TESTING THE PROMISE OF RESTORATIVE PRACTICES FOR REDUCING TEACHER TURNOVER IN HARD-TO-STAFF SCHOOLS

by

Ashley Anne Grant

A dissertation submitted to Johns Hopkins University in conformity with the requirements for the degree of Doctor of Philosophy

Baltimore, Maryland
September 2020

Abstract

The purpose of this study is to investigate the effect of Restorative Practices on teachers' turnover intentions in urban, high-poverty schools. Restorative Practices (RP) is a quickly growing whole school approach to community building and discipline, but little is known about teachers' perceptions of this intervention. This dissertation tests the hypothesis that if RP can improve teachers' perceived working conditions, including school climate, teachers may be more satisfied and more willing to stay at their schools. I specifically analyze data from a multi-site, cluster randomized control trial of Restorative Practices (in combination with Diplomas Now) in schools from eight large cities across the US. I use multilevel modeling, logistic regression, and structural equation modeling to evaluate the effects of RP on school climate and teachers' turnover intentions and the role of implementation in this relationship. Through my intent-to-treat, path (i.e., mediation), and observational analyses I find that RP has a significantly positive effect on school climate but a more complex and indirect relationship with teachers' turnover intentions. Overall, the findings from this dissertation suggest that RP is a policy that can improve school climate, but implementation and buy-in from teachers play a key role in its effect on teachers' turnover intentions.

Keywords: restorative practices, teacher turnover, randomized control trial, school climate

Primary Reader: Douglas MacIver, Ph.D.
Secondary Readers: Martha MacIver, Ph.D., Richard Lofton, Ph.D.
Other Committee Members: Ashley Rogers Berner, Ph.D., Nicholas Ialongo, Ph.D.

Dedication

For all of the teachers who continue to fight the good fight — showing up and giving their best to serve the next generation every day — through snow, student breakdowns, school closures, stacks of papers to grade, and smiles.

This is for you.

Acknowledgements

Acknowledgement of gratitude for their support in helping me reach the end of this dissertation and my PhD are owed…

To my partner, John Monopoli, who helped me make it through the darkest days and held onto hope for me when I could not. Through pushing me to be my best, you have helped me to become more and do more than I ever thought possible. And to our feline friend Maggie for keeping me company through the quarantine, late nights, and weekends of writing.

To my advisor, Doug MacIver, who has been my champion and advocate, and without whom I cannot have imagined reaching this milestone. Thank you for your stories, your empathy and restorative approach, and your innumerable hours and pages of feedback that have made this accomplishment possible.

To my committee members and other mentors, past and present, especially Andrew Brantlinger, Martha MacIver, Ashley Berner, Richard Lofton, Nick Ialongo, Rachel Durham, and Lieny Jeon, who helped me uncover the hidden curriculum of academia, inspired in me the joy of research and writing, and equipped me with the tools to pursue knowledge, evidence, and policy change through research.

To my collaborators and my support team, particularly my fellow PhD students and agraphia writing group members, who have helped me to set and meet many goals, but who have also helped me to have grace and show kindness to myself when I don't meet my goals or when things don't go quite as planned (which seems to happen quite often).

To all of my students, in grades 5 and post-secondary, who inspired me to pursue my PhD in the first place, who continually reminded me along the way of why I am here, and who gave me the fire to keep going.

And finally,

To my family and particularly my father, Andrew Grant, who first inspired my passion in education that continues to drive my work and pursuit of education equity so that all students can be empowered to accomplish their own "dissertation," whatever it may be.

Table of Contents

List of Tables

List of Figures

Chapter 1 — Introduction

How can we keep teachers in the schools that serve our most vulnerable and historically marginalized students and communities? This question continues to haunt policy makers, school administrators, and researchers. Although research continues to provide information on what types of schools teachers leave most, few interventions or policies have been tested as (or shown to provide) viable solutions to this problem. While national policy and programs have decreased untimely student departures, the teaching force continues to grow "greener" every year and hard-to-staff schools face debilitating rates of teacher turnover. School climate is a key factor in school success and predicts teacher retention, but can districts harness and leverage it to keep teachers in hard-to-staff schools? Growing numbers of districts and policymakers are turning to Restorative Practices (described more fully below) to create better school climates. Can these decisions also lead to greater teacher retention?

