Youth Gone Wild: Behavioral Disorder in Virginia High Schools

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Abstract

School misconduct and behavioral disorder interferes with the processes of teaching and learning. Prior research often analyzes the causal processes of school crime and disorder, but most methodologies combine multiple types of disorder into one measurement. This article takes a preliminary step towards a theoretical model of school crime that analyses different types of disorder separately. Utilizing a sample of N=302 Virginia high schools, the current article analyzes the causal processes surrounding behavior disorder and the punishment of behavioral disorder. Further, the current article also tests a hypothesis related to rational choice theory to determine if punishment can decrease future behavioral disorder. The results show that behavioral disorder is associated with both school and community variables and that punishment is primarily predicted by the amount of disorder within a school. Finally, the results do not show that punishment is effective in reducing future behavioral disorder.

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Introduction

Recent figures show that 40.7% of public school teachers report that student misconduct interferes with the educational process, and 13% of students are under the tutelage of a teacher who characterizes their school environment as disordered (*Bureau of Justice Statistics*, 2017). Misconduct interferes with the processes of teaching and learning, and research has shown that school disorder is related to lowered academic achievement and dropouts (Crashaw, 2015; Haas, 1988; Martin, Walford-Kraemer, & Light, 1984). However, no research has analyzed the specific causal mechanisms of school misconduct at the institutional level. We conceptualize school misconduct as behavioral disorder, a classification of offenses that includes disorderly conduct, insubordination, and disrespectful behavior, and this article seeks to examine the causes and correlates of behavioral disorder in a sample of N=302 Virginia high schools. Further, prior research shows that schools routinely use punitive responses to control behavioral disorder (Maimon, Antonaccio, & French, 2012). We also determine if these punitive responses actually reduce behavioral disorder in our sampled high schools.

Behavioral Disorder

In 2014 13.7% of American schools reported an incident of behavioral disorder they classified as being abusive towards a teacher, 2.3% of American schools reported incidents of widespread disorder, and these offenses occurred on a weekly basis in the reporting schools (*Bureau of Justice Statistics*, 2017, p. 154). These statistics show that behavioral disorder is a persistent and frequent problem in American schools. The Virginia Department of Education (VDOE) classifies offenses related to classroom disruption, disorderly conduct, insubordination, and disrespect as behavioral disorder. *Figure 1* provides a visual representation of these offenses. The VDOE classification reflects the most commonly cited problems of student misconduct as reported by teachers (*Bureau of Justice Statistics*, 2017; Crashaw, 2015). Therefore, this measure provides a good, cross-jurisdictional operationalization of behavioral disorder.

Prior research has partially disentangled the causal factors that create school disorder. First, school level variables effect the rate of crime and disorder within a school. The characteristics of the student body, size of a school, staffing procedures, staff-to-student ratios, the presence of a school resource officer, and operational budget all effect school disorder, crime, and violence (Gottfredson & Gottfredson, 1985; Welsh, Greene, & Jenkins, 1999; Servoss, 2017; Theriot, 2009; Welsh, 2000, Wynne & Hoo, 2011). Second, research demonstrates that extra-

institutional influences related to communities and neighborhoods also associate with school crime and disorder (Limbos & Casteel, 2008). The rate of crime in a school appears to be function of both intra-school factors and extra-school factors. However, these studies routinely utilize a measure of crime and disorder that aggregates different types of offenses and disorder into one measure. We contend that this research obfuscates the relationship between different types of crime and disorder and how these types of disorder effect the school environment. Therefore, we seek to utilize a methodology that seeks to only analyze the causal factors that create behavioral disorder.

Behavioral disorder directly impacts the educational process by disrupting the learning environment and interfering with teaching (Crashaw, 2015; Martin, Walford-Kraemer, & Light, 1984). Further, behaviorally disordered schools are less safe (Welsh, 2000). Research has also shown that juveniles who have improper externalized behavior patterns are more likely to be arrested (Hirschfield, Maschi, White, Traub, & Loeber, 2006), have persistent juvenile delinquency (Mohr-Jensen & Steinhauses, 2016), and have lower academic achievement (Erskine et al., 2016). Behavioral disruption creates a disordered environment that may lead to other crimes, which is a phenomenon that is observable in the relationship between street crime and community disorder (Braga & Bond, 2008; O'Shea, 2006). Behavioral disruption impairs educational operations, and schools utilize several methodologies to control disorder. However, the most commonly utilized mechanism of control within American high schools is punishment.

Punishment

The most common mechanism for dealing with behavioral disorder is punishment (Maimon, Antonaccio, & French, 2012). We utilize the term *Punishment Response* to define this process. Punishment responses can involve warnings, in-school and out-of-school suspension, or expulsions, and schools differ in their method of punishment. Most research shows that the punishment of high school students involves iatrogenic effects. Alschuler (1980) believes that school punishment stems from the poor conflict management skills of educational staff, which results in reactive, illogical punishment responses. The American Psychological Association (2008) conducted an evidentiary review and found that increases in both the certainty and severity of punishment may create negative effects for both the school and the student. Further, Maimon, Antonaccio, & French (2012) found that increases in punishment may decrease cognitive decision-making capabilities and lower self-control in student populations.

