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Restorative Practices: Using local evidence on costs and student outcomes to inform school district decisions about behavioral interventions

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ABSTRACT

School disciplinary practices affect student academic and life outcomes. Many schools have recently shifted towards the prevention of behavioral disorders rather than the punishment of such disorders, but disciplinary actions are still disproportionately meted out to Black students. We took advantage of a natural experiment in a large school district to investigate the costs and effects of a school-wide intervention based on the principles of restorative justice on suspensions, referrals, and three school climate constructs. The study involved 14 elementary and middle schools, each of which was already implementing Positive Behavioral Interventions and Supports (PBIS). Six of the schools integrated Restorative Practices into their PBIS framework during the first year of the study, whereas the other eight served as comparison schools and implemented the program the following year. We tested a difference-in-difference regression model for each of our five outcomes of interest after 1 year of implementation using Quasi-Poisson models for referrals and suspensions. We found no statistically significant effects on four of the outcomes, either for the overall sample or by racial subgroup. We found negative effects on student-reported personal safety. An additional analysis 1 year later showed that Black students in schools implementing Restorative Practices for 2 years experienced a greater reduction in suspensions than Black students in schools implementing the program for only 1 year. We used the ingredients method to estimate start-up costs and ongoing costs for the first full year of implementation. Our reference case analysis results using a societal perspective, national average prices, and a 3% discount rate were $57,450 per school and $139 per student for the first year of Restorative Practices implementation. These estimates included training costs from the prior year and were incremental to the costs of PBIS, which served as the business-as-usual condition. We compared these costs to those of a number of other behavioral interventions and concluded that Restorative Practices are relatively low cost but may need to be implemented for several years with greater fidelity in order to produce the desired improvements in behavior events and school climate.

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During the 2013–14 school year, 2.6 million public school students (over 5%) were suspended one or more times (National Center for Education Statistics [NCES], 2019). Students who are suspended lose instructional time and are more likely to repeat grades, drop out of school, and engage in crime (Marchbanks III et al., 2014; Rumberger & Losen, 2017). Disciplinary actions in K-12 education are disproportionately meted out to Black students, leading to negative consequences for both the students and society (U.S. Government Accountability Office, 2018; Skiba et al., 2011). Gregory et al. (2010) argued that the racial gap in school disciplinary actions contributes substantially to the achievement gap. Among Black students, 14% are suspended each year (18% of Black students categorized as males and 9% of Black students categorized as females), as compared to 1% of Asian students, 3% of White students, 5% of Hispanic students, 5% of Pacific Islanders, and 7% of American/Alaska Native students (Snyder et al., 2019). Annamma et al. (2014) presented such disproportionality in disciplinary actions as an example of institutionalized racism in schools that contributes to the school-to-prison pipeline.

The overrepresentation of Black students in school disciplinary consequences is one of multiple ways in which racial and socioeconomic inequality is manifested and perpetuated in schools, in addition to disparities in tracking and special education placements, mis- or underrepresentation in curriculum, quality of instruction and physical resources available, and funding (Gordon et al., 2000; Gregory, 1997; Skiba et al., 2002). Racial disparities in suspension and expulsion originate with disproportional office disciplinary referrals doled out in the classroom (Gregory et al., 2010; Skiba et al., 2011). Skiba et al. (2011, 2014) identified several mechanisms that may explain disciplinary disparities including poverty, differences in behavior, cultural mismatch between school personnel and students, implicit bias, and stereotyping of students in minoritized and lower socioeconomic groups. Although schools alone are not expected to repair entrenched societal problems, pressure has built over the past two decades for greater accountability for equity in schools, including better ways to approach discipline and to counter structural racism (e.g., Kohli et al., 2017). Based on findings that systemic school-level race variables are more predictive of suspensions than behavioral or student characteristics, Skiba et al. (2014) recommended addressing disciplinary disproportionality with school-wide approaches, such as improving principals' ability to confront issues of race and equity, focusing on improved achievement, and confronting implicit bias, as opposed to focusing on individual students or their behaviors. Vaught and Castagno (2008) called for the concept of distributive justice to be applied in schools to ensure that every student can receive their fair share of educational opportunities and benefits.

1. Positive Behavioral Interventions and Supports

Many schools are shifting towards the prevention of behavioral problems rather than responding to these problems with punishments (Morgan et al., 2014). For example, since the 1980s, over 26,000 school teams have implemented Positive Behavioral Interventions and Supports (PBIS). PBIS is a framework for choosing and implementing evidence-based practices with an emphasis on using data to track student outcomes and a system-wide approach to training and provision of ongoing support for educators (Sugai & Simonsen, 2012). PBIS involves practices designed to improve academic and social-behavioral outcomes for all students. School staff have reported fewer disciplinary referrals and improved school climate and culture as a result of implementing PBIS (Sugai & Simonsen, 2012). A recent meta-analysis of PBIS studies found significant reductions in office discipline referrals and suspensions, increased academic achievement, and improved perceptions of school safety and organizational health (Lee & Gage, 2020). Longer-term benefits of PBIS have not been documented, with Borgen et al. (2021) showing no long-term effects on academic outcomes, dropout rates, or criminal charges.

The economic costs of implementing PBIS have been estimated by various analysts. Economic cost analysis goes beyond documenting expenditures by systematically identifying and documenting the quantity, quality, and economic value of all resources required to implement a program in practice (Levin & McEwan, 2001). This may include expenditures for newly acquired resources in addition to the opportunity costs of existing resources, such as teachers' time, that are reallocated from other purposes. Blonigen et al. (2008) estimated costs of approximately $66,000 per school for a group of 10 schools based on assumptions about resources needed for PBIS implementation in a school district of 27,000 students. Bradshaw et al. (2020) estimated average costs of approximately $53,200 per school for 77 schools trained in PBIS in one state. This analysis focused on implementation in the schools and excluded costs to the school district or state. Lindstrom Johnson et al. (2020) estimated recurring annual costs of $48.16 per student or $27,000 per school for 20 schools participating in a randomized controlled trial, noting that program initiation costs are higher when the program is first introduced. As with most school-based interventions, the majority of costs for PBIS are associated with personnel time, including PBIS team meetings, training, implementation of evidence-based practices, and making referrals.

Restorative Practices

Over the past two decades, many schools have experimented with the adoption of restorative justice approaches to discipline, often supported by the International Institute for Restorative Practices (IIRP). Restorative Practices are a set of practices that are philosophically aligned with the PBIS framework and can be integrated with PBIS activities; both aim to prevent, reduce, and respond to behavioral issues by building positive relationships (IIRP, 2018). PBIS serves as the guiding framework to inform the selection, implementation, and improvement of 'external' (i.e., not PBIS-developed) evidence-based, tier-specific practices. Restorative Practices, as the name implies, constitute a specific set of strategies that are used across tiers in multitiered systems of support (MTSS). Critical elements include the establishment of agreements regarding expectations for school and classroom behavior that are developed with input from students and staff, as well as discipline policies and procedures that shift from punitive and exclusionary to preventive, instructive, and restorative (Sprague & Tobin, 2017a). The integration of Restorative Practices and PBIS implies the

adoption of Restorative Practices strategies and activities as the primary PBIS Tier 1–3 practices. As seen in Table 1, the PBIS foci on systems improvement and making data-informed decisions are considered complementary to Restorative Practices activities (Beckman et al., 2012; see also Sprague & Tobin, 2017b; Winsch, 2017).

Restorative Practices strive to develop community and manage conflict and tensions by repairing harm and restoring relationships (IIRP, 2018; Mallett, 2016; Thorsborne & Blood, 2013). In turn, these improvements are expected to reduce office disciplinary referrals and out-of-school suspensions, reduce disproportionality in suspensions, and improve overall school climate (Sprague & Tobin, 2017b). Restorative Practices are theorized to improve behavior and connectedness for students via three psychological mechanisms: (a) maximizing positive affect by developing closer bonds and relationships among students—and among students and teachers—using proactive activities such as group meetings between students and staff; (b) minimizing negative affect by asking offenders to accept responsibility for their behavior and helping them reintegrate into the community; and (c) encouraging expression of emotion through the use of affective statements and questions (Acosta et al., 2019). In addition to acting at the individual level, Restorative Practices are postulated to have school-level effects: positive interaction among students improves peer relationships and increases active participation in school, thereby creating a more positive school environment. Stronger relationships and an increased sense of connectedness to the school are expected to prevent harmful behaviors. Restorative Practices are implemented by training the entire staff body at each school in applying 11 practices (see Table 1 in Acosta et al., 2019), including the use of affective statements and a variety of circles and conferences in which students, staff, and sometimes family members participate.

The evidence regarding the effects of Restorative Practices on student behavior, school climate, and academic outcomes is mixed (Darling-Hammond et al., 2020). Augustine et al. (2018) found reductions in the suspension rate for elementary students in Pittsburgh Public Schools after 2 years of exposure to a version of Restorative Practices. They also observed reduced disparities in suspension rates between Black and White students and between low-income and higher-income students. The number of days lost to suspension declined 36% over 2 years in schools implementing Restorative Practices, as compared with an 18% decline in control schools. However, parallel improvements were not observed for middle school students. Additionally, no effects were found on academic outcomes for elementary school students and, surprisingly, negative effects were observed for middle school students. Similarly, Acosta et al. (2019) found no significant improvements in school connectedness, school climate, peer relationships, developmental outcomes, or victimization in middle schools in Maine that were implementing Restorative Practices. They suggested that the difficulty of implementing Restorative Practices—and school-wide approaches more generally—with fidelity is the likely cause of disappointing findings. Variable quality of implementation may explain the mixed findings across studies of Restorative Practices because higher fidelity of implementing Restorative Practices has been associated with greater improvements in the racial discipline gap (Gregory et al., 2016). Minkos et al. (2014) recommended that because of the paucity of research on restorative justice practices in schools, schools that implement the practices should be particularly attentive to fidelity, relevance, and benefit to students.

2. Research needs related to PBIS and Restorative Practices

To date, no studies have been published on the cost-effectiveness of Restorative Practices. Stinchcomb et al. (2006) observed that Restorative Practices are likely to be costlier to implement than zero tolerance policies, but long-term costs to society potentially are greater for the latter given the greater likelihood of students dropping out of school. Gordon (2018) and Gray et al. (2017) stressed the importance of attending to resource needs such as personnel time and space to facilitate implementation of new, non-punitive disciplinary approaches. Specifically, Gray et al. reported that the school administrators and teachers they interviewed identified shortages of staff, physical space, and supportive services as "the biggest impediment to reducing the use of suspension" (p. 15).

