, 811–819.

Brody, G. H., Beach, S. R. H., Philibert, R. A., Chen, U., & Murry, V. M. (2009). Prevention effects moderate the association of 5-HTTLPR and youth risk behavior initiation: Gene x environment hypothesis tested via a randomized prevention design. *Child Development*, *80*, 645–661.

Bullis, M., & Yovanoff, P. (2006). Idle hands: Community employment experiences of formerly incarcerated youth. *Journal of Emotional and Behavioral Disorders*, *14*, 71–85.

Bullis, M., Yovanoff, P., Mueller, G., & Havel, E. (2002). Life on the "outs"-examination of the facility-to-community transition of incarcerated youth. *Exceptional Children*, *69*, 7–22.

Burrell, S., & Warboys, L. (2000). *Special education and the juvenile justice system*. Washington, DC: Department of Justice, Office of Juvenile Justice and Delinquency Prevention.

Cairns, R. B. (2000). Developmental science: Three audacious implications. In L. R. Bergman, R. B. Cairns, L. G. Milsson & L. Mystedt (Eds.), *Developmental science and the holistic approach* (pp. 49–62). Mahwah, NJ: Lawrence Erlbaum.

Chen, W. Y., Propp, J., deLara, E., & Corvo, K. (2011). Child neglect and its association with subsequent juvenile drug and alcohol offense. *Child & Adolescent Social Work Journal*, *28*, 273–290.

Cicchetti, D., & Manly, J. T. (2001). Operationalizing child maltreatment: Developmental processes and outcomes. *Developmental Psychopathology*, *13*, 755–757.

Crowley, T. J., Mikulich, S. K., Ehlers, K. M., Hall, S. K., & Whitmore, E. A. (2003). Discriminative validity and clinical utility of an abuse-neglect interview for adolescents with conduct and substance abuse problems. *American Journal of Psychiatry*, *160*, 1461–1469.

Dodge, K., Greenberg, M., & Malone, P. Conduct Problems Prevention Research Group. (2008). Testing an idealized dynamic cascade model of the development of serious violence in adolescence. *Child Development*, *29*, 1907–1927.

Dodge, K., & Pettit, G. (2003). A biopsychosocial model of the development of chronic conduct problems in adolescence. *Developmental Psychology*, *39*, 349–371.

Domitrovich, C. E., Bradshaw, C. P., Greenberg, M. T., Embry, D., Poduska, J. M., & Ialongo, N. S. (2010). Integrated models of school-based prevention: Logic and theory. *Psychology in the Schools*, *47*, 71–88.

Farkas, M., Simonsen, B., Migdole, S., Donovan, M., Clemens, K., & Cicchese, V. (2012). Schoolwide positive behavior support in an alternative school setting: An evaluation of fidelity, outcomes, and social validity of implementation. *Journal of Emotional and Behavioral Disorders*, *20*, 275–288. doi:10.1177/1063426610389615

Farmer, T. W., & Farmer, E. M. Z. (2001). Developmental science, systems of care, and prevention of emotional and behavioral problems in youth. *American Journal of Orthopsychiatry*, *71*, 171–181.

Fazel, S., Doll, H., & Langstrom, N. (2008). Mental disorders among adolescents in juvenile detention and correctional facilities: A systematic review and metaregression analysis of 25 surveys. *Journal of the American Academy of Child & Adolescent Psychiatry*, *47*, 1010–1019.

Forgatch, M. S., & DeGarmo, D. S. (1999). Parenting through change: An effective parental training program for single mothers. *Journal of Consulting and Clinical Psychology*, *67*, 711–724.

Gardner, T. W., Dishion, T. J., & Connell, A. M. (2008). Adolescent self-regulation as resilience: Resistance to antisocial behavior within the deviant peer context. *Journal of Abnormal Child Psychology*, *36*, 273–284.

Granic, I., & Lamey, A. K. (2002). Combining dynamic systems and multivariate analyses to compare the mother –child interactions of externalizing subtypes. *Journal of Abnormal Child Psychology*, *30*, 265–283.