Due to the intragenic effects of punishment, researchers often recommend that schools adopt community building approaches to lower crime and disorder (Brookmeyer, Fanti, & Henrich, 2006; McNeely, Nonnemaker & Blum, 2002; Nettles, Mucharan, and Jones, 2006), increase conflict management through improving student-teacher communication (Alschuler, 1980), create a caring environment (Williams, 2005), use character education (Miller, Kraus, & Veltkamp, 2005), or utilize other similar responses. Research has shown that schools with stronger communities may have lower rates of crime and disorder (Payne, Gottfredson & Gottfredson, 2003; Welsh, Greene, & Jenkins, 1999; Welsh, 2000). However, criminological theory believes that increases in sanctions may decrease crime through deterrence.

Rational Choice Theory

Becker (1968) shows that increases in the severity and probability of sanctions can decrease crime. Clarke and Cornish (1985) conceptualize this as "Rational Choice" theory, which is a logical extension of classical deterrence theory. Under Becker's (1968) original conceptualization offenders make decisions based upon perceived costs of committing a crime or punishment as compared to perceived benefits. Contemporary research identifies perceptions of punishment as individual assessments of risk (Anwar & Loughran, 2011; Loughran, Paternoster, Piquero, & Pogarsky, 2011). Individuals will differ in their risk assessment capabilities due to the subjective nature of individualized ratio-economic analysis. Specifically, the risk assessment capabilities of juveniles are unclear. Anwar & Loughran (2011) found that juvenile offenders may be deterred by arrests but the levels of deterrence varied by individualized experience. Melde (2009) found that juveniles did not become more risk adverse in terms of victimization after negative life events, and Maimon, Antonaccio, and French (2012) found differing effects of punishment among juveniles. Juveniles with low amounts of prior criminality appeared to have decreased risk perceptions in a punitive environment, but juveniles with high amounts of prior criminality appeared to have higher risk perceptions in punitive environments.

Theoretical Model

Figure 2 provides a visual representation of our theoretical model of school crime and disorder. We construct this model from the findings of prior research and criminological theory. We organize the model into three levels. The first level visualizes the causal processes around school crime, which we hypothesize to be

the result of school level and community level variables. The second level provides an expansion of the causal relationships between school crime. The model illustrates that behavioral disorder creates violent crime, and violent crime then creates an atmosphere that allows the growth of serious weapon-related offenses. The final level of the model shows the operational path of the most common policy response to disorder and crime. An event or offense happens, and the school reacts with punishment-as-policy to deter future offenses. The cycle then restarts.

Methodology

Our analytical plan features three hypothesis tests. First, we conduct regression modeling to determine the causal processes of behavioral disorder. Second, we conduct regression modelling to determine the causal processes of punishment responses. Finally, we test a hypothesis concerning rational choice theory:

Hypothesis #1: Predicting Behavioral Disorder with Community and School Level Variables.

Prior research demonstrates that school crime and disorder is predicted by both community and school level characteristics. However, these studies routinely utilize an operationalization of disorder that includes both behavioral offenses and serious crime. Our theoretical model contends that disorder is the first step in the causal processes surrounding school crime. Therefore, we test the causal processes surrounding behavioral disorder as abstracted from total crime and disorder.

Hypothesis #2: Punishment as Reaction to Disorder.

Alschuler (1980) shows that punishment responses are often by nature reactionary, and our theoretical model reflects this finding. We hypothesize that this specifically applies to the punishment of behavioral disorder. Specifically, we hypothesize that a school's punishment response is primarily predicated by the amount of disorder within that school.

Hypothesis #3: The Effect of Past Punishment on Future Behavioral Disorder.

Our theoretical model holds that schools utilize punishment as a policy to deter future disorder, and rational choice theory contends that increased sanctions should lower the frequency of delinquent acts. In terms of the current article we hypothesize that increases in

punishment should lower the frequency of future behavioral disorder in the educational environment.

Sampling and Data Collection

The sample of this study features 302 Virginia High Schools drawn from school years ending in 2012-2016**.** The sample contains most public high schools in Virginia, but it does exclude private schools, alternative schools, and high schools that operate within correctional institutes. Further, since the data related to behavioral disorder operationalize into predictor and outcome variables, high schools (n=8) with incomplete disorder data were excluded from the sample of this study. We recognize that interstate generalizability may be questionable as our sample only features Virginia high schools. However, the inclusion of all Virginia high schools allows us to use the natural features and variation within Virginia, which is a state that features dense urban centers, seaside population clusters, and mountainous rurality, to analyze urban and rural, low and high population, and ordered and disordered schools. We feel this establishes a modicum of generalizability in our results. We address this topic further in the limitations section.

We gather the offense data through publically available data provided by the Virginia Department of Education (VDOE). The offense data stems from school climate survey related to school safety as completed by high school administrators, and administrators are required by Virginia to report all offenses in these surveys. The use of self-report data can be problematic, but findings from self-report offense data has been shown to be valid and reliable (Apel, Pogarsky, & Bates, 2008). Further, gathering non-secondary offense data within a high school population is problematic due to the special characteristics of juvenile research subjects. Therefore, we use the self-report data as our predictor and outcome variables while accepting any potential limitations.

