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School Cohesion Perception Discrepancy and Student Delinquency

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Abstract
Research suggests that positive school environments contribute to lower levels of school disorder. Studies have also documented stark differences between how students and personnel perceive their schools. The current study examines such "perception discrepancies" as a meaningful dimension of the school environment, investigating the hypothesis that when students perceive their schools as less cohesive than their teachers, they are more likely to engage in delinquent conduct. The University of Missouri–St. Louis Comprehensive School Safety Initiative (UMSL CSSI) study allows comparisons between student and personnel perceptions of school climate among an analytic sample of 2741 students nested in 12 American middle schools (average age = 13.6; 54% female; 39% black; 39% white). The results of a series of hierarchical regression models demonstrate that students engage in higher levels of delinquency when they perceive their school environments as less cohesive, on average, than do school personnel. This suggests that discrepancies among students and personnel concerning aspects of the school climate represent a deficiency in the school's ability to protect against student delinquency.

Keywords Delinquency · School climate · School disorder · Perception discrepancy

Introduction

A large body of literature points to the importance of school context for understanding student behavior and general well-being. Schools that foster positive connections among students and teachers, encourage shared governance, and those in which students and personnel work together to solve common problems are characterized by a host of positive outcomes, including lower levels of delinquent conduct (Payne 2008), substance use (Vogel et al. 2015), bullying (Wilson 2004), and criminal victimization (Gottfredson et al. 2005) among students. Overwhelmingly, scholars point to cohesive relationships between students and personnel as one of the most salient features of supportive school environments (Libbey 2004). Much of the research in this area relies on assessments of school cohesion derived from independent surveys of personnel and students. Responses are often aggregated to the school-level and linked to individual-level outcomes (for example, see Payne 2008). Studies that treat student and teacher assessments of climate independently may be problematic as they assume a strong degree of concordance among students and teachers. Unfortunately, this assumption is not readily supported in the empirical literature, as studies consistently report considerable variation between student and personnel assessments of school climate. Indeed, teachers frequently rate school climate more positively than students (see Mitchell et al. 2010). It follows that variation in perceptions form an important and often overlooked feature of school context.

Evidence suggests that "perception discrepancies" represent more than measurement artifacts; they provide important insight into contextual influences on reporting parties (see De Los Reyes 2013), therefore, examining variation in reports of school cohesion might provide insight into broader school processes. The current study addresses this lacuna in the empirical research by drawing on the perception discrepancy literature to capture nuances in school climate that affect student conduct. The analyses

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examine how differences in student and personnel assessments of school cohesion contribute to delinquency using a longitudinal survey of over 3,100 middle school students and their 409 teachers from St. Louis County, MO, collected between 2017 and 2018.

School Cohesion and Student Outcomes

Students' and school personnel's beliefs, attitudes, and behaviors, and school norms and procedures form the foundation of the school environment (Mitchell et al. 2010). A myriad of research demonstrates that supportive social environments are associated with positive student outcomes (Thapa et al. 2013). For example, schools characterized by a consensus on school values, an emphasis on participation and collaboration, and supportive relationships tend to exhibit greater teacher efficacy (Collie et al. 2012) as well as greater student interest in academics and student attachment (Roorda et al. 2011). These schools also display lower rates of disorder (Payne et al. 2003) and delinquent conduct (Payne 2008). Researchers have utilized various terms to describe how students and personnel perceive their school environments, however the importance of student-teacher relationships is central across studies (Libbey 2004). The nomenclature varies considerably so that terms such as school cohesion, connectedness, or supportiveness have been used to reflect student-teacher relationships. From this point forward, the term school cohesion is used to refer to the supportive relationships among students and personnel in a school, which, in turn, represents a significant component of an overall positive school climate. Research on school cohesion consistently reveals a negative relationship between cohesive student-personnel relationships and problem behaviors including delinquency, marijuana use (Vogel et al. 2015) and bullying (Wilson 2004). Overall, school cohesion forms an integral component of supportive school environments that provides important benefits for student behavior.

