



Sent Home Versus Being Arrested: The Relative Influence of School and Police Intervention on Drug Use

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ABSTRACT

Prior research has demonstrated that school disciplinary practices lead to juvenile justice intervention or the “school-to-prison pipeline” and that juvenile justice intervention leads to adversities, including drug-using behavior, in adolescence and adult life. Yet, it is not clear which form of official intervention, school suspension, and expulsion or police arrest, is more predictive of drug use among young people. Using data from the Rochester Youth Developmental Study, we examined both the immediate, concurrent influence of school and police intervention on drug use during adolescence and the long-term, cumulative impact of school and police intervention during adolescence on subsequent drug use in young established adulthood. The results indicate that school exclusionary practices appeared to be more predictive of drug use than police arrest during both adolescence and young adulthood. Additionally, such negative effects mainly exhibited among minority subjects, and the effects by gender appeared contingent on developmental stages.

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Introduction

A major premise of the labeling perspective is intervention in a punitive manner stigmatizes people and may lead to unintended consequences (Bernburg, 2009; Krohn & Lopes, 2015; Lemert, 1951; Paternoster & Iovanni, 1989; Schur, 1971).¹ Early work focusing on the impact of being labeled deviant either by the justice system or mental health agencies examined how such involvement could alter the perception of self, resulting in the adoption of a deviant identity (Lemert, 1951, 1967; Restive & Lanier, 2015; Schur, 1971; Tannenbaum, 1922, 1938) and triggering a self-fulfilling prophecy (Merton, 1948) and continuing deviant behavior. The emphasis has shifted away from the impact official intervention has on the self-concept of those who become involved in the system to other potential mediating variables such as educational achievement

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¹Although the labeling perspective often includes a hypothesis concerning the alteration in a person's self-concept, in the current analysis we are focusing on the impact of different forms of intervention (school and police) on problematic behavior (drug use) which may occur for reasons other than a change in one's self-concept (i.e. the societal reaction perspective).

(Bernburg & Krohn, 2003; Kirk & Sampson, 2013; Lopes et al, 2012), employment related variables (Lopes et al, 2012), economic well-being, and social relationships (Bernburg, Krohn, & Rivera, 2006; Jacobsen, Pace, & Ramirez, 2016; Restive & Lanier, 2015; Schmidt, Lopes, Krohn, & Lizotte, 2015). Much of this work has placed the process within a life-course perspective, viewing criminal or juvenile justice involvement as a negative “turning point” resulting in problematic life course transitions (Doherty, Cwick, Green, & Ensminger, 2016; Mowen & Brent, 2016; Sampson & Laub, 1993).

The work focusing on juveniles has mostly examined the impact of police contact or arrest, juvenile court referral or some form of incarceration (Barrick, 2014; Krohn & Lopes, 2015). However, an increasing amount of research has examined the importance of the exclusionary disciplinary actions that schools take in sanctioning misbehavior. Some estimates suggest that as many as one in nine students will be suspended or expelled in a year (Losen & Martinez, 2013) and that over half of all students will be suspended or expelled sometime during their student experience (Fabelo et al., 2011). Schools became more punitive in their disciplinary practices since the late 1980s (Hirschfield, 2018). This is in part due to the increase in school violence in the 1980s and 1990s including well-publicized school shootings (Hirschfield, 2008, 2018; Kupchik, 2010). Those events precipitated the felt need for tighter security measures as evidenced by the introduction of School Resource Officers (SRO’s) in our schools and in part to the advent of “zero tolerance rules” mandating exclusionary discipline in many cases. Hirschfield (2008) has referred to these developments as the criminalization of school discipline. Many educators and researchers are concerned that such practices lead to the “school to prison pipeline” suggesting that school discipline increases the probability of juvenile justice interventions. This is particularly true for minority students (Bradshaw, Mitchell, O’Brennan, & Leaf, 2010; Mizel et al., 2016; Skiba et al., 2011; Wallace, Goodkind, Wallace, & Bachman, 2008). A Department of Education report (2014) estimates that minority students are two to three times more likely to be suspended or expelled than are white students. In effect, the White–Black disparity has declined for achievement but increased for suspensions, especially among secondary school students (Rosenbaum, 2018).

School disciplinary practices are not only important because of their increasing prevalence, but also because of the adverse effect they may have on drug use and delinquency as well as other problematic outcomes for youth (Hirschfield, 2018). Indeed, it is possible that school disciplinary practices may have as much, if not a greater, impact on increasing the probability of subsequent problematic behavior than do police or juvenile court interventions. The increasing prevalence of school exclusionary practices and the fact that more young people are affected by school exclusion than the intervention of police or juvenile courts underscore the importance of comparing the impact of the two forms of societal reaction. The current study focuses on the relative impact of school exclusionary disciplinary practices compared to juvenile justice (police arrest) intervention on subsequent drug-using behavior. We examine the impact of intervention on drug use because prior work has suggested that having contact with the justice system in early adolescence is particularly important in predicting subsequent drug use in both later adolescence and adulthood (Lopes et al., 2012). Moreover, because school exclusionary disciplinary practices often result in

increasing the time juveniles are in an unsupervised environment, the opportunity for drug-using behavior should be substantially increased. Prior research has found that when children are suspended or expelled from school, their drug-using behavior increases (Kaplan & Fukurai, 1992; McCrystal, Percy, & Higgins, 2007). We begin by examining the theoretical rationale for why school exclusionary disciplinary practices would be expected to have a greater impact on drug use than police arrest.

Labeling approach, routine activities, and school discipline

The labeling approach is predicated on the premise that people's future behaviors will be affected by their interpretation of the reaction that others have to their current behavior. The reaction of others can affect behavior in more than one way. The original focus of the labeling approach emphasized the impact that social reaction, especially that of the legal system, would have on a person's image of themselves. For instance, Lemert (1951) stated that if the acts were highly visible and the social reaction sufficiently severe, "a process of self-identification is incorporated as part of the 'me' of the individual, which will lead to a reorganization based on a new role" (p. 76). A reaction resulting in the definition of the behavior and actor as being deviant, may lead to "knifing off" (Moffitt, 1993) of the individual from conventional others and conventional avenues to successful transitions to adulthood (Sampson & Laub, 1993). More recent work has emphasized consequences of being labeled such as its impact on educational, career and relationship goals (Bernburg, 2009; Bernburg et al., 2006; Link, Cullen, Frank, & Wozniak, 1987; Link, Cullen, Struening, Shrout, & Dohrenwend, 1989; Lopes et al., 2012; Schmidt et al., 2015; Wiley, Slocum, & Esbensen, 2013). These consequences are conceptualized as a result of others' reactions (e.g. school officials or employers) to knowledge of the label. Additionally, Link et al. (1989) suggest that the actor might anticipate the reaction of others' and opt not to engage in activity that will elicit the anticipated negative reaction. For instance, the labeled actor might opt not to apply for a particular job because of the expected rejection.

