

A longitudinal examination of predictors of delinquency: An analysis of data from the Mobile Youth Survey

Wesley T. Church II ^{a,*}, Sara Tomek ^{b,1}, Kathleen A. Bolland ^{a,2}, Lisa M. Hooper ^{b,3}, Jeremiah Jagers ^{a,4}, John M. Bolland ^{c,5}

^a University of Alabama, School of Social Work, Box 870314, Tuscaloosa, AL 35487, United States

^b University of Alabama, Department of Educational Studies in Psychology, Research Methodology, and Counseling, Box 870231, Tuscaloosa, AL 35487, United States

^c University of Alabama, College of Human and Environmental Studies, Box 870158, Tuscaloosa, AL 35487, United States

ARTICLE INFO

Article history:

Received 11 July 2012

Received in revised form 13 September 2012

Accepted 14 September 2012

Available online 23 September 2012

Keywords:

Delinquency

Self-worth

Family cohesion

Peer influences

Longitudinal study

ABSTRACT

This study analyzed the relationships among adolescent delinquency, self-worth, peer influence, and family cohesion (i.e., maternal and paternal warmth). The longitudinal analysis identified how these relationships develop and change through adolescence. Using data from the Mobile Youth Survey, a 14-year longitudinal study of high-poverty, primarily Black American youths living in Alabama ($N = 5400$), delinquency, self-worth, and peer influence were analyzed in linear growth models. Results from these three linear growth models are presented. Findings include a significant increase in delinquency over time for the adolescents in the study and significantly lower rates of delinquency overall for females than males. Delinquency was also found to have negative relationships to both parental warmth and self-worth, with higher levels leading to decreased delinquency. Peer influence was found to have a gender effect, with males exhibiting steady rates, while females exhibit an increase in peer influence over time. Furthermore, maternal warmth and self-worth are also found to increase the rates of peer influence as well as significantly increasing self-worth.

© 2012 Elsevier Ltd. All rights reserved.

1. Introduction

Despite decades of research and intervention, juvenile delinquency remains a social problem in modern American culture. Studies have shown that deviant behavior in adolescence leads to an increased likelihood of adult criminal behavior (Haynie, 2001; Patterson, DeBaryshe, & Ramsey, 1989). The literature abounds with empirical support for several causal factors. Although early research was often limited by its cross-sectional nature and attention to few variables, more recent research has been more complex, with studies based on longitudinal data and examining variables such as gender, ethnicity, and socioeconomic status. Still, such research is in its relative infancy and additional research is needed to increase knowledge regarding the various pathways through which certain juveniles become classified as delinquent.

Although relatively little research has investigated predictors of delinquency among youths living in extreme poverty, some factors,

such as inconsistent or low levels of parental monitoring and association with deviant peers have emerged as promising for further investigation for these youths as well as youths living in other situations (Brody et al., 2006; Hoeve et al., 2009; Murphy, Brecht, Huang, & Herbeck, 2012; O'Donnell, Richards, Pearce, & Romero, 2012; Simons & Burt, 2011). In contrast, the literature on the causes and consequences of delinquent behavior among Black American adolescents is extensive. For example, peer relationships (O'Donnell et al., 2012), family structure and relationships (Farrington, Jolliffe, Loeber, Stouthamer-Loeber, & Kalb, 2001), and self-image (McMahon & Watts, 2002) have been cited as factors associated with deviant behavior in Black American adolescents, although few models have been developed to explore the *strength* of these associations.

It is likely that age, gender, and ethnicity influence how various factors, both independently and interactively, influence delinquent behaviors among adolescents (Daigle, Cullen, & Wright, 2007; Ge, Brody, Conger, Simons, & Murry, 2002; O'Donnell et al., 2012; Whaley, Hayes-Smith, & Hayes-Smith, 2010). Association with delinquent peers, for example, has been found to be a better predictor of delinquency for males than for females (Piquero, Gover, MacDonald, & Piquero, 2005). Across gender and ethnicity, the effects of relationships with parents and problem behaviors have been shown to be partially mediated by school success and time spent with friends (Pilgrim, Schulenberg, O'Malley, Bachman, & Johnston, 2006). In addition, gender differences in rates of juvenile delinquency and in factors that predict juvenile delinquency have been reported (Fagan & Wright,

* Corresponding author. Tel.: +1 205 348 3933.

E-mail addresses: wchurch@sw.ua.edu (W.T. Church), stomek@bamaed.ua.edu (S. Tomek), kbolland@sw.ua.edu (K.A. Bolland), hooper@bamaed.ua.edu (L.M. Hooper), jwjagers@crimson.ua.edu (J. Jagers), jbolland@ches.ua.edu (J.M. Bolland).

¹ Tel.: +1 205 348 5736.

² Tel.: +1 205 348 3926.

³ Tel.: +1 205 348 5611.

⁴ Tel.: +1 270 293 8594.

⁵ Tel.: +1 205 348 9953.

2012; Jennings, Piquero, Gover, & Pérez, 2009; Neumann, Barker, Koot, & Maughan, 2010; Snyder et al., 2008).

In this study, we use longitudinal data from the Mobile Youth Survey (Bolland, 2004) to explore the effects of self-worth, peer influence, and family cohesion on delinquency in a sample of black adolescent males and females living in extreme poverty. By focusing on strengths of associations rather than just existence of associations, the study fills a gap in the literature.

Studies of delinquency often have been framed in one or more of three criminological theories: differential association/social learning; social control/social bonding, and general strain (Cullen, Wright, & Blevins, 2006; Lilly, Cullen, & Ball, 2007). Research that is framed within a particular theory, however, focuses on the variables important to that theory; such research may, therefore, fail to examine the influence of other variables important to the phenomena of interest (Daigle et al., 2007). We have avoided this limitation by selecting variables that have been demonstrated to be important, rather than by attempting to test one or more theories. We call upon these theories; however, to explain the findings, building a framework that links individual choice and environmental influence.

2. Literature review

There is a consensus that deviant behavior in adolescence leads to an increased likelihood of adult criminal behavior (Haynie, 2001; Patterson et al., 1989). There are fewer consensus; however, regarding causal links to adolescent negative behavior. Although the nature of a youth's peer relationships (Clark, 2007; Haynie & Osgood, 2005), social and family environments and relationships (Church, Wharton, & Taylor, 2009), and self-image (Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005; Giordano, 2003; Ostrowsky, 2010) have been cited as factors associated with deviant behavior in juveniles, few models have been developed to explore the strength of these associations and much of the research that has led to these conclusions has been cross-sectional.

2.1. Peer relationships

The influence of peer networks on delinquent activities among adolescents has been the focus of much research. Keijsers, Branje, Hawk, Schwartz, Frijns et al. (2012) found that an increased amount of time spent with delinquent peers increases the chance that an adolescent will engage in delinquent activities. These results are reinforced by research that finds that delinquent children seek out other delinquent children for friendship (Knecht, Snijders, Baerveldt, Steglich, & Raub, 2010). Among Black American youths, peer deviance has been shown to mediate the effects of parental monitoring, especially among females (O'Donnell, Richards, Pearce, & Romero, 2012).