Student and Personnel Perceptions of School Environment

Despite the overwhelming evidence of the protective influence of school cohesion on delinquent conduct, much prior research relies on *independent* assessments from teachers and students. This is problematic as students and personnel often perceive their school environments differently. On average, personnel perceive higher student involvement and teacher support (Fisher and Fraser 1983), a greater sense of school belonging and safety (Bradshaw et al. 2007), and, generally, a more positive school climate compared to students' personal views (Mitchell et al. 2010). For instance, in a longitudinal study of elementary to middle school students, students rated their junior high school teachers as less caring and friendly than their elementary school teachers, and as more likely to be unfair or critical. In contrast, teachers' self-reports of caring, supportive relationships with students did not significantly differ from the elementary school teachers—both groups indicated supportive relationships with their students (Feldlaufer et al. 1988). Similarly, a comparison between personnel and student ratings on a multi-dimensional assessment of school climate found no correspondence between ratings on factors including school order, teacher-student relationships, and student commitment (Mitchell et al. 2010). Of note, personnel perceptions of school climate were more strongly associated with classroom-level factors, while students' perceptions were more strongly associated with school-level factors. Poor classroom management and disruptive student behavior contributed to teacher reports of fairness, order, and student–teacher relationships. School-level measures of student mobility, student–faculty ratio, and administrator turnover were associated with students' reports of school climate (Mitchell et al. 2010). This suggests that student perceptions are more sensitive to global features of the school environment while personnel perceptions are more likely to be influenced by their experiences in the classroom.

Although there is little contemporary research documenting *why* personnel rate their school environment more positively than students, one potential explanation highlights differences in the roles occupied by personnel and students. Personnel may perceive a more positive school environment because they have a more active role in the school than students. Teachers exercise more control and responsibility over their classrooms; they perceive aspects of school climate positively because they have the power to influence the environment according to their preferences (Mitchell et al. 2010) In contrast, students may feel more passive. Because students are learning to become more independent, their desire for autonomy can negatively influence their perceptions (Feldlaufer et al. 1988).

Perception Discrepancies and Adolescent Offending

While research hints at the presence of disparities between students and personnel perceptions of school climate, comparably few studies have investigated whether and how these discrepancies influence student conduct. A sizeable body of research in developmental psychology underscores the meaningful differences in informants' reports of children's and adolescents' experiences. For example, a meta-analysis confirms that consistent disparities exist between parents and their children, teachers and students, and parents and teachers when it comes to reporting a child's internalized mental health concerns or externalized behavior

(De Los Reyes et al. 2015). Much of the research comparing perceptions of a youth's environment focuses on the parent-child relationship. Parents tend to report higher rates of positive parenting behaviors (e.g., warmth, support of child) and lower rates of negative behaviors (e.g., controlling, guilt inducing) compared to their child (Korelitz and Garber 2016). Some evidence suggests that parents also perceive their children's social environments more positively than their children, reporting more supportive family dynamics, such as family cohesion (Xu et al. 2017), and underestimating their children's exposure to negative influences, such as community violence (Zimmerman and Pogarsky 2011). These discrepancies are important because they form a key dimension of the quality of interpersonal relationships and can have implications for psychosocial and behavioral outcomes (De Los Reyes and Ohannessian 2016).

Because high levels of parental monitoring have been identified as protective factors for youth delinquency, multiple studies have specifically examined discrepancies in parent and child reports of monitoring in relation to this outcome. When discrepancies in which mothers report higher parental monitoring than their child perceives are high, the child is more likely to engage in delinquency compared to children who report consistent monitoring (De Los Reyes et al. 2010; Ksinan and Vazsonyi 2016). Similarly, parents tend to underestimate their child's exposure to violence in the community and when parents report less exposure to violence than their child, their child's involvement in delinquent behavior was higher (Zimmerman and Pogarsky 2011).

Discrepancies in parent and child perceptions have also been linked to adverse consequences such as poor emotional health and substance abuse. For instance, discrepancy in parent-child knowledge of adolescent substance use is a significant predictor of adolescent alcohol use (Abar et al. 2015). In addition, disagreement in perceptions of the parent-child relationship is associated with more symptoms of depression in children (Nelemans Branje et al. 2016). This disagreement in perceived conflict can be more impactful than the conflict itself: situations in which a father reports low conflict in the relationship and the child reports high conflict are more strongly associated with the child's depressive symptoms than when the child and father agree —even when both the child and the father are reporting high levels of negative interaction (Nelemans et al. 2016). These findings reveal that perception discrepancies between children or adolescents with their caregivers are associated with negative behavioral outcomes and highlight that the disagreement itself is a meaningful quality of the parent-child relationship.

