EMPIRICAL RESEARCH

Check for updates

Prosocial Peers as Risk, Protective, and Promotive Factors for the Prevention of Delinquency and Drug Use

Glenn D. Walters[1]

Abstract

Risk, protective, and promotive factors are instrumental in predicting and, in some cases, explaining human behavior. In the current study, an attempt was made to determine which of these three functions prosocial peers served with respect their effect on future delinquency and drug use. A sample of 2905 youth (51% female, 47% White, 21% Hispanic, 17% Black, mean age = 12.14 years) from the Gang Resistance Education and Training (GREAT) project were included in this study. Longitudinal analyses, conducted over a period of one year and controlling for age, sex, race, parental knowledge, parental support, unsupervised routine activities, peer delinquency, and prior delinquency/drug use, revealed that associating with prosocial peers led to significant reductions in property offending and drug use. Although there was no evidence that prosocial peers moderated or neutralized the risk generated by delinquent peer associations, they did serve as risk and promotive factors. Hence, associating less often with prosocial peers predicted a rise in property offending and drug use (risk effect), whereas associating more often with prosocial peers predicted a decline in future property offending and drug use (promotive effect).

Keywords Prosocial peers · Self-reported delinquency · Drug use · Risk · Protective · Promotive factors

Introduction

Risk factors have long been of interest to social and behavioral scientists. Unfortunately, there is little consensus as to how risk should be conceptualized, measured, and studied. Even so, there are several promising approaches to risk assessment, one of which has been proposed by Farrington and colleagues (Farrington et al. 2016). Three variable relationships or factors are highlighted in the Farrington model: risk factors, protective factors, and promotive factors. Risk factors predict an elevated or increased risk of some negative outcome. Protective factors, by contrast, interact with risk factors. A risk factor like peer delinquency, for instance, elevates a youth's odds of engaging in delinquency, whereas a protective factor neutralizes the effect of peer delinquency by reducing the impact of friend or peer antisocial behavior on future

offending. Promotive factors reduce risk by stimulating the lower or more functional end of the risk factor (i.e., little to no peer delinquency). Farrington et al. (2016) recommend dividing scores on a putative risk/protective/promotive factor into three categories, a "best quarter" (least pathological scores), a "worst quarter" (most pathological scores), and a middle half, and then crossing these three categories with a dichotomous outcome. Hence, if the negative outcome is significantly more common in the "worst quarter" of scores, then a risk factor is implied; if the outcome is significantly less common in the "best quarter" of scores, then a promotive factor is implied. If both outcomes occur, then the variable is classified as mixed (both a risk and promotive factor). The goal of the present study was to determine whether prosocial peer relations function as risk, protective, or promotive factors for delinquency and drug use.

Prosocial Peers

In criminology, peer research has focused primarily on how individuals are drawn to and influenced by the deviant, delinquent, and risk-taking actions of their friends and associates. Other areas of social and behavioral science,

✉ Glenn D. Walters
   walters@kutztown.edu

[1] Department of Criminal Justice, Kutztown University, Kutztown, PA 19530-0730, USA

however, adopt a more nuanced perspective on the effect of peer selection and influence on adolescent development, and in so doing advance the notion that positive peer associations are as important to adolescent development as negative peer associations. Studies show, for instance, that adolescents who experience more positive and supportive peer relations demonstrate greater classroom engagement (Moses and Villodas, 2017), stronger academic performance (Gallardo et al. 2016), and fewer behavioral problems (Williams and Anthony, 2015) in school than youth who experience less positive and supportive peer relations. By the same token, youth who lack positive, supportive peer interactions are at increased risk for both internalizing (Wang et al. 2018) and externalizing (O'Donnell and Barber, 2018) disorders. The results of these studies insinuate that positive peer relations are as vital to adolescent development as negative peer relations, and that they may be one way of preventing future delinquency and drug use.

In an attempt to incorporate risk and protective factors into a single theory, Catalano and colleagues created the social development model (Catalano et al. 1996). This model, which places equal emphasis on positive and negative peer influences, has been found to predict both delinquency (Fleming et al. 2008) and substance misuse (Lonczak et al. 2001). Other attempts to integrate positive and negative peer influences, however, have met with only modest success. Farrell et al. (2017), for instance, discovered that friend involvement in prosocial activities correlated cross-sectionally with participant prosocial behavior, but that participant antisocial behavior was more closely tied to friend antisocial behavior. In a longitudinal investigation using prospective data, Branstetter et al. (2011) discovered that while peer substance use was a strong predictor of participant substance use, friendship support neither increased nor decreased participant's risk of future substance use. Most recently, Walters (in press) observed an effect running from parental support to peer deviance to delinquency but uncovered no evidence that prosocial peer relations initiated or mediated a protective effect on future delinquency. There is a need, then, to address the issue of prosocial peer influence and whether prosocial peers provide a risk, protective, or promotive effect when it comes to predicting a change in future drug use and delinquency.

Deviant Peer Associations

If prosocial peer associations serve a protective function, then one way they might achieve this status is by neutralizing the effect of negative peer associations on future drug use and crime. Deviant peer associations (Hoeben et al. 2016), involvement in unstructured and unsupervised routine activities (Hoeben and Weerman 2016), and

participation in youth gangs (Dong and Krohn 2016) have all been found to increase delinquency risk. High levels of peer delinquency and deviance have also been found to be linked to higher levels of alcohol consumption in early adolescents (Trucco et al. 2011). Cox et al. (2017) report that negative peer influence is capable of counteracting the protective effect of positive parenting on drug use, whereas Brook et al. (2011) note the presence of a direct connection between peer delinquency and illicit drug use. Negative peer influence, in the form of peer delinquency and participation in unstructured routine activities, consequently served two purposes in the current study. First, the interaction between peer delinquency and prosocial peer relations was tested to determine whether the effect of prosocial peers on drug use and delinquency could be classified as a protective effect. Second, the predictive strength of prosocial peers was tested after controlling for peer delinquency and unstructured routine activities to ascertain whether prosocial peer associations had an effect on future drug use and delinquency, independent of negative peer associations and routine activities. Accounting for negative peer influences when investigating prosocial peer influences can greatly enhance the relevance of any research results emanating from such studies.