This dissertation examines this question, providing guidance for policymakers and administrators interested in the promise of Restorative Practices and building the knowledge base around teacher turnover in high-poverty, urban schools, and teachers' experiences of Restorative Practices. I specifically analyze data from a randomized control trial of Restorative Practices (in combination with Diplomas Now[1]) in high poverty middle and high schools in large cities throughout the United States. The analysis

[1] Diplomas Now is a whole-school reform in middle schools and high schools addressing students' early warning indicators of dropout risk that seeks to keep students on-track to graduation.

tackles the following questions: what is the effect of assignment to Restorative Practices on teachers' turnover intentions (Chapter 2)? What is the role of RP implementation in this relationship (Chapter 3)? And more generally, how does usage of RP relate with teachers' turnover intentions (Chapter 4)?

To set the stage for these studies, this introduction describes the landscape of research on the problem of teacher turnover, which is further developed in the individual studies that follow in Chapters 2, 3, and 4. First, I describe the extent and significance of teacher turnover — why it is a problem and why we should care about investigating it. I specifically address problematic turnover in the population of hard-to-staff schools (and their students and teachers) on which this study focuses. Second, I review the major theories explaining why teachers leave these schools — what we know so far about what leads teachers to leave. Third, I explore the limited research on potential interventions to reduce teacher turnover, including interventions to improve school climate such as Restorative Practices. Finally, I provide a brief introduction to the experiment that provided the data for this dissertation and a preview of the three studies that follow.

The Problem of Teacher Turnover and Its Significance

Every year, American public schools lose approximately half a million teachers, 40% of whom leave the teaching profession entirely. This exodus adds an estimated $2.2 billion in costs every year to already tight education budgets (Barnes, Crowe, & Schaefer, 2007; Alliance for Excellent Education, 2014). Increasing rates of teacher turnover have also led to a less stable teaching force and an overall "greening" of the teaching workforce. The most frequently occurring cases of turnover are teachers in their first year

of teaching (Ingersoll & Merrill, 2017), creating a "revolving door" in many schools and classrooms (Barnes et al., 2007; Hanushek, Rivkin, & Schiman, 2016; Ingersoll, 2003). Greater exits and increasing student enrollments in public schools (McFarland et al., 2018) have raised alarms about potential quality teacher shortages (Cochran-Smith et al., 2011; Ingersoll & Perda, 2008; Sutcher, Darling-Hammond, & Carver-Thomas, 2016).

Some researchers question the significance of this turnover, contesting whether it is truly a problem. They suggest that some turnover in organizations and companies is healthy and productive: spurring new ideas, fostering creativity, and transitioning out poorer performing employees (e.g., Burdett, 1978). They suggest that the turnover of teachers in the education sector is similarly a normal feature of any industry and is comparable in magnitude to other semi-professions like nursing and social work (Ballou & Podgursky, 2002; DeAngelis & Presley, 2007; Harris & Adams, 2007; Stinebrickner, 2002).

The educational context, however, serves a different function and clientele, with very different demands compared to other semi-professions.[2] Because the education system relies almost completely on public funding, the high monetary costs of turnover are a cause for concern to any taxpayer. Although the exact financial cost of turnover is hard to quantify, Barnes, Crowe and Schaefer (2007) calculated that the hiring and training of new staff costs the city of Chicago, alone, $86 million every year (roughly 2% of their total budget). Huge costs like these plague many big city districts and other

[2] Semi-professions, including nursing and social work, require advanced knowledge and qualifications, but do not enjoy the same status and respect as full professions like law and medicine; thus, semi-professions typically have higher turnover rates. See Etzioni, 1969.

districts serving predominantly low-income students. Thus, this turnover demands attention and further investigation to help alleviate school budgets, which are already so tight and under such public scrutiny.