Although the relationship between perception discrepancies and delinquency is generally examined in the family context, there are important parallels to the school context. In studies assessing discrepancies among parent and child perceptions of their relationship or parental monitoring behaviors, the disagreement is theorized to represent a deficiency in the relationship in which parents' lack the information about their child's behaviors and experiences that is necessary to prevent problem behaviors or encourage prosocial behavior (De Los Reyes and Ohannessian 2016). The discrepancy represents a characteristic of the developmental context (in this case, the family) that is distinct from simply conflict between two informants (De Los Reyes et al. 2013). This notion that disagreement represents a shortcoming in the family's ability to socialize a child suggests that one potential pathway through which discrepancies lead to delinquent conduct is by weakening social controls and diminishing adolescents' perceived risk that their behavior will come to the attention of their parents.

Both the family environment and the school are recognized as meaningful institutions of social control for youth. Social control theory argues that adolescents are less likely to engage in delinquency when they are more engaged in these contexts; in other words, they feel committed and attached to others in the institution so that they refrain from participating in deviant behavior (Hirschi 1969; Reiss 1951). Indeed, features of the school climate can act to prevent student delinquency by increasing social control (Payne 2008). It bears to reason that the mechanism for negative consequences of disagreement between parents and children may operate among students and school personnel: Discrepant reports of cohesive relationships reflect disconnect between students' experiences and feelings of support or connection to others and personnel's ideas of student needs. Cohesion among personnel and students is a beneficial characteristic of school climate so that disagreement regarding cohesion may diminish the school community's capacity to act as a social control and therefore protect against delinquent behavior.

Current Study

The present study extends recent literature to examine whether and how perception discrepancies in school settings contributes to delinquent conduct. Disagreement among parents and children regarding their family dynamic represents some dysfunctional aspect of the family environment associated with the child's behavior (De Los Reyes and Ohannessian 2016). When applied to the school context, it follows that discrepancies between school personnel and student perceptions of a key facet of the climate—school cohesion—may relate to students' delinquency on school grounds. Using a multi-wave dataset of adolescents (7th and 8th grade students at Wave 1) from 12 middle

schools, the current study operationalizes and models perception discrepancy as a student-level characteristic considered alongside an average indicator of personnel perceptions of school cohesion. The analyses are guided by the hypothesis that perceptions of school cohesion (both student- and personnel-level) will be negatively associated with students' delinquency at school (Hypothesis 1). This would confirm prior findings in the school climate literature, suggesting that cohesion is a protective factor against delinquency and misconduct. Additionally, larger discrepancies in which personnel perceive greater cohesion in their school relative to the student are expected to be positively associated with the student's subsequent delinquent behavior (Hypothesis 2). Support for this second hypothesis would highlight the importance of disagreement regarding this characteristic—similar to what is observed in developmental psychological literature—suggesting that when students perceive their school environment as less cohesive than personnel do, they are likely disconnected from the broader school context, driving down perceived social control and placing upward pressure on their likelihood of engaging in delinquent conduct.

Methods

Data

This study uses data from the University of Missouri–St. Louis Comprehensive School Safety Initiative (UMSL CSSI). This multi-year project explores the causes and consequences of school violence, including student offending, victimization, and school climate among a large sample of middle school students in a large Midwestern metropolis. Twelve schools participated in the study. These schools represent a broad range of students, with some drawing proportionally more from impoverished urban neighborhoods and others from suburban locales. The study includes three waves of longitudinal survey data following two cohorts of students (beginning in 7^{th} and 8^{th} grade) and a survey of personnel at each of the middle schools. This study uses data from the first and second waves of student surveys and the school personnel survey. The first wave of student surveys and the school personnel survey were administered during the spring of 2017. The second wave of student surveys was administered during the spring of 2018. The Wave 1 sample consists of approximately 3640 middle school students and 409 personnel. Wave 2 includes 3165 students with over 85 percent sample retention between waves.