Although PBIS and Restorative Practices have each been studied in terms of their impact on student behavior and achievement, little rigorous research has been conducted on the integrated approach to determine whether the addition of Restorative Practices yields improvements beyond any attained with PBIS alone. Vincent et al.'s (2016) non-experimental study of one high school adopting the integrated approach found substantial reductions in office disciplinary referrals and racial disparities; however, student perceptions of disciplinary fairness dropped. Riggs-Zeigen's (2019) study of two high schools, one implementing PBIS only and one adding Restorative Practices, showed that more teacher training in both programs was associated with improvement in school climate. We did not find published studies of the integrated approach implemented in elementary and middle schools. One challenge in evaluating the

Table 1
Shared and complementary features of PBIS and restorative approaches.

PBIS and Restorative approaches	
Shared core features	Complementary features
Whole-school approach	Restorative approaches provide early and/or intense interventions to repair harm and restore relationships.
Attention to changing the behavior of adults	The Circle process provides a way of delivering content, especially Social-Emotional Learning (SEL), that strengthens relationships at the same time as helping adults see each child.
See and pay attention to each and every child	The Schoolwide PBIS framework provides data for team-based decision making.
Change environment	Schoolwide PBIS reflects best practices in implementation science (or common principles of effective practice).
Identify, teach, and encourage positive behaviors	
Build assets and protective factors	

Note. Adapted with permission from Beckman et al. (2012; p. 22).

impact of Restorative Practices is that potential affective and social benefits may be hard to measure and quantify.

The costs of implementing PBIS have been well documented, but no rigorous economic evaluations of Restorative Practices have been published. Understanding the costs of adopting new evidence-based practices is critical for quality of implementation and longer-term sustainability (Eisman et al., 2021). It is also important for education decision makers to understand the costs to produce observed outcomes in order to assess whether resources are being used wisely or could be more productively allocated to other programs that produce better outcomes (Levin & McEwan, 2001). Furthermore, cost analysis can serve as a way to assess whether resources are being distributed equitably among students. If, as Ray (2019) argued, schools are typical of meso-level organizations that perpetuate racial inequality by funneling resources differentially to racial groups, then a close review of who benefits from investments in new programs is warranted.

This article addresses these gaps in the literature by reporting on a cost-effectiveness analysis of Restorative Practices as implemented in a large U.S. school district that had already established the PBIS framework in all its schools. Since 2010, the district has been under significant pressure from a local organization, Citizens of Louisville Organized and United Together (CLOUT, 2021), to implement Restorative Practices in all its schools to reduce the number of students being pushed out of school and into the criminal justice system. By helping schools understand the resource requirements—including the personnel time for training and implementation, materials, and physical spaces—for adopting Restorative Practices, we aim to improve fidelity of program implementation and to inform this district's decisions, as well as those of other education agencies, about the feasibility of implementing the program at scale. Juxtaposing the costs against the observed effects on student behavior and school culture and climate in a cost-effectiveness analysis can help these decision makers determine whether allocating resources to Restorative Practices, in addition to PBIS, is a worthwhile investment.

3. Setting and context

Jefferson County Public Schools

The Jefferson County Public Schools (JCPS), which agreed to being publicly identified, is a large, urban school district located in Louisville, KY. With 96,304 students and 6178 teachers at 169 school sites, JCPS is the largest district in the state and is one of the largest public-school districts in the United States. JCPS is one of 75 city school districts comprising the Council of the Great City Schools (Council of the Great City Schools, 2021). In 2020–21, the district's budget exceeded $1.6 billion, with reported per-pupil spending of more than $16,000. The district's school-based decision-making (SBDM) model grants broad authority to each school's SBDM council with regard to hiring, budgeting, and policymaking (JCPS, 2018a). SBDM councils typically consist of a school administrator and a small number of elected teachers and parents.

During the 2020–21 school year, the student population within JCPS was 40% White, 37% Black, 13% Hispanic/Latinx, and 10% other races, with 64% of JCPS's schools having received Title I funding, 63% of students being eligible for free or reduced lunch (FRL), and 5% being classified as being homeless. Roughly 12% of students were classified as English Learners (ELs) and 13% required Individualized Education Plans (IEPs). According to the Kentucky Department of Education (KDE, 2021), in that same year, public school students in Kentucky were 76% White, 11% Black, 7% Hispanic/Latinx, and 6% other races, with 61% FRL-eligible, 4% ELs, and 15% having IEPs. To give some national context, among the 8.2 million students enrolled in Council of the Great City Schools member districts, including JCPS, students were 44% Hispanic/Latinx, 27% Black, 18% White, and 11% other races, with 71% FRL-eligible, 16% ELs, and 15% having IEPs (Council of the Great City Schools, 2021).

JCPS teachers were predominantly White (83%), with approximately 82% of all teachers holding a master's or higher degree, and nearly 7% holding national board certifications. Although state assessments and star rankings were temporarily suspended in 2020 due to COVID-19, JCPS received two out of five stars in the KDE 's 2018–19 accountability ratings (KDE, 2019). Based on state testing in that same year, student proficiency at the elementary, middle, and high school levels was 46%, 50%, and 37%, respectively, for reading, and 40%, 35%, and 31%, respectively, for math. The average high school graduation rate was 84% and the dropout rate was 3%.

During the 2018–19 school year, Black students made up 36% of the JCPS student population. Of the 29,929 unique students receiving behavior referrals that year, 16,478 (55%) were Black, and 66% of all referrals were given to Black students. Among students receiving referrals, Black students averaged 7.48 referrals per student, as compared to 4.80 for non-Black students. Similarly, of the 9299 unique students receiving suspensions, 63% were Black, and those students received 67% of all suspensions. Among students receiving suspensions, Black students averaged 2.33 suspensions as compared with 1.97 for non-Black students. In that same year, despite making up 11% of the student population, Black public-school students in Kentucky received nearly 35% of discipline referrals and 33% of suspensions (KDE, 2021). These disproportionate disciplinary consequences spurred JCPS to invest in both PBIS and Restorative Practices.

How PBIS and Restorative Practices are implemented at JCPS

In 2013, as part of its MTSS framework (JCPS, 2018b), JCPS implemented PBIS district-wide to improve student behavior, attendance, and school culture. The district's MTSS approach specifies three levels of academic and behavioral interventions: Tier 1 for all students, Tier 2 for students needing more support, and Tier 3 for students requiring additional support beyond the first two tiers. Generally, it is expected that approximately 80% of students will respond to Tier 1 and 15% to Tier 2, and around 5% will require Tier 3 support. Within the MTSS framework, PBIS was intended to address behavior through (a) using research-based practices, such as Check

In Check Out (Crone et al., 2010); (b) improving the systems that support implementation of those practices among staff; and (c) analyzing data to guide improvement. This three-pronged approach was expected to lead to improved social competence among students (JCPS, 2018b). By 2017, over 90 JCPS schools had participated in PBIS training, and the district employed eight full-time resource teachers and a coordinator to provide support services.

However, despite this concerted investment in the program, a local evaluation did not find positive effects on student outcomes (Winsch, 2017), perhaps due to variable fidelity of implementation. Among 23 JCPS schools receiving extra PBIS support through a School Climate Transformation Grant in 2014–15 and 2015–16, only 13 schools (57%) achieved a passing score of 70 (out of 100) on the district's independently administered Tiered Fidelity Inventory (TFI: Algozzine et al., 2019), indicating satisfactory PBIS implementation (JCPS, 2016). A similar tool, the Prevention Practices Assessment (Institute on Violence and Destructive Behavior, 2008), was used by Vincent et al. (2013) to evaluate fidelity of implementation of PBIS in 30 middle schools in Oregon. By the end of 3 years, average scores on the overall scale climbed from 20% to almost 60%, and modest improvements were observed for some discipline outcomes. This suggests that it takes substantial time to shift disciplinary practices, but that, even at 60% fidelity, positive outcomes may be obtained. In a separate analysis of 20 JCPS schools that had been implementing PBIS for 3 years, Lin and Muñoz (2017) found that higher TFI scores were associated with fewer out-of-school suspensions, although as compared with non-PBIS schools, PBIS implementation was not associated with reduced suspensions. By 2016–17, which was the year before our study, the TFI scores for 42 observed JCPS schools had improved to an average of 86, but the range was still wide (i.e., ranging from 37 to 100). The average score remained steady over the next 2 years that encompassed our study period.

In reaction to the lack of positive student outcomes, in 2017–18, the district began integrating Restorative Practices into its PBIS approach in a further effort to reduce behavioral referrals, suspensions, and racial disparities in student treatment, and to improve school culture. According to Winsch (2017):

> If school staff are sufficiently trained and supported by IIRP and district behavior support resource teachers, then Restorative Practices will be implemented with high fidelity leading to measurable progress on the major outcome variables derived from the following domains: climate (i.e., relationship skills, self-awareness, social awareness, school engagement, school belonging, school discussion climate, caring environment, personal safety, overall satisfaction, personalization, collaboration, voice, perseverance, compassion, teaching, and site safety); student behavior (i.e., suspension events, attendance); staff Restorative Practices skills and engagement (i.e., self-reported skills, attendance, retention, discipline disproportionality); academics (i.e., gap, growth, novice reduction; p. 5).

Implementation of Restorative Practices began with the establishment of a 26-member District Leadership Team in 2016–17. These individuals participated in 11 days of training over the course of the year, delivered by trainers from IIRP. Over the next 3 years (2017–18, 2018–19, and 2019–20), any JCPS school that wanted help improving discipline and school climate could voluntarily apply to participate in the program. Participation had to be approved by the school's own SBDM Council. Three schools (one middle, one high, and one combined middle/high) were encouraged to apply for inclusion in the first cohort by central office staff because of high suspension and referral rates. The first 10 schools that applied were included in Cohort 1, the next 10 in Cohort 2, and so on. The first three cohorts included 18 elementary schools, four middle schools, one high school, one combined middle/high school, and six special schools serving designated middle and/or high school students. The first year of implementation involved three elementary schools, two middle schools, one high school, one combined middle/high school, and three special schools. For this study, the combined school was treated as separate middle and high schools.