Additionally, unlike many businesses and public institutions, schools serve *children*, a vulnerable population, with a focus on facilitating their learning and development. Children require consistency and stable relationships and caregivers to foster healthy sensitive developmental processes (Hamre & Pianta, 2001). The learning process, dynamic and social in nature, is quite sensitive to interpersonal relationships and interactions (Bronfenbrenner & Morris, 2006; Piaget, 2000). Constant changes in teacher personnel interfere with the building of relationships, trust, and routines that children need for optimal development (Bryk & Schneider, 2002; Bryk, Sebring, Allensworth, Easton, & Luppescu, 2010; Guin, 2004; Ingersoll & Smith, 2003; Kirby & Grissmer, 1993; Ronfeldt, Loeb, & Wyckoff, 2013).

Perpetually high levels of staff turnover are highly significant in schools because they undermine the stability and functioning of the school organization. The same relationships, trust, and routines necessary for child development are also needed to support the school's organization and complex network of systems. Teacher turnover prevents the development of trust and relationships that serve as the foundation for a school's culture and operations (Bryk & Schneider, 2002). Additionally, teachers serve as the backbone of the delivery of curriculum and instruction; when they leave, they take with them the hard-earned organizational knowledge that is often plentiful in complex organizations like schools (McKinley, Mone, & Moon, 1999; Opfer & Pedder, 2011).

Confirming these theories, newer teachers have been shown to produce lower student outcomes (Clotfelter, Ladd, Vigdor, & Wheeler, 2006; Rivkin, Hanushek, & Kain, 2005), and the disruptive features of high teacher turnover have been shown to harm student achievement (Carver-Thomas & Darling-Hammond, 2019; Ronfeldt et al., 2013).

Another reason why the turnover problem is worthy of study and intervention is the concentration of teacher turnover in "high needs" schools serving predominantly low-income students of color (Papay, Bacher-Hicks, Page, & Marinell, 2017). In low income and urban areas, schools on average lose up to 20% of their staff every year, over half every five years, and thus incur (the already mentioned) unaffordable annual replacement costs (Allensworth, Ponisciak, & Mazzeo, 2009; Barnes et al., 2007; Ingersoll, 2004). Labels for this category of schools, such as "hard-to-staff" or "revolving door," reflect their difficulty in attracting and keeping teachers (Ingersoll, 2003). Losing human capital and talent is never good, but it places even more strain on organizations when these personnel are replaced by less qualified individuals, as is often the case in schools serving high poverty and majority minority students (Guarino, Brown, & Wyse, 2011; Lankford, Loeb, & Wyckoff, 2002). Higher turnover compounds the other structural barriers these schools face by providing less access to quality teachers for the students attending these schools (Borman & Kimball, 2005). Consequently, turnover has an even greater negative effect on student achievement in low achieving and high minority population schools (Ronfeldt et al., 2013).

Predictors of Teacher Turnover in Hard-to-Staff Schools

Compelled by teacher shortages and unmanageable school budgets, many researchers have investigated the factors teachers consider when making decisions leaving the classroom (see Chapter 4 for more detail, and reviews from Borman & Dowling, 2008; Guarino, Santibanez, & Daley, 2006; Simon & Johnson, 2015). Many earlier studies focused on the influence of individual teacher characteristics such as gender (e.g., Gritz & Theobald, 1996), race/ethnicity (e.g., Achinstein, Ogawa, Sexton, & Freitas, 2010), and qualifications (e.g., education background; Henke et al., 2000). Ingersoll (2001) marked a shift in the conversation about turnover by focusing on the organizational lens of teacher turnover. Using the nationally representative Schools and Staffing Survey (SASS), Ingersoll showed the link between teacher shortages and teacher turnover, advocating for a greater focus on the role negative organizational conditions play in teachers' decisions to leave. He illustrated how teachers' perceptions of their working conditions, such as administrative support or student conflict, strongly related to their decisions to leave the profession and to leave one school for another, moving between schools. This framework continues to serve as the foundation for the perspectives of most current studies of turnover.