A variety of publically available sources provide data related to our control variables. We use data from the 2010 United States Census for population and income related controls. Virginia is organized into both counties and independent cities. The US Census reflects this division, and we assign county level data based on specific location. It is possible that intra-county level variation and the cross-sectional nature of the census data may obscure more recent trends. However, we utilize other controls to test more individualized and recent measures related to the Census data. The Uniform Crime Report provides county level crime and offense data. We obtain data related to school level variables through the VDOE and the

Virginia Department of Criminal Justice Services (VDCJS). The full description of the operationalizations of all variables is presented in the next section.

Variables and Operationalization

Table 1 presents the univariate statistics for all variables utilized in this article. Our methodology features a multi-step procedure of model building and three hypothesis tests. We describe the operationalizations for the variables for each step of our methodology.

Table 1: Univariate Statistics (N=302)

Outcome Variables (2012-2016):	
Behavioral Offenses	M=604.31(SD=721.4)
Behavioral Offenders	M=313.42(SD=319.98)
Behavioral Offenses-LOG Trans.	M=2.45(SD=.58)
Behavioral Offenders-Log Trans.	M=2.23(SD=.58)
Punishment Ratio (Short Term Suspension)	M=1.54 (SD=.43)
Long Term Suspension (0=No, 1=Yes)	57%
Expulsion (0=No, 1=Yes)	18.9%
Outcome Variables by Year (Untransformed):	
Behavioral Offenses (2012)	M=153.36(SD=196.36)
Behavioral Offenses (2013)	M=130.75(SD=157.92)
Behavioral Offenses (2014)	M=101.45(SD=126.06)
Behavioral Offenses (2015)	M=109.94(SD=148.48)
Behavioral Offenses (2016)	M=109.39(SD=149.82)
Predictor Variables:	
Punishment Ratio (2012)	M=1.75(SD=1.49)
Punishment Ratio (2013)	M=1.78(SD=1.93)
Punishment Ratio (2014)	M=1.59(SD=1.34)
Punishment Ratio (2015)	M=1.84(SD=2.16)

Control Variables:			
County Variables:			
Population (2010)	M=192k(SD=107k)	Violent Crime/100k	M=286.65(SD=981)
Pop. Dens. (2010)	M=1093(SD=1514)	Homicide/100k	M=6.72(SD=27.9)
Pop. Dens.-Sq.Rt.	M=26.52(SD=20.14)	Property Crime/100k	M=3002(SD=10,628)
Median Income-1K	M=59.43(SD=23.21)	Violent Crime-LOG	M=2.17(SD=.36)
% White (2010)	M=.73(SD=.17)	Homicide-LOG	M=.62(SD=.36)
% Vacant (2010)	M=.10(SD=.06)	Property Crime-LOG	M=3.1(SD=.35)
% Renter	M=.27(SD.=.1)		
School Variables:			
Avg. Student Pop	M=1218(SD=713.3)	#Years-SRO	M=4.7(SD=.399)
Avg. % White	M=.58(SD=.26)	Alt. School Acess	91%
Avg. % Freshman	M=.27(.08)	% Above Local Eff.	M=90.35(SD=38.69)
Avg. Blck. Fresh.	M=81.97(SD=91.05)	Avg. GCI Index	M=91.2(SD=4.6)
Avg. Bl.Fsh.-LOG	M=1.6(SD=.63)	Avg. English Score	M=80.6(SD=5)
Avg. % Free Lunch	M=.39(SD=.17)		

Hypothesis #1: Predicting Behavioral Disorder

Our first hypothesis tests the causal processes of the amount of behavioral disorder in our sample of high schools. These models feature an aggregation of five years of data for the school years ending in 2012-2016.

Outcome Variable

The outcome variable of the regression models in *Hypothesis Test #1* relates to the total aggregated amount of behavioral disorder in each school for the time period of this study. *Figure 1* provides a visual representation of this variable. The majority of these offenses are related to disruption (38%) or disorderly conduct (33%). The remaining offenses in this variable relates to student insubordination (17%) and disrespect of educational personnel (12%). Prior literature shows that the operationalization of this variable reflects teachers' most cited student discipline

issues in American schools (*Bureau of Justice Statistics*, 2017) as well as internationally (Crashaw, 2015).

Predictor Variables

In *Hypothesis Test #1* we separate our predictor variables into two categories. First, we test the impact of school level predictor variables on levels of behavioral disorder. These variables measure racial demographics, socioeconomic status, budgetary considerations, academic achievement, and school safety. We utilize average students per school year to control for population effects. The average percentage of white students per year controls for student body ethnicity. Further, we use the average percentage of students who participated in Virginia's reduced or free lunch program to control for the socioeconomic status of the student body. We operationalize budget expenditures as "Percentage of Local Expenditure Above Required Efforts", which is the amount of local expenditure divided by the state-required expenditure for each local district. We use two measures for academic achievement. First, we use a "Graduate Completer Index" to determine how many students graduated with a diploma. Second, we use standardized test scores for "English" as a measure of verbal intelligence, which research has shown to predict criminal behavior (Herrnstein & Murray, 1994). Finally, we use VDCJS data to determine if schools have access to school resource officers. It is worth nothing that our theoretical model of behavioral disorder is built upon prior research that contends that behavioral disorder predicts or predates more serious crime (O'Shea, 2006). Therefore, we purposefully exclude other measures of school crime from these models as they do not fit into our causal modelling.