Granic, I., & Patterson, G. R. (2011). Toward a comprehensive model of antisocial development: A dynamic systems approach. *Psychological Review*, *11*, 101–131.

Horner, R. H., Sugai, G., & Anderson, C. M. (2010). Examining the evidence base for school-wide positive behavior support. *Focus on Exceptional Children*, *42*(8), 1–14.

Individuals With Disabilities Education Improvement Act of 2004, 20 U.S.C. § 1400 *et seq*. (2004). (Reauthorization of the Individuals With Disabilities Education Act of 1990)

Jolivette, K., & Nelson, C. M. (2010). Adapting positive behavioral interventions and supports for secure juvenile justice settings: Improving facility-wide behavior. *Behavioral Disorders*, *36*, 28–42.

Katsiyannis, A., Barrett, D. E., & Zhang, D. (2012). Juvenile offenders with disabilities: Challenges and promises. In E. L. Grigorenko (Ed.), *Handbook of juvenile forensic psychology and psychiatry* (pp. 521–539). New York, NY: Springer.

Loeber, R., & Farrington, D. (Eds.). (1998). *Serious and violent juvenile offenders: Risk factors and successful interventions*. Thousand Oaks, CA: SAGE.

Maag, J. W., & Katsiyannis, A. (2010). School-based mental health services: Funding options and issues. *Journal of Disability Policy Studies*, *21*, 173–180.

Maas, C., Herrenkohl, T. I., & Sousa, C. (2008). Review of research on child maltreatment and violence in youth. *Trauma, Violence, & Abuse*, *9*, 56–67.

Mallett, C. (2008). The disconnect between delinquent youths with mental health and special education disabilities and juvenile court outcomes. *Correctional Health Today*, *1*, 12– 21.

Mallett, C. A., Stoddard, D. P., & Seck, M. M. (2009). Predicting juvenile delinquency: The nexus of childhood maltreatment, depression and bipolar disorder. *Criminal Behavior and Mental Health*, *19*, 235–246.

Malmgren, K., & Meisel, S. (2004). Examining the link between child maltreatment and delinquency for youth with emotional and behavioral disorders. *Child Welfare*, *83*, 175–188.

McGue, M., & Iacono, W. G. (2005). The association of early adolescent problem behavior with adult psychopathology. *American Journal of Psychiatry*, *162*, 1118–1124.

Metzler, C. W., Biglan, A., Embry, D., Sprague, J., Boles, S. M., & Kavanagh, K. A. (2008). *Improving the well-being of adolescents in Oregon*. Eugene: Center on Early Adolescence, Oregon Research Institute.

Morrison, H. R., & Epps, B. D. (2002). Warehousing or rehabilitation? Public schooling in the juvenile justice system. *Journal of Negro Education*, *71*, 220–221.

Nelson, C. M., Jolivette, K., Leone, P. E., & Mathur, S. R. (2010). Meeting the needs of at-risk and adjudicated youth with behavioral challenges: The promise of juvenile justice. *Behavioral Disorders*, *36*, 70–80.

Nelson, C. M., Sprague, J. R., Jolivette, K., Smith, C. R., & Tobin, T. J. (2009). Positive behavior support in alternative education, community-based mental health, and juvenile justice settings. In W. Sailor, G. Dunlap, R. H. Horner & G. Sugai (Eds.), *Handbook of positive behavior support* (pp. 465–496). New York, NY: Springer.

Nissen, L. B. (2011). Community-directed engagement and positive youth development: Developing positive and progressive pathways between youth and their communities in Reclaiming Futures. *Children and Youth Services Review*, *33*, 23–28.

No Child Left Behind Act of 2001, 20 U.S.C. 70 § 6301 *et seq*.

Patterson, G. R., DeBaryshe, B. D., & Ramey, E. (1989). A developmental perspective on antisocial behavior. *American Psychologist*, *44*, 329–335.