2.2. Family structure and relationships

Research supports the connection between deviant behavior and family factors, such as family stability, poverty, and the availability of resources (Church et al., 2009; Farrington et al., 2001; Feldman & Gehring, 1988; Gove & Crutchfield, 1982; Loeber & Farrington, 2000). A number of researchers have focused on how family structure and family relationships affect juvenile delinquency, and some have found that family factors play a role in peer relations as well (Deutsch, Crockett, Wolff, & Russell, 2012). For example, family strain in early life can prepare juveniles to enter deviant peer groups, and these peer groups are where youths are first exposed to antisocial behaviors and substance use (Beg, Casey, & Saunders, 2007; Patterson et al., 1989).

Beg et al. (2007) research indicates that strong family cohesion might protect adolescents from the influence of deviant peers, particularly as they transition through school and begin to form their self-image in relation to their peers. Deutsch et al.'s (2012) research supports the influence of parental control on peer relationships and deviance. The critical role

the family plays in juvenile delinquency has been said to be the single most replicated finding in the juvenile deviance literature (Gove & Crutchfield, 1982). Family influences on delinquency, however, are not limited to effects on peer relations. Snyder, Edwards, McGraw, Kilgore, and Holton (1994) point out that family relations have an effect on early childhood development and others have noted that the establishment of parent–child relations may influence the development of conduct problems (Cooper, McLanahan, Meadows, & Brooks-Gunn, 2009).

Youths who have poor relationships with their parents, or who reside in homes where adults are poor role models for problem solving and prosocial behaviors, are more likely to turn to deviant peer groups and are more likely to engage in delinquent behavior (Cooper et al., 2009; Patterson et al., 1989). Patterson and colleagues argue that “disrupted parent practices are causally related to child antisocial behavior” (p. 330), suggesting that disruption to parenting practices is the variable of consequence, not family structure per se. Additional research also indicates that family structure, while important, is not as important as parenting practices (Griffin, Botvin, Scheier, Diaz, & Miller, 2000).

Maternal support, for example, is among the parenting practices that have been shown to be influential in delinquency, both for African American and European American youths (Deutsch, Crockett, Wolff, & Russell, 2012). The involvement of nonresident fathers is another variable that has been shown to influence delinquency. Nonresident fathers' involvement may buffer the negative effects of living in single mother households, regardless of racial identification of the participants (Thomas, Farrell, & Barnes, 1996). The 2010 U.S. Census estimates that 49.7% of Black American children live with their mother only, and further research indicates that youths coming from two-parent households are less likely to engage in delinquent behavior than those coming from one-parent households (Demuth & Brown, 2004). The Pittsburgh Youth Study, a three-wave longitudinal study of 500, predominantly Black American (53%–56%), adolescent males offers some explanation of generational offending as well as familial criminality and the prediction of future offending in young men (Farrington et al., 2001). The authors conclude that if relatives had been arrested, one could predict an adolescent's re-disposition to delinquency as well, acknowledging environmental factors, including law enforcement and court bias toward criminal families as well as genetic mechanisms (Farrington et al., 2001).

2.3. Self-worth

Relationships between self-worth and delinquent behavior are well discussed in the literature, with much attention to self-esteem and violence among delinquent youths (Church et al., 2009; Ostrowsky, 2010). Narcissism and low self-esteem, for example, may predict delinquent behavior (Barry, Grafeman, Adler, & Pickard, 2007). Among Black American youths, feelings about one's own ethnic identity can shape self-worth (McMahon & Watts, 2002). Additionally, poor parental support may influence self-worth and delinquency in Black American adolescents (Bean, Barber, & Crane, 2006; Church et al., 2009). Other developmental phenomena such as puberty, development of self, and peer influences also play a major role in self-worth (Steinberg & Morris, 2001).

The adolescent delinquency literature emphasizes the importance of family, family environment, social environment, and self-worth in the development or prohibition of deviant behavior. Filling a gap in the literature base, this study, uses longitudinal data to investigate the roles of peer influences, family cohesion, and self-worth on the development of juvenile delinquency. The basis for our relational analyses is a model previously tested by Church et al. (2009). This model, shown in Fig. 1, shows the predicted relationships between delinquency, self-worth, peer influence, and family cohesion. The previous test used cross-sectional data, whereas the present analysis uses longitudinal data. The model leads us to the following three research questions:

RQ #1: How do self-worth, peer influence, and family cohesion affect delinquency over time?

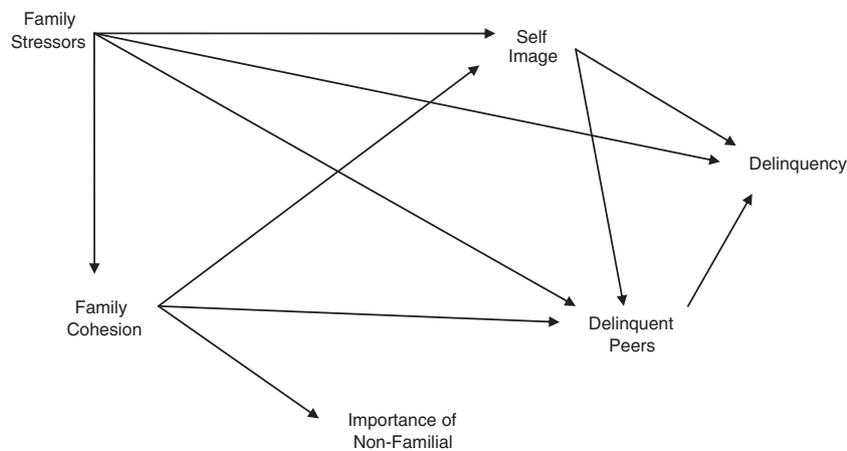


Fig. 1. Path model from Church et al.

RQ #2: How do self-worth and family cohesion affect peer influence over time?

RQ #3: How does family cohesion affect self-worth over time?

3. Method

3.1. Sample

The Mobile Youth Survey (MYS) is a 14 year longitudinal study of adolescents living in low-income neighborhoods in the Alabama port city of Mobile, as well the neighboring town of Prichard (Bolland, 2004). The current analysis includes data from 5400 adolescents.

The MYS data were collected annually between 1998 and 2011 from a total of 10,694 youths aged 9–19. In the current study, participants were included if they had at least two data points. Additionally, data points at ages 9, 10, and 19 were excluded from analyses due to a small number of observations at these age values. Data from the year 2011 were not available for analysis. This left a final sample of 5400 participants with multiple data points from ages 11 through 18.

Among the 5400 participants, 2730 were male (50.4%) and 2680 were female (49.6%). The sample consisted predominantly of Black American youths ($n = 5160$, 95.5%), with few Hispanic youths, ($n = 224$, 4.2%) and even fewer White American youths ($n = 16$, 0.3%), all of whom had qualified to receive free lunches at some point during their participation in the study, highlighting the poverty levels of this sample. While one argument might be to exclude the adolescents in the sample that were either Hispanic or White American, because this paper is focused on the high-poverty sample, we did not make that exclusion. Racial/ethnic differences will not be analyzed, but it should be noted that this sample has little racial/ethnic diversity.