Students who attrited were more likely to be black, from single parent households, and slightly older than respondents surveyed at both waves. The Wave 1 survey instrument did not include an in-school delinquency measure (the outcome variable modelled here); however, analyses using a general delinquency measure from Wave 1 show that those retained had significantly lower levels of delinquent conduct compared to those lost through attrition, consistent with patterns in other panel studies (Brame and Paternoster 2003). The correlation between general delinquency and school delinquency is rather strong ($r = 0.69$), suggesting that individuals who engage in high-level school delinquency may be slightly underrepresented in the analyses.

The analytic sample includes 2741 students and 401 personnel with complete information on each of the measures. Respondents with complete information varied somewhat from the full sample available at Wave 2. Respondents in the analytic sample perceived slightly more cohesion, had higher levels of school commitment, and included more white (and fewer black) students from two parent households relative to respondents with missing information on key variables (the results of analyses on attrition patterns and missing data available from first author upon request). There were no differences in self-reported offending between groups. As described below, the regression models employ multiple imputation to address missing data.

Measures

Students and personnel were administered questionnaires covering a range of topics from basic demographic information to perceptions and attitudes about their schools and involvement in specific behaviors. All but one measure was constructed using data from the student questionnaire. In addition to the measures described in detail below, the empirical models also include control variables for student respondents' self-identified race (non-Hispanic black, non-Hispanic white, Hispanic, non-Hispanic other race), sex (male = 1), and age measured in years at the time of the Wave 1 survey. Table 1 presents the descriptive statistics for the analytic sample. Approximately 54 percent of student respondents are female, 39 percent identify as non-Hispanic white, 39 percent as non-Hispanic black and 5 percent as Hispanic. The average respondent is 13.60 years old.

Self-reported delinquency

Delinquency is measured as a nine-item variety scale capturing the number of unique acts of delinquency that students reported engaging in *on school grounds* in the six months preceding the Wave 2 survey. This scale was adapted from items included in the Gang Resistance Education and Training (G.R.E.A.T.) evaluation, a well-established school-based longitudinal survey used and

Table 1 Descriptive statistics

	Mean	SD	Min	Max
Individual-level ($N = 2741$)				
Delinquency	0.30	0.90	0.00	9.00
Student-perceived school cohesion	16.61	4.41	5.00	25.00
Control variables				
School commitment	16.03	2.72	4.00	20.00
Impulsivity	8.45	2.30	3.00	15.00
Two parent household	0.58	0.49	0.00	1.00
Moved schools	0.52	0.50	0.00	1.00
Age	13.60	0.70	10.23	15.73
Male	0.46	–	0.00	1.00
Black	0.39	–	0.00	1.00
White	0.39	–	0.00	1.00
Hispanic	0.05	–	0.00	1.00
School-level ($N = 12$)				
Personnel-perceived School Cohesion	18.82	1.43	16.31	21.95

Descriptive statistics for the non-imputed sample

SD standard deviation; *Min* minimum value; *Max* maximum value

Source: (University of Missouri–St. Louis Comprehensive School Safety Initiative)

referenced frequently in school-based delinquency research (see Esbensen and Osgood 1999 for discussion of constructs and measures). Although the original items referred to delinquent behavior in general, Wave 2 of the survey instrument included items referring to a variety of property and personal offenses that occurred specifically in school. Respondents were asked how many times in the last six months they engaged in the following behaviors: destruction of property, hitting someone, attacking someone with a weapon, property theft above a $50 value, property theft below a $50 value, carrying a weapon, engaging in a gang fight, using a weapon or force to get money or things from someone, going into a building to steal something. These count responses were dichotomized to indicate whether they had or had not engaged in the behavior, then the nine items were combined into a 9-item scale ($\alpha = 0.745$) with a mean of 0.30 and standard deviation of 0.90.