Ingersoll (2001) also identified the higher rates of turnover present in urban schools and those serving low-income student populations; more recent research on teacher retention and attrition has started to focus on this subset of schools with the highest turnover. Simon and Johnson (2015) reviewed some of the largest and most recent studies of turnover in low-income schools. Some of these studies have focused on

the relationships between turnover and student demographics: schools with more "disadvantaged" student populations witness greater departures of their teachers to less "disadvantaged" schools or from the profession entirely (Boyd, Lankford, Loeb, & Wyckoff, 2005; Hanushek, Kain, & Rivkin, 2004b). This model of turnover is based on labor market theory (supply and demand), and theorizes that teachers rationally evaluate the costs and benefits of their job options, making career decisions based on observable, work-related factors such as student demographics and salary (Hanushek & Rivkin, 2010). According to this theory, a teacher might only take a job in a school serving a high proportion of students in traditionally underserved communities as a last resort, because they could not get any other teaching jobs (knowing the job would be more difficult). Once they gained more experience, this teacher would transfer to a "less difficult" position in a school serving a higher proportion of high-income students.

Drawing on this observation of the salience of student demographics, another strand of turnover research identified the potentially more important role of working conditions underlying the demographic trends (Simon & Johnson, 2015). This model of turnover is based in organizational theory and imagines the school organization containing many sub-systems that affect teachers' experience of their work environment, such as the physical building, their workload (e.g., class size, contact hours, non-instructional duties, out-of-field assignments), the school culture, the curriculum, testing pressures, etc. (Johnson, 2006). Some working conditions, like the availability of science equipment, are more easily observable, while more social working conditions, such as leadership and collegiality, are more difficult to observe and measure. The multitude of

working conditions, together and individually, influence teachers' turnover decisions (e.g., Johnson, Kraft, & Papay, 2012; Ladd, 2011). According to this theory, a teacher in a school serving many low-income students is also more likely to experience high turnover of their colleagues or an overburdened (or seemingly negligent) administrator; these organizational factors lead the teacher to feel less satisfied with their experience at the school and thus this teacher may seek another opportunity where they feel more supported to be successful (Johnson & Birkeland, 2003).

Of the many factors in teachers' work environments that affect their turnover decisions, school climate has begun to receive more attention (largely for its widespread effects on student achievement). School climate is defined in this study as, "…the quality and character of school life. School climate is based on patterns of people's experiences of school life and reflects norms, goals, values, interpersonal relationships, teaching and learning practices, and organizational structures" (Cohen, McCabe, Michelli, & Pickeral, 2009, p. 182). This definition of school climate can encompass and be affected by the social working conditions in the school (such as collegiality and leadership). Additionally, this definition of school climate attempts to capture, more holistically, teachers' experienced environment: their interactions, relationships, feelings of safety and care, etc. Cornell and Huang (2018) compare a school's climate to a city's meteorological climate — it does not include buildings and streets (school buildings) but focuses on the patterns of systems like temperature and humidity (collaboration and learning). Kraft, Marinell, and Shen-Wei Yee (2016) found that improvements in these systems (specifically leadership, academic expectations, teacher relationships, and school safety)

were associated with reduced turnover among New York City middle school teachers. Other researchers have found similar associations in other urban schools serving high-poverty student populations (Djonko-Moore, 2015; Guin, 2004; Kushman, 1992).