Parental Control and Support

Whereas differential association (Sutherland 1947) and social learning (Akers 1998) theories emphasize the risk created by peer deviance, self- (Gottfredson and Hirschi, 1990) and social (Hirschi 1969) control theories highlight parental discipline and parent-child bonding as key protective factors in lowering a child's risk of future delinquency and substance misuse. In a meta-analysis of investigations assessing the relationship between parenting and delinquency, Hoeve et al. 2009 observed that parental support (bonding, acceptance) and control (monitoring, discipline) were equally important in protecting a child against future antisocial behavior. Studies conducted since the Hoeve et al. review add further support to this general conclusion, with qualification. Thus, while some studies suggest that parental control is the critical factor (Harris-McKoy and Cui 2013), other studies emphasize the role of parental support (Melotti et al. 2018), and still others assert that the interaction between parental control and support may be of prime significance (Micalizzi et al. 2019). Shifting the focus from delinquency to alcohol and drug use, studies have shown that parental control (Fagan et al. 2013) or parental control and support (King and Chassin 2004) do an effective job of protecting youth against future drug and alcohol involvement and substance-related problems. Because of their well-documented buffering effect

on future delinquency and drug use, measures of parental control and support should be considered candidate control variables for studies assessing the ameliorative effects of prosocial peers on future delinquency and drug use.

Current Study

The current study addresses the gap in understanding over whether and how prosocial peers impede future delinquent and drug use behavior, net the effects of other relevant risk and protective factors. Adopting a prospective methodology, the current study sought to determine whether prosocial peer associations predicted decreased levels of future delinquency and drug use in early adolescents. To properly evaluate the status of prosocial peers as risk, protective, or promotive factors, traditional parental protective (i.e., control and support, with the former being assessed with a measure of parental knowledge) and peer risk (i.e., peer delinquency or drug use and unsupervised routine activities) factors were controlled in the analyses. The first hypothesis tested in this study held that prosocial peer associations would predict a significant reduction in delinquency and drug use over a period of one year, controlling for basic demographic (age, sex, race), peer risk, and parental protection factors. In contrast to the confirmatory nature of the first hypothesis, the second hypothesis was more exploratory in nature. The second hypothesis or research question sought to determine whether the effect of prosocial peer associations on future delinquency and drug use, established by the first hypothesis, constituted a protective effect, a risk effect, or a promotive effect.

Method

Participants

Total membership in the longitudinal portion of the Gang Resistance Education and Training (GREAT: Esbensen, 2002) study numbers 3568 youth. Participants for the current investigation were 2905 (1417 males, 1488 females) early adolescents from the GREAT sample with complete data on more than half the study variables (81% of the total). Study participants ranged in age from 10 to 14 years ($M = 12.14$, $SD = 0.65$) and were enrolled in the sixth or seventh grade at the start of the study. Nearly half the sample was White (46.6%), with 20.7% Hispanic, 16.9% Black, 3.6% Asian/Pacific Islander, 3.6% Native American, and 8.6% mixed/other. The longitudinal portion of the GREAT study was conducted in six U.S. cities (Philadelphia, Pennsylvania; Portland, Oregon; Phoenix, Arizona; Omaha, Nebraska; Lincoln, Nebraska; and Las Cruces, New Mexico) between 1995 and 1999.

Research Design

The current investigation employed a three-wave longitudinal panel design composed of the first three waves of GREAT data. Waves 1 and 2 of the GREAT study were separated by 11 weeks and Waves 2 and 3 were separated by a year. Wave 1 was reserved for control (age, sex, race, group, parental knowledge, parental support, unsupervised routine activities, and peer delinquency/drug use) and precursor (prior participant delinquency/drug use) measures, whereas the main predictor variable (prosocial peers) was assessed at Wave 2 and the outcome measures (participant delinquency/drug use) were assessed at Wave 3. Measuring the precursor variables before the main predictor variable reduced the possibility of a collider effect.[1]

Measures

Prosocial Peers

Prosocial peers were assessed with eight items ("how many friends involved in community activities;" "how many friends involved in family activities;" "how many friends involved in school activities;" "how many friends are good students;" "how many friends get along with adults at school;" "how many friends obey school rules;" "how many friends involved in religious activities;" "how many friends are honest"). Each item was rated on a five-point Likert-type scale (1 = *none of them*, 2 = *a few of them*, 3 = *about half of them*, 4 = *most of them*, 5 = *all of them*) and the results summed to create a total score that could range from 8 to 40. The internal consistency of this 8-item scale was good ($\alpha = 0.84$) at Wave 2 of the GREAT study, the wave used to assess friend prosocial involvement as a predictor variable.

Delinquency

The present study utilized two outcome measures: delinquency and drug use. Delinquency was assessed at Wave 3 of the GREAT study and required respondents to identify which of the following 14 delinquent acts they had participated in over the past six months: destroyed property, carried a weapon, spray painted a building, stole < $50,

---

[1] A collider effect or endogenous selection bias (Elwert and Winship, 2014) can occur when a researcher controls for a precursor or prior measure of the outcome variable. Conditioning on the outcome, as it is often called, can create a non-causal path between the predictor and outcome that appears causal on the surface, but which is actually the product of an interaction between the precursor and predictor variables. By assessing the precursor measure (Wave 1 delinquency or drug use) before the predictor variable (Wave 2 prosocial peers), the odds of producing a collider effect were greatly reduced (Greenland 2003).

stole > $50, went into a building to steal, stole a motor vehicle, hit someone, attacked someone with a weapon, committed armed robbery, involved in a gang fight, shot someone, sold marijuana, and sold other drugs. A variety score, which can range from 0 to 1.00, was then calculated by dividing the number of identified categories by 14. A sensitivity test was also performed in which total offending frequency counts (range = 0–11,590) replaced variety scores in a negative binomial regression analysis.

Drug use

The second outcome variable included in this study was drug use, also assessed at Wave 3 of the GREAT study. This required that participants identify which of the following five substances they had used at least once in the past six months: tobacco, alcohol, marijuana, inhalants (paint), and illegal drugs. A variety score that could range from 0 to 1.00 was calculated by dividing the number of substance categories reportedly used in the last six months by 5. This score then served as an indicator of drug use in a multiple regression analysis in which the prosocial peers variable predicted drug use. Variety scores have a number of advantages over frequency and dichotomous scores in assessing delinquency and drug use, to include greater consistency and reliability and lower vulnerability to recall bias (Mahler et al. 2017). As with delinquency, a frequency count of all drug use (range = 0–3,190) was assessed as part of a follow-up sensitivity analysis.

Lagged outcome variables

Cole and Maxwell (2003) recommend lagging the outcome variable in a regression analysis to establish the temporal direction of the predictor and outcome. Others have argued that lagging an outcome variable can bias the results toward null and away from significance (Keele and Kelly 2006). As the focus of the current investigation was on developmental change, it was felt that lagging the outcome measure was the best option. Lagging was accomplished by including a prior measure of the outcome as a predictor (i.e., Wave 1 delinquency in the equation predicting Wave 3 delinquency and Wave 1 drug use in the equation predicting Wave 3 drug use).

Control variables

There were nine control variables and one precursor measure included in the current study. Three of the control variables were demographic in nature—age (in years), sex (1 = male, 2 = female), and race (1 = White, 2 = non-White)—and a fourth (group) inquired as to whether the child's class had received the GREAT gang curriculum

(1 = no, 2 = yes). The other five control variables were major risk and protective factors. The two protective factors were parental knowledge and parental support and the three risk factors were unsupervised routine activities, friend delinquency, and friend drug use.