Whether the focus is on the impact the label has on self-identity or self-concept or the impact it has on life opportunities such as education, employment and establishing social relationships, it is essential to recognize the role played by social reaction and the audience that observes or learns of the reaction, in the overall process (Lemert, 1951; Link et al., 1987, 1989; Matsueda, 1992). Although social reaction that is sufficiently severe may impact the individual directly by either changing their self-image (Schur, 1971) or having them preemptively withdraw in anticipation of others' reactions (Link et al., 1989), it is more likely that the impact will be greater if the reaction is known to the people with whom the individual interacts and the representatives of arenas (school, work place) in which that interaction took place.

While being arrested or being referred to the juvenile court is a traumatic event for many young people, the event is not supposed to be publicized and records of juveniles are sealed. While such events may become known, there is some protection against it becoming widely known among one's social networks. On the other hand, it is difficult to keep a school suspension, and especially an expulsion, from being known not only by one's social networks but also by teachers and potential employers.

Individuals thus are more likely to have to negotiate and adopt new roles and opportunities on a daily basis due to school exclusion rather than juvenile justice intervention (Matsueda, 1992). Although juvenile justice interventions are considered more severe by many,² school suspensions and expulsions are arguably more directly visible than juvenile justice involvement and therefore may have more extensive impact within school and the community—increasing the likelihood and frequency the person may come across others' biased responses—than being arrested or being referred to the juvenile court (Hirschfield, 2018).

Additionally, while police arrest or court referral affects life course transitions in the future, the impact of school disciplinary practices is immediate. Being excluded from the school impacts one's academic performance (Balfanz, Byrnes, & Fox, 2015; Shollenberger, 2015), increases the probability of dropping out of school (Balfanz et al., 2015; Marshbanks et al., 2015), and will ultimately impact the probability of getting any higher education.

One immediate impact of school exclusionary discipline is to provide youngsters with more time away from adult supervision and greater opportunities to engage in problematic behaviors. Osgood and colleagues (Osgood & Anderson, 2004; Osgood, Wilson, O'Malley, Bachman, & Johnston, 1996) have convincingly argued that youth activities taking place in the absence of adult supervision and which are unstructured are predictive of problematic behavior. Being excluded from the school setting, which is typically both supervised and highly structured, in many cases affords youth the possibility of being in unstructured routine activities such as hanging out in arenas like street corners or malls without adult supervision. Hence, the likelihood that they will engage in inappropriate behaviors increases. In the long run, such negative consequences may accumulate and persist, contributing to economic hardship and family problems, which, in turn, lead to the continuing use of illicit drugs in adulthood.

A number of issues regarding school exclusionary discipline have been examined including the disproportionate minority representation and the impact of exclusionary practices on school-related outcomes (Fenning & Rose, 2007). The literature has also documented its impact on juvenile justice intervention (Hirschfield, 2018). After a brief review of research on the relationship between school exclusionary discipline and juvenile justice intervention, we examine the relationship between both school discipline and juvenile justice intervention and subsequent problematic behavior.

School exclusion and juvenile justice intervention

The "school to prison pipeline" has been a primary concern among educators, social scientists, and law enforcement officials (Department of Education Office of Civil Rights, 2014; Hirschfield, 2008; Hirschfield & Celinska, 2011; Morrison et al, 2001; Raffaele-Mendez, 2003; Skiba & Knesting, 2001). Several studies have documented the relationship between school suspension and expulsion and subsequent arrest, court referral and incarceration (Arum & Beattie, 1999; Fabelo et al., 2011; Monahan,

²If a wide variety of people become aware of youth's juvenile justice involvement, the impact of labeling may become stronger than receiving school suspension or expulsion. We would like to thank an anonymous review for pointing out this possibility.

VanDerhei, Bechtold, & Cauffman, 2014; Mowen & Brent, 2016; Na & Gottfredson, 2013; Nicholson-Crotty, Birchmeier, & Valentine, 2009; Shollenberger, 2015). Here we briefly review three recent studies that go beyond simply demonstrating a relationship between suspensions and arrest but illustrate additional aspects of this relationship. The three studies explore the cumulative effect of suspensions over multiple years, the effect of suspensions on juvenile justice involvement during the month of the suspension, and, even more specifically, during the days suspension occurred.

Mowen and Brent (2016) used four waves of data from the National Longitudinal Survey of Youth 1997 (NLSY97) to examine whether school discipline contributes to increased odds of arrest over time and whether suspensions received over multiple years present a “cumulative” increase in odds of arrest. Using hierarchical generalized linear model (HGLM), they delineated both the “within-individual” and “between-individual” effects of school suspension on arrest. Their results indicate that an individual is more likely to report an arrest each year they are suspended relative to a year in which they are not suspended, and individuals who are suspended relative to those who are not are also significantly more likely to be arrested, even while accounting for theoretically important constructs such as self-reported delinquency and demographic characteristics. Moreover, each increase in the number of years in which the youth reports being suspended leads to an increase in the odds of arrest for that youth, thus showing a cumulative effect.

To further determine if arrests were the result of school suspensions, Monahan et al. (2014) examined whether arrests occurred during the same months in which students were suspended or expelled from school by using a fixed-effects analysis. They used month-level data from 6636 months from the Pathways to Desistance study (i.e. data from the first 2 years of assessments during months when an individual was enrolled in school), a prospective study of 1354 juvenile offenders in two major metropolitan areas. The results indicate that during months when students were suspended or expelled from school, they had an increased likelihood of being arrested. This was particularly true for those who did not have a history of behavior problems and when youth associated with less delinquent peers. The authors suggested that their findings may be explained by the exclusionary school disciplinary policies placing youth more at risk for unstructured and unsupervised activities (Osgood et al., 1996). The observed effects are also consistent with educational theory that posits that the deleterious effects of forced school removal may be strongest among “less risky” youth (Morrison et al., 2001).

Cueller and Markowitz (2015) were able to more precisely connect school suspensions and juvenile court referrals by determining whether referrals occurred for youths during the days when they were suspended from school.³ Data were obtained from an urban school district and a county juvenile justice system for 2002–2009. The school data provided the specific dates when students were suspended and the authors matched these dates with dates of juvenile court referral. Using a difference-in-difference (D-D) analytic framework, they tested for the effects on crime of being

³A “referral” is the juvenile justice system’s alternative to an adult arrest. Once an arrest is made, the youth is “referred” to the juvenile court for a decision whether the youth should be detained and charged, released, or transferred into another youth program (Cueller & Markowitz, 2005).

suspended on a school day as compared to a weekend or holiday, net of the time-of-week-based difference in crime for non-suspended students. They found referrals to be most likely during days when students were on suspension. Being suspended from school more than doubled the probability of being referred to the juvenile court. They also found this effect to be particularly strong among African American students.

The research on the relationship between school suspensions and expulsions and arrests, juvenile court referrals and incarceration is consistent (Hirschfield, 2018). School exclusionary disciplinary practices lead to an increase in juvenile justice involvement. Prior research has also established a relationship between involvement in the juvenile justice system and subsequent delinquency, crime and drug use (e.g. Bernburg, 2009; Krohn & Lopes, 2015). Yet, there has been less research on whether school suspensions and expulsions lead directly to subsequent delinquent and drug-using behavior.