Second, we utilize a variety of county level predictor variables to capture community context. The US census provides controls at the county and independent city level. The population density of each county or city provides a control for area population. We operationalized socio-economic status as median income in thousand dollar increments. The percentage of white residents controls for demographic influences related to race. We use two variables to address any potential effects of social disorganization: "Percent Vacant Houses" and "Percent Renter". Finally, the Uniform Crime Report (UCR) provides information about county level crime rates. We aggregate the UCR data for the time period of (2011-2016) of the study and transform the data into rates of offenses per 100,000 citizens. Three measures are used: "Homicide/100k", "Violent Crime/100k", and "Property Crime/100k".

Hypothesis Test #2: Punishment as a Reaction to Behavioral Disorder

Our second hypothesis test analyzes the association between behavioral disorder and punishment. We utilize three separate models within *Hypothesis Test #2*. We use a combination of linear and logistic regression modelling to predict different types of punishment responses. Specifically, we examine the processes surrounding three types of punishment: Short Term Suspensions, Long Term Suspensions, and Expulsions. Like *Hypothesis Test #1* these models utilize an aggregation of data for the school years ending in 2012-2016.

Outcome Variables

The first outcome variable we utilize in *Hypothesis Test #2* concerns the amount of short term suspensions in a school. A short term suspension is an out-of-school suspension usually lasting between one and five days. We create a "Punishment Ratio" by dividing the total number of suspensions for behavioral offenses by the total number of behavioral offenders. This correlates roughly to an aggregated arrest-to-crime ratio (Anwar & Loughrin, 2011) and reflects a school's willingness to punish behavioral offenders, whom the data show commit more than one behavioral infraction per year. Lower ratios reflect less willingness to punish every infraction with suspension, and higher ratios reflect more punitive schools where individual offenders are being punished by multiple suspensions during the time period of this study.

The second outcome variable is a binary operationalization of long term suspensions. A long term suspension is any suspension longer than five days in duration. Virginia high schools rarely use long term suspensions to punish behavioral disorder. Therefore, we dichotomize our operationalization to reflect whether a school ever used a long term suspension as a punishment response to behavioral disorder during the time of this study. We follow the same procedure for expulsions, as they are even rarer than long term suspensions.

Predictor Variables

We hypothesize that punishment is primarily reactive in nature. Therefore, the amount of behavioral disorder within a school should predict the amount of punishment in a school. Specifically, increases in behavioral disorder should lead to a higher rate of punishment within the educational environment, and we include the amount of behavioral disorder within in a school as our predictor variable for this model. We utilize the amount of behavioral offenses within the school as the operationalization of behavioral disorder in all models of *Hypothesis Test #2*.

Control Variables

For this hypothesis test we use the predictor variables from our earlier models as control variables. The regression models that test *Hypothesis Test #1* show that behavioral disorder is a function of both community and school variables, and we include all prior predictors as possible controls to ensure that any significant effect of our predictor variable is non-spurious.

Hypothesis #3: The Effect of Past Punishment on Future Behavioral Disorder

Our theoretical model suggests that schools utilize punishment to control behavioral disorder. The models of *Hypothesis Test #2* show that punishment is primarily predicted by behavioral disorder. Due to the aggregation of data in the prior steps of this methodology, a test of the efficacy of punishment in lowering rates of behavioral disorder is difficult, since punishment is responsive to the amount of disorder within the same time period. Our theoretical model illustrates that schools likely respond to disorder with punishment in an attempt to control future disorder. Therefore, punishment within an earlier time period may decrease the behavioral disorder within a later time period.

Outcome Variables

In terms of rational choice theory behavioral offenders may utilize past punishment or perceptions of risk (Anwar & Loughran, 2011; Becker, 1968) when deciding whether or not to engage in disruptive behavior. We test our hypothesis under rational choice theory by disaggregating the data from our earlier hypothesis test. This hypothesis test features four separate models that test yearly rates of behavioral disorder. Each model utilizes the amount of behavioral disorder for individual years ending in 2013-2016. The use of these four years of individual data allows us to test the effects of variables from the previous year on the current year of data and provides a cursory examination of time-series effects on behavioral disorder in high schools.

Predictor Variables

Given the prevalence of short term suspensions as a punishment response to behavioral disorder, the models in this hypothesis test utilize the *Punishment Ratio* from the previous year as the predictor variable. Theoretically, larger punishment ratios, which reflect more punitive policy responses, should decrease the behavioral disorder of the next year. We recognize that individual measures of risk

assessments allow for more nuanced examinations of rational choice, but we believe our measure to offer a reasonable examination of the efficiency of punishment in reducing behavioral disorder within a student population. We also realize that school populations are not stable. Graduations, the entrance of new freshman, and student attrition through dropouts and relocations may decrease the efficacy of punishment from year to the next. However, our statistics reveal that freshman only represented an average of M=25% of a school's student population, which means that besides relocations and attrition approximately 75% of a current year's student population witnessed the prior year's punishment responses.