Parental knowledge

Parental knowledge was assessed with two items ("parents know where I am;" "parents know who I am with"), each of which was rated on a 5-point Likert-type scale (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree). Ratings on the two individual items were then combined to create a scale that could range from 2 to 10, with higher scores indicating greater parental knowledge. Despite the fact the scale contained only two items, it achieved good internal consistency during Wave 1 of the GREAT study (α =0.74).

Parental support

Participants were also asked to rate parental support using the following eight statements—"can talk to mother;" "mother understands me;" "ask mother's advice;" "mother praises me;" "can talk to father;" "father understands me;" "ask father's advice;" "father praises me." These ratings were made on a 7-point scale (1= none of the time, 7 = all of the time). Item scores were then summed to create a total score that could range from 8 to 56, with higher scores signaling greater parental support. These 8 parental items displayed good internal consistency at Wave 1 of the GREAT study (α = 0.86).

Unsupervised routine activities

Participants were asked to estimate the number of hours they spent each week in unsupervised routine activities with friends: "how many hours per week do you spend hanging around with your current friends, not doing anything in particular, where no adults are present?" The raw number of hours was then converted to a 7-point scale (0 = no hours, 1 = one or two hours per week, 2 = three to five hours per week, 3 = six to ten hours per week, 4 = eleven to fifteen hours per week, 5 = sixteen to twenty hours per week, 6 = more than twenty hours per week).

Peer delinquency

The peer delinquency control variable was restricted to equations in which participant delinquency served as the outcome measure. Youth were asked to estimate the proportion of friends (1 = none of them, 2 = a few of them, 3 = about half of them, 4 = most of them, 5 = all of them) that

had been involved in 10 different delinquent acts (e.g., destroyed property, stole > $50, sold illegal drugs) over the past year. The sum of the individual items yielded a total score that could range from 10 to 50. The friend delinquency scale displayed excellent internal consistency in the current sample of participants ($\alpha = 0.90$).

Peer drug use

Friend drug use was confined to equations in which participant drug use served as the outcome measure. Employing a five-point rating scale (1 = *none of them*, 2 = *a few of them*, 3 = *about half of them*, 4 = *most of them*, 5 = *all of them*), respondents estimated what portion of their friendship network used tobacco, alcohol, marijuana, and illegal drugs in the past year. The total score, which can range from 4 to 20, displayed good internal consistency in the current sample of participants ($\alpha = 0.85$).

Data Analytic Plan

Data were analyzed with *MPlus* 8.2 (Muthén and Muthén 1997–2017). Each outcome measure was tested against the same group of predictors, except that peer delinquency was only included as a predictor in the equation where Wave 3 delinquency was being predicted and peer drug use was only included as a predictor in the equation where Wave 3 drug use was being predicted. Because participants in the GREAT longitudinal study were nested by classroom, the classroom variable was included as a cluster variable in a complex model multiple regression analysis, in which standard errors were adjusted using a Huber/White sandwich estimator. To accommodate a complex statistical model in which data are nested within classrooms, a maximum likelihood with robust parameters and standard errors (MLR) estimator is required.

The analyses were conducted in three steps or stages. The first step consisted of two MLR regression analyses, one in which participant delinquency served as the outcome measure and one in which participant drug use served as the outcome measure. Originally, only delinquency and drug use were tested, but based on recommendations from an anonymous reviewer of an earlier draft of this paper, delinquency was further subdivided into property offending (destroyed property, spray painted a building, stole < $50, stole > $50, went into a building to steal, stole a motor vehicle) and violent offending (hit someone, attacked someone with a weapon, committed armed robbery, involved in a gang fight, shot someone). Outcomes that were successfully predicted in both the main (MLR regression of variety scores) and sensitivity (negative binomial regression of frequency counts) analyses were included in the Step 2 and 3 analyses.

The second step of the analytic procedure examined the possibility of a significant interaction between prosocial peers and peer delinquency for all outcomes achieving significance in both Step 1 analyses. The interaction was tested across four combinations of variables: Wave 1 prosocial peer and Wave 1 peer deviance (delinquency/drug use), Wave 1 prosocial peer and Wave 2 peer deviance, Wave 2 prosocial peer and Wave 1 peer deviance, and Wave 2 prosocial peer and Wave 2 peer deviance. Step 2 was designed to determine whether prosocial peers inhibited future delinquency and/or drug use by neutralizing the effect of peer deviance on delinquency and/or drug use. In other words, the goal of Step 2 was to determine whether prosocial peers could be considered a protective factor relative to peer deviance.

The third step of the analytic procedure was designed to assess whether prosocial peers could be classified as a risk or promotive factor. Following the procedure outlined in Farrington et al. (2016), prosocial scores were organized into four roughly equal quartiles, with the upper quartile containing the highest scores ("best quarter") and the lower quartile the lowest scores ("worst quarter"). Prosocial scores were evaluated for risk by calculating the odds ratio of "worst quarter" participants to participants from the "best quarter" and middle half in terms of their involvement in any delinquency or any drug use over the past six months. The scores were evaluated for promotion by calculating the odds ratio of "best quarter" participants to participants from the "worst quarter" and middle half in terms of their involvement in any delinquency or any drug use over the past six months. Participants had to present with complete data on both the predictor (prosocial peers) and outcome (delinquency or drug use) to be included in these analyses.

Missing Data

Two-fifths of the present sample had complete data on all 15 study variables (39.0%); another 11.8% were missing data on one variable, 26.1% were missing data on two variables, and 23.2% were missing data on three to seven variables. Four variables had more than 10% missing data: Wave 3 drug use (45.9%), Wave 3 delinquency (45.6%), Wave 2 prosocial peers (23.2%), and Wave 1 routine activities (11.1%). There were significantly more cases with missing data from the Omaha subsample and significantly fewer cases with missing data from the Lincoln subsample than there were in the other four subsamples. Missing data were handled with full information maximum likelihood (FIML). It should be mentioned that FIML estimates model parameters and standard errors for the entire sample from analyses performed on all non-missing data.