Student cohesion

Cohesion is a construct of the environment representing perceived connectedness, support, and involvement of students and personnel that is commonly recognized as a beneficial aspect of school climate (Libbey 2004). The student cohesion scale captures students' perceptions of the construct, combining three items adapted from Brown and Evans' (2002) school connection scale and two from Vessels' (1998) teacher-student relationship construct. Respondents indicated their level of agreement, ranging from 1 (strongly disagree) to 5 (strongly agree), with statements regarding adults listening to students' concerns, adults asking students about their ideas, students' opportunities to make decisions, teachers showing respect for students, and teachers treating students fairly. For example, one item is: "Adults at this school listen to students concerns." The 5 items were assessed for scale reliability ($\alpha = 0.858$) and combined so that higher values reflect a greater degree of cohesion. The mean level of student-perceived cohesion equals 16.61 with a standard deviation of 4.41.

Personnel cohesion

Personnel cohesion refers to the school personnel's perceptions of the cohesion construct. The same five Likert-items asked of students were included in a web-based questionnaire administered to school personnel. These items were combined to create a measure parallel to the student cohesion measure, according to recommended practice for informant comparison studies (De Los Reyes 2013). Personnel responses were averaged to generate a mean personnel score for each school ($\alpha = 0.846$). The average of the twelve school personnel means is 18.82 with a standard deviation of 1.43.

School commitment

Research identifies a student's commitment to school as a meaningful protective factor against delinquent conduct, where commitment represents the student's engagement or attachment to the institution (Hirschi 1969). Because this factor may relate to the school delinquency outcome, it is included as a control variable. The school commitment scale was used in the Denver Youth Survey (Huizinga et al. 1991) and adapted for the National G.R.E.A.T. evaluation (Esbensen and Osgood 1999) and it includes students' responses to four Likert-items. Students indicated their agreement, on a scale from (1) strongly disagree to (5) strongly agree, with the following statements: I try hard in school; in general, I like school; grades are very important to me; I usually finish my homework ($\alpha = 0.69$). The average reported level of commitment is 16.03 with a standard deviation of 2.72.

Impulsivity

Impulsivity is an individual's tendency to act without thinking, often considered a facet of low self-control that acts as a risk-factor for delinquent behavior (Gottfredson and Hirschi 1990). As a well-established predictor of delinquency (Vogel and Barton 2013), it is included as a control variable. Impulsivity is measured using a three-item scale, an abbreviated version of Grasmick and colleagues'

(1993) measure. Students reported their level of agreement, on a scale from (1) strongly disagree to (5) strongly agree, with the following statements: I often act without stopping to think; I don't devote much thought and effort to preparing for the future; I often do whatever brings me pleasure here and now ($\alpha = 0.44$). The average level of impulsivity, where higher values indicate greater impulsivity, equals 8.45 with a standard deviation of 2.30.

Two-parent household

Two-parent household is a dichotomous measure based on a single item asking students to indicate the adults with whom they lived with most of the time. This measure acts as an indicator for the students' family structure. It is included as a control variable because living in a single parent household can be a risk factor for delinquent behavior (Brown 2004). Responses were coded to demarcate students who lived with both their biological mother and father from students who did not (1 = two parent household). Overall, 58 percent of students in the sample indicated they live in a two-parent household, while the remaining 42 percent reported some other family structure.

Moved schools

Moved schools is a dichotomous variable indicating whether students moved schools between waves of data collection. Over 1500 students moved from middle school to high school and over 100 students transferred schools. In total, 52 percent of the analytic sample moved to a different school in Wave 2. This measure indicates the students' changing school environments and is relevant to consider in the potential relationship between perceptions of school cohesion and student behavior.

Analytic Strategy

This study employs hierarchical regression models to estimate the association between student cohesion and offending within schools as well as contextual influences on offending across schools. This approach specifies both between- and within- school effects and estimates the corresponding equations simultaneously. These models allow for the variance to be partitioned between the individual and school level (for a general overview of HLM models, see Raudenbush and Bryk 2002). The outcome variable is the variety of self-reported delinquent conduct. Given the count-based nature of the dependent variable, all models are estimated as two-level negative binomial regressions. Perception discrepancies are conceptualized and empirically modelled as deviations of student-level cohesion scores away from the school-level personnel perceptions of school cohesion. In this sense, the level one measure of student cohesion is essentially group-mean centered on the school-level personnel perceptions.