3.2. Procedures

The MYS study is a multiple cohort design where new cohorts are added each year and tracked thereafter. Full details regarding the methodology and sampling procedures are described elsewhere (Bolland, 2004). Within several neighborhoods, the MYS research team identified homes where youths between the ages of 10 and 18 during the calendar year resided (youths within 3 months of their 10th or 18th birthday were allowed to participate, thus yielding a sample of youths aged 9 to 19). Once identification was verified, investigators attempted to make contact with each of these targeted participants. Once contacted, the youth and his or her adult caregiver were informed about the purpose of the survey and the youth was invited to participate (parental consent and youth assent were obtained; the study received IRB approval). When the youth

and his or her caregiver agreed that the youth could participate, a group administration of the survey was scheduled. The questions were read aloud to groups of 20 to 30 participants, and they were asked to mark their answer to each question in the survey booklet. Participants who required individual attention were assisted one-on-one, however most participants completed the survey independently. The survey administration procedure took approximately 1 h and each participant received an incentive of \$10 prior to 2005 and \$15 in subsequent years (Bolland, 2004).

3.3. Measures

3.3.1. Delinquency of youths

Delinquency of the adolescent was measured by calculating a summative scale of 18 items from the MYS questionnaire. The first six questions addressed whether the adolescent had ever carried a gun, carried a knife, pulled a gun or knife on someone, cut or shot someone, had been arrested, or had been involved in gang activity over the previous year. A sample item is, "Have you ever carried a gun?" Participants responded with a yes or no for these items. Additional questions were asked about the recency of the events. For both the gun and knife carrying, questions were asked about the previous year, 90 days, 30 days, and 7 days. Pulling a gun or knife was asked about the previous year, 90 days, and 30 days, while cutting or shooting someone was asked about the current year. A sample item is, "In the past 3 months (90 days), did you carry a gun?" For each of these additional 9 items, responses were collected with three options, "no", "yes, just once", or "yes, more than once." One additional question was asked regarding being arrested that looked at recency within the last year, but responses were dichotomized to a yes or no for the current analysis. Two additional questions addressed gang activity after the initial question of ever being involved in a gang: the first asked whether youths were currently involved in a gang and the second asked whether they hang out with gang members. The three gang questions (including the first about whether they had ever been involved in a gang and the two follow-up questions) were combined on a 4 point ordinal scale before they were added to the sum. The final summative scale, calculated from the 15 individual items and the 3 item scale yielded a range between 0 and 28 points, with higher values indicating greater delinquency. The Cronbach's alpha reliability of these collective questions was calculated to be 0.77.

3.3.2. Peer influence

Peer influence on delinquency was measured by creating a summative scale of six items. These questions assessed the amount of pressure applied by friends to participate in delinquent activities. A

sample item is, “How many of your friends think you are a punk if you don’t carry a weapon?” Survey participants were given three options: most of them, some of them, or almost none of them. The scale thus ranged from 6 points to 18 points, with higher values indicating higher peer influence. The reliability of this measure was calculated to be 0.86.

3.3.3. Self-worth

Self-worth has been discussed as both a trait and a state, with some aspects of self-worth being relatively stable and other aspects varying over time or situation (Harter & Whitesell, 2003). For this study, we used a global conception of self-worth measured by a summative scale of 9 items, adapted from the Perceived Competence Scale for Children (Harter, 1982). A sample question is, “select one of the following: I am usually unhappy with myself or I am usually happy with myself.” Although the original 28-item scale included Likert-type response categories, in this study the responses were dichotomized to reduce the response burden of the long survey instrument. The reliability was 0.65, which is lower than the 0.85 rate typical of the original scale.

3.3.4. Family cohesion

Two measures of family cohesion were used: maternal warmth and paternal warmth subscales, both created by Lamborn, Mounts, Steinberg, and Dornbusch (1991). Six questions were asked for each parental figure. The individual in question did not need to be the youths’ biological father or mother, but rather the person they saw as the father figure and mother figure in their life. A sample item from the warmth toward the mother figure scale is, “I can usually count on her to help me out if I have some kind of problem.” The questions are identical for the father figure. Participants responded using a dichotomous scale of agree or disagree. Final measures for both scales ranged between 0 and 6 points, with higher values indicating more warmth toward the mother or father. Reliability was adequate for the two measures, calculated to be 0.80 and 0.82, respectively, in the MYS sample.

3.3.5. Age and gender

Age was measured as the age in years at the time of each survey administration, as reported by the adolescent. The ages ranged from 11 to 18, with the variable centered at age 11. Gender was also included as a dichotomous covariate in the analyses.

3.4. Data analysis

The analysis examines the longitudinal associates between the variables in the model proposed by Church et al. (2009). With this longitudinal data set, each of the endogenous variables was analyzed in a separate linear growth model. Ideally, a full model would have been run to include all six of the main variables of interest, delinquency, self-worth, peer influence on delinquency, maternal warmth, paternal warmth, and gender, over time, using latent growth modeling in a structural equation modeling framework. However, due to the presence of seven time points for each of the variables, that would yield a full model with over 200 paths to be estimated and interpreted. Additionally, either full panels of data or imputation of missing values would be required for estimation. Rather, our approach was to fit three separate longitudinal growth models using a hierarchical linear modeling framework. This approach is more straightforward in its analysis and interpretation, while still allowing us to examine the longitudinal relationships in this set of variables.

According to Singer and Willett (2003), growth models can be used for all individuals as long as they have at least one observation in the data set; however, these individuals will be contributing only to the group parameter estimates, not the individuals’ parameter estimates. Due to the high prevalence of adolescents in this study with only a

single time observation (over 50%), these observations were removed to allow for more precise model estimation. No imputation methods were implemented because the linear growth model estimation procedure using maximum likelihood is robust to missing data within the analyses and because we had eliminated adolescents with fewer than two data points.

For this study, we fit three separate linear growth models with the three dependent variables of delinquency, peer influence on delinquency, and self-worth. The unconditional growth model, using the Singer and Willett (2003) notation, is as follows:

$$\text{Level 1 : } Y_{ij} = \pi_{0i} + \pi_{1i} * \text{age} + \epsilon_{ij}$$

$$\text{Level 2 : } \pi_{0i} = \gamma_{00} + \zeta_{0i}$$

$$\pi_{1i} = \gamma_{10} + \zeta_{1i}$$

Each of the four predicting factors in the analyses (peer influence on delinquency, self-worth, maternal warmth, and paternal warmth) is added to the Level 1 portion of the model as time-varying predictors. For example, we allow the self-worth measures to vary across all time points. As such, these four variables are added to the Level 1 portion of the model, with random variances for each added to the Level 2 portion of the model. Our covariate of gender was added to each of the Level 2 random effects to test for its existence as a covariate for each variable present in Level 1. Additionally, non-linear trends were also explored by adding both a quadratic and cubic age term to the Level 1 model. However, these parameters were not significant, indicating the linear trend to be the best fit to the data. All analyses were conducted using Proc Mixed with full information maximum likelihood in SAS 9.2 software (SAS Institute Inc., Cary, N.C.).

4. Results

4.1. Model 1: delinquency

A linear growth model was estimated with delinquency of the individual as the dependent variable, peer influence on delinquency, self-worth, warmth toward the mother, and warmth toward the father as time-varying covariates, and gender as a time-invariant covariate. Non-significant terms were removed from the final model. Estimates for the unconditional growth model and the final conditional model are shown in Table 1.

Table 1
Linear growth model of delinquency of the adolescent.