The Search for a Solution

Although many studies have documented the plight of urban, hard-to-staff schools stuck in cycles of unhealthy school climates that lead to high turnover, fewer studies have examined potential ways to end this cycle. Interventions and policies to reduce teacher turnover have thus far primarily focused on changing job features, such as pay or mentoring supports. These interventions operate based on the labor market framework: teachers seek out jobs with the highest rewards (including financial rewards like a salary) and will therefore be more likely to remain at a teaching position with higher rewards. These types of interventions are attractive because they are seemingly straightforward and simplest to implement: policymakers or administrators can simply alter an already existing administrative policy such as salary. Yet, as studies of the pay initiatives have shown, even these policies are complex and difficult to enact. Teachers in the North Carolina Bonus Program, for instance, reported confusion over the program (only 7% of teachers receiving the bonus correctly identified the eligibility criteria), likely reducing the impact of the intervention (Clotfelter, Glennie, Ladd, & Vigdor, 2008b).

Some interventions have targeted another driver of teacher turnover: teachers' social working conditions. For new teachers, mentoring programs are a popular option to foster early teacher development and retention (Ingersoll & Strong, 2011), but the only causal evidence of the effect of a mentoring program on turnover is mixed (Glazerman et

al., 2010). Although many programs seek to improve school climate (e.g., Positive Behavioral Interventions and Supports, PBIS, Bradshaw, Koth, Thornton, & Leaf, 2009), none of these have yet been evaluated for their impact on teachers' commitment or turnover.[3]

Restorative Practices (RP), a quickly growing whole school approach to community building and discipline, has the potential to address the last two theoretical explanations behind teacher turnover from high poverty schools. The theory behind RP proposes a view of human beings as motivated by human relationships, empathy, and the desire for positive interactions with others (Morrison, 2006). A restorative school acknowledges and incorporates this basic human motivation into community development and response to conflict. By expressing emotion to one another, students and teachers can create better understanding, relate to one another, and develop empathy (Gonzalez, 2012). These feelings then form and strengthen relationships: a key element of school climate and support for the school organization (Bryk et al., 2010). These relationships motivate members of the community to maintain and strengthen the community. Previous research has suggested that RP could potentially improve the experienced school environment (Armour, 2013; Jain, Bassey, Brown, & Kalra, 2014; Mirsky & Wachtel, 2007), though the design of these studies generally does not permit causal conclusions. The evidence on school climate from randomized control trials of RP is potentially mixed. A study in Pittsburgh (Augustine et al., 2019) showed that RP

[3] On a related note, the Cultivating Awareness and Resilience in Education (CARE, see Jennings et al., 2017) program for teachers has been shown to improve aspects of teachers' well-being and school climate (Jennings, Frank, Snowberg, Coccia, & Greenberg, 2013).

improved teachers' perceptions of school climate (but not students' perceptions of school climate), but a study in Maine found no significant impact on school climate (Acosta et al., 2019)[4].

If RP improves teachers' perceived working conditions, they may be more satisfied and more willing to stay. RP has shown promise to improve student-teacher relationships (Augustine et al., 2019; Gregory, Clawson, Davis, & Gerewitz, 2016), which matter to teachers and their turnover decisions (Simon & Johnson, 2015). Additionally, if RP can live up to its critical theory roots, teachers as well as students could feel empowered by their school and feel like they are working towards justice and equity (Vaandering, 2010a). Teachers, who sought out positions in high poverty schools to make a difference in their students' lives and promote social justice, could feel empowered by the critical aspect of RP, and once feeling like they are achieving their goals to advance equity will be more likely to continue in their schools (Johnson & Birkeland, 2003).

Most of the evidence about RP comes from case studies and limited observational studies and does not allow for causal conclusions (see S. Darling-Hammond et al., 2020; Fronius, Persson, Guckenburg, Hurley, & Petrosino, 2016 for a research review). Additionally, few studies have examined teachers' responses to this intervention, with no studies yet assessing its impact on teachers' turnover or turnover intentions. Implementation studies of RP are also nascent and largely focus on anecdotal lessons

[4] Acosta et al. (2019) did find a positive significant relationship between the usage of RP and school climate but no significant relationship with assignment to RP.