The intercept and the measure of school cohesion are allowed to vary across schools, thus capturing differences in average levels of offending across schools as well as differences in the effect of perception discrepancies on school delinquency across schools. The remaining covariates are grand-mean centered and fixed. In order to preserve temporal ordering, all independent variables are measured at Wave 1 and the outcome variable, delinquency, is measured at Wave 2. For ease of interpretation, the parameter estimates from the models are presented in terms of log-counts and incidence-rate ratios, the latter being interpreted as the expected change in the rate of delinquent conduct given a one-unit increase in the predictor variable. Missing data on the independent variables were imputed using the MI suite of commands in Stata 16. The regression models present the combined results of HLM models estimated on 10 imputed datasets. The full, imputed sample contains 3025 cases. Missing values were not imputed for students missing items on the dependent variable. Data management was performed in SPSS v.23 and the empirical models were estimated in Stata v.15.

Results

Descriptive statistics of the sample reflect that approximately 18 percent of students reported that they engaged in some type of delinquency on school property during the six-month recall period, with a mean variety score of 0.30. A comparison of the mean-levels of student and personnel cohesion suggests that school personnel are more likely to perceive their schools as cohesive compared to students. The standard deviations in perceived-cohesion measures indicate more variation among student reports relative to personnel reports.

Table 2 presents the results of the hierarchical negative binomial regression models. As might be expected, the results of a null model suggest that rates of self-reported delinquency differ significantly across the twelve schools in the sample (results suppressed, available upon request). The parameter estimates presented in Table 2 indicate that impulsivity and being male both emerge as positive correlates of delinquency. The incidence rate for males is approximately 35 percent higher than for females and a one-unit increase in impulsivity is associated with a 4.7 percent increase in the expected rate of self-reported offending. School commitment and moving schools from Wave 1 to Wave 2, on the other hand, both emerge as protective factors. The expected rate of offending is approximately 23 percent lower among movers than non-movers and a

Table 2 Hierarchical negative binomial regression of self-reported delinquency ($N = 3035$)

	b	se	IRR
Fixed effects			
Intercept	2.24	2.36	9.41***
Age	−0.72	0.96	1.07
Male	0.30	1.35	1.14**
Non-Hispanic Black	0.26	0.18	1.29
Hispanic	0.02	0.26	1.02
Non-Hispanic other race	0.06	0.22	1.06
Multiracial	0.13	0.25	1.14
Impulsivity	0.05	0.01	1.05*
School commitment	−0.04	0.02	0.96*
Moved schools	−0.26	0.14	0.76*
Centered student cohesion	−0.06	0.02	0.94***
Personnel cohesion	−0.24	0.10	0.79*
Random effects	VC[b]		χ^2
Between Schools	0.262		145.74***
Student cohesion slope	0.004		67.05***
Model statistics			
Likelihood	−1949.79		

b log count, *se* standard error, *IRR* incident rate ratio

*$p < 0.05$; **$p < 0.01$; ***$p < 0.01$

one-unit increase in school commitment is associated with a four percent reduction in the expected rate of self-reported offending.

Consistent with the first hypothesis, the parameter estimate for personnel cohesion suggests that rates of student delinquency diminish substantially as average-level personnel reports of cohesion increase—a one-unit increase in personnel cohesion is associated with a 21.4 percent reduction in the expected rate of student delinquency. Consistent with Hypothesis 2, the group-mean centered measure of student cohesion suggests that the less cohesive students perceive their school environment relative to their teachers, the more likely they are to engage in delinquent conduct. A one-unit increase in this measure is associated with a 5.5 percent reduction in the rate of self-reported delinquent conduct (meaning, as student perceptions more closely align with or exceed that of school personnel, they offend less). Taken together, these results indicate that perceptions of cohesion are negatively associated with delinquency: *Disagreement* regarding cohesion where students view the environment as less cohesive than personnel perceive is positively associated with delinquent behavior. The random effects estimates suggest that both offending and the effect of perception discrepancies on offending vary significantly across schools, perhaps pointing to the presence of other individual or school-level factors that explain variation in misconduct beyond the indicators of school climate examined here.