Patterson, G. R., Littman, R. A., & Bricker, W. (1967). Assertive behavior in children: A step towards a theory of aggression. *Monographs of the Society for Research in Child Development*, *32*(5, Serial No. 113).

Positive Behavioral Interventions and Supports. (2012). *What is school-wide positive behavioral interventions & supports?* Retrieved from http://www.pbis.org/school/what_is_swpbs.aspx

Puzzanchera, C. (2009, December). *Juvenile arrests 2008*. (Juvenile Justice Bulletin). Washington, DC: Office of Juvenile Justice and Delinquency Prevention. Retrieved from https://www.ncjrs.gov/pdffiles1/ojjdp/228479.pdf

Puzzanchera, C., Adams, B., & Sickmund, M. (2011). *Juvenile court statistics 2008*. Pittsburgh, PA: National Center for Juvenile Justice. Retrieved from http://www.ncjj.org/pdf/jcs-reports/jcs2008.pdf

Quinn, M. M., Rutherford, R. B., Leone, P. E., Osher, D. M., & Poirier, J. M. (2005). Youth with disabilities in juvenile corrections: A national survey. *Exceptional Children*, *71*, 339–345.

Rutherford, R. B., Bullis, M., Anderson, C. W., & Griller-Clark, H. M. (2002). *Youth with disabilities in the correctional system: Prevalence rates and identification issues*. Washington, DC: Center for Effective Collaboration and Practice.

Smedly, M., Levinson, E., Barker, W., & DeAngelis, D. (2003). Differences in career maturity among adjudicated and nonadjudicated male students with and without disabilities. *Journal of Employment Counseling*, *40*, 108–121.

Steinberg, L. (2011). *Adolescence* (9th ed.). Boston, MA: McGraw-Hill.

Sullivan, H. S. (1953). *The interpersonal theory of psychiatry*. New York, NY: Norton.

Sullivan, P. M., & Knutson, J. F. (1998). The association between child maltreatment and disabilities in a hospital-based epidemiological study. *Child Abuse & Neglect*, *2*, 271–288.

Teplin, L. A., Abram, K. M., McClelland, G. M., Dulcan, M. K., & Mericle, A. A. (2002). Psychiatric disorders in youth in juvenile detention. *Archives of General Psychiatry*, *59*, 1133–1143.

Twomey, K. (2008). The right to education in juvenile detention under state constitutions. *Virginia Law Review*, *94*, 765.

U.S. Department of Health and Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau. (2011). *Child maltreatment 2010*. Retrieved from http://www.acf.hhs.gov/programs/cb/pubs/cm10/cm10.pdf

Wasserman, G. A., McReynolds, L. S., Lucas, C. P., Fisher, P., & Santos, L. (2002). The voice DISC-IV with incarcerated male youths: Prevalence of disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, *41*, 314–321.

Waters, E., Merrick, S., Treboux, D., Crowell, J., & Albersheim, L. (2000). Attachment security in infancy and early adulthood: A twenty-year longitudinal study. *Child Development*, *71*, 684–689.

Weiss, B., & Garber, J. (2003). Developmental differences in the phenomenology of depression. *Development and Psychopathology*, *15*, 403–430.

Wilson, S. J., & Lipsey, M. W. (2007). School-based interventions for aggressive-disruptive behavior: Update of a meta-analysis. *American Journal of Preventative Medicine*, *33*, 130–143.

Yu-Ling Chiu, Y. L., Ryan, J. P., & Herz, D. C. (2011). Allegations of maltreatment and delinquency: Does risk of juvenile arrest vary substantiation status? *Children and Youth Services Review*, *33*, 855–860.

Zabel, R. H., & Nigro, F. A. (2001). The influence of special education experience and gender of juvenile offenders on academic achievement scores in reading, language, and mathematics. *Behavioral Disorders*, *26*, 164–172.

Zhang, D., Hsu, H. Y., Katsiyannis, A., Barrett, D. E., & Ju, S. (2011). Adolescents with disabilities in the juvenile justice system: Patterns of recidivism. *Exceptional Children*, *77*, 283–289.