Personnel from the first cohort of schools implementing Restorative Practices participated in initial IIRP training sessions (8 h total per person over 2 days) in 2017–18 and received ongoing support from IIRP trainers during monthly, day-long, on-site consultations (IIRP, 2018). During the on-site consultations, the IIRP trainer conducted a variety of activities depending on the needs of the specific school. Activities included embedded professional development for teachers, classroom observations and feedback to teachers, modeling restorative circles, and working with administrators on how to make disciplinary conversations more restorative. Although the training and ongoing support represented additional time burdens for the personnel involved, no additional time was set aside for implementation of Restorative Practices with students as the approach was integrated with existing PBIS and classroom activities.

According to a local evaluation, implementation of Restorative Practices in 2017–18 involved "formulating 3–5 school-wide expectations, introducing circles into classrooms, speaking restoratively, using the 'with' style, and remembering to focus on the person, not the actions conducted by them" (Brahim et al., 2018, p.7). As part of the district's evaluation, fidelity of implementation was assessed by trained observers who observed classrooms selected at random from the implementing schools. Rubrics developed by the district's resource teachers and evaluation department were designed to capture incidence of affective statements, restorative questions, small impromptu conferences, proactive circles, responsive circles, and fair process. By the end of the second year of implementation, schools scored 41% on average on the observation tool, although this ranged from 22% to 80% fidelity (JCPS, 2019), suggesting that initial training and monthly consultations were not consistently leading to changes in classroom practices.

4. Purpose of the present study

This study was undertaken as part of a research-practice partnership (RPP) that was investigating different methods of providing information to help district decision makers determine which programs and practices to invest or reinvest in when making annual budgeting decisions. JCPS Restorative Practices and PBIS personnel assisted with the current study, but the district's initial implementation of Restorative Practices during the 2017–18 school year, including the application and approval process and collection of administrative and survey data, was conducted prior to the inception of the RPP. The goal of the RPP was to identify methods that

produce timely results and are feasible to conduct for multiple programs within the context of regular implementation. This inevitably results in a tradeoff between rigorous research methods using strictly causal designs and methods that rely on comparisons using existing data. Cost-effectiveness analysis was one of the methods that we utilized. Cost-effectiveness analysis is a form of return-on-investment (ROI) analysis in which the costs of implementing a program, above and beyond the costs of the business-as-usual condition, are compared with the effects on the outcomes of interest (Garber & Phelps, 1997; Karlsson & Johannesson, 1996). Ideally, the cost per unit of effects—that is, the cost-effectiveness ratio—of an intervention is compared with that of other interventions targeting the same outcomes to assess which ones represent the best use of resources. Investigating the costs of implementing a program requires a detailed understanding of its implementation which, in turn, can help explain outcomes (Durlak & DuPre, 2008). JCPS's substantial investments in PBIS and Restorative Practices over the past few years, in conjunction with the increasingly widespread adoption of these approaches in U.S. schools, merit an evaluation of their ROI. Accordingly, our research questions for this study were:

RQ1: How do student disciplinary referrals, suspensions, and measures of school culture and climate compare between schools implementing PBIS with and without integrating Restorative Practices?

RQ2: Does implementing Restorative Practices help reduce racial disparities in disciplinary actions?

RQ3: What are the resource requirements and costs of implementing Restorative Practices in schools above and beyond the costs of implementing PBIS?

We hypothesized that schools integrating Restorative Practices into their existing PBIS framework would experience additional costs but fewer disciplinary referrals and suspensions, reduced racial disparities in disciplinary actions, and higher scores on measures of school culture and climate.

5. Method

In cost-effectiveness analysis, estimates of incremental costs and effects are obtained via different procedures but for the same instance of program implementation and for the same set of participants (Cost Analysis Standards Project [CASP], 2021). We first report our methods for estimation of effects to address Research Questions 1 and 2, following the Journal Article Reporting Standards (JARS; American Psychological Association [APA], 2020) for quantitative studies. Subsequently, we report our methods for estimating costs to address Research Question 3. Currently, there are no JARS standards for economic evaluations. Instead, we generally followed the procedures for cost analysis design, data collection and analysis, and reporting as detailed in Hollands et al.'s (2020) cost analysis standards and guidelines. Our analysis and reporting were also guided by CASP 's 2021 *Standards for the Economic Evaluation of Educational and Social Programs*. These standards were developed by a group of 15 experts in the economic evaluation of educational and social programs.

Estimation of effects of Restorative Practices

Inclusion and exclusion

We included JCPS schools that adopted Restorative Practices in 2017–18 or 2018–19. We excluded special schools and one high school to improve the comparability of the treatment and comparison groups.

Participant characteristics

Three elementary and three middle schools (Cohort 1 = Treatment schools) adopted Restorative Practices in 2017–18, and another six elementary and two middle schools (Cohort 2 = Comparison schools) implemented the program in 2018–19. The six treatment schools served a total of 2477 students, 53% categorized as male and 47% categorized as female, averaging 413 students per school. The eight comparison schools served 4483 students, with 51% categorized as male and 49% categorized as female, averaging 560 students per school. Treatment school students were 42% Black, 33% White, 19% Hispanic/Latinx, and 6% other races. Comparison group students were 36% Black, 38% White, 12% Hispanic/Latinx, and 14% other races.

Sampling procedures

We compared the first cohort of schools with the second during the first year of adoption in 2017–18 (i.e., prior to the second cohort adopting Restorative Practices) and in 2018–19, when Cohort 1 had completed 2 years of implementation and Cohort 2 had completed a single year. Data were collected at each of the treatment and comparison sites during the 2016–17, 2017–18, and 2018–19 school years.

Students not in Grades 1–8 were excluded from all analytic samples. For effectiveness analyses using survey responses to address the first research question, we excluded students who did not attend the same school during the prior year's (2017) survey administration because we aimed to determine the relationship between Restorative Practices and changes in reported school belonging, site safety, and personal safety *within* each school. We also excluded fourth-grade students from our analytic sample because they lacked prior-year survey results due to district survey administration procedures (i.e., Grades 4–12 only).

The study was covered by Teachers College, Columbia University Institutional Review Board Protocol 18–415, dated July 5, 2018, and a data-sharing agreement effective July 25, 2018, approved by the Jefferson County Board of Education. JCPS district personnel obtained approval for explicit mention of the school district's name and location.

Sample sizes and power

The analytic sample ($n = 6437$) for estimation of effects consisted of 2331 students from the treatment schools and 4106 students from the comparison schools. The sample for survey analyses ($n = 3687$) resulting from our exclusion rules consisted of 1229 students in the treatment schools and 2458 students in the comparison schools.

According to G*Power v3.1.97 (Faul et al., 2007), a minimum sample size of $n = 1145$ was needed to detect a small effect size ($f^2 = 0.02$) for our eight-predictor Comprehensive School Survey (CSS) difference-in-difference (DiD) regression models, based on $\alpha = 0.05$ and, conservatively, power = 0.95. There is a lack of clear guidance in the literature on how to conduct a power analysis for our preferred Quasi-Poisson DiD regression models for behavior outcomes, and we were unable to locate a software package for this purpose.

Effectiveness measures and covariates

Outcome variables

The dependent variables we included in our analyses were each prescribed in Winsch's (2017) JCPS Restorative Practices evaluation plan. These variables were selected to reflect the overall objectives of Restorative Practices, including reducing disparate impacts of punitive and exclusionary disciplinary measures, addressing concerns that altering consequences of misbehavior would increase behavioral incidents and make managing student behavior more challenging for teachers, and reflecting the goals of the program to build more positive community and climate (Wachtel, 2016). Although additional survey subscales were included in Winsch's (2017) evaluation plan (e.g., self-awareness, teaching), the items comprising the three constructs described below were consistent in wording and number across the elementary and middle school surveys, permitting our combined elementary and middle school analysis.

Research question 1. Specifically, to address our first research question, we compared differences between 2016–17 baseline and 2017–18 (Year 1) or, 2018–19 (Year 2) student discipline referrals and out-of-school suspension occurrences, and 2017–2018 (Year 1) student responses to the JCPS CSS (JCPS, 2018c) for students in Cohort 1 versus Cohort 2 schools. *Referrals* and *Suspensions* were count data indicating a student's total number of unique discipline referrals and out-of-school suspensions, respectively. For the CSS, which has been administered annually to students in fourth grade and above since 1997, we focused on responses to three constructs: *School Belonging* (e.g., "I feel that I belong in my school"), *Site Safety* (e.g., "The adults in my school take care of safety problems quickly"), and *Personal Safety* (e.g., "I feel safe at school"). School belonging and personal safety each consisted of three items, whereas site safety consisted of a single item. Students were asked to rate their agreement to positively worded survey items as *strongly disagree* (1), *disagree* (2), *agree* (3), or *strongly agree* (4), with higher scores indicating better school climate and culture. Three-item mean scores were used for school belonging and personal safety.

Research question 2. To address our second research question, separate models for Black and non-Black students were estimated using the same dependent variables, measures, and covariates, except that race/ethnicity was not included as a covariate (more details below).

Covariates

Covariates for all Year 1 and Year 2 behavior and survey analyses were *Race* (categorized as Black, Hispanic/Latinx, Other, White), *Gender* (categorized as female/male), *Lunch status* (free/reduced, paid), *Special education* (no, yes), and *Level* (elementary, middle), with the first category listed serving as the referent. Additionally, binary variables were created for *Time* (0 = 2016–17, 1 = 2017–18 or, 2018–19); *Treatment* (0 = comparison, 1 = treatment); and *DiD* (i.e., *Time*Treatment*).

Data collection

We used secondary administrative data to compute effectiveness. These data were originally collected as per usual district procedures and subsequently used for this study.

Masking

Implementation was not masked (i.e., Cohort 2 and all district Restorative Practices personnel were aware of implementation for Cohort 1).

Psychometrics

Although students can opt out of answering individual CSS items, the students in our sample had scores for either all items or no items. Response rates overall for the district were 96% for elementary students and 89% for middle school students. For treatment students, response rates were 92% for elementary students and 87% for middle school students. For comparison students, the response rates were 98% for elementary students and 73% for middle school students.

Muñoz (2008) reported Cronbach's alpha for CSS school belonging (α = 0.53, 0.64) and personal safety (α = 0.62, 0.74) for elementary and middle school students, respectively. Internal consistency reliability (Cronbach's alpha) coefficients were $\alpha = 0.69$ for school belonging and $\alpha = 0.73$ for personal safety among all JCPS middle and elementary students and $\alpha = 0.73$ for both school belonging and personal safety among the current sample. Statistically significant ($p < .001$) Pearson correlations between the three CSS scales ranged from $r = 0.42$ to $r = 0.48$ in this study.