Supplementary Analyses

Past research has been criticized as the inclusion of difference scores in regression models (i.e., subtracting the score derived from one informant's perceptions from the other informant's), in the absence of the constituent perceptions from both parties, may increase the risk of spurious correlation (see Laird and Weems 2011 for review). The approach utilized here treats personnel perceptions as a school-level covariate and the student-level variable as deviations off this level-2 feature. The comparison used here is between average, school-level personnel scores and a student's score in that school, not a dyadic comparison between two individuals. While this multilevel approach overcomes some of the limitations highlighted in prior work, the regression models were estimated through several alternative specifications to assess the robustness of the results (the results of these supplementary analyses are available upon request from the first author). The first sensitivity analysis follows the advice of Laird and De Los Reyes (2013), and models perception discrepancy through a polynomial interaction between student and personnel-level perceptions of school climate. The results from these supplemental models reveal that the main effects for both personnel and student reports of school cohesion are negative and statistically significant. The fully specified model is inestimable, as the small number of level-2 units does not allow for the inclusion of two cross-level interactions with random effects for the level-1 measure of student perception and its polynomial. However, a model in which all level-1 covariates were fixed largely comports with the results reported here. Namely, the main effects for personnel and student cohesion were negative and their interaction positive (although failing to reach traditional levels of statistical significance) and the polynomials for both personnel and student cohesion were positive while their product term was negative, trivial in magnitude, and statistically significant.

In an effort to simplify the method proposed by Laird and De Los Reyes (2013), the perception discrepancy measure was next recoded to differentiate students who reported that their perception of school cohesion was below that of the school personnel from those who ranked their perceptions of cohesion higher than personnel did. While not perfect, this approach overcomes the differencing bias by reducing the discrepancy into a straightforward dichotomy. Approximately one-third of respondents reported their schools as more cohesive than the personnel average and the other two-thirds as less cohesive. The results from this supplemental analysis reveal that students who report their

schools as less cohesive than personnel report incident rates 48 percent higher than students who report higher levels of cohesion. The results of these supplemental regression models largely comport with the findings reported above: When students perceive their school environments as less cohesive than their teachers do, they engage in higher levels of delinquent conduct.

Discussion

Research in developmental psychology indicates that discrepancies between informants' perceptions of their social environments can provide important insights into broader contextual processes. Often framed in terms of family dynamics, this line of research suggests children and adolescents tend to engage in higher levels of problematic behaviors when they view their family and residential environment as less cohesive than their parents (for example, Ksinan and Vazsonyi 2016). The current study applies this general framework to the school context to examine (1) the extent to which students and personnel vary on their perceptions of school climate and (2) whether such perception discrepancies are associated with students' self-reported delinquent conduct.

The analyses reveal two important findings. First, the descriptive results largely comport with prior research (Mitchell et al. 2010), demonstrating that school personnel, on average, report higher levels of school cohesion than do their students. School personnel also report considerably less variation in cohesion than students do. This suggests that there is a higher degree of concordance among teacher and administrators' perceptions of their school climate than among students. This variation was then exploited to determine whether perception discrepancies were associated with delinquent conduct. Given the data structure, perception discrepancies were operationalized as the extent to which individual students' perceptions of school climate deviated from the school-level average personnel rating. The first hypothesis, seeking to confirm prior research that school cohesion represents a beneficial characteristic of school climate, proposes that perceptions of cohesion are negatively associated with student delinquency. Expanding on this relationship, disagreement—or discrepancies—regarding school cohesion may also represent a meaningful characteristic of the climate. Guided by the assumption discrepancy hinders the schools' capacity to effectively regulate student behavior, Hypothesis 2 predicts that students who perceive their school environment as less cohesive than personnel will perceive less social control, and thereby engage in more delinquent conduct.

The results from the HLM analyses support both hypotheses. For one, the models corroborate past findings that school cohesion is negatively associated with student delinquency. This is most clear in the main effect of personnel cohesion on student self-reported offending. More importantly, the results reveal that discrepancies between students and personnel increase student offending – when students perceive their schools as less cohesive than personnel, they report greater involvement in delinquent conduct. While the CSSI data do not contain direct measures of intervening mechanisms, one possible explanation is that students who perceive their school as substantially less cohesive are disconnected from their teachers and peers, and, consequently, may perceive lower levels of informal social support and social control. This, in turn, may increase their risk of engaging in delinquent conduct (see Payne 2008).