Research indicates that FIML is significantly less biased than traditional missing data procedures like simple

Table 1 Descriptive Statistics and Correlations for the 15 Variables Included in the Current Investigation

Variable	n	M	SD	Range	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Group	2905	1.53	–	1–2	0.00	−0.03	0.07*	−0.02	−0.01	0.03	0.07*	0.07	−0.05	−0.02	0.04	0.01	0.04	0.02
2. Age	2887	12.14	–	10–14		−0.10*	0.03	−0.07*	−0.08*	0.09*	0.13*	0.15*	−0.10*	−0.09*	0.13*	0.10*	0.16*	0.09*
3. Sex	2905	1.51	–	1–2			0.06	0.17*	−0.06	−0.06	−0.20*	−0.06	0.05	0.05	−0.18*	−0.23*	−0.05	−0.05
4. Race	2905	1.54	–	1–2				−0.08*	0.01	0.02	0.13*	0.07*	−0.14*	−0.15*	0.10*	0.05	0.07*	−0.01
5. Parental knowledge	2874	7.39	1.98	2–10					0.27*	−0.13*	−0.25*	−0.22*	0.30*	0.28*	−0.25*	−0.22*	−0.22*	−0.20*
6. Parental support	2875	41.70	10.06	8–56						−0.14*	−0.23*	−0.25*	0.32*	0.28*	−0.22*	−0.15*	−0.25*	−0.18*
7. Routine activities	2582	1.55	1.78	0–6							0.30*	0.30*	−0.17*	−0.20*	0.32*	0.20*	0.28*	0.20*
8. Peer delinquency	2801	14.22	6.12	10–50								0.74*	−0.38*	−0.35*	0.61*	0.38*	0.50*	0.33*
9. Peer drug use	2770	5.69	2.92	4–20									−0.38*	−0.35*	0.59*	0.34*	0.70*	0.42*
10. Prosocial peers-1	2827	26.05	6.18	8–40										0.63*	−0.36*	−0.24*	−0.37*	−0.24*
11. Prosocial peers-2	2232	26.03	6.49	8–40											−0.32*	−0.26*	−0.34*	−0.31*
12. Delinquency-1	2812	0.10	0.16	0–1.00												0.48*	0.65*	0.42*
13. Delinquency-3	1579	0.13	0.20	0–1.00													0.38*	0.64*
14. Drug use-1	2789	0.13	0.23	0–1.00														0.48*
15. Drug use-3	1571	0.17	0.26	0–1.00														

Group = classroom did not receive GREAT curriculum (1) vs. classroom received GREAT curriculum (2) at Wave 1; age = age in years at Wave 1; Sex = male (1) vs. female (2); Race = White (1) vs. non-White (2); Parental Knowledge = perceived parental knowledge at Wave 1; parental support = perceived parental support at Wave 1; routine activities = unsupervised routine activities with friends at Wave 1; peer delinquency = perceived delinquency of peers at Wave 1; peer drug use = perceived drug use of peers at Wave 1; prosocial peers-1 = prosocial peers at Wave 1; prosocial peers-2 = prosocial peers at Wave 2; delinquency-1 = delinquency variety score at Wave 1; delinquency-3 = delinquency variety score at Wave 3; drug use-1 = drug use variety score at Wave 1; drug use-3 = drug use variety score at Wave 3; n = number of non-missing cases; M = mean, SD = standard deviation; range = range of scores in current sample

*p < 0.00048 (Bonferroni-corrected alpha: 0.05/105 correlations)

imputation and listwise deletion (Allison 2012). It is also reasonably robust to violations of its basic assumptions (Young and Johnson 2013). In an effort to enhance the precision of FIML, ten auxiliary variables (Wave 2 parental knowledge, Wave 3 parental knowledge, Wave 2 parental support, Wave 3 parental support, Wave 2 unsupervised routine activities, Wave 3 unsupervised routine activities, Wave 2 peer delinquency, Wave 3 peer delinquency, Wave 2 delinquency, and Wave 2 drug use) were added to the study. Whereas auxiliary variables are included in the calculation of parameters and standard errors, they are not included in the actual analyses (Collins et al. 2001).

Results

Preliminary Analyses

Descriptive statistics for and intercorrelations between the 15 variables included in this study are listed in Table 1. A review of this table reveals that three-quarters of the correlations achieved significance using a Bonferroni-corrected alpha level. Of particular note, are the moderate negative zero-order correlations between concurrent measures of prosocial peers and peer delinquency/drug use ($r = -0.38$) which suggest that despite being related, these two peer variables share no more than 14 percent of their variance in common. Collinearity diagnostics failed to show evidence of multicollinearity in the various regression equations included in this study: tolerance $= 0.457$–0.989, variance inflation factor $= 1.011$–2.190.

Step 1 Analyses

The first step of the analytic procedure was to assess whether prosocial peer associations predicted delinquency and drug use, controlling for basic demographic variables, peer risk factors, and parental protective factors. As indicated by the results found in the left-hand columns of Table 2, prosocial peer associations failed to predict reductions in delinquency from Wave 1 to Wave 3 ($p = 0.058$) and the effect size obtained in this analysis was small ($\beta = -0.10$). By contrast, prosocial peer associations successfully predicted a significant reduction in drug use from Wave 1 to Wave 3 ($p < 0.001$), as reported in the right-hand columns of Table 2, and did so with a slightly higher effect size ($\beta = -0.15$) than was obtained in the analyses predicting delinquency. Parental knowledge was the only control variable to achieve significance in both analyses.

When the same analyses were performed on delinquency broken down into property offending (six items) and violent offending (five items), prosocial peers successfully predicted both outcomes. As delineated in Table 3, prosocial

Table 2 MLR regression analyses of Wave 3 delinquency and drug use

Predictor	Delinquency			Drug use		
	β	z	p	β	z	p
Intercept		1.15	0.249		1.61	0.106
Group	−0.019	−0.54	0.589	0.000	0.00	1.000
Age	0.040	1.06	0.287	0.021	0.79	0.430
Sex	−0.134	−6.26	<0.001	−0.003	−0.15	0.882
Race	0.013	0.93	0.350	−0.047	−0.91	0.361
Parental knowledge	−0.057	−2.66	0.008	−0.065	−2.74	0.006
Parental support	−0.031	−0.85	0.396	−0.009	−0.32	0.751
Routine activities	0.053	2.22	0.027	0.063	1.46	0.145
Peer deviance	0.044	0.84	0.403	0.086	3.40	<0.001
Prosocial peers-2	−0.100	−1.90	0.058	−0.150	−6.32	<0.001
Deviance-1	0.377	8.75	<0.001	0.362	10.37	<0.001
R^2	0.301			0.302		

Delinquency = Wave 3 delinquency as the outcome measure; drug use = Wave 3 drug use as the outcome measure; β = standardized beta coefficient; z = Wald Z-test of the unstandardized coefficient; p = significance level of the Wald z-test; Predictor = predictor variables; intercept = Y-intercept or constant term; group = classroom did not receive GREAT curriculum (1) vs. classroom received GREAT curriculum (2) at Wave 1; age = age in years at Wave 1; sex = male (1) vs. female (2); race = White (1) vs. non-White (2); parental knowledge = perceived parental knowledge at Wave 1; parental support = perceived parental support at Wave 1; routine activities = unsupervised routine activities with friends at Wave 1; peer deviance = peer delinquency (delinquency outcome) or peer drug use (drug use outcome) at Wave 1; prosocial peers-2 = prosocial peers at Wave 2; deviance-1 = delinquency variety score (delinquency outcome) or drug use variety score (drug use outcome) at Wave 1; R^2 = R-square for each model; N = 2905

peer behavior predicted a significant reduction in property offending ($p = 0.002$) and a significant reduction in violent offending ($p = 0.005$), controlling for all other variables in the equation. The effect sizes remained small, however (-0.092 and -0.093, respectively). There were two control variables that achieved significant results across the two offending outcomes: sex and peer delinquency. The results outlined in Tables 2 and 3 indicate that prosocial peers are capable of predicting property offending and drug use above and beyond the contributions of peer risk and parental protection.