Conditions and design

We took advantage of the natural quasi-experiment created by the staggered introduction of Restorative Practices at JCPS to estimate the effects of the program above and beyond the effects of PBIS, which had previously been introduced to all schools, on student referrals, suspensions, and measures of school culture and climate in elementary and middle schools. For this particular district at the time of the study, PBIS was part of "business as usual" and subject to ongoing local evaluations of fidelity of implementation and effectiveness at improving student and school outcomes. In contrast to typical efficacy studies in which implementation is tightly controlled and conducted under ideal conditions, our study was conducted under routine practice conditions; that is, it was more akin to an effectiveness study as defined by the Institute of Education Sciences and National Science Foundation (Institute of Education Sciences, 2013). As such, the extent to which PBIS and Restorative Practices were implemented with fidelity in this study, and the results on student outcomes, are more likely to reflect the realities of implementation in other districts.

During both years of our study, all schools that we included in our comparison group scored above 70 on the TFI, indicating satisfactory PBIS implementation. Their average scores were 93 in 2017–18 and 89 in 2018–19. All but one of the schools that we included in our treatment group scored 70 or above in the first year. A second school dropped a few points below 70 in the second year. Their average scores were 90 in 2017–18 and 82 in 2018–19. The drop in scores from 2017–18 to 2018–19 was primarily due to stricter demands from the central office for evidence to support all schools' TFI scores.

As noted earlier, fidelity of implementation for Restorative Practices was assessed as part of a local district evaluation in 2017–18 and 2018–19. Observers from the district office visited each school and observed randomly selected classes from each main subject area for 20 min, using district-developed rubrics to document the incidence of specified practices, the level of engagement, and types of interactions. An overall implementation score was computed for each school from these data. In 2017–18, schools included in our treatment group scored an average of 42%. In 2018–19, they scored an average of 39%, whereas schools included in our comparison group scored an average of 44%.

Analytic strategy: estimating the effects of Restorative Practices

Research question 1

To answer our first research question, we tested a separate DiD regression model with clustered standard errors for each outcome, using the general form:

$$Outcome = Race + Gender + Lunch\ status + Special\ education + Level + Time + Treat + DiD,$$

where *Outcome* represents 2016–17 (*Time* = 0) and 2017–18 (*Time* = 1) values for *Referrals* (Model 1), *Suspensions* (Model 2), *School Belonging* (Model 3), *Site Safety* (Model 4), or *Personal Safety* (Model 5). Based on dispersion parameters = 13.49 and 2.49, respectively, we estimated Quasi-Poisson models (e.g., Ver Hoef & Boveng, 2007) for Year 1 referral and suspension regression models (cf., Gage et al., 2016).

Because some researchers (e.g., Beckman et al., 2012) have suggested that a single year may be insufficient to implement Restorative Practices fully, we reran the analyses of behavior outcomes substituting 2018–19 (*Time* = 1) referrals and suspensions for 2017–18 outcomes, while keeping 2016–17 (*Time* = 0) pretest values. This change allowed us to investigate 2-year effects of Restorative Practices integrated with PBIS in the treatment schools versus 1 year of PBIS plus 1 year of Restorative Practices integrated with PBIS for the comparison schools. As with Year 1 analyses, we estimated Quasi-Poisson models for Year 2 based on dispersion parameters = 13.05 and 2.62 for referrals and suspensions, respectively.

Research question 2

To address our second research question, we used the same approach just described, including Quasi-Poisson models for Year 1 and Year 2 behavior outcomes based on similar dispersion parameters, except that separate models were estimated for Black and non-Black students, as follows:

$$Outcome = Gender + Lunch\ status + Special\ education + Level + Time + Treat + DiD.$$

Analyses and interpretation

All effectiveness analyses were conducted in R using RStudio version 1.4.1717 (RStudio Team, 2021). Regression models for referrals and suspensions used the glm.cluster() command (with family = "quasipoisson") to cluster standard errors at the school level. For those models, dispersion parameters were obtained via the dispersiontest() command. CSS models were estimated using the lm.cluster() command to cluster standard errors at the school level. Statistical significance was determined by p-values < .05. Standardized mean difference (*SMD*) effect sizes were computed for any statistically significant results. *SMD* for behavior models was computed using RcountD (Coxe, 2018).

Estimating the costs of Restorative Practices

Research design overview for research question 3

For the same sample of schools used to assess effectiveness of Restorative Practices integrated with PBIS, we utilized the ingredients method (Levin, 1975; Levin & McEwan, 2001; Levin et al., 2018) to estimate the economic costs of all resources used to implement Restorative Practices above and beyond PBIS (i.e., the incremental costs of Restorative Practices). Following the recommendations of both Hollands et al. (2020) and CASP (2021), we adopted a societal perspective—that is, we included the costs to all stakeholders; we estimated costs using both local and national average prices; and, in addition to our base case analysis, we provide a reference case analysis using national average prices and a 3% discount rate. We present costs per school and per student, and we provide breakdowns into start-up and ongoing costs as well as into fixed, lumpy, or variable costs. We separately document expenditures to provide information about budget requirements. The main assumptions used in our analysis are documented in Supplemental Materials Table 1. We conducted several sensitivity analyses (Boardman et al., 2017) to test the robustness of our cost estimates to changes in various assumptions.

Collection of cost data

We estimated costs by gathering data on the type, quality, and quantity of all personnel, facilities, materials, and other inputs used to facilitate JCPS's adoption of Restorative Practices. This included training for the District Leadership Team in 2016–17, training of district office and school-based personnel in 2017–18, and implementation in schools throughout 2017–18. Implementation involved 17 members of the District Leadership Team in addition to school-based personnel at each of the Cohort 1 schools. We isolated the costs of Restorative Practices above and beyond PBIS for the elementary and middle school students in the six treatment schools to compare costs for these schools with effects for these same students. Because training occurred over 2 years, we compounded costs from 2016–17 forward to 2018–19 using a 2% discount rate based on the lower end of the range of interest rates set on JCPS School Building Revenue bonds since 2015 (we use the upper end of the range, 5%, in a sensitivity analysis). Our cost analysis was conducted using a multi-tab Excel worksheet, which is shown in Supplemental Materials Tables 1-6. The entire worksheet is available in the Supplemental Materials and may be used as a template for other analysts to conduct their own cost analyses.

Sources of data on resource use

Sources of data on resources used for Restorative Practices included the JCPS Restorative Practice Implementation Guide (IIRP, 2018), a monthly JCPS schedule of behavior support activities for school-based teams, a schedule of training dates, training rosters, JCPS's evaluations of Restorative Practices implementation and outcomes (Brahim et al., 2018; Hensel & Carpenter, 2019), interviews and email exchanges with JCPS's Behavior Support Systems Coordinator, and district budget spreadsheets. Following the JCPS school schedule, we used a 174-day/1392-h year for our cost calculations unless the district's schedule of workdays by position indicated otherwise for certain staff positions.

In addition to estimating total costs of implementing Restorative Practices in the six treatment schools, we estimated site-level costs for each. District-level costs were split among the schools, some equally among the schools and some in proportion to the number of staff trained by IIRP in each school. For example, because Restorative Practices were implemented in 10 schools in 2017–18, we assigned six tenths of the costs associated with the District Leadership Team and other district personnel to the six treatment schools, assuming an equal amount of time spent on each of the 10 schools. We split the costs of the IIRP trainers in 2017–18 across the schools based on the number of hours of training received by personnel at each school plus a weighted share of the district office personnel training time.

Sources of price data

Sources of local price data included a public database of JCPS personnel salaries, JCPS schedules for salaries and number of workdays by position type, and JCPS's fringe-rate calculator provided by the Human Resources department. National median or mean salaries and average fringe benefits rates were sourced from the Bureau of Labor Statistics (BLS), the School Superintendents Association, the American Association of University Professors, the NCES, and the Organisation for Economic Co-operation and Development. Many personnel positions are not listed in national surveys, requiring judgment in selecting a suitable price for an equivalent position. Therefore, in our sensitivity analyses, we tried alternative ways to estimate national costs as we separately applied each of two geographical adjustments to our local cost estimate. One was the 2018 American Community Survey Comparable Wage Index for Teachers (ACS-CWIFT; Cornman et al., 2019), which we applied to the wage portion of our local cost estimate. The second was Aten et al.'s (2012) geographical price index for Kentucky, further adjusted for metropolitan areas, which we applied to the entire local cost estimate.

Prices for physical space were calculated using Wang et al.'s (2020) Cost of Facilities Calculator. We assumed training took place in elementary school buildings, and we amortized construction costs uprated 21% for furnishing, fees, and equipment (Living on Campus, 2011) over 30 years, using a 2% interest rate based on the 30-year U.S. treasury bond yield. The 30-year building lifetime and 2% interest rate assumptions are easily adjustable in our spreadsheets to allow for sensitivity analyses. We obtained regional construction costs from Cumming Corporation, an international project management and cost consulting firm. The closest regional construction price we could obtain was for Raleigh-Durham, NC. We calculated a national average price per square foot for elementary school buildings by averaging the construction cost across all 20 U.S. regions available from Cumming Corporation. Mileage rates for travel

reimbursement for district resource teachers were obtained from the Commonwealth of Kentucky Finance and Administration Cabinet Regulation on Travel for our local price estimate and from the Internal Revenue Service for our national price estimate. We used the inflation calculator provided by the BLS, which is based on the Consumer Price Index, All Urban Consumers (CPI-U), where necessary to adjust prices to 2018.

Analysis of costs

Estimating start-up costs

Substantial personnel time is required to participate in training before Restorative Practices is implemented in schools. To estimate the opportunity costs of personnel time spent on this training, we listed each staff member trained by name, district office unit or school, position, classified vs. certified status (this affects fringe rate calculations), and number of hours trained. JCPS administrative staff populated the spreadsheet with the 2018 salary for each person sourced from a public database of personnel compensation. We estimated fringe benefits for each staff member using the district's fringe benefits calculator and added this to the salary to obtain total compensation per person. For each person, we identified the number of hours their salary covered per year using the JCPS schedule of workdays by position. We calculated the fraction of time spent on training by dividing the number of training hours per person by their total expected work hours for the year. To obtain the local cost of training per person, we multiplied the fraction of time spent on training by their total local compensation. For national costs, we estimated total compensation using a national average salary and fringe rate for the same or a similar position. Training costs for school-based personnel are documented in Supplemental Materials Table 5 and for district-based personnel in Supplemental Materials Table 6. Restorative Practices handbooks were distributed to each trainee at training sessions. We obtained the costs of these books, including shipping, from a JCPS departmental budget which listed them as a line item.