Alternatively, parent-child perception discrepancy may influence delinquency because differences in perceptions reflect parents' lack of knowledge of their child's experiences (De Los Reyes and Ohannessian 2016). When applied to the school context, the positive association between discrepancy and delinquency could reflect situations in which teachers generally lack understanding of their students' experiences; students are less engaged with the school and more likely to participate in delinquent acts. Even if teachers report strong relationships with students, the students may feel differently, and therefore the beneficial qualities of the school climate cannot optimally function to prevent misconduct (Payne 2008).

Limitations

The results of this study should be considered with a note of a few limitations. First, differential attrition and missing data could impact the internal and external validity of the findings. Attrition analyses suggest that respondents not re-surveyed in Wave 2 indicated higher levels of general delinquency at Wave 1 compared to those retained, meaning the current findings may underrepresent delinquent adolescents. Second, the analyses did not control for students' self-reported delinquency on school grounds at Wave 1 because these items were not included in the questionnaire until Wave 2. Third, degrees of freedom excluded the possibility of including other school-level variables. Contextual factors beyond personnel-perceived cohesion almost certainly impact student behavior (e.g., student to teacher ratio, percent eligible for free or reduced lunch). As such, future attempts at replication would be well-served to incorporate a greater number of level-2 units and, consequently, a greater range of school characteristics.

Lastly, although discrepancies are theorized to represent a deficiency in the school's ability to exert social control on student behavior, this mechanism is largely speculative in the current application. While prior research suggests that

schools serve a social control function and that cohesive relationships among students and personnel allow students to be more invested in the school environment and therefore dissuaded from engaging in negative behaviors (Thapa et al. 2013), the current study does not contain direct measures of intervening mechanisms. Rather than a critical limitation, this is a fruitful direction for future researchers to unpack the mechanisms underlying the relationship between perception discrepancies and delinquency.

Future Directions

These findings can serve as a guidepost for future research and help to inform aspects of school programming and policy. For one, this study provides a first step in understanding the role of perception discrepancies as meaningful qualities of school climate. While the current study focuses specifically on student delinquency, it bears to reason that these discrepancies extend to a variety of maladaptive behaviors. Subsequent research can further specify how agreement between personnel and students (i.e., concordance) may control delinquent behavior, as well as further explore how discrepancies affect other student outcomes (e.g., bullying, victimization). By demonstrating the additional consequences of perception discrepancies, future research may further bolster the results reported here.

Evidence that teachers and administrators tend to perceive the environment as supportive or positive relative to students, and that this has adverse consequences for students, underscores the need for encouraging open and communicative teacher-student relationships. Discrepancies or disagreement can restrict the ability for teachers to recognize and intervene in harmful situations, so efforts must be taken to reduce the gap between student and personnel experiences (Bradshaw et al. 2007). Prior work on school policy initiatives aimed at improving teacher-student communication shows that offering students' avenues to voice their experiences is associated with their improved perceptions of the environment. For example, in schools with policies allowing students to evaluate their teachers, student reports reflect a better school climate (Barile et al. 2012). Initiatives allowing students to communicate their perceptions and experiences to school personnel, as well as those encouraging more supportive relationships may improve the quality of the school environment by reducing disparity in different groups' reports.

Conclusion

The literature comparing perspectives from multiple sources challenges the conclusion of past work that "one informant must be right while another must be wrong" (Achenbach 2011, p. 85); however, much of prior research on perception discrepancies focuses on the family setting, linking differences in parent and child's views of the environment to the child's behavior. This study applies the perception discrepancy framework to the school environment to assess differences in personnel and student perceptions of school cohesion in relation to student delinquency. These results reveal that when students perceive school relationships as less cohesive than their school personnel do, they engage in higher levels of delinquent conduct. This finding underscores that differences in how students and personnel view their school climate is a unique aspect of the school environment—one with important implications for student behavior.

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Data Sharing and Declaration The datasets generated and/or analyzed during the current study are not publicly available at this time but are available from the corresponding author on reasonable request.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the Institutional Review Board at the University of Missouri – St. Louis.

Informed Consent Informed consent was obtained from student respondents and their parents, as well as personnel before participation in the study.

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