School exclusion and subsequent delinquent behavior

Although many of the studies linking school exclusionary disciplinary practices to juvenile justice involvement assume that those affected have committed behaviors while out of school that bring them into contact with law enforcement officials, few studies actually empirically examined the relationship between exclusionary practices and subsequent delinquent or drug-using behavior. This contrasts with the literature on the impact of juvenile justice intervention in which a number of studies have demonstrated that juvenile justice intervention increases the probability of subsequent delinquent and drug-using behavior (Barrick, 2014; Bernburg, 2009; Krohn & Lopes, 2015).

The limited research on the relationship between school exclusionary disciplinary practices and delinquent and drug-using behavior suggests that these practices result in a continuation or increase in deviant behavior. Using data from the Fragile Families and Child Wellbeing Study, Jacobsen, Pace, and Ramirez (2016) concluded that exclusionary discipline is a common experience in the first few years of elementary school (before the age of 9) with males and blacks being more likely to be excluded than females or whites. Among those suspended or expelled from school, physically aggressive behaviors (as measured by the Child Behavior Checklist) were more, rather than less, likely than among those children who were not removed from school. They suggest that school exclusionary disciplinary practices increased stress and imposed labels on the children facilitating cumulative disadvantage (Agnew & Brezina, 2010; Sampson & Laub, 1997). Similar conclusions were drawn from McCrystal et al. (2007)—students excluded from school had higher rates of drug use and antisocial behavior and lower levels of communication with their parents than the in-school sample. The authors also showed that those excluded from school had a higher probability of contact with the criminal justice system. In addition, Kaplan and Fukurai (1992) explicated that negative social sanctions, including having been suspended or expelled from school, were indirectly related to drug use through self-rejection, disposition to deviance, and deviant peer associations.

Hemphill, Toumbourou, Herrenkohl, McMorris, and Catalano (2006) reported findings that are closely relevant to the current investigation. They used data on 3655 students aged 12 to 16 from both the state of Washington, United States and Victoria, Australia. They included measures of both school suspension and arrest (year 1) in a logistic regression analysis predicting scores on a general delinquency scale (year 2). A comprehensive list of both risk and protective factors including items from the individual, family, peer, school, and community domains were also included in the analysis. In the fully adjusted model, school suspension remained a significant predictor of general delinquency while arrest did not. It would be interesting to see if the same pattern holds for drug use.

Although limitations are associated with prior studies,⁴ these findings are largely consistent with those from research focusing on juvenile justice intervention and subsequent delinquency and drug use. Moreover, the effects of both juvenile justice intervention and school exclusionary disciplinary practices may not be the same for males and females and for different racial and ethnic groups (Chiricos, Barrick, Bales, & Bontrager, 2007; Hirschfield, 2018). Some prior research has suggested that juvenile justice intervention would be more problematic for blacks and Hispanics since it serves to exacerbate their already disadvantageous position (Bernburg, 2009). We would expect the same to be true of school disciplinary practices. There is also some evidence suggesting that adolescent females place more importance on school performance and school related activities (Krohn & Massey, 1980; Spinath, Edckert, & Steinmayr, 2014). If so they may be more affected than males by exclusion from school.

Current study

From a labeling perspective, both intervention by the juvenile justice system and school suspensions and expulsions would be expected to have problematic consequences for youth undergoing such experiences. Empirical evidence has suggested that 1) school exclusionary practices lead to juvenile justice intervention; 2) to a large extent, juvenile justice intervention leads to difficult life-course transitions and delinquent and drug-using behavior; and 3) limited studies have investigated and shown that school exclusionary practices lead to difficult life-course transitions and delinquent and drug-using behavior.

The current study is concerned with the question of which type of societal reaction, juvenile justice intervention (police arrest) or school exclusionary practices, is more predictive of drug use. We hypothesize that school exclusionary practices will have an effect independent of the “school to prison pipeline” effect that has been so often examined (Hirschfield, 2018; Mallett, 2016). Indeed, we hypothesize that school exclusionary disciplinary practices will be more predictive of drug use than juvenile justice intervention based on our assumptions that such practices have the potential to

⁴For instance, school exclusion and aggressive behavior were measured over the same time period in Jacobsen et al. (2016), thus limiting their ability to establish the appropriate time order. Kaplan and Fukurai (1992) used a measure of negative social sanctions that also tapped contact with police, sheriff, or juvenile authorities as well as being sent to a psychiatrist, psychologist, or social worker. Consequently, the unique effect of school sanctions on subsequent drug use could not be determined.

become better known to social networks than does juvenile justice intervention, have an immediate impact on excluding youth from school-related activities and other associates who are involved in those activities, and affords excluded youth the opportunity to increase their time in unstructured and unsupervised activities (Balfanz et al., 2015; Marshbanks et al., 2015; Osgood et al., 1996; Shollenberger, 2015).

Moreover, prior research has not examined both the immediate or concurrent influence and long-term cumulative impact of school exclusionary discipline on drug use. Adversities in adolescence may accumulate and lead to difficulties in adult life (Morrison et al., 2001; Raffaele-Mendez, 2003; Rosenbaum, 2018). We thus investigate the above hypotheses both during the adolescent years and longer impact into young established adulthood. Additionally, we stratify the analyses by gender and minority status to determine if the predicted effects are different among males and females or blacks, Hispanics and white youth.

Methods

Data and sample

The data for the current study come from the Rochester Youth Development Study (RYDS), a longitudinal panel study aimed at understanding the causes and consequences of serious delinquency and drug use. Data collection for the RYDS began in 1988 with an original sample of 1000 seventh- and eighth-grade students in the public schools of Rochester, New York. The sample was stratified on two dimensions to over-represent high-risk youth: First, males were oversampled (75% vs. 25%) because empirical evidence has consistently shown that males are more likely than females to engage in crime and drug use. Second, students from high crime neighborhoods were oversampled based on the premise that living in such areas of the city represented enhanced risk for delinquency and drug use. To identify high crime neighborhoods, each census tract in Rochester was assigned a resident arrest rate reflecting the proportion of the total population living in that tract that was arrested by the Rochester police in 1986. Subjects were oversampled proportionate to the rate of offenders living in a tract. The sample was predominantly comprised of minorities (68% African American, 17% Hispanic, and 15% White) and males (73%).

The RYDS has collected 14 waves of data across three study phases, covering the subjects from their early teenage years (about age 14) to young established adulthood (age 31). Phase 1 covered the adolescent years of the subjects from about 14 to 18 years of age. In Phase 1, the respondents and their primary caretakers (most often biological mothers) were interviewed nine and eight times respectively at 6-month intervals (waves 1–9). After a 2.5-year gap in data collection, the respondents with their primary caregivers were interviewed at three annual intervals at ages 21 to 23 (waves 10–12) in Phase 2. Phase 3 consisted of respondent interviews at 29 and 31 years of age (waves 13 and 14). The interviews covered a wide range of topics including psychological functioning, family structure and relationships, peer relationships, educational aspirations and commitments, employment and economic indicators, and individuals' self-reported offending and drug use. In addition to self-reported measures, the RYDS also collected official data (e.g. school-performance data, child

maltreatment information, and official arrest records) from schools, social services, and the police. The attrition rate in the RYDS data has been acceptable. At wave 14, about 76% of the original sample had been retained (Dong & Krohn, 2016).