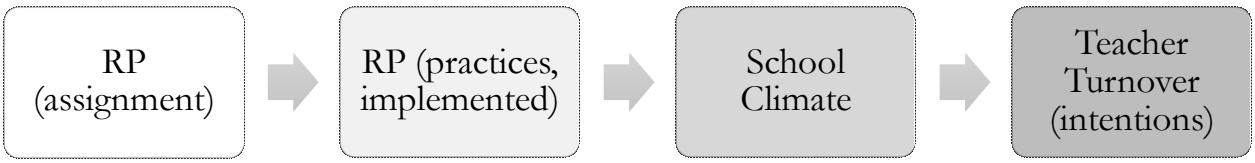
learned rather than systematic analysis and theory building from empirical inquiries (Gonzalez, 2012, 2015; Gregory & Evans, 2020; Mayworm, Sharkey, Hunnicutt, & Schiedel, 2016). However, emerging evidence indicates that implementation is varied and can potentially influence the efficacy of the Restorative Practices intervention (Gregory et al., 2016; McCluskey et al., 2008), which mirror findings about other whole-school interventions like PBIS (Bradshaw, Waasdorp, & Leaf, 2015). Implementation evidence from one of the few randomized control trials of RP revealed that teachers had mixed feelings of preparedness and success with the intervention (Augustine et al., 2019). This study seeks to fill these gaps.

The Restorative Practices/Diplomas Now (RP/DN) Project

This study is part of a larger project evaluating the impacts of Restorative Practices and Diplomas Now using a blocked, cluster randomized control trial. Data for the larger project was collected from schools involved in the Diplomas Now randomized study (which began in 2011; see Corrin et al., 2014, 2016), including the subset of schools that also participated in the Restorative Practices experiment (beginning in 2014). Original recruitment for the Diplomas Now study focused on low-performing middle and high schools in large urban districts across the United States because the Diplomas Now intervention primarily aims to keep 6th and 9th grade students on track to graduation and facilitate school turnaround efforts to support these students. Participating schools were organized into blocks (by school district, school level, and time of recruitment) before being randomly assigned (at the school level within blocks via a lottery) to the Diplomas Now treatment or the "business as usual" control condition. From the original 23 blocks

in the Diplomas Now study, 12 blocks further participated in the Restorative Practices sub-study. In these 12 blocks, schools remained in their prior experimental condition, with treatment schools adding Restorative Practices (to Diplomas Now) and control schools continuing with "business as usual." (Chapters 2 and 3 provide further details about the study design.)

Figure 1.1 *Hypothesized Causal Chain (Treatment Theory)*



Dissertation Overview

The purpose of this dissertation is to investigate the effect of Restorative Practices on teachers' turnover intentions in urban, high-poverty schools. Figure 1.1 illustrates my hypothesized causal chain (or treatment theory, Leviton & Lipsey, 2007), which I summarized above and which I explore in more depth in the chapters that follow. I employ a quantitative approach to examine the potential explanatory pathways of RP through its impact on school climate. I also explore how variation in implementation of RP is related to its impact on teacher turnover decisions. Finally, I leverage data from the larger study (within which the RP study is situated) to explore the relationships among teacher and school characteristics, the usage of RP, and teacher turnover related outcomes more generally. The following three chapters tackle each of these analyses; each chapter

is a stand-alone, article-length analysis, but all three articles provide complimentary perspectives on how RP is associated with teacher turnover in high-poverty, urban schools.