Parameter	Unconditional growth model		Full model	
	Estimate	SE	Estimate	SE
Intercept	2.327***	0.095	8.732***	0.509
Peer inf.			-0.115***	0.015
Self-worth			-0.390***	0.053
Mom			-0.358***	0.059
Gender			-2.885***	0.522
Gender*self-worth			0.104**	0.047
Gender*mom			0.260**	0.079
Age	0.497***	0.026	0.987***	0.101
Age*gender			-0.207***	0.053
Age*self-worth			-0.039**	0.013
Age*dad			-0.021**	0.008
Variance (intercept)	7.407***	0.915	4.026***	0.893
Variance (age)	0.479***	0.065	0.238***	0.066
Error variance	15.775***	0.275	14.787***	0.304
Deviance	90,881.0		71,179.6	

** p<.01.

*** p<.001.

The unconditional growth model demonstrates a significant increase in delinquency over time for the adolescents in the study, $\gamma = 0.50$, $t(4264) = 374.84$, $p < .001$. The conditional growth model shows a statistically significant improvement in fit over the unconditional growth model, $\chi^2(9) = 19,701.4$, $p < .001$. This significant growth in delinquency is also present in the final model, $\gamma = 0.99$, $t(3402) = 96.38$, $p < .001$. We find this growth rate to be moderated by gender, as we find a significant interaction between age and gender, $\gamma = -0.21$, $t(3265) = 15$, $p < .001$. Males have a higher growth in delinquency than do females. Gender also appears as a main effect, $\gamma = -2.89$, $t(3265) = 30.52$, $p < .001$, indicating that males have higher delinquency rates at age 11 than do females. From these two effects, we see that males exhibit higher delinquency at age 11 and then exhibit a higher growth in delinquency throughout their adolescent years than do females.

The amount of maternal warmth had a significant effect on delinquency, $\gamma = -0.36$, $t(3265) = 37.54$, $p < .001$. Those adolescents with higher maternal warmth exhibited lower overall delinquency. Gender moderated the effect of maternal warmth at age 11, as seen by the significant interaction effect, $\gamma = 0.10$, $t(3265) = 10.7$, $p = .001$. The impact of maternal warmth on the delinquency of the adolescent was greater for males, with greater maternal warmth predicting lower delinquency at age 11. While this trend is similar in direction for females, the effect is smaller. Paternal warmth had a significant effect on the change in delinquency over time, $\gamma = -0.02$, $t(3265) = 7.57$, $p = .006$. Higher paternal warmth results in less of an increase in delinquency across adolescence. This effect was found to be identical for both genders.

Additionally, self-worth was found to have a significant effect on delinquency at age 11, $\gamma = -0.39$, $t(3265) = 53.3$, $p < .001$, as well as having a significant impact on delinquency over time, $\gamma = -0.04$, $t(3265) = 8.74$, $p = .003$. Adolescents having higher levels of self-worth will not only have lower delinquency at age 11, but they will also have significant slower rates of increase in their delinquency rates as they age. The rate of increase in delinquency as they age is proportional to their amount of self-worth, meaning the higher the self-worth, the less the increase. Peer influence also had an effect on the delinquency of the adolescents, $\gamma = -0.12$, $t(3265) = 56.69$, $p < .001$. Surprisingly, the coefficient was negative, indicating that adolescents not engaged in delinquent behaviors receive pressure from their peers to participate in delinquent behavior.

4.2. Model 2: peer influence

A linear growth analysis was performed using peer influence as a dependent variable, self-worth, maternal warmth, and paternal warmth as time-varying covariates, and gender as a time-invariant covariate. Non-significant terms were removed from the final model. Estimates for the unconditional growth model and the final conditional model are shown in Table 2.

The unconditional growth model shows a significant increase in reported levels of peer influence over time, $\gamma = 0.06$, $t(4455) = 16.06$, $p < .001$. The conditional growth model shows a statistically significant improvement in fit over the unconditional growth model, $\chi^2(6) = 4784.4$, $p < .001$. Interestingly, in the final model, we find that age itself is not significant, $\gamma = 0.001$, $t(4283) = 0.00$, $p = .96$, but rather is moderated by gender, $\gamma = 0.07$, $t(4925) = 6.18$, $p = .013$. These effects show that females see an increase in the amount of peer influence, while the peer influence for males remains relatively stable. At age 11, females report a higher level of peer influence than their male counterparts, $\gamma = 1.83$, $t(4925) = 47.20$, $p < .001$. From these two results we see that not only are females receiving higher peer pressure at age 11, but this peer influence will increase steadily as they get older. Males are receiving less pressure from peers, with no significant increase over time.

In this model, self-worth also has a significant effect on peer influence, $\gamma = 0.26$, $t(4925) = 203.88$, $p < .001$. This effect is also moderated by gender, $\gamma = -0.06$, $t(4925) = 6.62$, $p = .01$. Males show an

Table 2
Linear growth model of peer influence.

Parameter	Unconditional growth model		Full model	
	Estimate	SE	Estimate	SE
Intercept	15.659***	0.059	13.039***	0.192
Self-worth			0.257***	0.018
Gender			1.830***	0.266
Mom			0.129***	0.028
Gender* mom			-0.123**	0.040
Gender* self-worth			-0.063*	0.024
Age	0.058***	0.014	0.001	0.020
Gender* age			0.070*	0.028
Variance (intercept)	3.285***	0.343	2.918***	0.327
Variance (age)	0.081***	0.021	0.073***	0.020
Error variance	6.884***	0.021	6.516***	0.106
Deviance	78,057.7		73,273.3	

* $p < .05$.

** $p < .01$.

*** $p < .001$.

increase in peer influence as their self-worth increases. Interestingly, the opposite effect is shown for females, with increases in self-worth resulting in decreasing amounts of peer influence on delinquency.

Maternal warmth also has a significant effect on the peer influence measure, $\gamma = 0.13$, $t(4925) = 20.49$, $p < .001$. This effect is also moderated by gender, $\gamma = -0.12$, $t(4925) = 9.57$, $p = .002$. The males in the sample exhibit a positive relationship between maternal warmth and peer influence, with increases in maternal warmth leading to an increase in peer influence. For females, however, the level of peer influence on delinquency remained steady irrespective of the level of maternal warmth. Paternal warmth was not significant in this model.

4.3. Model 3: self-worth

A linear growth model was estimated with self-worth as the dependent variable, maternal warmth and paternal warmth as time-varying covariates, and gender as a time-invariant covariate. Non-significant terms were removed from the final model. Estimates for the unconditional growth model and the final conditional model are shown in Table 3.

The unconditional growth model shows a significant increase in self-worth over time for the adolescents in the study, $\gamma = 0.11$, $t(4541) = 136.11$, $p < .001$. The conditional growth model shows a statistically significant improvement in fit over the unconditional growth model, $\chi^2(4) = 12,443.7$, $p < .001$. In the final model, we do see this significant increase in self-worth over time for adolescents, $\gamma = 0.11$, $t(3740) = 122.23$, $p < .001$. Unlike the previous two models,

Table 3
Linear growth model of self-worth of the adolescent.