Control Variables

The results of *Hypothesis Test #1* and *Hypothesis Test #2* provide the foundation for the models of *Hypothesis Test #3*. The models reveal several significant school-level and county-level variables, and we utilize all these significant variables as control variables in *Hypothesis Test #3*. First, we utilize the current year's amount of black freshman and graduate completers as a control of school level influences. Second, we utilize the previous year's behavioral disorder as a control to test for any persistence of disorder. Third, we utilize two county level controls: The Percentage of White Citizens and Population Density. Further, due to the results of *Hypothesis Test #2*, we include an interaction term between our predictor variable of the prior year's punishment ratio and the prior year's behavioral disorder to control for any relationship between the amount of disorder and punishment response.

Analytical Plan

The three individual hypothesis tests of this article allow us to engage in a process of sequential model building. Therefore, the results of earlier hypothesis tests influence the models of later hypothesis tests.

Hypothesis #1: Predicting Behavioral Disorder

We utilize stepwise linear regression models to test the effect of community or county level and school level predictors on the amount of behavioral disorder within a high school. First, we conduct full diagnostic procedures on all variables. Our outcome variable related to behavioral disorder displays a positively skewed distribution. We transform this variable with the *Log Function* to force normality. Further, we found that one of our predictor variables, Population Density, also had a positively skewed distribution. A *Log* transformation reveals a bimodal distribution. Therefore, we transform Population Density with a *Square Root*

Function, since the *Square Root* transformation reduces the magnitude of the bimodal distribution. We also impute both of these transformations into separate regression models, and the *Square Root* transformation shows the best model fit statistics. Therefore, we include this variable in our final model.

We then enter all variables into our model and remove non-significant variables in individual steps. Further, we then impute all excluded variables individually to examine changes in model fit statistics and the significance levels of our predictor variables. This procedure shows that the variables related to the percentage of white students in a school's population and the percentage of freshman are significant only when imputed into the model alone. An inclusion of both of these variables results in a loss of significance for both. We hypothesize that this phenomenon relates to an interaction effect of the age and racial characteristics of a student body. Therefore, we compute a variable related to the amount of black freshman in the student population to address this interaction. This variable is significant, but an examination of the distribution reveals a positive skew. We use a *Log Transformation* for this variable also.

A pattern of collinearity manifests between population density and several other controls. The size of the student population, both untransformed and transformed county level crime rates, and school level measures of social disadvantage like the use of free lunch programs all drop from significance with the inclusion of population density. This relationship is true regardless if we utilize the non-transformed, *Log* transformed, or *Square Root* transformed operationalization of population density. We include only Population Density in our final models. We realize that these other variables have an effect on school disorder, but our models reveal them to be a function of population density or urbanity.

Hypothesis #2: The Effect of Behavioral Disorder on Punishment Responses

We utilize a combination of linear and logistic regression models to test the association between behavioral disorder and punishment responses. The first outcome variable features a continuous operationalization, and we use a linear regression model for this variable. The other two outcome variables feature dichotomized operationalizations, and we utilize binary logistic regression models. We again run full diagnostic procedures on all variables, and we utilize the transformed variables from the first hypothesis tests in these models. The initial models reveal changes in the direction of association between a school's amount of behavioral disorder and different types of punishment. We hypothesize that this is

due to differences in punishment responses in “low-disordered” and “high-disordered” schools. To test this refined hypothesis we discretize the amount of behavioral disorder within a school into quartiles. We then combine the quartiles into a three category variable where *Quartile #1* represents “low-disordered” schools, *Quartiles #2* and *#3* combine into category representing schools with average disorder, and *Quartile #4* are “high-disordered” schools. We then use these categorical variables as predictor variables in separate models.

Hypothesis #3: The Effect of Past Punishment on Future Behavioral Disorder

Our last hypothesis seeks to test the ability of past punishment to lower future behavioral disorder. We test this hypothesis with four linear regression models. Starting with the school year ending in 2013, we test the effect of the previous year’s punishment response on behavioral disorder. Each model contains any variable that was significant in either *Hypothesis Test #1* or *Hypothesis Test #2*. Further, as the results of the prior hypothesis tests show an association between the amount of behavioral suspensions in a school and the amount of disorder, we impute an interaction term between these two variables. We test models with and without this interaction effect and select the models with the best fit statistics.

Results

Univariate Statistics

Table 1 presents the univariate statistics for this study. These statistics reveal a large amount of behavioral disorder within the Virginia high schools in this study, which triangulates with surveys where teachers routinely report behavioral problems in their classrooms (*Bureau of Justice Statistics*, 2017). The five-year period of this study contained a total of 186,166 behavioral offenses which were committed by 96,211 offenders. On average a school had M=120.86 behavioral offenses per year that were committed by an average of M=62.64 offenders per year. This shows that the average behavioral offender commits M=1.93 offenses. These figures translate to the startling rate of one behavioral offense per ten students or 10,004 per 100,000 students, and behavioral offenders constituted 5% of the total student population. *Figure 3* shows the statewide totals of behavioral disorder per year. *Figure 3* shows a slight downward trend, and there were fewer behavioral offenses in 2016 as compared to 2012. However, the trend does feature some variation.