For the purposes of sensitivity testing the outcome variables were measured as frequency counts and subjected to negative binomial regression analysis (overdispersion statistic, $p < 0.001$). Analyses conducted with drug use ($Z = -5.61$, $p < 0.001$) and property offending ($Z = -3.68$, $p < 0.001$) serving as the outcome measures proved significant. Negative binomial regression analyses of general delinquency ($Z = -0.99$, $p = 0.324$) and violent offending ($Z = 0.34$, $p = 0.732$), on the other hand, proved non-significant. Accordingly, only property crime and drug use

Table 3 MLR regression analyses of Wave 3 property and violent offending

Predictor	Property offending			Violent offending		
	β	z	p	β	z	p
Intercept		0.63	0.527		2.04	0.041
Group	−0.008	−0.31	0.754	−0.035	−1.54	0.125
Age	0.051	2.31	0.021	0.024	0.93	0.354
Sex	−0.135	−6.38	<0.001	−0.119	−5.47	<0.001
Race	0.005	0.23	0.816	−0.020	−0.94	0.350
Parental knowledge	−0.066	−2.80	0.005	−0.033	−1.67	0.094
Parental support	−0.009	−0.34	0.736	−0.048	−1.94	0.053
Routine activities	0.046	1.60	0.110	0.075	2.89	0.004
Peer delinquency	0.107	2.70	0.007	0.080	1.96	0.050
Prosocial peers-2	−0.092	−3.14	0.002	−0.093	−2.83	0.005
Delinquency-1	0.302	6.89	<0.001	0.305	6.77	<0.001
R^2	0.266			0.234		

Property Offending = Wave 3 property offending as the outcome measure; violent offending = Wave 3 violent offending as the outcome measure; β = standardized beta coefficient; z = Wald Z-test of the unstandardized coefficient; p = significance level of the Wald z-test; predictor = predictor variables; intercept = Y-intercept or constant term; group = classroom did not receive GREAT curriculum (1) vs. classroom received GREAT curriculum (2) at Wave 1; Age = age in years at Wave 1; sex = male (1) vs. female (2); race = White (1) vs. non-White (2); parental knowledge = perceived parental knowledge at Wave 1; parental support = perceived parental support at Wave 1; routine activities = unsupervised routine activities with friends at Wave 1; peer delinquency = perceived delinquency of peers at Wave 1; prosocial peers-2 = prosocial peers at Wave 2; delinquency-1 = property offending variety score (property offending outcome) or violent offending variety score (violent offending outcome) at Wave 1; R^2 = R-square for each model; N = 2905

were analyzed in the final two steps of the analytic procedure.

Step 2 Analyses

The second step of the analytic procedure was to assess all possible interactions between prosocial peers and peer deviance as predictors of property crime and drug use. The overall purpose of these analyses was to ascertain whether the effect of prosocial peers on property crime and drug use could be classified as a protective effect. Prosocial peers were crossed with peer delinquency to create four interactions (i.e., Wave 1 prosocial peers x Wave 1 peer deviance, Wave 1 prosocial peers x Wave 2 peer deviance, Wave 2 prosocial peers x Wave 1 peer deviance, and Wave 2 prosocial peers x Wave 2 peer deviance), each of which was tested individually for property offending and drug use. Results indicated that only one out of the 8 interactions achieved significance (Prosocial-1 x Peer Drug-2; p =
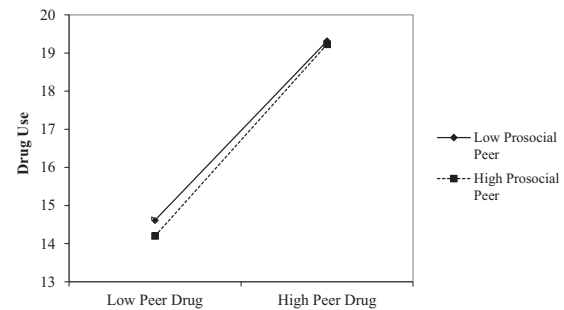
Fig. 1 Wave 1 Prosocial peer association x Wave 2 peer drug use interaction as a predictor of Wave 3 drug use

0.021). A graph of the interaction, however, was inconsistent with a protective effect. As depicted in Fig. 1, the benefit comes at the low end of drug use (where peer drug use is low and prosocial peer behavior is high), rather than at the high end (where peer drug use is high and prosocial peer behavior is high). In other words, the gap between the two lines would be wider at the higher points and narrower at the lower points if prosocial peers were acting as a protective factor.

Step 3 Analyses

The third step of the analytic procedure was to organize the Wave 2 prosocial peer scores into an upper quartile ("best quarter"), a lower quartile ("worst quarter"), and a middle half and compare the "best quarter" to the remainder to assess the promotive effect and the "worst quarter" to the remainder to assess the risk effect on dichotomized measures of property offending and drug use. Each outcome, property offending and drug use, achieved significant odds ratios in the risk and promotive analyses (p < 0.001). Odds ratios of 2.3 to 3.1 reflect modest to moderate effect sizes (see Table 4). From these results, it can be surmised that prosocial peers functioned as both risk (at the low end of the prosocial peer score distribution) and promotive (at the high end of the prosocial peer score distribution) factors, although the promotive effect was slightly stronger than the risk effect.

Discussion

Although it has long been recognized that prosocial peer relations have a positive impact on youth development (Brown and Larson 2009), research assessing their ability to prevent delinquency and drug use has produced mixed and inconclusive results. Prior studies have shown that delinquency (Farrell et al. 2017) and drug use (Branstetter et al.