Parameter	Unconditional growth model		Full model	
	Estimate	SE	Estimate	SE
Intercept	6.119***	0.038	5.004***	0.090
Dad			0.088***	0.015
Mom			0.125***	0.018
Gender* mom			0.087***	0.019
Gender* dad			-0.059**	0.020
Age	0.107***	0.009	0.109***	0.010
Variance (intercept)	2.267***	0.143	2.918***	0.153
Variance (age)	0.061***	0.008	0.073***	0.009
Error variance	2.302***	0.037	6.516***	0.041
Deviance	65,707.6		53,263.9	

** $p < .01$.

*** $p < .001$.

these growth rates are not moderated by gender, rather, they are identical for the two genders. There are no moderating effects of the increase in self-worth over time. What does change in this model is the self-worth at age 11. We find a significant effect of maternal warmth, $\gamma = 0.13$, $t(3978) = 46.15$, $p < .001$, as well as for paternal warmth, $\gamma = 0.09$, $t(3978) = 34.27$, $p < .001$. Both of these effects are also moderated by gender, as seen by the interactions with gender and maternal warmth, $\gamma = 0.09$, $t(3978) = 20.01$, $p < .001$, as well as with gender and paternal warmth, $\gamma = -0.06$, $t(3978) = 8.82$, $p = .003$. Adolescents with greater maternal warmth exhibit higher self-worth ratings. Although maternal warmth is positively related to self-worth for both males and females, the relationship is stronger for females. Paternal warmth is also positively related to self-worth for both males and females, with a stronger relationship for males. The same gender parent has greater influence on the self-worth of the adolescent. Self-worth of the adolescent is strongly predicted by their beginning self-worth at age 11, as all groups experience identical rates of increase.

5. Discussion

In this study, we investigated several factors that have been shown to be associated with adolescent delinquency. Using 13 waves of data from over 5000 adolescents aged 11–18; we estimated growth models for three outcomes: delinquency, peer influence on delinquency, and self-worth. Family cohesion (i.e., maternal and paternal warmth) and gender were covariates in each model. Overall, results from this study are consistent with previous research findings that among adolescents who exhibit delinquent behaviors, delinquency tends to increase with age (Loeber, Stouthamer-Loeber, & Green, 1991), with males beginning delinquent acts at a younger age (Loeber et al., 1991) and exhibiting more delinquency than females (Kroneman, Loeber, & Hipwell, 2004); delinquent peers are positively related to delinquency; and family cohesion (Church et al., 2009) and self-worth are negatively related to delinquency. Also consistent with the literature, we found that for both males and females, self-worth tends to increase with age (Mears, Ploeger, & Warr, 1998). We also found that peer influence on delinquency remained steady for males but increased with age for females. Within this sample of adolescents, gender, family cohesion, peer influences, and self-worth were all related to juvenile delinquency, as either main effects or interaction effects.

It is important to note that the sample in this study was homogeneous with respect to socioeconomic status; all the adolescents lived in extreme poverty. In addition, the overwhelming majority of the sample was Black American. In this study, therefore, the differences in influences on delinquency cannot be attributed to ethnicity or socioeconomic status nor to interactions of those variables with other variables.

Although we did not design this study to test theories related to delinquency, several theories can be helpful in explaining the results. As several theorists have mentioned, social learning/differential association theory and social control/social bonding theory can be viewed as complementary rather than competing (Alarid, Burton, & Cullen, 2000). Social cohesion/social disorganization and strain theories can also be helpful in understanding delinquent behavior among adolescents living in extreme poverty.

Social learning/differential association theory states that adolescents learn, through social interactions, to look favorably upon delinquent behaviors; they also learn how to commit delinquent acts (Akers & Jensen, 2006; Hoffmann, 2002; Sutherland, 1939). The theory predicts that an individual may choose a criminal path when the individual perceives the balance of societal norms for breaking laws or rules to exceed those for abiding by laws or rules; he/she anticipates more rewards and fewer consequences for breaking laws or rules than for abiding by them. In contrast, social control/social bonding theory holds that individuals tend to abide by laws or rules (Gottfredson & Hirschi, 2003; Hirschi, 1969). According to this theory,

typically individuals have a stake in their community and have internalized moral codes. These individuals therefore tend to avoid deviant acts, unless processes of socialization or social control dictate otherwise. The importance of family and school as agents of socialization and control is particularly important in social control/social bonding theory. A major difference in the two theories is that social learning/differential association theory views adolescents as neutral with respect to delinquency, unless and until they learn (through modeling) to favor delinquency, whereas social control/social bonding theory views adolescents as avoiding delinquency unless and until they are socialized (through social control) to favor delinquency. Another difference is that social learning/differential association theory views individuals as acting in concert with the social norms they value whereas social bonding/social control theory views individuals as committing delinquent or criminal acts because they have few ties to social norms. According to both theories, however, morality is created in the construction of social order, where costs and consequences are assigned to certain choices and some are defined as evil, immoral, and/or illegal. Together, social learning/differential association theory and social control/social bonding theory address both the initiation and the persistence of socially deviant behavior. In this integrated framework, for adolescents who turn to a delinquent path, the cultural transmission of the importance of deviant values exceeds the importance of law-abiding values, and the environment provides rewards for deviant behavior and does not provide incentive for any change in the perceived relative value of prosocial and antisocial behaviors.

According to the general strain theory, when individuals are in aversive situations and see no means of escape, they experience strain and they may engage in behavior to lessen the strain—that behavior may be delinquent or criminal (Agnew, 1992, 2006). An individual with alternative goals, adequate coping skills, and social bonds may avoid delinquency, whereas an individual with opportunities for delinquent behavior, pro-delinquency beliefs, and lack of social control is likely to embark upon a trajectory of delinquency. More stressful life events tend to occur in communities that have a combination of high poverty, high unemployment, and low education (Simons, Johnson, Conger, & Lorenz, 1997). According to the social disorganization theory (Shaw & McKay, 1942), in such neighborhoods, it is difficult for residents to organize to achieve common goals or solve common problems. It is reasonable to assume that many adolescents in these communities experience strain, and those who have not developed pro-social goals, socially acceptable coping skills, and social bonds are likely to embark on a delinquent path as a means of coping with the strain; especially those adolescents who associate with delinquent peers, have low self-worth, and do not have family support. Although we did not directly test the social disorganization theory or strain theory, our results are consistent with studies that have related delinquent behaviors to neighborhood disadvantage (Cantillion, 2006; Gorman-Smith, Tolan, & Henry, 2000; Jones & Lynam, 2009; Kingston, Huizinga, & Elliott, 2009; Vazsonyi, Cleveland, & Wiebe, 2006; Wikstrom, Ceccato, Hardie, & Treiber, 2010).

Theories of social learning and social control and theories of strain and social disorganization can help to illuminate our findings regarding the relationships among adolescent delinquency, family relationships, peer influence on delinquency, and self-worth.

Family relationships and their influence on delinquency have been measured in several ways. In this study, adolescents' self-reports regarding the maternal and paternal warmth in their lives were used as measures of family cohesion. We found that higher maternal warmth and higher paternal warmth were related to lower rates of delinquency for both males and females, with the relationship becoming stronger over time. The impact of maternal warmth, however, was greater for males than for females. The relationship between warmth and delinquency demonstrates that the more an adolescent feels connected to his/her family the less likely he/she is to begin and sustain delinquent activity. This finding supports previous conclusions that youths with

greater parental/familial support have lower levels of delinquency (Church et al., 2009). It is instructive to consider results regarding family relationships along with results regarding self-worth. Higher self-worth is related to lower delinquency for both males and females, with the impact greater for males than for females. Adolescents reporting family cohesion (both maternal warmth and paternal warmth) also reported higher self-worth. For females, the effect of maternal warmth on self-worth was higher than for males, whereas for males, the effect of paternal warmth on self-worth was higher than for females. Family cohesion and self-worth can help youths develop socially acceptable methods of coping with the strain of living in extreme poverty. Family cohesion and self-worth can also help youths to avoid the influence of delinquent peers.