The statistics show that schools were very likely to use punishment to control behavioral disorder. Of the 185,166 behavioral offenses in this study 160,689 or

86% received a punishment. The schools only used a form of expulsion in 83 instances, and long term suspension was used in only 832 cases. However, schools responded with short term suspension in 159,774 cases of behavioral disorder. Short term suspension is the preferred method of punishment for behavioral disorder in Virginia high schools, and roughly 4% of the student population of Virginia received an out-of-school suspension for a behavioral offense, which translates to 79,560 students over the five-year period of this study. The use of suspension as a response for behavioral offenses may be designed to reduce the prevalence of behavioral disorder, or it may be an illogical punishment response as detailed in Alschuler (1980). *Figure 3* also features a visual representation of the average punishment ratio for each year within this study. While the total amount of behavioral disorder shows a slight downward trend, the average punishment ratio shows no clear trend over the years. Further, the average punishment ratio shows no clear association with the amount of behavioral disorder within Virginia schools.

Hypothesis Test #1: Predicting Behavioral Disorder

Table 2 presents the results of the linear regression models that test the causal processes surrounding behavioral disorder. Our use of stepwise regression reveals four significant variables. Two county level variables are significant. First, the median income of the county displays a negative association with behavioral disorder. Second, population density also displays a negative association with behavioral disorder. The negative association between median income and behavioral disorder is not surprising as prior research shows that communal disadvantage relates to increases in disorder in schools (Limbos & Casteel, 2008), and the negative association between population density and behavioral disorder likely reflects the statistics that show that urban schools are less likely to be disordered (*Bureau of Justice Statistics,* 2017).

Table 2: Linear Regression Models: Behavioral Disorder (N=302)

Variables	***Model #1 (Offenses)***	***Model #2 (Offenders)***
Median Income-1K	-.003(.001)***	-.003(.001)***
Population Density-Sq.Rt.	-.005(.002)**	-.005(.001)**
Avg. Grad. Completer	-.036(.006)***	-.029(.005)***
Avg. Black Freshman-LOG	.629(.046)***	.619(.041)***
Log. Likelihood	-164.008	-131.401

Note$_1$: This table presents unstandardized coefficients and standard errors.
Note$_2$: *=p<.05, **=p<.01, & ***=p<.001.

Two characteristics of the school or student body are also significant. The amount of graduations or completions in a high school decrease behavioral disorder, and this gives support for the research that shows that school dropouts equate to delinquency and disorder (Hoffman, Erickson, & Sprence, 2013). Finally, the amount of black freshman in a high school has the most powerful association with behavioral disorder within a school. *Figure 4* shows a visual representation of this association. These results give support to our hypothesis that behavioral disorder is a result of variables related to both the community and the school.

Hypothesis #2: The Effect of Behavioral Disorder on Punishment Responses

Table 3 presents the results of linear and logistic regression models that test *Hypothesis #2*. *Model #3* features a linear regression model testing the causal processes of the use of short term punishment in a high school. The results show that as behavioral disorder increases a school will be more likely to use short term suspensions. Three control variables are also significant in this model. The amount of black freshman in a high school decreases the likelihood of a school utilizing short term suspensions. Further, two county level controls are significant. First, the amount of white residents in a county decreases the likelihood of short term suspensions, and the median income of a county decreases the likelihood of short term suspensions.

Table 3: Linear and Logistic Regression Models: Punishment Responses (N=302)

Variables	***Model #3 (Shrt. Trm)***	***Model #4(Lng. Trm)***	***Model #5(Expulsion)***
Beh. Offense-LOG	.171(.049)***	-1.705(.365)***	-1.255(.485)***
Avg. Blk. Frsh.-LOG	-.155(.0572)**	-2.03(.341)	-.420(.457)
% White-County	-.576(.181)**	-.054(1.086)	-.660(1.261)
Median Income-1K	-.004(.001)***	-.027(1.54)***	.006(.008)
Log. Likelihood	-131.355	-164.718	-129.499

Note$_1$: This table presents unstandardized coefficients and standard errors.
Note$_2$: *=p<.05, **=p<.01, & ***=p<.001.

Behavioral disorder displays a positive relationship with short term suspensions, but the direction of this effect changes with more severe types of punishment. *Model #4* tests the effects of behavioral disorder on the likelihood of a school utilizing long terms suspensions as a punishment response. Behavioral disorder displays a significant negative relationship with this punishment response. *Model #5*

shows a similar association with expulsions. Therefore, schools with increased amounts of behavioral disorder are more likely to use short term suspensions, and schools with lower amounts of behavioral disorder are more likely to use long term suspensions or expulsions as punishment responses. Only one control variable is significant in *Model #4* or *Model #5*. The median income of the county shows a significant negative relationship with a school's likelihood to use long term suspension as a punishment for behavioral disorder.