Specifically, the current investigation uses data from Phase 1, when most subjects were still in school, to explore the *immediate, concurrent* impact of school discipline and police arrest on drug use during adolescence, and uses data from Phase 1 and 3 to examine the *long-term, cumulative* impact of school discipline and police arrest during adolescence on subsequent drug use in young established adulthood. To control for drug-using opportunities, individuals who were incarcerated during Phase 1 and 3 are excluded from the analyses.⁵

The first phase of the RYDS was conducted in the late 1980s and early 1990s, a period of time that Hirschfield (2018) attributes to the onset of an increase in the use of harsh school disciplinary practices including suspensions and expulsions. The years covered by the RYDS provided a particularly opportune time period over which to examine the impact of school exclusionary practices.

Measures

Dependent variable

Drug use

We created a dichotomous variable indicating whether the respondent had used any illicit drug since the date of last interview during adolescence (Phase 1). At each wave, if the respondent answered “yes” to any of the illegal drug activities including marijuana, crack cocaine, cocaine other than crack, heroin, LSD, PCP, tranquilizers, inhalant, and other nonprescription drugs, they had a score of “1.” Otherwise, they had a score of “0.” To measure drug-using behavior during young established adulthood (Phase 3), we created a summed score of dichotomous indicators across Waves 13 and 14. We coded it “0” if the respondent did not use any drug in Phase 3, “1” if the respondent used at either Wave 13 or 14, and “2” if the respondent used at both waves.

Independent variables

School discipline

Between Waves 2 and 9, the respondents who remained in school were asked to report if they got suspended or expelled from school since the date of last interview. Youth could respond either “yes” (1) or “no” (0) for each wave making this a binary measure. Following prior research (e.g. Mowen & Brent, 2016), when exploring the cumulative impact of school discipline during adolescence on adult drug use, we created a count variable indicating how many waves an individual was suspended or expelled from school during Waves 2–9. The cumulative score ranged from 0 to 8.

⁵As a robustness check, we also ran analyses when the incarcerated respondents were included. Substantively similar findings were observed.

Police arrest

Police arrest is a measure of criminal justice intervention. Using official records collected from the Rochester Police Department, we examined whether an individual experienced police arrest at each wave during Waves 2–9. The binary indicator equals “1” if the respondent was arrested at a particular wave of data collection and “0” otherwise. In addition, to investigate the cumulative impact of police arrest during adolescence on adult drug use, we created a count variable indicating how many waves an individual was arrested between Waves 2 and 9. The cumulative score ranged from 0 to 4.

Control variables

To minimize potential confounding effects, a variety of time-varying covariates that are known to be associated with both school and police intervention and drug use were controlled in the analyses.⁶

Self-esteem represents an individual’s sense of self-worth and is measured by a 9-item scale derived from Rosenberg’s (1965) self-esteem scale. During Waves 2–9, the respondent were asked whether they agree or disagree with statements like “in general, you are satisfied with yourself,” “at times you think you are no good at all” (reverse coded), “you feel that you have a number of good qualities” or “you can do things as well as most other people.” Responses were indicated on a 4-point scale from “strongly disagree” (1), “disagree” (2), “agree” (3) to “strongly agree” (4). Items were averaged to provide the mean score and higher scores indicate greater self-esteem. *Depression* is measured by a 14-item scale tapping the frequency of depressive symptoms during Waves 2–9 (Radloff, 1977). The respondents were asked, for instance, how often you “feel you had trouble keeping your mind on what you were doing,” “feel depressed or very sad” or “feel scared or afraid.” Responses were indicated on a four-point scale from “never” (1), “seldom” (2), “sometimes” (3), to “often” (4). Items were averaged to provide the mean score, and higher scores indicate greater depressive symptoms. *Living with both parents* is a dichotomous variable indicating whether the respondent lived at home with both biological parents (“1”) or in some other family constellation (“0”) at each wave between Waves 2 and 9. *Parental supervision* is measured by a 4-item scale assessing how often the primary caregiver knew where the respondent was and with whom, and how important that was to the primary caregiver. *Commitment to school* is a 10-item scale measuring one’s level of agreement on the importance of school work during Waves 2–9. The respondents were asked, for instance, whether “school is boring to you (reverse coded),” “you don’t really belong at school (reverse coded),” “you usually finish your homework,” or “your try hard at school.” Responses were indicated on a 4-point scale from “strongly disagree” (1), disagree” (2), “agree” (3), to “strongly agree” (4). Higher scores indicate greater commitment to school. To control for unstructured time spent with peers during adolescence, *risky time with friends* is measured by three questions regarding how

⁶Some of these covariates may also be considered potential mediators of the effects of school and police intervention on drug use. We thus conducted conservative tests of the hypotheses because our models only captured “direct” effects (τ) of school and police intervention on drug use, but not potential “indirect” effects ($\tau - \tau$) or “total” effects (τ).

often the respondent and his friends got together where no adults were present, drove around with no special place to go, and got together where someone was using or selling drugs or alcohol. Responses were indicated on a five-point scale from “never” (1), “one time per week” (2), “two times per week” (3), “three or four times per week” (4), to “everyday” (5). Items were averaged to provide the mean score, and higher scores indicate greater involvement with delinquent friends. *Peer substance use* is measured by a 4-item scale assessing the proportion of one’s peers that “drank alcohol,” “used marijuana,” “used crack,” and “used hard drugs” during Waves 2–9. Responses ranged from “none of them” (1) to “most of them” (4), and items were averaged to provide the mean score. *Street crime* is measured by a variety scale covering 11 items of criminal behavior during adolescence.⁷ These offenses are generally serious, and often elicit public concern and fear.

In addition to the time-varying covariates, several time-stable characteristics were also included when examining the impact of school and police intervention on drug use. We created a dummy indicator for *male* and indicators for *African-American* and *Hispanic* race/ethnicity (reference group is white). *Academic aptitude* is measured by the math percentile score received on the California Achievement Test in 1987 (when the respondents were approximately 12 years old). Higher scores on this variable indicate greater academic aptitude. Additionally, *parental education* refers to the highest grade completed by the principal family wage-earner.

Data analysis

To answer our research questions, data analysis proceeded in three main steps using Stata (Version 15.0; StataCorp 1985–2017). First, we presented descriptive information of school discipline, police arrest, and drug use during adolescence. In the second step, we used fixed-effects logistic regression models to estimate the immediate, concurrent relationship between school and police intervention and drug use during adolescence (Waves 2–9). Since fixed-effects models focus on only within-person variance, all time-invariant characteristics (e.g. primary deviance), observed or unobserved, are accounted for, thereby eliminating individual variability and potentially a large source of bias. This represents the key advantage of using fixed-effects models as it is very difficult to assess all of the between-person covariates that could potentially influence whether a person is suspended, expelled, arrested, or involved in drug use. Fixed-effects estimates, however, may still be biased when time-variant confounding effects are not considered. We therefore incorporated theoretically-informed time-varying covariates in our fixed-effects models. Third, we take further advantage of the longitudinal nature of our data to examine the long-term, cumulative effects of school and police intervention during adolescence on adult drug use. We estimated negative binomial count models, which are capable of handling over-dispersion in the outcome variable that causes bias in parameter estimations. To preserve temporal order in this

⁷These criminal acts include whether the individual entered or attempted to enter a house to steal or damage something; carried a hidden weapon; stole a purse, wallet, or picked someone’s pocket; stole something from a car; tried to buy or sell goods that were stolen; stole or attempted to steal a car; used a weapon or force to commit robbery; attacked someone with a weapon; engaged in a gang fight; sold marijuana; or sold hard drugs.