In our study, both males and females who reported that their peers influenced their delinquency had higher rates of delinquency than adolescents who reported less peer influence. The influence of delinquent peers grew steadily over time for females, but remained steady for males. Peer influence on delinquency is inversely related to self-worth for females, but positively related for males. Maternal warmth and peer influence on delinquency are positively related for males, but are not significantly related for females. Poor parental support may influence self-worth and delinquency (Bean et al., 2006; Church et al., 2009).

The relationship between delinquency and peer influence on delinquency is counterintuitive: although the youths in the sample who were delinquent were associating with more delinquent peers, they saw themselves as less delinquent than their delinquent peers. This finding is consistent with Church et al.'s (2009) findings, in which youths with higher levels of perceived self-worth were less likely to be associated with delinquent peers and less likely to be delinquent.

Others have found that association with delinquent peers predicts delinquency better for males than for females (Piquero et al., 2005). Peer deviance has been shown to mediate the effects of parental monitoring, especially among females (O'Donnell et al., 2011). Family factors play a role in peer relations (Deutsch, Crockett, Wolff, & Russell, 2012). Family strain may result in adolescents spending more time with peers and if those peers are deviant, then those peers may influence the adolescents toward delinquency (Beg et al., 2007). In contrast, strong family cohesion could protect adolescents from the influences of deviant peers. Time spent with friends has been shown to be related to relationships with parents (Pilgrim et al., 2006).

Our findings of strong relationships among delinquency, family relationships, self-worth, and delinquent peers not only are consistent with previous research that demonstrated the existence of those relationships, but also suggest several points for intervention. The early age at which adolescents begin to engage in delinquency demonstrates the need for earlier intervention as well as longer, more sustained interventions with youths, especially boys, who are at risk for delinquency.

It is clear that how children see themselves plays a large role in their behavior. Youths who have higher self-worth are less likely to commit delinquent acts, demonstrating the importance of nurturing a youth's sense of self. Youths who believe they have worth are less likely to act outside of societal norms. Interventions that provide opportunities for youths to be successful are likely to contribute to their self-worth and to minimize their likelihood of developing anti-social values.

Family cohesion or, in the case of this study, youths' self-report of warmth toward one or more of their parents or parent-figures, has an effect on how youths view delinquency and delinquent behavior. The stressors that parents have in daily life shape their relationship with their child. Interventions that focus on specific stressors that are affecting the lives of parents should be considered when dealing with parents who have at-risk youths. Working with parents to facilitate good role modeling in decision making might be one point of intervention for at-risk children who might be exhibiting delinquent behaviors. Positive role models are vital in the development of children and having a

positive male role model has been shown to be a key indicator of success for at-risk youths in this country.

Our findings suggest that many delinquent youths associate with delinquent peers but view themselves as less delinquent than their delinquent peers (and perhaps as less delinquent than they actually are). These youths have a positive sense of self in that they perceive that they are "better" than the peers they deem more delinquent than themselves, regardless of the actual level of delinquency of the youth in question or of their peers. To follow the social work principle of "starting where the client is," social workers and others who work with adolescents must recognize that many youths see themselves as less delinquent than they actually are (according to society's definition of delinquency). Programs that provide the youth opportunities to be successful in socially-acceptable activities and to observe and learn from peers who are being successful in socially acceptable ways have potential for both reducing delinquency and increasing the consonance between the youth's perceptions of their delinquency and their actual delinquency. Finally, attention must be given to the profound effect that poverty and living in an economically disadvantaged area have on families and children. Individuals who live in an environment that perpetuates stress have a high chance of their children having that stress, which in children often leads to delinquent behavior. Not all youths in such environments engage in delinquent behavior, so it is also important to develop greater understanding of the "inner workings" of the families of youths at risk for delinquency. Appropriate and thorough assessments of both the child and the family can lead to improved services and outcomes for these children and their families.

Finally, attention must be given to the profound effect that poverty and living in an economically disadvantaged area have on families and children. Individuals who live in an environment that perpetuates stress have a high chance of their children having that stress, which in children often leads to delinquent behavior. Not all youths in such environments engage in delinquent behavior, so it is also important to develop greater understanding of the "inner workings" of the families of youths at risk for delinquency. Appropriate and thorough assessments of not only the child, but of the family, can improve services and outcomes for these children and their families.

6. Limitations and strengths

Several limitations of the study must be considered. First, while the current study set out to analyze relationships proposed by Church et al. (2009) in a longitudinal data set, the sample size was too small and the number of parameters was too large to estimate a full longitudinal structural model. As an alternative, each of the endogenous variables was analyzed in a separate linear growth model. This limits our results to the direct effects of the variables, as opposed to capturing all the longitudinal indirect effects as well. Still, our analyses enabled conclusions that add to the literature regarding predictors of delinquency and gender differences in delinquency and predictors of delinquency.

Another limitation is a result of the cognitive limitations of many of the adolescents in the sample. Their low school achievement scores (in 1999 the median SAT reading percentile score was 35 and the median SAT percentile score was 30), coupled with low IQ test scores (between 2005 and 2007, the Kaufman Brief Intelligence Test was administered to a subsample of nearly 500 MYS participants: the median IQ percentile score was 27), led us to question whether these individuals had the ability to differentiate among multiple response categories. This, coupled with the large number of questions, led to a decision to limit most responses to two categories (e.g., agree, disagree) rather than the more typical Likert-type response alternatives. This choice resulted in reduced variance in responses, with a likely reduction in the magnitude of associations among variables and lower levels of internal consistency within scales. The results, therefore, are likely more conservative than they

would have been if a greater number of response categories had been used.

Additionally, the MYS study contains data collected from a large population of at-risk youths. Because the sample is from a demographically homogeneous area, the results may not be generalizable to other populations. Another limitation is that the study does include missing observations. The panels are not fully complete for most of the adolescents (i.e. data collected at every age from 12 to 18). However, we have limited our analysis to those youths who participated in two or more data collection years (50% of the original data). Within our sample, 69% of subjects have three or more data points. From this, we know that our model estimation will be valid. Lastly, the reliability of self-worth (.65) was found to be much lower than is typically accepted in practice. The dichotomizing of this variable caused lower reliability measures. The difference between the Likert-type response scale and the dichotomized scale is currently being investigated.

The current study also has several strengths that are worth noting. First, this investigation is one of the first studies to explore these relations using a longitudinal methodology with a large sample and several waves of data. This allowed for the examination of change over time, which improves our understanding of this population. Second, the population that the sample was derived from is unique in that the participants are predominantly Black American, living below the poverty line, and living in low-income housing areas. This gives greater insight into the plight of youths living under these conditions, which affords us the opportunity to develop interventions to work with this population. Last, the data from this study come from 13 years of data. These youths have been tracked from most of their adolescent years, thus producing a plethora of meaningful data on this population.