We spread the 2016–17 costs of training the District Leadership Team, including personnel time, trainer fees, and the implementation handbooks, across 7 years on the basis that the benefits of these start-up inputs would last over this period of time. Limiting this period to 7 years reflects expected staff turnover, which leads to additional training costs for new staff. Training costs from 2017–18 attributed to five of the six treatment schools were similarly spread over 7 years. The sixth school discontinued the program at the end of the first year, so we attributed all introductory training and materials costs for this school to 2017–18 instead of spreading them over 7 years. For the treatment school that was in a building housing both middle and high school students, we excluded the costs of training personnel who only served the high school students, and we only included half the costs of training for staff who served both middle and high school students at this site.

To estimate facilities costs for the District Leadership Team training, we assumed that 26 people were trained for 88 h (11 days) in a 770-square-foot elementary school classroom. For training in 2017–18, which occurred on many dates and at many locations for different numbers of people each time, we assumed 25 square feet per trainee in an elementary school building and attributed facilities costs per school based on the total number of hours spent in training by personnel from that school.

In addition to estimating personnel costs to attend training using the opportunity costs of their time, we separately calculated the district's expenditures on stipends. Personnel could choose to acquire professional development credits or receive stipends when participating in training outside of their regular work schedules. Classified staff earned stipends at a fixed rate of $21.49 per hour, and certified staff earned the equivalent of their hourly rate based on their individual salaries—not including fringe benefits. Our economic cost estimate included the opportunity costs of personnel time spent on training, whereas our expenditure estimate was based on stipends. Start-up costs and expenditures are documented in Supplemental Materials Table 3.

Estimating ongoing costs of implementation

Ongoing costs of implementation during 2017–18 for the 17 members of the District Leadership Team and for school-based personnel were derived in a similar fashion as training costs by multiplying each person's total compensation by the fraction of time devoted to Restorative Practices. For example, the JCPS Behavior Systems Support Coordinator devoted 35% of their time throughout the year to the program. Costs of any staff that moved during the year were appropriately apportioned. School-based personnel at the treatment schools participated in monthly on-site consultations that lasted one full day each time. We did not have records of which exact school personnel participated in the on-site consultation sessions or for how many hours each. Based on interview data, we assumed that the principal of each school spent 1 h each month on a phone call to plan the day-long consultation activities and 1 h each month participating in the activities. We valued the principals' time using their salaries and fringe benefits. We assumed a total of 8 h of other personnel time for each consultation day, totaling 64 h per year. We valued this time for our local cost estimate by averaging the total compensation for certified staff (other than the principal) from each school who attended the training and applying this average to the 64 h. Our assumption was that trained certified personnel would be most likely to participate in the ongoing coaching activities.

For national prices, we averaged the compensation for four elementary school or four middle school positions to reflect a range of personnel. The positions were as follows: an entry-level teacher, a teacher with 15 years of experience, a teacher at the top of the pay scale, and a public-school principal with any level of experience. We expected that at least one assistant principal would have participated in each monthly consultation at each school, but no specific assistant principal price was found in national surveys; therefore, we used a general price for principals. We did not assign any ongoing costs for materials because no additional materials were used in the treatment schools. For physical space used during the on-site consultations, we used the same approach as for calculating facilities costs for the school-based personnel training, estimating the costs of 25 square feet per person for 72 h at each school.

Sensitivity analysis

In addition to providing the recommended reference case analysis, we conducted several sensitivity analyses to assess the extent to which our cost estimates changed if we used different assumptions for parameters about which there was some uncertainty. First, because we were not sure about our estimate of school-based personnel time spent on monthly on-site consultations, we doubled the number of hours from 72 to 144 per school to assess the impact on costs. Second, we experimented with different geographical price adjustments. As an alternative estimate of national costs, we adjusted our local estimate using two different geographical indices: applying the ACS-CWIFT index of 0.926 for JCPS to the personnel compensation portion of our estimate, and applying Aten et al.'s (2012) geographical price index for Kentucky of 89.7 and metropolitan area adjustment of 102.3 to the entire local cost estimate. We also assessed the impact on our results of making changes to the discount rate and to the number of years over which we amortized facilities. Finally, we estimated costs per school and per student if all six schools were assumed to continue implementing Restorative Practices over 7 years.

Costs of comparable programs

To provide context for our analysis of Restorative Practices costs, we searched for studies of PBIS and other school-based behavioral or social-emotional programs for which costs had been estimated. This included a review of the behavior programs listed in the What Works Clearinghouse as having positive evidence of effectiveness at improving student outcomes. We also reviewed studies of social-emotional learning (SEL) programs that were included in Belfield et al.'s (2015) cost-benefit analysis, which was based on a meta-analysis by Durlak et al. (2011) at the Collaborative for Academic, Social, and Emotional Learning (CASEL). We aimed to include programs for which costs were estimated using comparable methods and perspectives so that results could be more readily compared to our own.

6. Results

Statistics and data analysis: effects

In this section, we first present results of our effectiveness analyses and, subsequently, of our cost analysis. Within these two sections, we organize results by research question.

Missing effectiveness data

A total of 456 (192 treatment, 264 comparison) students were missing 2016–17 behavior data; thus, the final Year 1 analytic sample for models using behavior outcomes (*Referrals* and *Suspensions*) was $n = 5981$. An additional 317 (191 treatment, 126 comparison) students were missing 2019 behavior data; thus, the final Year 2 analytic sample was $n = 5664$. Students without behavior data were not enrolled in JCPS during the year(s) for which they were missing data; thus, we did not impute missing values. Of the 3687 students in our CSS sample, 2096 were missing 2017 and/or, 2018 survey scores, resulting in a final analytic sample for survey outcomes of $n = 1591$. These data were not missing at random but were the result of either non-enrollment in the district or non-participation in the CSS. As such, no missing data were imputed. The CSS final analytic sample size exceeded the minimum requirement described earlier in the power analysis.

Research question 1

Year 1 behavior outcomes. Total analytic sample means and standard deviations for 2017–18 *Referrals* ($M = 2.37$, $SD = 6.48$) and *Suspensions* ($M = 0.25$, $SD = 0.93$) are presented by treatment ($n = 2139$) and comparison ($n = 3842$) groups in Table 2.

Table 2
Outcome variable means and standard deviations by analytic subsample.

Sample	Referrals	Suspensions	School belonging	Site safety	Personal safety
Year 1 Treat	4.01 (8.42)	0.48 (1.29)	2.55 (0.97)	2.57 (1.32)	2.76 (0.93)
Year 1 Comp	1.44 (4.82)	0.12 (0.62)	2.90 (0.84)	3.01 (1.09)	3.05 (0.81)
Year 2 Treat	4.19 (9.74)	0.47 (1.36)			
Year 2 Comp	1.86 (5.65)	0.18 (0.82)			
Year 1 B Treat	6.07 (10.34)	0.75 (1.64)			
Year 1 B Comp	2.66 (6.85)	0.23 (0.82)			
Year 1 NB Treat	2.52 (6.28)	0.28 (0.91)			
Year 1 NB Comp	0.74 (2.89)	0.06 (0.44)			
Year 2 B Treat	6.43 (12.75)	0.71 (1.68)			
Year 2 B Comp	3.53 (7.95)	0.35 (1.10)			
Year 2 NB Treat	2.50 (6.13)	0.29 (1.02)			
Year 2 NB Comp	0.89 (3.33)	0.09 (0.58)			

Note. Standard deviations in parentheses; Treat = Cohort 1 treatment schools; Comp = Cohort 2 comparison schools; B = *Black student subsample*; NB = *non-Black student subsample*.

Year 1 CSS outcomes. Total analytic sample mean scores and standard deviations for 2017–18 *School Belonging* ($M = 2.78$, $SD = 0.90$), *Site Safety* ($M = 2.86$, $SD = 1.19$), and *Personal Safety* ($M = 2.95$, $SD = 0.87$) are presented by treatment ($n = 580$) and comparison ($n = 1011$) groups in Table 2.

Year 1 regression results. Table 3 provides results of five Year 1 regression models analyzed to answer the question: How do student disciplinary referrals, suspensions, and measures of school culture and climate compare between schools implementing PBIS with and without integrating Restorative Practices? The DiD coefficient for *Personal Safety* (Model 5; $\beta = -0.23$, $p = .03$, $SMD = 0.26$) was statistically significant, indicating lower reported scores for students in treatment versus comparison schools. DiD coefficients for *Referrals* (Model 1: Exp(β) = 0.89, $p = .35$), *Suspensions* (Model 2: Exp(β) = 0.83, $p = .12$), *School Belonging* (Model 3; $\beta = -0.02$, $p = .72$), and *Site Safety* (Model 4; $\beta = -0.09$, $p = .38$) were not statistically significant.

Year 2 behavior outcomes. Total analytic sample means and standard deviations for 2018–19 *Referrals* ($M = 2.70$, $SD = 5.65$) and *Suspensions* ($M = 0.29$, $SD = 1.05$) were also computed separately for treatment ($n = 2013$) and comparison ($n = 3651$) schools (see Table 2).

Year 2 regression results. Although not shown in Table 3, the DiD coefficients in our Year 2 Quasi-Poisson regression models were not statistically significant for *Suspensions* (Exp(β) = 0.55, $SE = 0.31$, $p = .05$, $SMD = 0.10$) or *Referrals* (Exp(β) = 0.72, $SE = 0.30$, $p = .28$).

Research question 2

Year 1 behavior outcomes. The means and standard deviations of our analytic subsample of Black students for 2017–18 *Referrals* ($M = 4.01$, $SD = 8.57$) and *Suspensions* ($M = 0.43$, $SD = 1.24$) were also computed separately for treatment ($n = 907$) and comparison ($n = 1410$) schools. Likewise, the means and standard deviations of our non-Black student analytic subsample for 2017–18 *Referrals* ($M = 1.35$, $SD = 4.44$) and *Suspensions* ($M = 0.13$, $SD = 0.65$) were also computed separately for treatment ($n = 1232$) and comparison ($n = 2432$) schools. Means and standard deviations for treatment and control subgroups are presented in Table 2.