Table 1. Descriptive information of school discipline, police arrest, and drug use during adolescence.

	% of eligible participants ($N = 960$) who reported behavior at least once across Waves 2–9 of the RYDS	% of eligible person-time points ($N = 6301$) with corresponding behavior across Waves 2–9 of the RYDS
School discipline	54.6%	18.8%
Police arrest	18.1%	4.0%
Drug use	29.8%	10.5%

step of analysis, control variables were measured prior to or at Wave 2, cumulative scores of school and police intervention at Waves 2–9, and adult drug use at Waves 13 and 14. As discussed earlier, we hypothesized that the effects of school discipline and police arrest on drug use may vary according to gender and race/ethnicity. Thus, we stratified the analyses in steps 2 and 3 by gender and minority status.⁸

Missing values due to sample attrition or non-responses to specific questions are often observed in longitudinal panel studies. Because we are interested in examining the relative impact of school discipline and police arrest on drug use, we restricted our sample to person-time points when the subjects were enrolled in schools. Consequently, depending on the age and enrollment status of the individual, he or she may have a different number of waves to contribute data.⁹ Missing data among other variables were screened for patterns of missingness, and we found little evidence that the assumption of “missing at random” was violated. We employed the technique of multiple imputation by chained equations (MI imputed chained; number of imputations = 20) to deal with missing data in the present analyses (Allison, 2002). Stata’s Multiple Imputation (MI) procedure runs the specified estimation command on each of the 20 imputed datasets to obtain the 20 completed-data estimates of coefficients and their variance-covariance estimates (VCEs). It then computes MI estimates of coefficients and standard errors by applying combination rules to the 20 completed-data estimates (Rubin, 1987, 1996; Schafer, 1997).¹⁰

Results

Descriptive information of school discipline, police arrest, and drug use

As Table 1 shows, between Waves 2 and 9 of the RYDS, there were a total of 960 eligible participants who were enrolled in school for at least one wave of data collection.

⁸Since the effects of other important covariates (besides school and police intervention) on drug use may also vary by gender and minority status, we chose to stratify the analyses by gender and minority status rather than including statistical interaction terms between school and police intervention and gender and race/ethnicity.

⁹It is possible for an individual to leave the study (being out of school) but come back at later waves (being back in school).

¹⁰Imputation modeling also requires careful consideration of how to handle complex data structures, such as survey or longitudinal data, and how to preserve existing relationships in the data during the imputation step. For the adolescent models, we accounted for the clustering in the data (i.e. multiple observations per subject) when creating multiple imputed datasets. We first reshaped the data from long to wide. Having the data in wide form addresses the nesting issue and allows us to use variables from other time periods as predictors of missing values. Once we obtained our multiply imputed data, we reshaped the data back to long format for fixed-effects analyses. For the adult models, we excluded subjects from negative binomial regressions if they had missing information on the outcome variable, although the outcome variable was included in the imputation model.

More than half of them (54.6%) have ever been suspended or expelled from school during adolescence. In addition, 18.1% of them have been arrested and 29.8% have used drugs during adolescence. More specifically, the 960 eligible participants contributed 6301 eligible person-time or data points. Of the 6301 data points, school discipline or being suspended/expelled was positive 18.8% of the time. Comparing with school intervention, police arrest was a less frequent phenomenon, which was positive for 4.0% of the time. Moreover, the subjects used drugs for 10.5% of the 6301 person-time points. [Table 1](#) indicates that there is adequate variability in the key predictor and outcome variables for statistical analysis.

The immediate impact of discipline on drug use in adolescence

We present the fixed-effects logistic regression results first for when the respondents were in their adolescent years. Models 1 and 2 in [Table 2](#) show the bivariate relationships between school and police intervention and drug use. As expected, both school discipline and police arrest are significant predictors of drug use in a bivariate sense. Model 3 shows that school discipline and police arrest remain significant predictors of drug use when only the two predictors are in the model. Model 4 in [Table 2](#), however, shows that when theoretically-informed time-varying covariates are included in the model, only school discipline remains a significant predictor of drug use. While holding other variables constant, being suspended or expelled from school increases the odds of drug use by a factor of 1.489 (or an increase of 48.9%). Consistent with prior research, living in an intact family and having higher levels of parental supervision and commitment to school reduce the likelihood of drug use during adolescence, whereas spending unstructured time with peers, peer substance use, and self-reported offending increase the risk of drug use.

[Table 3](#) shows the results stratified by gender and minority status. Comparing the model estimates of Model 1 and 2, we observed that both school discipline and police arrest are significant predictors of drug use only among females during adolescence. While holding other variables constant, the odds of drug use for female subjects who were suspended or expelled from school is 1.861 times that of female subjects who did not experience school intervention. In the meantime, while holding other variables constant, the odds of drug use for female subjects who were arrested is 4.484 times that of female subjects who did not experience police intervention. It is also worth noting that parental supervision exhibits protective effects among females only, whereas risky time with friends is a risk factor for males only.

Additionally, we observed that school discipline leads to drug use among minority subjects only (Models 3 and 4 in [Table 3](#)). While holding other variables constant, the odds of drug use for minority subjects who were suspended or expelled from school is 1.714 times that of minority subjects who did not experience school intervention. It is worth mentioning that although not statistically significant, the direction of the effects of school and police intervention on drug use appears negative, or in other words, protective for white subjects. While living in an intact family appears protective, in particular, for white subjects, enhancing parental supervision and commitment to school are especially important for reducing drug use among minority youth. In brief,



Table 2. Fixed-effects logistic regression models predicting drug use during adolescence.

	Model 1				Model 2				Model 3				Model 4			
	<i>b</i>	SE	OR		<i>b</i>	SE	OR		<i>b</i>	SE	OR		<i>b</i>	SE	OR	
School discipline	.662***	.149	1.939	—	—	—	—	.628***	.152	1.874	—	—	.398*	.194	1.489	—
Police arrest	—	—	—	.675**	1.964	—	—	.638*	.263	1.894	—	—	.340	.332	1.405	—
Self esteem	—	—	—	—	—	—	—	—	—	—	—	—	-.376	.297	0.686	—
Depression	—	—	—	—	—	—	—	—	—	—	—	—	-.054	.237	0.947	—
Living with both parents	—	—	—	—	—	—	—	—	—	—	—	—	-.662*	.295	0.516	—
Parental supervision	—	—	—	—	—	—	—	—	—	—	—	—	-.611**	.222	0.543	—
Commitment to school	—	—	—	—	—	—	—	—	—	—	—	—	-1.110***	.301	0.329	—
Risky time with friends	—	—	—	—	—	—	—	—	—	—	—	—	.534***	.141	1.706	—
Peer substance use	—	—	—	—	—	—	—	—	—	—	—	—	2.013***	.193	7.489	—
Street crime	—	—	—	—	—	—	—	—	—	—	—	—	.493***	.090	1.638	—

SE: standard error; OR: odds ratio.