Table 4 Risk and promotive factors for property offending and drug use

Wave 2 predictor	Wave 3 outcome	% Engage in outcome			Odds ratio	
		Prom	Middle	Risk	Prom	Risk
Prosocial peers	Drug use	21.4	41.4	56.5	3.10 (2.36, 4.08)	2.49 (1.91, 3.24)
Prosocial peers	Property offending	24.0	40.9	54.7	2.58 (1.98, 3.36)	2.26 (1.74, 2.95)

Wave 2 predictor = Wave 2 variable (prosocial peers) divided into upper quartile, middle half, and lower quartile; Wave 3 outcome = Wave 3 variables (property offending, drug use) dichotomized into present and absent for past six months; % engage in outcome = proportion of upper quartile (Prom or Promotive), middle half (middle), and lower quartile (risk) that engaged in the outcome (drug use or offending) in the past six months; odds ratio = odds ratio and 95% confidence interval (in parentheses) for a promotive (upper quartile vs. remaining participants) and risk (lower quartile vs. remaining participants); $n = 1361$ (drug use), 1367 (property offending)

2011) are more closely tied to antisocial peer influences than they are to prosocial peer influences. In addition, Walters (in press) found no evidence that prosocial peers played a role in initiating or mediating general delinquent behavior. Given a lack of consensus in the research literature on the role of prosocial peers in the development of delinquency and drug use, it is imperative that this issue be examined in greater depth with studies that include prospective data and proper controls for prior delinquency/drug use and relevant risk and protective factors. The current study accomplished this by assessing the longitudinal effect of prosocial peers on a change in delinquency and drug use, while controlling for peer risk and parental protective factors.

In providing greater clarity to an area of research that has thus far produced mixed, ambiguous, and inconclusive results, the current study contributes to the literature by shedding light on the predictive relationship between prosocial peers and delinquency/drug use. A principal conclusion that can be drawn from this study is that prosocial peers may have as much impact on future delinquency and drug use as antisocial peers. Besides documenting an inverse prospective relationship between prosocial peers and property crime/drug use, the present study holds valuable clues as to how prosocial peers inhibit future property crime and drug use. Of particular note, the ameliorative effect of prosocial peers on property crime and drug use is not attributable to prosocial peer neutralization of antisocial peer influence. Instead, prosocial peer relations appear to have a direct effect on property offending and drug use by serving as risk factors for youth with few prosocial friends and as promotive factors for youth with many prosocial friends. Moreover, the results for property offending and drug use were consistent across data formats (variety scores, frequency counts, and dichotomous outcomes) and comported well with social development theory (Fleming et al. 2008) and the notion that positive and negative peer influences contribute equally to property offending and drug use in early adolescents.

Prosocial Peers as Risk/Promotive Factors

There is a noticeable difference between serving as a risk/promotive factor and acting as a preventive factor. With prevention, the goal is to identify the preventive factor and the risk factor it moderates. With promotion, there is no need to identify a moderated risk factor because the promotive factor represents thoughts, feelings, and relationships that protect the individual from future drug use and crime without having to moderate a risk factor. In this way, promotive factors support resilience theory and the concept of preparing youth to deal with adversity by accumulating and reinforcing various forms of social and personal capital (Zimmerman et al. 2013). Also, by conceptualizing prosocial peers as promoters of resilience, it may be possible to shield vulnerable youth from risks that have not yet been identified. Because lack of prosocial peers serves as a risk factor for children with few prosocial friends, a certain degree of protection can be achieved by providing these youth with opportunities to develop the assets and resources needed to make new friends and reduce the risk created by diminished levels of positive peer association (Eisman et al. 2016). These findings suggest that prosocial peers can serve as a buffer against drug use and certain forms of offending.

It should also be noted that while prosocial peers may protect a child against future property crime and drug use, they do not seem to do so through formal protective channels (i.e., by interacting with negative peer influences). Instead, they appear to act directly on deviant behavior by serving as a risk factor when they are weak and as a promotive factor when they are strong. Thus, while isolation from prosocial peers serves as a risk factor for future property offending and drug use, high levels of association with prosocial peers generate low levels of problem behavior, perhaps by enhancing the youth's own coping skills. The odds ratios obtained for the promotive and risk effects in the present study revealed that those in the high prosocial peer quadrant ("best quarter") were 3.1 times more likely to not engage in drug use and 2.6 times more likely not to

engage in property offending compared to the lower three-quarters of the sample, and that those in the low prosocial peer quadrant ("worst quarter") were 2.5 times more likely to engage in drug use and 2.3 times more likely to engage in property crime compared to the upper three-quarters of the sample. The size of these effects suggests that prosocial peers had a modest to moderate ameliorative effect on future property offending and drug use in a group of early adolescents by virtue of their ability to promote resilience and reduce risk.

Research and Practical Implications

There are several research implications to the current results that warrant discussion. One such implication is that it may be advisable to assess positive peer influence when conducting research on negative peer associations. Although positive and negative peer influence appear to be separate constructs, they nonetheless overlap as evidenced by a zero-order correlation of −0.38 between Wave 1 peer delinquency/drug use and Wave 1 prosocial peer relations (see Table 1). Second, more research is required to determine how associating with friends who are involved in prosocial and conventional activities protects the individual against future delinquency and drug use. One possibility is that it instills counter-deviant beliefs that discourage future anti-social and risky behavior, just as exposure to negative peers can instill deviant beliefs that encourage future antisocial and risky behavior (Walters 2016). A third aspect of the current study that requires further clarification is the fact that property offending but not violent offending or general delinquency displayed a consistent response to prosocial peer associations. It may be that property offending, which tends to be less expressive and more instrumental than violent crime (Youngs et al. 2016), increases sensitivity to both positive and negative peer influences.

From a practical standpoint, the current results suggest that positive peer relations might protect vulnerable or at-risk youth from engaging in early stage property offending and drug use. Evidence-based primary prevention programs for drug use and abuse, such as Life Skills Training (LST: Botvin et al. 2006) and Project ALERT (Gorman and Conde 2010), enlist older prosocial students to serve as discussion leaders and provide participants with positive role models. Questions that require answers include whether the older peer leaders contribute significantly to the success of LST/ Project ALERT and if so, what is the mechanism through which this effect is achieved. Although there is no published research bearing on the first question, a study by Spoth et al. (1996) offers clues as to why prosocial peers may encourage resistance to drug use and experimentation. Employing two waves of data separated by 3.5 months,

Spoth et al. (1996) discovered that affiliation with prosocial peers and affection toward parents led to an increase in mastery and self-esteem. This implies that increased self-efficacy, a pattern known to promote positive change in cognitive behavioral interventions (Schaumberg et al. 2013), might be one of the mechanisms by which positive peer relations protect vulnerable youth against future drug use and certain forms of offending like property crime.

Limitations

There are several study limitations that should be taken into account when interpreting the results of this investigation. First, the GREAT data are nearly 25 years old. American society has changed a great deal in the time since the GREAT study was conducted, thus raising questions about how relevant these data are to current adolescent behavior. Hence, while people change slower than technology, certain technological advances, like cell phones, could make the results of the present study less applicable to today's youth than if the study had been conducted on a more recent sample of participants. Second, whereas the sample for the GREAT study was not selected to be representative of the overall U.S. youth population, efforts were made to maximize geographic and ethnic diversity. The current study removed 19% of the original GREAT longitudinal sample because of missing data on more than half the variables. The fact that missing cases were more prominent in Omaha, Nebraska than in Lincoln, Nebraska should be cause for some concern, but the fact that over 80% of the sample was retained implies that the geographic and ethnic diversity of the sample remained largely intact.