Table 4 contains models that test a more nuanced examination of the effects of behavioral disorder on punishment responses. The predictor variable is divided by quartiles, and "high-disordered" schools are the reference category. For short term suspensions both schools with low and average amounts of behavioral disorder are less likely to use short term suspensions, but *Model #7* show that schools with low amounts of disorder are far more likely to use long term suspensions as a punishment response to behavioral disorder. The categorized predictor variable is not significant in the model concerning expulsions. These models show that schools with large amounts of behavioral disorder are more likely to use short terms suspensions as their punishment response. We theorize that this is most likely a "business-as-usual" approach to dealing with behavioral disorder. Schools with low amounts of disorder may view behavioral offenses as more shocking and serious, which then leads them to respond in a more punitive manner with long term suspensions. Regardless, our results do show that the amount of behavioral disorder in a school does effect the punishment responses of that school. We do not reject *Hypothesis #2.*

Hypothesis #3: The Effect of Punishment Responses on Future Behavioral Disorder

Table 5 contains the results of *Hypothesis Test #3*. The models with the interaction term have better model fit statistics, and we include the interaction term in all models. The punishment ratio of the prior year is only significant in two models. In *Model #9* and *Model #11* the past punishment ratio shows a significant positive association with the behavioral disorder of the current year. Therefore, increased likelihoods of short term suspensions increase future behavioral disorder, which demonstrates the iatrogenic effect of punishment (*American Psychological Association*, 2008). The previous year's behavioral disorder is our most reliable predictor of the current year's behavioral disorder, and this variable displays a significant positive association in all models. Schools appear to be persistently disordered from year to year. Further, a negative interaction term is significant and reflects the findings of *Hypothesis Test #2*. The interaction term

shows that schools with higher likelihoods of using punishment and low amounts of disorder are more likely to have increased behavioral disorder the next year. Alternatively, schools with high amounts of disorder but low likelihoods of punishment are more likely to have increases in behavioral disorder in the next year.

Table 4: Linear and Logistic Regression Models: Punishment Responses & Behavioral Offense-Quartiles (N=302)

Variables	***Model #6 (Short Term)***	***Model #7 (Long Term)***	***Model #8 (Expulsion)***
Behavioral Offense			
Quartile #1	-.225(.089)**	2.420(.536)***	1.408(.690)
Quartile #2 & #3	.-.239(..065)**	.724(.383)***	.454(.3924)
Quartile #4	*Reference*		
Avg. Blk. Frsh.-LOG	-.100(.057)	-.464(326)	-.824(.438)
% White-County	-.429(.188)*	-.366(1.070)	-.892(1.203)
Median Income-1K	-.004(.011)**	-.025(.007)***	.009(.008)
Log. Likelihood	-151.893	-171.720	-135.424

Note1: This table presents unstandardized coefficients and standard errors.
Note2: *=p<.05, **=p<.01, & ***=p<.001.

An examination of our control variables also show that time series effects may decrease the power of variables to predict or effect behavioral disorder in a school. For example median income was only significant in the test for one year, and the amount of white residents in a county displayed both a significant positive and negative association with behavioral disorder. The most reliable control variable is the amount of black freshman within a school which always show a significant positive association with behavioral disorder. However, we do not find support for our hypothesis that prior punishment may decrease future behavioral disorder within a school. The punishment ratio is not significant in two models, and when the variable is significant it displays a direction of effect opposite of our hypothesis and rational choice theory.

Discussion

The results of our statistical models (*Table 2*) show that behavioral disorder is caused by a combination of community and school factors. First, both county level income and population density decrease behavioral disorder. These findings are

supported by prior statistics (*Bureau of Justice Statistics,* 2017) which show that schools in moderate size towns have more disorder as compared to dense urban areas, and prior research has established that high schools in economically disadvantaged neighborhoods are more likely to have increases in crime and reduced safety (Limbos & Casteel, 2008). Further, two school level factors are significant. The average rate of completion by graduation has a negative association with behavioral disorder, and the amount of black freshman has a positive association. These findings also support prior research which shows that dropout is associated with delinquency at the student and school level (Hoffman, Erickson, & Sprence, 2013).

We interpret the significant association between black freshman and disorder as pointing to two causal processes. First, research has shown that younger students and minority students are more likely to engage in behavioral disorder (*Bureau of Justice Statistics*, 2017). The amount of black freshman provides a variable that measures an interaction of the amount of younger and minority students in a school and would logically be significant. While we do not engage in analyzing any causal processes behind these phenomenon other researchers have pointed to social disorganization and a lack of pro-educational norms in communities (Wilson, 1996) as being responsible for these statistics. Second, our model testing reveals that the amount of black freshman was the best measure of the minority population of the school, and this variable may merely be the best operationalization of the broader influence of racial heterogeneity.