Chapter 2 focuses on the question: *Does a school's assignment to implement whole-school reforms featuring Restorative Practices improve school climate and increase teachers' reported intentions to remain at their school?* Chapter 2 employs a rigorous quantitative approach to study the effect of Restorative Practices (paired with another whole school intervention, Diplomas Now[5]) on teachers' turnover intentions. I describe the background of the Restorative Practices/Diplomas Now (RP/DN) intervention and describe the randomized control trial, which provides the data for all the studies collected here. I first present an intent-to-treat analysis on school climate to test whether assignment to the combined intervention actually improved perceptions of school climate. Next, I complete an intent-to-treat analysis examining the impact of school assignment to RP/DN on teacher' turnover intentions and problematic teachers absenteeism. The analysis in chapter 2 tackles the following specific research questions:

2.1 Did assignment to the treatment, RP/DN, positively impact school climate?

2.2 Did assignment to the treatment, RP/DN, increase teachers' intentions to stay?

Chapter 3 investigates the research question: *Does variation in the implementation of the Restorative Practices intervention help to explain the effect of assignment to RP/DN on perceptions of school climate and on teachers' intentions to*

[5] In this study, Restorative Practices was combined with supports from the Diplomas Now program. The next chapter (2) will fully describe the combined treatment and experimental setup.

stay? Chapter 3 takes a more nuanced look at the data from the randomized control trial, to evaluate the roles of intervention support uptake and usage of program practices in the effect of RP/DN on perceived school climate and teachers' turnover intentions. I first examine how implementation of RP varied across schools randomized to treatment and describe the service contrast between the treatment and control schools. Then, I use a structural equation modeling approach to examine how the variation in uptake of RP (among treatment schools) associated with RP usage and with school climate and teachers' turnover intentions. Finally, I estimate a second path analysis to identify the indirect effect of assignment to RP/DN on school climate and turnover intentions via its impact on the usage of RP practices. Chapter 3's analysis examines the following specific research questions:

3.1 Among schools assigned to RP/DN, how does variation in uptake relate to variation in RP usage?

3.2 Among schools assigned to RP/DN, how does variation in uptake directly relate to variation in school climate and teachers' intentions to remain at their school and indirectly through RP usage?

3.3 Did assignment to RP/DN increase the usage of RP in treatment schools, compared to control schools?

3.4 How does variation in usage of RP help to explain the impact of RP/DN on school climate and teachers' intentions to remain at their school and does RP usage help to explain this relationship?

Chapter 4 utilizes the data from all schools in the larger Diplomas Now randomized control trial (including teachers and schools from randomization blocks not included in the Restorative Practices sub-study) to answer the question: *what is the association between the prevalence of RP and teachers' turnover intentions and perceptions of problematic absenteeism?* This observational analysis takes advantage of the data collected from this large non-random sample of high-poverty, urban schools. I use multivariate (multilevel, generalized linear) regression analyses to examine whether student and teacher reported usage of RP (independent of assignment) predicted turnover intentions. Additionally, I investigate relationships between teachers and school characteristics and the usage of RP (at the individual teacher level and restorative culture at the whole school level). Specifically, the study in Chapter 4 addresses the following research questions:

4.1 How prevalent are restorative practices and restorative cultures in schools, as reported by teachers and students? Which practices are used most frequently?

4.2 What teacher, job, and school characteristics predict more frequent RP usage?

4.3 To what extent do more frequent teacher RP usage and greater student reports of restorative culture predict teachers' intentions to leave their school?

4.4 Do similar patterns of association hold between intentions to move to another school and intentions to leave the teaching profession?

4.5 Do similar patterns of association hold with teachers' perceptions of problematic teacher absenteeism at their school?

4.6 Which RP practices have the strongest association with teachers' turnover intentions and perceptions of problematic absenteeism?

Contribution

The results from this study are summarized and fully discussed in chapter 5. In brief, the findings from these studies add to the research discussion around challenges for teachers working in high-poverty, urban schools and the promise of RP to address high turnover rates among these teachers. The empirical investigations provide evidence from one randomized control trial about the effects of Restorative Practices, when combined with Diplomas Now, on teachers' turnover intentions. This study also contributes preliminary evidence around the hypothesized mechanisms in this relationship, such as school climate and implementation. This evidence can begin to fill a gap in our understanding of how whole school interventions designed to improve school climate and keep students on-track to graduation may also affect teacher turnover.