*** $p < .001$; ** $p < .01$; * $p < .05$ (two-tailed).

Table 3. Fixed-effects logistic regression models predicting drug use across gender and minority status during adolescence.

	Model 1: Male				Model 2: Female				Model 3: White				Model 4: Minority			
	<i>b</i>	SE	OR		<i>b</i>	SE	OR		<i>b</i>	SE	OR		<i>b</i>	SE	OR	
School discipline	.296	.238	1.344	.621*	.319	1.861	—	—	-.401	.498	0.669	—	-.539***	.209	1.714	—
Police arrest	.262	.334	1.299	1.500*	.692	4.484	—	—	-.009	1.305	0.991	—	.387	.332	1.472	—
Self esteem	-.192	.363	0.825	-.651	.555	0.521	—	—	-.894	.939	0.408	—	-.334	.315	0.715	—
Depression	.014	.301	1.015	-.219	.414	0.803	—	—	.319	.860	1.376	—	-.117	.247	0.889	—
Living with both parents	-.485	.319	0.615	-1.125 ^o	.662	0.324	—	—	-1.094*	.424	0.334	—	-.527	.339	0.591	—
Parental supervision	-.390	.253	0.677	-1.253**	.461	0.286	—	—	-.558	.755	0.571	—	-.622**	.235	0.536	—
Commitment to school	-.995**	.370	0.370	-1.082*	.534	0.338	—	—	.429	.910	1.536	—	-1.469***	.333	0.230	—
Risky time with friends	.646***	.171	1.907	.297	.275	1.346	—	—	.914*	.450	2.496	—	.472**	.148	1.603	—
Peer substance use	2.015***	.251	7.498	2.176***	.303	8.817	—	—	2.595***	.537	13.399	—	1.984***	.214	7.275	—
Street crime	.352***	.096	1.422	1.022***	.221	2.778	—	—	.566 ^o	.330	1.761	—	0.471***	.091	1.602	—

SE: standard error; OR: odds ratio.

*** $p < .001$; ** $p < .01$; * $p < .05$; ^o $p < .10$ (two-tailed).

our results revealed that school intervention appears to be an important predictor of adolescent drug use among female and minority subjects, and police arrest leads to drug use among females only.

The long-term impact of discipline on drug use in adulthood

Table 4 reports descriptive statistics of variables used when assessing the long-term, cumulative effects of school, and police intervention on adult drug use. The sixth column in the table specifies the waves from which the measures were taken.

Models 1 and 2 in Table 5 show that adolescent cumulative score of school discipline is a significant predictor of adult drug use in a bivariate sense, whereas adolescent cumulative score of police arrest is not. Model 3 in Table 5 also indicates that when both variables are simultaneously included in the model, only school discipline remains a significant predictor of drug use. The result holds when other theoretically-informed covariates are added in the model (Model 4 in Table 5). While holding other variables constant, a one-unit increase in the cumulative score of adolescent school discipline leads to an increase in the incidence rate for drug use by a factor of 1.137 (or an increase of 13.7%) during young established adulthood. Among control variables, being male and having a higher level of parental education (though the effect size is small; IRR = 1.073) are positively related to adult drug use, whereas being older and living in an intact family at the start of the RYDS are negatively correlated with adult drug use.

Table 6 shows the negative binomial regression results stratified by gender and minority status. Different from the results in the adolescent models, Models 1 and 2 in Table 6 suggest that the cumulative score of adolescent school discipline reaches statistical significance when predicting adult drug use only for male subjects. While holding other variables constant, a one-unit increase in the cumulative score of school

Table 4. Descriptive statistics of variables in the long-term impact models ($N = 761$).

Variables	Mean (proportion)	S.D.	Min	Max	Wave
Drug use	0.502	0.769	0.000	2.000	13-14
School discipline	1.189	1.489	0.000	8.000	2-9
Police arrest	0.229	0.580	0.000	4.000	2-9
Male	0.696	0.460	0.000	1.000	1
African American	0.682	0.466	0.000	1.000	1
Hispanic	0.162	0.368	0.000	1.000	1
Parental education	11.426	2.178	6.000	18.000	1
Academic aptitude	58.407	25.585	1.000	99.000	a*
Age	14.433	0.767	11.900	16.200	2
Self esteem	3.068	0.407	1.778	4.000	2
Depression	2.160	0.459	1.000	3.786	2
Living with both parents	0.348	0.477	0.000	1.000	2
Parental supervision	3.635	0.392	1.500	4.000	2
Commitment to school	3.080	0.351	1.600	4.000	2
Risky time with friends	1.988	0.607	1.000	4.111	2
Peer substance use	1.298	0.464	1.000	4.000	2
Prior street crime	0.579	1.176	0.000	8.000	2
Prior drug use	0.122	0.328	0.000	1.000	2

a*, measured by the math percentile score received on the California Achievement Test in 1987 (prior to Wave 1 of the RYDS).

Table 5. Negative binomial regression of adult drug use (Wave 13-14) on adolescent school discipline and police arrest (Waves 2-9).

	Model 1			Model 2			Model 3			Model 4		
	<i>b</i>	SE	IRR	<i>b</i>	SE	IRR	<i>b</i>	SE	IRR	<i>b</i>	SE	IRR
School discipline	.157***	.028	1.170	—	—	—	.158***	.031	1.171	.129***	.033	1.137
Police arrest	—	—	—	.102	.084	1.107	-.013	.091	0.987	-.036	.101	0.964
Male	—	—	—	—	—	—	—	—	—	.645***	.151	1.907
African American	—	—	—	—	—	—	—	—	—	.078	.159	1.081
Hispanic	—	—	—	—	—	—	—	—	—	.021	.201	1.021
Parental education	—	—	—	—	—	—	—	—	—	.071**	.027	1.073
Academic aptitude	—	—	—	—	—	—	—	—	—	.002	.003	1.002
Age	—	—	—	—	—	—	—	—	—	-.233**	.081	0.792
Self esteem	—	—	—	—	—	—	—	—	—	-.308 ^o	.174	0.734
Depression	—	—	—	—	—	—	—	—	—	.082	.149	1.085
Living with both parents	—	—	—	—	—	—	—	—	—	-.262*	.116	0.768
Parental supervision	—	—	—	—	—	—	—	—	—	.102	.135	1.107
Commitment to school	—	—	—	—	—	—	—	—	—	-.227	.171	0.796
Risky time with friends	—	—	—	—	—	—	—	—	—	-.039	.100	0.961
Peer substance use	—	—	—	—	—	—	—	—	—	.215	.142	1.241
Prior street crime	—	—	—	—	—	—	—	—	—	.015	.053	1.016
Prior drug use	—	—	—	—	—	—	—	—	—	.365 ^o	.189	1.440

SE: standard error; IRR: incidence rate ratio.
 ****p* < .001; ***p* < .01; **p* < .05; *op* < .10 (two-tailed).

Table 6. Negative binomial regression of adult drug use (waves 13–14) on adolescent school discipline and police arrest (waves 2–9) across gender and minority status.