Year 1 regression results. To explore whether implementing Restorative Practices helped reduce racial disparities in disciplinary actions, we reran Model 1 (*Referrals*) for Black and non-Black students separately (excluding the race covariate). Model 1 subgroup results were not statistically significant for Black students (Exp(β) = 0.88, $SE = 0.10$, $p = .20$) or for non-Black students (Exp(β) = 0.89, $SE = 0.19$, $p = .56$). These null average results mask considerable heterogeneity among schools (see Table 4) and are consistent with

Table 3
Difference-in-difference regression results for Restorative Practices.

Independent variables	Model 1 Referrals β (SE) $n = 5981$[a]	Model 2 Suspensions β (SE) $n = 5981$[a]	Model 3 Belonging β (SE) $n = 1591$[a]	Model 4 Site safety β (SE) $n = 1591$[a]	Model 5 Pers. Safety β (SE) $n = 1591$[a]
Race Hispanic/Latinx	−1.27*	−1.57*	0.09	0.04	0.01
	(0.21)	(0.13)	(0.05)	(0.07)	(0.05)
Race other	−1.18*	−1.13*	0.07	0.02	-0.03
	(0.24)	(0.28)	(0.09)	(0.10)	(0.07)
Race White	−0.82*	−0.87*	0.03	−0.02	−0.03
	(0.11)	(0.11)	(0.05)	(0.07)	(0.05)
Gender categorized as male	0.58*	0.43*	0.04	0.05	0.07
	(0.20)	(0.17)	(0.03)	(0.03)	(0.03)
Lunch status paid	−0.57*	−0.75*	0.13*	0.12*	0.00
	(0.22)	(0.32)	(0.05)	(0.06)	(0.03)
Special education	0.53*	0.59*	0.00	0.08	0.06
	(0.20)	(0.18)	(0.06)	(0.09)	(0.05)
Level middle	0.84*	1.61*	−0.38*	−0.55*	−0.32*
	(0.33)	(0.30)	(0.07)	(0.09)	(0.07)
Time	0.17*	0.31*	−0.14*	−0.11*	0.34*
	(0.06)	(0.08)	(0.03)	(0.04)	(0.08)
Treatment	0.86*	1.19*	−0.23*	−0.24*	-0.02
	(0.40)	(0.44)	(0.06)	(0.12)	(0.06)
Difference-in-difference	−0.12	−0.18	−0.02	−0.09	−0.23*
	(0.13)	(0.12)	(0.06)	(0.10)	(0.10)
Quasi-Poisson Dispersion Parameter	13.49	2.49			

Note. Suspensions and referrals are count variables; thus, Models 1 and 2 utilized Quasi-Poisson regression. Standard errors are clustered at the school level. Referent for race is Black; Referent for lunch status is free/reduced; Referent for level is elementary.
[a]*n*s listed above are for total cases analyzed and do not include ($n = 456$; 456; 2096; 2096; 2096) students missing pre- and/or posttest outcome data for Models 1–5, respectively.
*$p < .05$

qualitative evidence on uneven Restorative Practices implementation. As with *Referrals*, we reran Model 2 separately for Black students (Exp(β) = 0.85, SE = 0.11, p = .14) and non-Black students (Exp(β) = 0.78, SE = 0.21, p = .24), and the results indicated no statistically significant differences in suspensions for either group associated with Restorative Practices implementation.

Year 2 Behavior Outcomes. The means and standard deviations of our analytic subsample of Black students for 2018–19 *Referrals* (M = 4.68, SD = 10.22) and *Suspensions* (M = 0.49, SD = 1.37) were also computed separately for treatment (n = 872) and comparison (n = 1352) schools. Likewise, the means and standard deviations of our non-Black student analytic subsample for, 2018–19 *Referrals* (M = 1.42, SD = 4.54) and *Suspensions* (M = 0.15, SD = 0.76) were also computed separately for treatment (n = 1141) and comparison (n = 2299) schools. Subgroup means and standard deviations are reported in Table 2.

Year 2 regression results. We further analyzed the 2-year referral and suspension models for Black and non-Black students separately. DiD coefficients for Black (Exp(β) = 0.71, SE = 0.26, p = .18) and non-Black (Exp(β) = 0.76, SE = 0.40, p = .50) students in our *Referrals* models and for non-Black (Exp(β) = 0.58, SE = 0.43, p = .20) students in our *Suspensions* model were not statistically significant. The DiD coefficient for Black students in our 2-year suspension model was statistically significant (Exp(β) = 0.53, SE = 0.27, p = .02, SMD = 0.11) and indicated a 47% reduction in the expected number of suspensions for Black students in treatment versus comparison schools. To put the suspension model results in perspective and to caution against overinterpreting seemingly large percentage reductions in expected counts, we remind readers that 80% of students in our sample received no suspensions and another 6% received just a single suspension.

Statistics and data analysis: Costs

Research question 3

Resource requirements

The primary resource needed to implement Restorative Practices was personnel time. Initial training for the 26 members of the District Leadership Team took place over 11 days during the 2016–17 school year. At 8 h per day, this totaled 2288 h of personnel time to attend the training. A total of 290 unique school-based personnel at the six treatment schools received an average of 7.8 h each of introductory training, totaling 2334 personnel h. This included certified staff such as licensed teachers and administrators and classified staff such as instructional assistants and other support personnel. Schools varied in the number of staff members who attended training, varying from 40 to 80 personnel per school. The ratio of students per staff member trained ranged from 5.4 to 9.9 across the six treatment schools. The proportion of trainees from each school who were certified personnel varied from 48% to 79%. In addition to the school-based personnel, 119 personnel from the district office participated in training during 2017–18, including bus drivers, custodians, counselors, and substitute teachers. Although we did not include training time spent by personnel from non-study schools in our costs, we noted that some individuals attended from schools that were not on the list of 30 schools slated to adopt Restorative Practices over the first 3 years of the rollout. In addition, a small number of personnel attended training more than once—for example, nine of the 290 school-based personnel from the six treatment schools.

Implementing Restorative Practices in 2017–18 involved substantial ongoing time and effort from 17 members of the District Leadership Team, primarily from 11 full-time resource teachers who each spent 22.5% of their time supporting the program. The total number of hours for these 17 personnel was estimated at 5375. We estimated school-based personnel time spent during the monthly on-site consultations at 72 h per school. Because Restorative Practices at JCPS is integrated with existing PBIS activities rather than being a set of additional activities conducted at separate times, we assigned no additional costs to the time school staff spent

Table 4
Discipline referrals for treatment vs. control schools in 2016–17 and 2017–18.

School	Students with ≥1 referral			Average referrals per student[a]		
	2017	2018	Δ	2017	2018	Δ
Middle Control 1	166	177	11	3.16	3.71	0.56
Middle Control 2	309	349	40	5.34	5.58	0.25
Elem Control 1	109	121	12	6.26	7.55	1.29
Elem Control 2	101	118	17	5.08	7.19	2.11
Elem Control 3	63	75	12	3.37	3.91	0.54
Elem Control 4	96	106	10	4.52	3.78	−0.74
Elem Control 5	86	92	6	4.19	3.32	−0.87
Elem Control 6	78	78	0	5.18	3.79	−1.38
Middle Treat 1	60	68	8	6.32	6.31	−0.01
Middle Treat 2	557	576	19	11.45	10.63	−0.82
Middle Treat 3	160	216	56	3.71	5.08	1.37
Elem Treat 1	80	132	52	5.84	6.76	0.92
Elem Treat 2	73	72	−1	4.58	4.44	−0.13
Elem Treat 3	51	45	−6	3.86	3.24	−0.62

Note. Elem = elementary. [a] Average referrals per student for students receiving one or more referrals.

conducting activities such as restorative circles. Restorative conferences (in which school administrators meet with all relevant parties to an incident individually and then as a group) were not implemented as prescribed, reportedly because of their time-intensive nature. Instead, existing disciplinary meetings were continued with an effort to use more restorative approaches such as asking referred students to explain what happened rather than simply meting out consequences without a conversation.

Cost estimates

Total costs of Restorative Practices for start-up and first year implementation in the six treatment schools amounted to $281,820 in local prices and $344,230 in national prices. Details and data are available in our accompanying cost spreadsheets (Supplemental Materials Tables1-6). Average start-up and first-year costs per school for the six schools were $46,970, using local JCPS prices and $57,370 using national prices (see Table 5). These are incremental to the costs of implementing PBIS. Local costs per school (see Supplemental Materials Table 2) ranged from $38,915 to $41,980 per year at the five schools which continued to implement Restorative Practices after the first year and were $76,750 for the school only implementing for 1 year (and for which we therefore did not spread start-up costs over 7 years). Per student, average start-up and first-year costs were $114 in local prices and $139 using national prices. These costs per student varied substantially with school size from $97 at the largest school to $272 at the smallest.

Most of the costs incurred (90%) were for personnel, whereas training fees constituted 9% of the costs. Materials and facilities together accounted for 1% of costs. The majority of costs (76%) accrued to the district office, whereas 23% of the costs were borne by the schools and 1% combined by the state, the teachers' union, and a local university. Most of the costs (72%) were associated with ongoing implementation of the program and 28% were for start-up costs, such as initial training and materials. At the current scale, the program requires ongoing investment of approximately $33,650 per school per year using local prices ($40,500 using national prices) or $81 per student, primarily for the district office-based resource teachers and coordinator. Actual expenditures on Restorative Practices amounted to an average of $38,160 per school, which included training fees to IIRP, costs of handbooks, stipends paid to personnel for attending training, and mileage reimbursement to district resource teachers for bimonthly visits to the schools implementing Restorative Practices.

Fixed, variable, lumpy, and marginal costs

Costs of Restorative Practices for start-up and first-year implementation included costs that were fixed (i.e., would not vary if more JCPS schools adopted Restorative Practices), lumpy (i.e., would increase at certain points of expansion), and variable (i.e., would increase more or less proportionally as additional JCPS schools adopted the program; see Supplemental Materials Table 3 and Table 4). Training costs for the District Leadership Team of $22,230 and ongoing costs of $72,100 for the 17 members involved in implementation would not change if more schools adopted the program; these are considered fixed. However, the costs of the district resource teachers ($131,000) can be considered "lumpy" because additional resource teachers at the district office would need to be hired as new schools are added. The district has no stated ratio of schools per resource teacher, but other districts that are considering adopting the program should plan a reasonable caseload of schools per resource teacher. Costs associated with training school-based personnel and ongoing costs for implementation ($119,085 of our total estimate) would increase as each school adopts the program and are therefore considered variable. Marginal costs of adding one school would include training and ongoing implementation costs for school-based personnel, plus a share of the district office resource teachers' time and travel costs, totaling approximately $42,000.