References

- Agnew, R. (1992). Foundation for a general strain theory of crime and delinquency. *Criminology*, 30, 47–87.
- Agnew, R. (2006). General strain theory: Current status and directions for further research. In F. T. Cullen, J. P. Wright, & K. Blevins (Eds.), *Taking stock: The status of criminological theory*, Vol. 15. (pp. 101–123) New Brunswick, NJ: Transaction Publishers.
- Akers, R. L., & Jensen, G. F. (2006). The empirical status of social learning theory of crime and deviance: The past, present, and future. In F. T. Cullen, J. P. Wright, & K. Blevins (Eds.), *Taking stock: The status of criminological theory, advances in criminological theory*, Vol. 15. (pp. 37–76) New Brunswick, NJ: Transaction.
- Alarid, L. F., Burton, V. S., & Cullen, F. T. (2000). Gender and crime among felony offenders: Assessing the generality of social control and differential association theories. *Journal of Research in Crime and Delinquency*, 37, 171–199.
- Barry, C. T., Grafeman, S. J., Adler, K. K., & Pickard, J. D. (2007). The relations among narcissism, self-esteem, and delinquency in a sample of at-risk adolescents. *Journal of Adolescence*, 30(6), 933–942.
- Bean, R. A., Barber, B. K., & Crane, D. R. (2006). Parental support, behavioral control, and psychological control among African American youth: The relationships to academic grades, delinquency, and depression. *Journal of Family Issues*, 27(10), 1335–1355.
- Beg, M. R., Casey, J. E., & Saunders, C. E. (2007). A typology of behavior problems in preschool children. *Assessment*, 14, 111–128.
- Bolland, J. M. (2004). *Overview of the Mobile Youth Study*. Tuscaloosa: The University of Alabama, Institute for Social Science Research.
- Brody, G. H., Chen, Y.-F., Murry, V. M., Simons, R. L., Ge, X., Gibbons, F. X., et al. (2006). Perceived discrimination and the adjustment of African American youths: A five-year longitudinal analysis with contextual moderation effects. *Child Development*, 77(5), 1170–1189.
- Cantillon, D. (2006). Community social organization, parents and peers as mediators of perceived neighborhood block characteristics on delinquent and prosocial activities. *American Journal of Community Psychology*, 37, 111–127. <http://dx.doi.org/10.1007/s10464-005-9000-9>.
- Church, W. T., Wharton, T., & Taylor, J. K. (2009). An examination of differential association and social control theory: Family systems and delinquency. *Youth Violence and Juvenile Justice*, 7(1), 3–15.
- Clark, A. (2007). "It wasn't me, it was them!" Social influences in risky behavior by adolescents. *Journal of Health Economics*, 26(4), 763–784.
- Cooper, C., McLanahan, S., Meadows, S., & Brooks-Gunn, J. (2009). Family structure transitions and maternal parenting stress. *Journal of Marriage and Family*, 71, 558–574.
- Cullen, F. T., Wright, J. P., & Blevins, K. R. (2006). Introduction: Taking stock of criminological theory. In F. T. Cullen, J. P. Wright, & K. R. Blevins (Eds.), *Taking stock: The status of criminological theory, advances in criminological theory*, Vol. 15. (pp. 1–36). New Brunswick, NJ: Transaction.
- Daigle, L. E., Cullen, F. T., & Wright, J. P. (2007). Generality-specificity debate gender differences in the predictors of juvenile delinquency: Assessing the generality-specificity debate. *Youth Violence and Juvenile Justice*, 5(3), 254–286. <http://dx.doi.org/10.1177/1541204007301289>.
- Demuth, S., & Brown, S. L. (2004). Family structure, family process, and adolescent delinquency: The significance of parental absence versus parental gender. *Journal of Research in Crime & Delinquency*, 41(1), 58–81.
- Deutsch, A. R., Crockett, L. J., Wolff, J. M., & Russell, S. T. (2012). Parent and peer pathways to adolescent delinquency: Variations by ethnicity and neighborhood context. *Journal of Youth and Adolescents*, 41(8), 1078–1094.
- Donnellan, M. B., Trzesniewski, K. H., Robins, R. W., Moffitt, T. E., & Caspi, A. (2005). Low self-esteem is related to aggression, antisocial behavior, and delinquency. *Psychological Science*, 16, 328–335.
- Fagan, A. A., & Wright, E. M. (2012). The effects of neighborhood context on youth violence and delinquency: Does gender matter? *Youth Violence and Juvenile Justice*, 10(1), 64–82. <http://dx.doi.org/10.1177/1541204011422086>.
- Farrington, D. P., Jolliffe, D., Loeber, R., Stouthamer-Loeber, M., & Kalb, L. M. (2001). The concentration of offenders in families, and family criminality in the prediction of boys' delinquency. *Journal of Adolescence*, 24, 579–596.
- Feldman, S. S., & Gehring, T. M. (1988). Changing perceptions of family cohesion and power across adolescence. *Child Development*, 59(4), 1034–1045.
- Ge, X., Brody, G. H., Conger, R. D., Simons, R. L., & Murry, V. M. (2002). Contextual amplification of pubertal transition effects on deviant peer affiliation and externalizing behavior among African American children. *Developmental Psychology*, 38, 42–54.
- Giordano, P. C. (2003). Relationships in adolescence. *Annual Review of Sociology*, 29(1), 257–281.
- Gorman-Smith, D., Tolan, P. H., & Henry, D. B. (2000). A developmental-ecological model of the relation of family functioning to patterns of delinquency. *Journal of Quantitative Criminology*, 16, 169–198. <http://dx.doi.org/10.1023/A:1007564505850>.
- Gottfredson, M. R., & Hirschi, T. (2003). A general theory of crime. In F. T. Cullen, & R. Agnew (Eds.), *Criminological theory: Past to present* (pp. 240–251). (2nd ed.). Los Angeles, CA: Roxbury Publishing.
- Gove, W. R., & Crutchfield, R. D. (summer). The family and juvenile delinquency. *The Sociological Quarterly*, 23, 301–319.
- Griffin, K. W., Botvin, G. J., Scheier, L. M., Diaz, T., & Miller, N. (2000). Parenting practices as predictors of substance abuse, delinquency, and aggression among urban minority youth: Moderating effects of family structure and gender. *Psychology of Addictive Behaviors*, 14(2), 174–184.
- Harter, S. (1982). The perceived competence scale for children. *Child Development*, 53, 87–97.
- Harter, S., & Whitesell, N. R. (2003). Beyond the debate: Why some adolescents report stable self-worth over time and situation, whereas others report changes in self-worth. *Journal of Personality*, 71, 1027–1058.
- Haynie, D. L. (2001). Delinquent peers revisited: Does network structure matter? *The American Journal of Sociology*, 106(4), 1013–1057.
- Haynie, D. L., & Osgood, D. W. (2005). Reconsidering peers and delinquency: How do peers matter? *Social Forces*, 84(2), 1109–1130.
- Hirschi, T. (1969). *Causes of delinquency* (1st ed.). Berkeley, CA: University of California Press.
- Hoeve, M., Dubas, J. S., Eischelsheim, V. I., van der Laan, P. H., Smeenk, W., & Gerris, J. R. M. (2009). The relationship between parenting and delinquency: A meta-analysis. *Journal of Abnormal Child Behavior*, 37, 749–775. <http://dx.doi.org/10.1007/s10802-009-9310-8>.
- Hoffmann, J. P. (2002). A contextual analysis of differential association, social control, and strain theories of delinquency. *Social Forces*, 81(3), 753–785.
- Jennings, W. G., Piquero, N. L., Gover, A. R., & Pérez, D. M. (2009). Gender and general strain theory: A replication and exploration and Brody and Agnew's gender/strain hypothesis among a sample of southwestern Mexican American adolescents. *Journal of Criminal Justice*, 37, 404–417.
- Jones, S., & Lynam, D. R. (2009). In the eye of the impulsive beholder: The interaction between impulsivity and perceived informal social control on offending. *Criminal Justice and Behavior*, 36(3), 307–321.
- Keijsers, L., Branje, S., Hawk, S. T., Schwartz, S. J., Frijns, T., Koot, H. M., van Lier, P., & Meeus, W. (2012). Forbidden Friends as Forbidden Fruit: Parental Supervision of Friendships, Contact With Deviant Peers, and Adolescent Delinquency. *Child Development*, 83, 651–666.
- Kingston, B., Huizinga, D., & Elliott, D. S. (2009). A test of social disorganization theory in high-risk urban neighborhoods. *Youth & Society*, 41(1), 53–79.
- Knecht, A., Snijders, T. A. B., Baerveldt, C., Steglich, C. E. G., & Raub, W. (2010). Friendship and delinquency: Selection and influence in early adolescence. *Social Development*, 19, 494–514.
- Kroneman, L., Loeber, R., & Hipwell, A. E. (2004). Is neighborhood context differently related to externalizing problems and delinquency for girls compared with boys? *Clinical Child and Family Psychology Review*, 7(2), 109–122.
- Lamborn, S. D., Mounts, N. S., Steinberg, L., & Dornbusch, S. (1991). Patterns of competence and adjustment among adolescents from authoritative, authoritarian, indulgent, and neglectful families. *Child Development*, 62, 1049–1065.
- Lilly, J. R., Cullen, F. T., & Ball, R. A. (2007). *Criminological theory: Context and consequences* (4th ed.). Thousand Oaks, CA: Sage Publications.
- Loeber, R., & Farrington, D. P. (2000). Young children who commit crime: Epidemiology, developmental origins, risk factors, early interventions, and policy implications. *Development and Psychopathology*, 12, 737–762.
- Loeber, R., Stouthamer-Loeber, M., & Green, S. M. (1991). Age at onset of problem behavior in boys, and later disruptive and delinquent behaviors. *Criminal Behavior and Mental Health*, 1, 229–246.
- McMahon, S. D., & Watts, R. J. (2002). Ethnic identity in urban African American youth: Exploring links with self-worth, aggression, and other psychosocial variables. *Journal of Community Psychology*, 30(4), 411–431.