A third limitation of this study is that all of the variables except group assignment were based on child self-report. Given that using a single data source, in this case self-report, can bias one's results, some of the correlations observed in the current study may have been artificially inflated by an all-self-report complement of measures (Shadish et al. 2002). The use of self-report measures of friend delinquency and drug use raises another issue. Young and colleagues (Young et al. 2013) have argued that perceived peer delinquency, and presumably drug use, may constitute a projection of participants' own delinquency and drug use onto their peers. Although the projection hypothesis received minimal support in a 22-sample study on this issue (Walters 2019), it nonetheless raises the specter of what the results might have been had direct measures of friend delinquency and drug use been used instead. Additional recommendations for future research are provided in the next section of this paper, although increasing the diversity of measurement methods would appear to be a prime consideration in future research on prosocial peers, delinquency, and drug use.

Future Directions

In mapping out future directions for research, one of the leading objectives should be to identify the mechanisms responsible for the temporal relationship between prosocial peers and future deviant behavior. What is it about friends who are involved in family, school, and community activities, follow the rules, do well in school, and are honest in their interactions with others that protects a youth from future involvement in property crime and drug use? One possibility is that regular association with those who display conventional attitudes and behaviors provides the youth with counter-deviant definitions of behavior, along the lines proposed by social learning theory (Akers 1998). As previously mentioned, Walters (2016) discerned that youth acquire deviant attitudes and behaviors from their contacts with law-violating peers, so why couldn't the converse also hold true? A second possibility can be found by digging into the results of the previously reviewed Spoth et al. (1996) study, in which affiliation with prosocial peers led to increased mastery, higher self-esteem, and greater coping self-efficacy. It is worth noting that Spoth et al. also discovered that an affectionate bond with one's parents, a feature known to protect children against negative peer influence (Walters in press), also predicted increased levels of future mastery and esteem. This provides a further example of how associating with peers who engage in conventional activities and hold prosocial beliefs may promote less deviance by increasing resilience and reducing risk.

Conclusion

Existing research has been unclear on how much impact prosocial peers have on future delinquency and drug use. To fill this gap, the current study evaluated whether having a large number of prosocial peers reduced or limited youth involvement in delinquency and drug use over time, controlling for important peer risk and parental protective factors. In contrast to the equivocal results obtained in prior research on prosocial peers, delinquency, and drug use, the current findings identified a prominent role for prosocial peers in reducing property crime and drug use. Further investigation revealed that the effect was the combined result of promoting youth resilience and lowering the risk associated with having too few prosocial friends. The results of this study also showed that the relationship between prosocial peers and peer delinquency is formidably complex and that prosocial peers operate on future delinquency and drug use in ways other than interacting with negative peer risk factors. In other words, positive peer influence is not simply the flip-side of negative peer influence. Instead, it signals youth resilience and the creation of relationships that have important implications for future prosocial development. These findings indicate that prosocial peers need to be viewed on par with delinquent and drug using peers as part of an ongoing effort to make sense of social environmental causes and correlates of behavioral deviance.

Compliance with Ethical Standards

Conflict of Interest The author declares that he has no conflict of interest.

Ethical Approval This research was approved by the Kutztown University Institutional Review Board (IRB).

Informed Consent This was a secondary data analysis, although informed consent from parents and informed assent from youth were obtained when the study was originally conducted.

Publisher's note: Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

References

Akers, R. L. (1998). *Social learning and social structure: a general theory of crime and deviance*. Boston: Northeastern University Press.

Allison, P. D. (2012). Handling missing data by maximum likelihood. *SAS Global Forum 2012* (Paper 312-2012). Cary, NC: SAS Institute.

Botvin, G. J., Griffin, K. W., & Diaz-Nichols, T. (2006). Preventing youth violence and delinquency through a universal school-based prevention approach. *Prevention Science*, 7, 403–408.

Branstetter, S. A., Low, S., & Furman, W. (2011). The influence of parents and friends on adolescent substance use: a multidimensional approach. *Journal of Substance Use*, 16, 150–160.

Brook, D. W., Brook, J. S., Rubenstone, E., Zhang, C., & Saar, N. S. (2011). Developmental associations between externalizing behaviors, peer delinquency, drug use, perceived neighborhood crime, and violent behavior in urban communities. *Aggressive Behavior*, 37, 349–361.

Brown, B. B. & Larson, J. (2009). Peer relationships in adolescence. In R. M. Lerner & L. Steinberg (Eds), *Handbook of adolescent Psychology: Vol. 2 Contextual influences on adolescent development* (3rd. edn, pp. 74–103). Hoboken, NJ: Wiley.

Catalano, R. F., Kosterman, R., Hawkins, J. D., Newcomb, M. D., & Abbott, R. D. (1996). Modeling the etiology of adolescent substance use: a test of the social development model. *Journal of Drug Issues*, 26, 429–455.

Cole, D. A., & Maxwell, S. E. (2003). Testing mediational models with longitudinal data: questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology*, 112, 558–577.

Collins, L. M., Schafer, J. L., & Kam, C. M. (2001). A comparison of inclusive and restrictive strategies in modern missing data procedures. *Psychological Methods*, 6, 330–351.

Cox, R. B., Criss, M. M., Harrist, A. W., & Zapata-Roblyer, M. (2017). Are negative peer influences domain specific? Examining the influence of peers and parents on externalizing and drug use behaviors. *Journal of Primary Prevention*, 38, 515–536.

Dong, B., & Krohn, M. D. (2016). Dual trajectories of gang affiliation and delinquent peer association during adolescence: an examination of long-term offending outcomes. *Journal of Youth and Adolescence*, 45, 746–762.

Eisman, A. B., Stoddard, S. A., Bauermeister, J. A., Caldwell, C. H., & Zimmerman, M. A. (2016). Trajectories of organized activity participation among urban adolescents: an analysis of predisposing factors. *Journal of Youth and Adolescence*, 45, 225–238.

Elwert, F., & Winship, C. (2014). Endogenous selection bias: the problem of conditioning on a collider variable. *Annual Review of Sociology*, 40, 31–53.

Esbensen, F.-A. (2002, September). *National evaluation of the Gang Resistance Education and Training (G.R.E.A.T.) program: Final report (94-IJ-CX-0058)*. Washington, DC: U.S. Department of Justice.

Fagan, A. A., Van Horn, M. L., Hawkins, J. D., & Jaki, T. (2013). Differential effects of parental controls on adolescent substance use: for whom is the family most important? *Journal of Quantitative Criminology*, 29, 347–368.

Farrell, A. D., Thompson, E. L., & Mehari, K. R. (2017). Dimensions of peer influences and their relationship to adolescents' aggression, other problem behaviors and prosocial behavior. *Journal of Youth and Adolescence*, 46, 1351–1369.