The results of our regression models (*Table 4*) lend support for our hypothesis that the amount of punishment in a school is predicted by the amount of disorder. In schools with larger amounts of disorder administrators are more likely to utilize short out-of-school suspensions to control behavioral disorder. However, our results show a negative association between behavioral disorder and more severe punishment. Schools with high amounts of behavioral disorder are less likely to use long term suspensions and expulsions to control disorder. Interestingly, the amount of black freshman also displayed a reversal in association as compared to behavioral disorder, and schools with larger amounts of black freshman are less likely to use punishment to control disorder. Punishment also decreased as a county has more white residents, and these findings again point to factors of racial heterogeneity influencing the processes surrounding behavioral disorder in high schools.

We also theorize that punishment responses differ between “low-disordered” and “high-disordered” schools, and our statistical analysis provides support for this

theory. The results show that schools with large amounts of behavioral disorder are more likely to use short term suspensions when compared to schools with low or average amounts of disorder. However, the results show that schools with low amounts of disorder are far more likely to use more severe punishment in the form of long term suspensions. We believe this reflects something analogous to the "fear of crime" in the public. Research has shown that systems and civilians are more punitive to crimes they feel are shocking (Fuselier, Durham, & Wurtele, 2002). In schools with low amounts of behavioral disorder a disorderly offense may be "shocking", which motivates the administration to take a harder stance and utilize more severe punishment as compared to "high-disordered" schools where it is merely "business-as-usual".

Table 5: Linear Regression Models: Behavioral Disorder by Year (N=302)

Variables	Model #9 ('13)	Model #10('14)	Model #11('15)	Model #12('16)
Punish. Ratio$_1$	.042(.019)*	.031(.023)	.089(.027)**	-.032(.02)
Beh. Dis.-LOG$_1$	.748(.052)***	.885(.059)***	.956(.054)***	.790(.045)***
Interaction$_2$	-.04(.021)*	-.047(.02)*	-.102(.03)**	.016(.177)
Blk. Fresh-LOG$_3$	.110(.032)**	.222(.046)***	.235(.067)***	.072(.033)*
Median Inc.-1K	-.001(.001)	-.002(.001)	-.001(.001)	-.002(.001)*
Pop.Dens-Sq.Rt.	-.003(.001)	.001(.001)	.001(.001)	.000(.001)
% White County	-.318(.137)***	.415(.182)*	-.633(.146)***	-.043(.149)
Grad.Completer$_3$	-.011(.004)**	-.002(.004)	-.004(.004)	.000(.004)
Log. Likelihood	-36.756	-93.213	-82.848	-61.905

Note 1: This table presents unstandardized coefficients and standard errors.
Note 2: *=p<.05, **=p<.01, & ***=p<.001.
Note 3: Predictor variables related to the prior year of data. (Ex: Model #9 features variables from 2012).
Note 4: Interaction between Punishment Ratio and Behavioral Disorder from prior year.
Note 5: Control variables from current year of data.

The results of *Table 5* do not provide support for our hypothesis drawn from rational choice theory, and we do not find evidence that the punishment of disorder can prevent future disorder. Instead, our findings support the research that finds punishment to have iatrogenic effects (*American Psychological Association*, 2008). Our models show that prior punishment increases future punishment in two years. Punishment has no significant effect in the other two years. Past behavioral disorder is our most effective predictor of future behavioral disorder, which shows

that schools maintain persistent levels of disorder from year to year. Further, there are significant interactions between disorder and punishment that operationalize the effect between "low-disordered" or "high-disordered" schools and punishment responses that we mention above.

Conclusion

Our research demonstrates that punishment is not an effective policy to control future behavioral disorder in schools. Punishment either shows no significant impact on future disorder, or it increases future disorder. These findings do not provide support for rational choice theory, and it does appear that juveniles may indeed lack full rationality when making decisions (Melde, 2009). However, our results do provide support for our theoretical model. First, we find that behavioral disorder is the result of both community and school variables. Second, we find that a school's punishment responses are primarily predicted by the amount of behavioral disorder in a school. Punishment is a reactive response by a school to control behavioral disorder. However, these reactions are not effective in lowering disorder within a school. We recommend that schools take steps to reduce reactive punishment responses, which may harm a student's educational attainment and increase the risk of juvenile and adult delinquency (*American Psychological Association*, 2008), and enact proactive measures to control disorder. Future research should design, implement, and test these preventative interventions.

Limitations

1) The most obvious limitation of this study is the geographic isolation involved in only using Virginia schools. While the use of a single state controls for interstate influences, generalizability is questionable. Although Virginia provides several regional differences that may magnify the generalizability of our study, future research should replicate our methodology in other states to test for regional differences. Finally, multilevel methodologies may be able to combine these individual studies into one analysis to allow for greater theoretical elucidation.

2) The data in our study stems from self-report measures of school delinquency and punishment. Prior research establishes that self-report measures are reliable in a school setting (Apel, Pogarsky, & Bates, 2008), but future research should replicate our methodology on non-self-report data to ensure validity and reliability.

3) Our operationalization of punishment is an aggregate measure at the school level, and we accept that this may not be the best measure to test rational choice

theory. Therefore, we do not discount the dictates of this theory or its applicability to juveniles or the school environment. Future research should test rational choice theory with more individualized measures within the school environment.

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