- Mears, D. P., Ploeger, M., & Warr, M. (1998). Explaining the Gender Gap in Delinquency: Peer Influence and Moral Evaluations of Behavior. *Journal of Research in Crime and Delinquency*, 35(3), 251–266.
- Murphy, D. A., Brecht, M., Huang, D., & Herbeck, D. M. (2012). Trajectories of delinquency from age 14 to 23 in the National Longitudinal Survey of Youth sample. *International Journal of Adolescence and Youth*, 17(1), 47–62. <http://dx.doi.org/10.1080/02673843.2011.649401>.
- Neumann, A., Barker, E. D., Koot, H. M., & Maughan, B. (2010). The role of contextual risk, impulsivity, and parental knowledge in the development of adolescent antisocial behavior. *Journal of Abnormal Psychology*, 119, 534–545. <http://dx.doi.org/10.1037/a0019860>.
- O'Donnell, P., Richards, M., Pearce, S., & Romero, E. (2012). Gender differences in monitoring and deviant peers as predictors of delinquent behavior among low-income urban African American youth. *Journal of Early Adolescence*, 32(3), 431–459. <http://dx.doi.org/10.1177/0272431610397661>.
- Ostrowsky, M. K. (2010). Are violent people more likely to have low self-esteem or high self-esteem? *Aggression and Violent Behavior*, 15(1), 69–75.
- Patterson, G. R., DeBaryshe, B. D., & Ramsey, E. (1989). A developmental perspective on antisocial behavior. *American Psychologist*, 44(2), 329–335. <http://dx.doi.org/10.1037//0003-066X.44.2.329>.
- Pilgrim, C., Schulenberg, J., O'Malley, P., Bachman, J., & Johnston, L. (2006). Mediators and moderators of parental involvement on substance use: A national study of adolescents. *Prevention Science*, 7(1), 75–89.
- Piquero, N. L., Gover, A., MacDonald, J., & Piquero, A. R. (2005). The influence of delinquent peers on delinquency: Does gender matter? *Youth and Society*, 36, 251–275.
- Shaw, C. R., & McKay, H. D. (1942). *Juvenile delinquency and urban areas*. Chicago, Illinois: Chicago: University of Chicago Press.
- Simons, R. I., & Burt, C. H. (2011). Learning to be bad: Adverse social conditions, social schemas, and crime. *Criminology*, 49(2), 553–598. <http://dx.doi.org/10.1111/j.1745-9125.2011.00231>.
- Simons, R. L., Johnson, C., Conger, R. D., & Lorenz, F. O. (1997). Linking community context to quality of parenting: A study of rural families. *Rural Sociology*, 62, 207–230.
- Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis*. New York, NY: Oxford University Press.
- Snyder, J., Edwards, P., McGraw, K., Kilgore, K., & Holton, A. (1994). Escalation and reinforcement on mother–child conflict: Social processes associated with development of physical aggression. *Development and Psychopathology*, 6, 305–321.
- Snyder, J., Schrepferman, L., McEachern, A., Barner, S., Johnson, K., & Provines, J. (2008). Peer deviancy training and peer coercion: Dual processes associated with early-onset conduct problems. *Child Development*, 79(2), 252–268.
- Steinberg, L., & Morris, A. S. (2001). Adolescent development. *Journal of Cognitive Education and Psychology*, 2(1), 55–87.
- Sutherland, E. H. (1939). *Principles of criminology*. Philadelphia, PA: Lippincott.
- Thomas, G., Farrell, M. P., & Barnes, G. M. (1996). The effects of single-mother families and nonresidential fathers on delinquency and substance abuse in black and white adolescents. *Journal of Marriage and Family*, 58(4), 884–894.
- Vazsonyi, A. T., Cleveland, H. H., & Wiebe, R. P. (2006). Does the effect of impulsivity on delinquency vary by level of neighborhood disadvantage? *Criminal Justice and Behavior*, 33(4), 511–541. <http://dx.doi.org/10.1177/0093854806287318>.
- Whaley, R. B., Hayes-Smith, J., & Hayes-Smith, R. (2010). Gendered pathways? Gender, mediating factors, and the gap in boys' and girls' substance use. *Crime & Delinquency*, XX(X), 1–19. <http://dx.doi.org/10.1177/001128710389581>.
- Wikstrom, P. -O. H., Ceccato, V., Hardie, B., & Treiber, K. (2010). Activity fields and the dynamics of crime. *Journal of Quantitative Criminology*, 26(1), 55–87.