Farrington, D. P., Ttofi, M. M., & Piquero, A. R. (2016). Risk, promotive, and protective factors in youth offending: results from the Cambridge study in delinquency development. *Journal of Criminal Justice*, 45, 63–70.

Fleming, C. B., Catalano, R. F., Mazza, J. J., Brown, E. C., Haggerty, K. P., & Harachi, T. W. (2008). Misbehavior in school, and delinquency from the end of elementary school through the beginning of high school: a test of social development model hypotheses. *Journal of Early Adolescence*, 28, 277–303.

Gallardo, L. O., Barrasa, A., & Guevara-Viejo, F. (2016). Positive peer relationships and academic achievement across early and midadolescence. *Social Behavior and Personality*, 44, 1637–1648.

Gorman, D. M., & Conde, E. (2010). The making of evidence-based practice: the case of Project ALERT. *Children and Youth Services Review*, 32, 214–222.

Gottfredson, M. R., & Hirschi, T. (1990). *A general theory of crime*. Stanford, CA: Stanford University Press.

Greenland, S. (2003). Quantifying biases in causal models: classical confounding versus collider-stratification bias. *Epidemiology*, 14, 300–306.

Harris-McKoy, D., & Cui, M. (2013). Parental control, adolescent delinquency, and young adult criminal behavior. *Journal of Child and Family Studies*, 22, 836–843.

Hirschi, T. (1969). *The causes of delinquency*. Berkeley, CA: University of California Press.

Hoeben, E. M., Meldrum, R. C., Walker, D., & Young, J. T. N. (2016). The role of peer delinquency and unstructured socializing in explaining delinquency and substance use: a state-of-the-art review. *Journal of Criminal Justice*, 47, 108–122.

Hoeben, E. M., & Weerman, F. M. (2016). Why is involvement in unstructured socializing related to adolescent delinquency? *Criminology*, 54, 242–281.

Hoeve, M., Dubas, J. S., Eichelsheim, V. L., 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 Psychology*, 37, 749–775.

Keele, L., & Kelly, N. J. (2006). Dynamic models for dynamic theories: the ins and outs of lagged dependent variables. *Political Analysis*, 14, 186–205.

King, K. M., & Chassin, L. (2004). Mediating and moderating effects of adolescent behavioral undercontrol and parenting in the prediction of drug use disorders in emerging adulthood. *Psychology of Addictive Behaviors*, 18, 239–249.

Lonczak, H. S., Huang, B., Catalano, R. F., Hawkins, J. D., Hill, K. G., & Kosterman, R. (2001). The social predictors of adolescent alcohol misuse: a test of the social development model. *Journal of Studies on Alcohol*, 62, 179–189.

Mahler, A., Simmons, C., Frick, P. J., Steinberg, L., & Cauffman, E. (2017). Aspirations, expectations and delinquency: the moderating effect of impulse control. *Journal of Youth and Adolescence*, 46, 1503–1514.

Melotti, G., Poti, S., Gianesini, G., & Brighi, A. (2018). Adolescents at risk of delinquency: the role of parental control, trust, and disclosure. *Deviant Behavior*, 38, 347–362.

Micalizzi, L., Sokolovsky, A. W., Janseen, T., & Jackson, K. M. (2019). Parental social support and sources of knowledge interact to predict children's externalizing behavior over time. *Journal of Youth and Adolescence*, 48, 484–494.

Moses, J. O., & Villodas, M. T. (2017). The potential protective role of peer relationships on school engagement in at-risk adolescents. *Journal of Youth and Adolescence*, 46, 2255–2272.

Muthén, B., & Muthén, L. (1997–2017). *Mplus user's guide* (8th edn.). Los Angeles, CA: Muthén and Muthén.

O'Donnell, A. W., & Barber, B. L. (2018). Exploring the association between adolescent sports participation and externalising behaviours: the moderating role of prosocial and risky peers. *Australian Journal of Psychology*, 70, 361–368.

Schaumberg, K., Kuerbis, A., Morgenstern, & Muench, F. (2013). Attributions of change and self-efficacy in a randomized controlled trial of medication and psychotherapy for problem drinking. *Behavior Therapy*, 44, 88–99.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston, MA: Mifflin.

Spoth, R., Redmond, C., Hockaday, C., & Yoo, S. (1996). Protective factors and young adolescent tendency to abstain from alcohol use: a model using two waves of intervention study data. *American Journal of Community Psychology*, 24, 749–770.

Sutherland, E. H. (1947). *Principles of criminology* (4th edn.). Philadelphia: J.B. Lippincott.

Trucco, E. M., Colder, C. R., & Wieczorek, W. F. (2011). Vulnerability to peer influence: a moderated mediation study of early adolescent alcohol use initiation. *Addictive Behaviors*, 36, 729–736.

Walters, G. D. (2016). Friends, cognition, and delinquency: Proactive and reactive criminal thinking as mediators of the peer influence and peer selection effects among male delinquents. *Justice Quarterly*, 33, 1055–1079.

Walters, G. D. (2019). Peer influence or projection bias? Predicting respondent delinquency with perceptual measures of peer delinquency in 22 samples. *Journal of Adolescence*, 70, 1–12.

Walters, G. D. (in press). Positive parents and negative peers: Assessing the nature and order of caregiver and friend effects in predicting early delinquency. *Youth Violence and Juvenile Justice*.

Wang, C., Williams, K. E., Shahaeian, A., & Harrison, L. J. (2018). Early predictors of escalating internalizing problems across middle childhood. *School Psychology Quarterly*, 33, 200–212.

Williams, L. R., & Anthony, E. K. (2015). A model of positive family and peer relationships on adolescent functioning. *Journal of Child and Family Studies*, 24, 658–667.

Young, J. T. N., Rebellon, C. J., Barnes, J. C., & Weerman, F. M. (2013). Unpacking the black box of peer similarity in deviance: understanding the mechanisms linking personal behavior, peer behavior, and perceptions. *Criminology*, *52*, 60–86.

Young, R., & Johnson, D. R. (2013). Methods for handling missing secondary respondent data. *Journal of Marriage and Family*, *75*, 221–234.

Youngs, D., Ioannou, M., & Eagles, J. (2016). Expressive and instrumental offending: Reconciling the paradox of specialization and versatility. *International Journal of Offender Therapy and Comparative Criminology*, *60*, 397–422.

Zimmerman, M. A., Stoddard, S. A., Eisman, A. B., Caldwell, C. H., Aiyer, S. M., & Miller, A. (2013). Adolescent resilience: promotive factors that inform prevention. *Child Development Perspectives*, *7*, 215–220.

Glenn D. Walters is a Professor in the Department of Criminal Justice at Kutztown University in Kutztown, Pennsylvania, where he teaches classes in criminology, corrections, research methods, and substance abuse and crime. His current research interests include criminal thinking, mediation analysis, and peer relations and deviant behavior.