	Model 1: Male			Model 2: Female			Model 3: White			Model 4: Minority		
	<i>b</i>	SE	IRR	<i>b</i>	SE	IRR	<i>b</i>	SE	IRR	<i>b</i>	SE	IRR
School discipline	.123***	.035	1.131	.122	.082	1.129	.092	.086	1.097	.143***	.037	1.154
Police arrest	-.048	.098	0.952	.176	.574	1.193	-.148	.331	0.862	-.062	.110	0.940
Male	—	—	—	—	—	—	.428	.571	1.533	.668***	.156	1.949
African American	.126	.162	1.134	-.450	.524	0.638	—	—	—	—	—	—
Hispanic	-.100	.218	0.904	.221	.601	1.248	—	—	—	—	—	—
Parental education	.064*	.028	1.067	.078	.079	1.082	.133	.086	1.143	.063*	.029	1.065
Academic aptitude	.001	.003	1.001	.010	.007	1.010	-.002	.007	0.998	.003	.003	1.003
Age	-.219*	.088	0.803	-.273	.227	0.761	-.552*	.247	0.575	-.182*	.087	0.833
Self esteem	-.336 ^o	.191	0.714	-.158	.398	0.854	.092	.437	1.096	-.357 ^o	.191	0.699
Depression	.021	.155	1.021	-.115	.364	0.891	.383	.424	1.466	.027	.160	1.028
Living with both parents	-.192	.123	0.825	-.360	.377	0.697	-.542	.339	0.581	-.209 ^o	.126	0.811
Parental supervision	.073	.137	1.076	.295	.408	1.343	.274	.469	1.316	.063	.141	1.065
Commitment to school	-.246	.189	0.781	-.374	.402	0.687	-.631	.404	0.531	-.176	.185	0.838
Risky time with friends	-.037	.109	0.964	-.112	.227	0.893	.001	.292	1.001	-.043	.106	0.958
Peer substance use	-.076	.167	0.926	1.061***	.287	2.889	.343	.532	1.409	.217	.151	1.243
Prior street crime	.068	.055	1.071	.075	.156	1.078	.044	.239	1.045	.014	.057	1.015
Prior drug use	.338	.208	1.403	.375	.398	1.455	-.131	1.016	0.877	.413*	.190	1.511

SE: standard error; IRR: incidence rate ratio.
 *** $p < .001$; ** $p < .01$; * $p < .05$; ^o $p < .10$ (two-tailed).

discipline leads to an increase in the incidence rate for drug use by a factor of 1.131 (or an increase of 13.1%) for male subjects. Yet, the cumulative effects of adolescent school discipline did not reach statistical significance when predicting adult drug use for female subjects. Consistent with the results from the adolescent models, the cumulative score of school discipline leads to adult drug use among minority subjects only (Models 3 and 4 in Table 6). While holding other variables constant, a one-unit increase in the cumulative score of school discipline leads to an increase in the incidence rate for drug use by a factor of 1.154 (or an increase of 15.4%) during young established adulthood. Thus, our results revealed that school discipline during adolescence rather than police arrest has a long-term, cumulative impact on adult drug use, and such negative effects mainly exhibit among male and minority subjects.

Discussion and conclusion

The use of school suspensions and expulsions as a way of disciplining student misbehavior has been increasing over the past 20 years (Hirschfield, 2008; Mallett, 2016). Much research on what has come to be known as the “school to prison pipeline” has demonstrated that youth who are excluded from school either by suspension or expulsion are more likely to experience some form of juvenile justice intervention (e.g. Cueller & Markowitz, 2015; Monahan et al., 2014; Mowen & Brent, 2016).

Research from a labeling perspective has focused on the unintended consequences of juvenile justice intervention. The findings from such studies suggest that being labeled by the juvenile justice system increases the probability of future delinquent and drug-using behavior (Barrick, 2014). Similarly, a more limited amount of research has found that school exclusionary disciplinary practices increase the probability of future problematic behavior (e.g. Hemphill et al., 2006; Jacobsen et al., 2016; Kaplan & Fukurai, 1992; McCrystal et al., 2007). The primary question we addressed in the current study is whether juvenile justice intervention or school exclusion has a greater impact on concurrent and future drug use. From a societal reaction perspective, we hypothesized that school exclusionary discipline would have a greater impact on both concurrent and future subsequent drug use than would juvenile justice intervention.

The findings are supportive of our hypothesis. First, we examined the impact of both juvenile justice intervention and school exclusionary discipline on drug use concurrently during adolescence and found that when covariates are taken into account, school exclusion is significantly predictive of drug use whereas police arrest is not. Taking further advantage of the longitudinal nature of our data, we examined the cumulative effect of school exclusion and police arrest during adolescence on drug use in young established adulthood, up to 17 years after experiencing the intervention. Again, we found that for the full sample being suspended or expelled from school during the adolescent years predicted drug use in early adulthood whereas the effect of police arrest on later drug use was not statistically significant.

These findings can be interpreted from two complementary theoretical perspectives. The immediate impact of school exclusion increases the potential for youth to be in unstructured and unsupervised situations in which deviant behavior has been shown to be more likely (Osgood et al., 1996; Osgood & Anderson, 2004). We argued

that the impact of school exclusion should be especially important for activities like drug use that usually entail a block of time to use and experience the effects of the drug. We incorporated a measure of risky time spent with friends which, while being significantly related to adolescent drug use, did not fully mediate the relationship between school exclusion and drug use. We suspect that the increased time spent with friends in unstructured and unsupervised activities is in part a result of school exclusion and has an impact on using drugs during adolescence. Our findings, however, also suggest that if parents of suspended and expelled students provide adequate supervision, the negative impact of school exclusion could be mitigated. If adolescents think their parents know where they are and with whom they are interacting, parents will have a “psychological presence” that should, at least partially, counter negative influence of unstructured time with friends, and thus constrain them from delinquent and drug-using behavior (Hirschi, 1969; Krohn & Massey, 1980). Risky time with friends and parental supervision during adolescence were also included as control variables in the adult models. It might not be surprising that unstructured activities and parental supervision at the start of the RYDS were not directly related to adult drug use. On the one hand, unstructured and unsupervised situations should have a more immediate impact on drug use rather than exhibiting long-term impacts, and, on the other hand, there may be an indirect pathway of participating in unstructured and unsupervised activities in adolescence on adult use patterns through adolescent drug use and other problematic outcomes of spending time in unstructured and unsupervised activities. This may be an interesting avenue for future research to investigate.

Additionally, recent work from a labeling perspective emphasizes the impact of intervention during adolescence on the ability to make a successful transition to adulthood. The longer-term, significant impact of school exclusion may be understood from this angle. Prior research indicates that school exclusion has an important impact on academic achievement both in terms of the quality of that performance and the probability of graduating from high school. Acquiring a high school education is an important factor in obtaining quality employment and having some economic success (Lopes et al, 2012; Marshbanks et al., 2015). Thus, exclusion from school may result in a cascading series of problematic transitions which in turn may lead to problematic behaviors such as illicit drug use. While the current study did not focus on investigating potential mediating factors such as educational success, employment, and economic well-being, our findings are at least suggestive of such a process.