The majority of the funding needed to support Restorative Practices at JCPS was provided from the district's general funds or, for school-based personnel time, from the regular school budgets. A few ingredients were supported by state and federal grants to the district office. The Behavior Systems Support Coordinator's position was funded by a Safe Schools grant from the KDE to JCPS. All mileage reimbursement to the district's resource teachers for bimonthly school visits and four of these personnel positions were funded by a federal School Climate Transformation Grant to JCPS.

Sensitivity analysis

Results of our sensitivity analysis are reported in Table 6. Notably, doubling the number of hours of school-based personnel spent on monthly on-site consultations from 72 to 144 per school led to an increase in per school costs of just over 10%. Our national cost estimate was 22% higher than the local estimate, and we perceived this as being too high, given the Bureau of Economic Analysis's

Table 5
Local and national costs of first year implementation of Restorative Practices (2018 prices).

Resource category	Costs using local prices	Local costs with wages adjusted to a national average using ACS-CWIFT index	Costs using national average prices	Local expenditures	Percentage of costs in this resource category
Personnel	$254,500	$274,840	$316,480	$135,110	90%
Materials	$1700	$1700	$1700	$5470	1%
Facilities	$950	$950	$1310	–	0%
Other inputs	$24,680	$24,680	$24,740	$88,400	9%
Total	$281,820	$302,160	$344,230	$228,980	100%
Average Cost per School	$46,970	$50,360	$57,370	$38,160	
Average Cost per Student	$114	$122	$139	$92	

Note. Dollar amounts rounded to nearest $10 except for per student costs.

2019 regional price parity of 87.4 for Kentucky (U.S. = 100). As an alternative estimate of national costs, applying the ACS-CWIFT index of 0.926 for JCPS to the personnel compensation portion of our estimate yielded national costs of $50,360 per school or $122 per student, instead of $57,370 per school or $139 per student. Applying Aten et al.'s (2012) geographical price index for Kentucky of 89.7 and a metropolitan area adjustment of 102.3 to the entire local cost estimate (not just personnel), we obtain national costs of $51,190 per school or $124 per student. Changes to the discount rate and to the number of years over which we amortized facilities made minimal differences to the cost results due, respectively, to the short timeframe over which we studied Restorative Practices and to the small percentage of costs attributable to facilities.

Our reference case analysis using a societal perspective, national average prices, and a 3% discount rate produced cost results of $57,450 per school and $139 per student for the first year of Restorative Practices implementation. These estimates included training costs from the prior year and are incremental to the costs of PBIS, which was implemented in all district schools and, therefore, served as the business-as-usual condition.

Costs and effects of comparable programs

The costs of Restorative Practices for 1 year are on the lower end, as compared to several other behavioral and SEL programs for which costs have been estimated by other analysts using the ingredients method (see Table 7). To improve comparability, we adjusted all costs to 2020 values. Some of the listed programs are school-wide approaches, whereas others target specific students. Most of these interventions have been shown to produce positive effects on student outcomes. Second Step, which is an SEL program, demonstrated positive effects on self-reported physical aggression after 1 year (Espelage et al., 2013) and costs between $55 and $490 per student in 2020 dollars (Belfield et al., 2015). Responsive Classroom is an evidence-based approach to instruction that emphasizes the connection between academic success and SEL. It improves teacher self-efficacy and students' academic performance, social skills, and perceptions of school (CASEL, 2013; Rimm-Kaufman et al., 2007, 2014; Rimm-Kaufman & Chiu, 2007). Responsive Classroom costs schools between $1220 and $2400 per student in 2020 dollars (Belfield et al., 2015). The 4Rs (Reading, Writing, Respect, & Resolution) program is a school-based intervention for elementary students focused on SEL and literacy development. It was found to reduce aggression and increase social competence over 2 years (Jones et al., 2011), and it costs between $470–$760 per student in 2020 dollars (Belfield et al., 2015). The Life Skills Training program is a classroom intervention that aims to reduce substance abuse and violence for middle and high school students by teaching social-emotional skills, such as building confidence, resisting peer pressure, and improving health outcomes. Life Skills Training costs per student are $145–$180 over 3 years in 2020 dollars (Belfield et al., 2015). The program was found to have significant impacts on reducing delinquency and fighting after 1 year and on reducing later substance abuse and risky behaviors (Botvin et al., 2006; Griffin et al., 2006; Spoth et al., 2008). Finally, RULER (Recognizing, Understanding, Labeling, Expressing, Regulating) is a school-wide approach to SEL that infuses five emotional intelligence principles into the structure of school systems, informing how all stakeholders (school leaders, teachers, students, families) lead, teach, learn, and support one another (Rivers et al., 2013). In a cluster randomized trial, RULER was found to have significant impacts on school climate (Rivers et al., 2013). Escueta et al. (2019) estimated the costs of RULER to be $280 per student in 2020 dollars.

7. Discussion

Our hypotheses regarding fewer referrals and higher climate and culture survey scores for schools implementing Restorative Practices into an existing PBIS framework were not supported, although the small, marginally significant 2-year reduction in suspensions is promising. Our hypothesized negative relationship between Restorative Practices implementation and out-of-school suspensions was partially supported, specifically for Black students, based on Year 2 results. Overall, our results provided only partial support for our hypothesis that Restorative Practices implementation in existing PBIS schools would be associated with reduced racial disparities in disciplinary actions. *SMD* effect sizes, where reported, were considered small based on conventional interpretations. However, with initial implementation costs of $114 per student in local prices and expected ongoing costs (Year 2 onwards) of $81 per student per year, Restorative Practices is a relatively low-cost approach to addressing student behavior issues as compared with other

Table 6
Sensitivity analyses for cost estimates of Restorative Practices.

Analysis	Cost per school (National)	Cost per student (National)
Base case	$57,370	$139
Reference case (3% discount rate, societal perspective, national average prices)	$57,450	$139
Applying the ACS-CWIFT index of 0.926 for JCPS to the personnel compensation portion	$50,360	$122
Applying Aten et al.'s (2012) geographical price index for Kentucky of 89.7, and metropolitan area adjustment of 102.3	$51,190	$124
Discount rate moved from 2% to 5%	$57,600	$140
Facilities amortized over 40 years instead of 30 years	$57,330	$139
Amortize Middle Treat 2 start-up costs over 7 years instead of over none	$49,840	$121
Doubling the time spent by school-based personnel on implementation	$64,010	$155

Table 7
Costs of behavior and SEL interventions for comparison with Restorative Practices.

Program	Costs per student at time of study	Cost per student adjusted to September 2020	Cost covers this number of years	Source
Responsive Classroom	$1100–$2160	$1220–$2400	1	Belfield et al. (2015)
4Rs	$420–$680	$470–$760	2	Belfield et al. (2015)
RULER	$270	$280	1	Escueta et al. (2019)
Character First	$230	$237	1	Escueta et al. (2019)
Restorative Practices	$139	$143	1	Current study
Life Skills Training	$130–$160	$145–$180	3	Belfield et al. (2015)
PBIS	$69[a]	$82	1	Blonigen et al. (2008)
Second Step	$50–$440	$55–$490	1	Belfield et al. (2015)

Note. [a]This cost estimate is based on Blonigen et al.'s (2008) estimate but was recalculated using assumptions closer to those used in the other studies to improve comparability. In addition, reported per school costs were divided by the average number of students in JCPS schools in the current study to obtain a per-student cost.

programs such as Responsive Classroom. Costs of Restorative Practices are almost all related to personnel time for training and implementation. However, these costs are additive to the costs of PBIS.

The failure of Restorative Practices to improve overall behavioral and school climate outcomes in its first year of implementation at JCPS may have been partially due to lack of treatment contrast between the treatment and comparison schools because the comparison condition provided similar services to students (Jacob et al., 2019). Given the district's findings prior to this study that PBIS was not producing the desired improvements, we cannot presume that our own results were simply due to diminishing returns beyond an already effective practice. Our findings regarding lower reported personal safety are consistent with both prior literature on non-punitive restorative justice methods as well as mixed results from JCPS's own internal evaluation of Restorative Practices (Brahim et al., 2018). For example, Augustine et al. (2018) found that students in schools implementing Restorative Practices rated teachers lower on classroom management after the introduction of the program.

An underlying assumption of our effectiveness analyses was that Restorative Practices *as implemented* would produce measurable results in 1–2 years at the elementary and middle school levels. However, Beckman et al. (2012) suggested that full implementation of Restorative Practices may take 3–6 years. The results from our analysis of 2-year referral and suspension data provided some support for this assumption, particularly among Black students. Statistically significant reductions in suspensions for Black students, combined with no statistically significant reduction in discipline referrals, suggested that Restorative Practices implementation may have been improving; that is, although the number of referrals remained the same, fewer referrals were culminating in suspensions.

Qualitative data from the district's internal evaluations (Brahim et al., 2018; Hensel & Carpenter, 2019; JCPS, 2019) and the cost analysis reported here demonstrated that JCPS schools were not implementing the program uniformly or with high fidelity during the study period, which may explain the limited impacts (Durlak & DuPre, 2008). For example, the number and types of staff members trained per school and the ratio of students to trained staff members varied across the six schools, and the frequency of restorative circles and other Restorative Practices was low and uneven. Tellingly, restorative conferences, an important component of Restorative Practices, were not implemented at all due to lack of personnel time to plan and conduct these events that involve multiple meetings with individuals, including family members, in advance of a group meeting. This demonstrates the importance of assessing in advance the personnel time needed to implement a program with fidelity and determining what can be given up to accommodate this time demand. Weak implementation may also reflect inadequate efforts to develop buy-in for changing traditional disciplinary methods. Furthermore, a change in district leadership during 2017–18, the year in which Cohort 1 schools adopted Restorative Practices, may have contributed to diminished focus on implementing Restorative Practices while schools waited to assess whether the new superintendent would continue prioritizing the program or switch focus and resources elsewhere.