We also hypothesized that school exclusion would have a greater impact for minority youth and for females than it does for whites and males. Our rationale for expecting school exclusion to be more problematic for minorities is based on the recognition that minorities are typically at a disadvantage in succeeding in the school system even without being suspended or expelled. Exclusion from school further jeopardizes academic success and ultimately is predicted to lead to drug use (Anyon et al., 2014; Fenning & Rose, 2007; Hannon, DeFina, & Bruch, 2013; Skiba, Michael, Nardo, & Peterson, 2002). Our findings support this argument as in both the concurrent and longer-term analysis, school discipline was a significant predictor of drug use for minorities but not for whites.

The results for males and females are intriguing. We anticipated that females would be more likely to be affected by school exclusion since previous research has suggested school success and school-related activities are more important for female adolescents than they are for males (Krohn & Massey, 1980; Spinath et al, 2014). Our analysis of the concurrent effect of school exclusion on drug use during adolescence is consistent with this hypothesis. For adolescent females school exclusion is predictive of concurrent drug use whereas it is not for male adolescents. The longer-term contingent effect of gender, however, is not consistent with our hypothesis. We observed that school exclusion during adolescence is significantly related to subsequent adult drug use for males, but the relationship for females is not statistically significant. It might be that the impact of school exclusion on the future success of males is greater given the cultural emphasis on being able to secure a quality job and support a family; the strain/stress associated with difficulties in life transitions results in continuing deviant behavior. For females, other events, such as having children, may serve as a buffer for the impact of school exclusion on future offending and drug-using behavior. Future research should examine these possible explanations.

It is interesting to note that while prior research has found juvenile justice intervention including police arrest increases the likelihood of both delinquent behavior and drug use, when entered into our full models, police arrest is not a statistically significant predictor of adolescent or adult drug use. The bivariate relationship, however, is significant for adolescents. As noted earlier, research has demonstrated the relationship between school exclusionary practices and getting arrested (e.g. Cueller & Markowitz, 2015; Monahan et al., 2014; Mowen & Brent, 2016). It is not that police arrest is unimportant in predicting subsequent drug use, but rather it is simply not as important as school disciplinary practices in our investigation. We have argued that removing adolescents from school provides for the type of settings (unstructured and unsupervised time) which facilitate drug use, while being arrested does not necessarily do so. Future research should also explore whether and how school exclusionary practices are more likely than police arrest to facilitate cumulative disadvantage in the longer-term (e.g. lower educational and economic achievements), which, in turn, leads to drug-using and other problem behaviors.

Our findings have important implications for school policies regarding the use of exclusion from school as a disciplinary measure. While no one would deny the need to protect other students and the general academic setting from disruptive and potentially violent behavior, excluding the child from school, even on a temporary basis has been shown to have unintended problematic consequences. Hence, much like Edwin Schur's (1973) argument that the juvenile justice system should adopt a policy of "radical non-intervention," schools should also view exclusionary discipline as only a last resort.

There have been several suggestions as to what schools can do to either prevent the need for exclusionary discipline or to provide for alternative forms of discipline. In the second half of Losen's (2015) edited volume on school discipline, a number of specific programmatic alternatives are suggested. In terms of measures to limit the need for exclusionary discipline, more effective teacher professional development that would increase the sensitivity to student needs, the need to limit exclusionary

practices, and the particular vulnerability of minority students is one suggested (Gregory, Allen, Mikami, Halen, & Pianta, 2015). Cornell and Lovegrove (2015) suggest the use of a student threat assessment measure as a way to limit school suspensions. One of the more intriguing suggestions is to follow the path taken in some aspects of our legal system and institute policies reflective of restorative justice. Gonzalez (2015) indicates that restorative justice practices implemented in schools in other countries have been shown to have positive outcomes for students, parents and teachers. Gonzalez reviews a program of a school restorative justice program instituted in the Denver school system. Anyon et al. (2014) and McNeill, Friedman and Chavez (2016) draw similar conclusions regarding restorative justice programs as an alternative to exclusionary school practices. In addition to restorative justice programs—a reactive approach, Skiba and Sprague (2008) and McNeill et al. (2016) report that Positive Behavior Intervention and Support (PBIS)—a proactive approach—is an effective alternative to school exclusionary practices. We do not have the space to review the details of these programs. Yet, based on the preliminary evaluations, both approaches not only help in reducing the number of school suspensions (Gonzalez, 2015) but also have positive effects on educational and behavioral outcomes and improve school climate (McNeill et al., 2016).

The main focus of this research was limited to assessing the relative impact of school exclusionary disciplinary practice compared to juvenile justice intervention on the unintended consequence of increasing the probability of drug use. The findings suggesting that the former is more predictive of drug use than the latter are both revealing and alarming. However, we did not empirically investigate the reasons for why the school exclusion has such a problematic impact. Examining the potential mediating factors in the relationship between school exclusion and drug use is beyond the scope of the current study. Future research, including our own, must address this limitation.

Another limitation of the study is the inability to specifically match drug-using behavior to the days, weeks, or months of exclusion from the school system. Our data simply does not have this kind of temporal specificity. Therefore, we cannot adequately address the routine activities argument suggesting that school exclusion leads to a change in routine activities placing youth in unstructured and unsupervised activities. Based on our findings regarding the measure of risky time spent with friends, and our cumulative findings regarding drug use in young established adulthood, we have argued that even if part of the explanation for our findings can be accounted for by a routine activities explanation, there appears to be more to the story. We have offered a labeling theory approach as a potential avenue to explain our findings.

Our assessment of the long-term, cumulative impact can be further improved. Following prior research (e.g. Mowen & Brent, 2016), we defined “cumulative impact” as the number of waves in which the youth reports being suspended/expelled or arrested. This measure suggests duration of the involvement over years, but not intensity, frequency, or changes over time. With appropriate data, future research should advance our understanding of “cumulative impact” by using a more accurate measure.

Although we are comfortable with our conclusions regarding gender and race/ethnicity differences, we acknowledge that our sample of females and whites is limited because of the original research design which intentionally oversampled high-risk respondents (i.e. male and minority subjects). Replication studies with different samples from other cities or contexts are clearly warranted.

Both a strength and a weakness of our study is that it covers the time period between the late 1980s and mid-2000s. We have suggested that this is a strength because those years encompass the time period when the use of harsh school disciplinary practices such as suspensions and expulsions were increasing. More recently, however, due to changes in laws and regulations regarding the use of exclusionary discipline and the recognition of the potential unintended consequences of those practices, there has been a moderate decrease in the use of exclusionary disciplinary practices over the past decade (Hirschfield, 2018). A reduction in the use of these practices does not necessarily mean that the adverse effects of school exclusion would be any different for those who are suspended or expelled. However, we do not have the data with which to examine this possibility.

In conclusion, much has been written about the problematic outcomes of school exclusionary disciplinary practices. Our research adds to the growing concerns about such practices by demonstrating that school exclusion is even more problematic for the ultimate well-being of students than is juvenile justice intervention. This finding coupled with research demonstrating that school exclusion leads to an increased probability of juvenile justice intervention and other problematic outcomes, underscores the need to discover alternative methods of discipline and to use school exclusion only as a last resort.

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