We found that costs per school dropped from over $57,000 per school to approximately $50,000 per school if start-up costs for all schools were spread over 7 years, illustrating the importance of carefully considering length of commitment when adopting a new program. Consistent with Blonigen et al.'s (2008) conclusion regarding economies of scale with respect to PBIS, costs per school should also fall as additional schools adopt Restorative Practices because fixed costs such as District Leadership Team time will be spread across more schools and students. Expenditures for onboarding additional schools over time will be reduced as district resource teachers become certified trainers and can replace IIRP trainers in training school-based personnel. But it is not clear whether overall costs would fall as trainer fees are eliminated in favor of paying salary and benefits for district-employed personnel to provide the same training and coaching.

We expect that our cost and effectiveness results would be typical for large urban districts with substantial Black and Latinx student populations that are also integrating Restorative Practices with PBIS already in place. Costs per school and student may be higher in small districts that cannot take advantage of economies of scale and where distance between schools would make it harder for resource teachers to support multiple schools. Costs per student will depend on the number of years during which the program is implemented, and this is also likely to affect impact, with an expectation that costs and impacts increase over the years.

8. Limitations

The quasi-experimental design of our study limited our ability to draw causal inferences regarding the effectiveness of Restorative Practices (e.g., Kim & Steiner, 2016; Shadish et al., 2002). Although we might have identified a relevant comparison group via propensity scores (e.g., Pas et al., 2019) or some other matching algorithm, the staggered adoption of Restorative Practices provided a set of comparison schools that self-selected for the program. Our design choice was constrained mainly due to the post hoc nature of the analysis (JCPS prohibits randomized controlled trials as a general rule), but also partly due to data reporting inconsistencies prior to 2017–18 for our primary outcome of interest (i.e., discipline referrals). Given these constraints, we elected to utilize DiD as a simplified (e.g., Somers et al., 2013) comparative interrupted time series with a single year of pre- and posttest values. Somers et al. urged caution in interpreting causality when fewer than 4 years of pretest data are available, as was the case in our study. From a practical standpoint, however, their recommendation effectively eliminates comparative interrupted time series and DiD designs for elementary schools, except perhaps fifth graders, and implies that at least 2 years of pretest scores for middle school students must come from elementary school. For small districts with few elementary schools, including baseline scores from elementary schools may not introduce much unwanted school-level variance. In our study, however, middle school students in both the treatment and comparison groups spent at least some time in a total of 91 different elementary schools (not the same set of 91 schools for the two groups). In this scenario, we might question the face validity of parallel trends, whether present or not.

Our exclusion criteria for school survey analyses, combined with the loss of fourth graders who did not take the survey as third graders, resulted in a much smaller analytic sample and raises legitimate external validity concerns. Although the two multi-item constructs used here showed acceptable internal consistency reliability, the lack of validity evidence, including underlying factor structure, deterred us from using structural equation modeling to analyze the survey data. We therefore suggest caution in interpreting the CSS results in isolation. We also recommend a validity study on the CSS.

A further limitation of our approach is that we did not capture qualitative assessments from school personnel or students about the potential benefits or problems associated with Restorative Practices. Vincent et al. (2013) suggested that qualitative measures can better capture "perceptions of cultural discontinuities or potential disciplinary unfairness" that may lead to inequitable outcomes (p. 24). Interviews or focus groups with teachers, students, and principals, or open-ended survey questions asking about the implementation and impact of the program, could have helped to explain our results and may have surfaced barriers to implementation or benefits that are difficult to measure and quantify, including resistance to changing ingrained practices that favor the dominant culture. In particular, it would be useful to gauge student, parent, and staff reception to the prospect of using restorative conferences to replace more severe punitive consequences as well as to inquire about possible modifications to the practices that could reduce disciplinary inequities.

We also assessed the extent to which our economic evaluation of Restorative Practices comports with standards recommended by Hollands et al. (2020) and CASP (2021). We followed almost all recommendations that were relevant to our analysis, including a key suggestion to provide a reference case analysis. We did not, however, conduct the analysis concurrently with the relevant implementation period as we needed to match costs to the historical period from which we were collecting effectiveness data. Collecting cost data retrospectively, that is, after implementation occurs, limits the accuracy of information about resource use, especially when records of resource use are not available or detailed enough to isolate those used for the program of interest (Levin et al., 2018). Although some of the cost data we obtained were very accurate—for example, training data for 2017–18 and local salary information, we had to make assumptions about the amount of staff time spent on monthly consultations. A more accurate account of this effort at schools could be obtained if staff members at each school were asked to maintain a log of who participated in the monthly consultations and for how long. This information might also yield insights into the level of buy-in at each school which, in turn, could explain variability in implementation and effectiveness results (Datnow et al., 2006).

Importantly, we note that our cost estimate using national average prices reflects what it would cost on average across the United States for the same set of resources used at JCPS to implement Restorative Practices. This does not imply that this is a nationally representative cost estimate, which would need to reflect average resource use to implement the program across the country. This information can only be obtained by conducting cost analysis at multiple U.S. locations.

Cost-effectiveness analysis ideally compares multiple programs targeting the same outcome; our study only investigated the costs and effects of one program. As the CASP standards suggest, we are able to comment on how our results compared with the costs and effects of other behavioral programs. However, these economic evaluations were conducted in different contexts, and it was not always clear what assumptions were used for estimating costs. We made some adjustments to the reported results to improve comparability of costs across studies, but without full transparency of the data and analytic assumptions, as modeled in our accompanying spreadsheets, direct comparisons are tenuous. A further limitation of our analysis is that, as is often the case with school-wide educational programs, we do not have data that would allow us to comment factually on the extent to which costs of Restorative Practices vary by student.

9. Recommendations and future directions

To conclude our discussion, we outline the implications of our study findings for school psychologist practices, suggest several ways in which resources could be used more efficiently to better implement Restorative Practices, and suggest several avenues for further research to explore the potential merits of the program.

Implications for school psychologists

Our study raises several issues of relevance for school psychologists in schools that implement or are considering the adoption of Restorative Practices. Their role in the provision of evidence-based mental and behavioral health services and interventions could be extended to school-wide activities, as opposed to being reserved for referred students. This implies shifting time spent on small group or individual interactions to classroom-based activities such as consulting with teachers about how to adapt current classroom management practices and modeling restorative interactions with students during class time. School psychologists could also help monitor fidelity of implementation by conducting classroom observations. They could use their data analysis skills to review data regularly on disciplinary events and consequences with school staff and leaders, drawing attention to particular subgroups that are disproportionately represented. To promote safe and supportive schools, they could help students address potential or actual conflicts by teaching them proactive strategies that align with the restorative justice philosophy. However, they need to be mindful that students may, at least in the first years, feel less safe at school if they perceive that teachers are less in control and discipline has been relaxed. They could facilitate parent and community engagement by eliciting input on whether and how to adapt school discipline practices to accommodate diverse cultural norms. They could also organize workshops to help parents apply Restorative Practices to resolve conflicts at home (Ingraham et al., 2016).

Improving efficiency of resource use

Efficiency of resource use could be improved in several ways, which could also help improve fidelity of implementation for Restorative Practices. Personnel training at each school should take place shortly before implementation begins, and the initial training could be supplemented with shorter, district-led annual sessions focusing on specific practices. Ongoing support should be provided in the form of regular observations, coaching, and feedback to assure adequate integration of Restorative Practices into classroom and disciplinary activities. Schools should be asked to commit to the program for several years to justify the high up-front investment in training, to allow sufficient time for teachers to integrate Restorative Practices into their lessons, and to facilitate a shift in school culture. By implementing the program over multiple years, more students can benefit from the initial investment in introductory training and materials, and schools can move past the potential implementation dip (Fullan, 2001) caused by teachers adjusting classroom activities to accommodate the new practices. Building internal capacity to provide training and ongoing coaching would reduce expenditures on fees to external trainers but increase the district's payroll and fringe benefits commitments. It would be wise to conduct an analysis that compares the longer-term costs of continuing the program using external coaches versus the costs of hiring in-house staff (see Roza, 2020, for a discussion of cost-equivalent tradeoffs). Districts can benefit from economies of scale as additional schools adopt Restorative Practices because fixed costs from the district office are spread across more schools and students.

Further research needed on Restorative Practices

Given the compatibility of the philosophy of Restorative Practices with current efforts to shift school discipline approaches in ways that reduce disproportionate negative consequences for Black and Latinx students, the program merits continued study at JCPS and elsewhere. Improved guidance on how to conduct a power analysis for Quasi-Poisson DiD regression models would help ensure that studies investigating behavioral outcomes have adequate sample sizes. A validated fidelity of implementation measure for Restorative Practices is also needed and could help assess whether multiple years of implementation and higher fidelity of implementation lead to improved behavioral and school climate outcomes. For example, if schools conduct restorative conferences instead of typical disciplinary meetings, will behavioral outcomes improve over time? It would also be useful to investigate whether particular practices are associated with better outcomes and whether this varies for elementary, middle, and high school students as well as for different racial groups. Because higher fidelity of implementation will require additional personnel time, this may lead to higher costs, but also perhaps to a better ROI.

Although the focus of our study was on the costs and effectiveness of Restorative Practices, school board members and district leaders consider other factors when deciding which programs to implement or maintain (Asen et al., 2013; Hollands et al., 2019). The restorative justice underpinnings of Restorative Practices appealed to the values of the JCPS community and school board, and these benefits are not captured in a cost-effectiveness analysis. We recommend additional types of economic evaluation to investigate the potential returns to investing in the program. For example, a cost-utility analysis juxtaposes costs against the usefulness of a program as measured by multiple evaluation criteria, each weighted according to importance to stakeholders. Applying this to Restorative Practices would accommodate both objective criteria, such as reduced suspensions, and subjective criteria, such as alignment with local values, thereby providing an assessment of how well it addresses a variety of stakeholder concerns (see Hollands et al., 2019). A cost-benefit analysis of Restorative Practices that follows students for multiple years to track impacts on later graduation rates and college attendance would determine whether potential long-term financial benefits to students and society outweigh the upfront costs of implementing the program.

10. Conclusion

Implementing Restorative Practices requires a substantial initial investment in training and a commitment to change expectations and reactions to discipline issues. If implemented as intended, with restorative conferences being used more widely instead of resorting to suspensions, the cost would no doubt be substantially greater due to the time commitments required from school personnel and

family members. However, Restorative Practices might also lead to better behavioral outcomes, both in the near term and long term—even beyond school—if students learn to assume responsibility for their actions more consistently and perceive that they can exert control over their social, academic, and career prospects. Furthermore, this extra initial investment may represent a more equitable distribution of resources whereby schools invest substantially in practices that can reduce racial disparities in educational opportunities and outcomes.

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Appendix A. Supplementary data

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