Chapter 2 - The Impact of Restorative Practices and Diplomas Now on School Climate and Teachers' Turnover Intentions: Evidence from a Cluster Multi-site Randomized Control Trial

In the United States, fears of an inadequate supply of quality teachers have prompted the study of why teachers leave their classrooms (Ingersoll, 2003; Sutcher et al., 2016). Underfunded and overburdened schools in large urban districts face the largest losses in their teaching forces; less than half of the teachers in these districts remain after five years (Ingersoll, 2004). Individual schools face staggering annual turnover (and therefore replacement) rates at an average of 20%, or one fifth, of their teaching staff (Holme, Jabbar, Germain, & Dinning, 2017; Papay et al., 2017).

Most of the research on teacher turnover has examined descriptive patterns, particularly observed variation in turnover based on school working conditions (Guarino et al., 2006; Simon & Johnson, 2015). Experimental evidence on potential solutions to reduce teacher turnover is rare with the exception of a few recent studies (Borman & Dowling, 2008). Varied teacher hiring and transfer procedures and policies, as well as job opportunity and choice patterns, generally preclude the random assignment of individual teachers to schools. One of the only studies to attempt individual teacher assignment, DeCesare, McClelland, and Randel (2017) found that the Retired Mentors for New Teachers program had no significant effect on teacher turnover. Alternatively, whole district or school-level random assignment designs require large numbers of study schools to have sufficient statistical power to detect impacts. The few evaluations of such policy interventions, including the Chicago Teacher Advancement Program (Glazerman et al., 2010) or pay-for-performance initiatives (Springer et al., 2011) have shown

limited, or null, impacts on turnover, at large costs. More frequently, observational and quasi-experimental studies of programs, such as the North Carolina Bonus Program, have shown some small impacts on turnover, but remain open to validity threats from selection bias (Clotfelter, Glennie, Ladd, & Vigdor, 2008a).

This study seeks to add to the current research on teacher turnover by evaluating the impact of Restorative Practices (RP) on teacher turnover. Specifically, I examine the results from a randomized control trial of RP when these practices are combined with the teacher and student supports provided by the Diplomas Now intervention (Corrin, Sepanik, Rosen, & Shane, 2016).[6] RP is a relatively new intervention[7] aimed at whole school change: reducing punitive disciplinary measures, eliminating disciplinary inequities, and promoting a more positive school environment (Costello, Wachtel, & Wachtel, 2009; Evans, Lester, & Anfara Jr, 2013). Although many schools and districts have raced ahead to implement this intervention, evidence of its efficacy largely remains limited to observational and case studies (S. Darling-Hammond et al., 2020; Trevor Fronius et al., 2016; Song & Swearer, 2016). Although teachers are not randomized to schools, this study examines how teachers in schools randomized to implement Restorative Practices responded to this intervention in their intentions to leave their school and the profession of teaching.

Few studies have examined RP's impact on teachers (Trevor Fronius et al., 2016; Hurley, Guckenburg, Persson, Fronius, & Petrosino, 2015). Theoretically, RP is designed

[6] See below for a more detailed description of Diplomas Now.
[7] The Real Justice program, focused on restorative conferencing, was founded in 1994. In 1999, the founders of this program established the broader International Institute of Restorative Practices to train professionals not only in formal restorative conferencing but also in a broad array of informal and preventative restorative practices that build community and trusting, empowered relationships.

to improve the whole school environment and positively impact all school community members' relationships and satisfaction. If RP succeeds at improving school climate, a factor teachers rate as important to their decision to stay, teachers should want to stay at their school and teacher turnover should be reduced. However, some qualitative studies and media reports of opposition to RP have picked up on potential resistance from teachers who claim that RP could instead lead to less organized schools with no consequences for student behavior and more stress for teachers (Dominus, 2016; Lustick, 2017b).

This study tests those hypotheses by examining the impact of assignment to RP on teachers' turnover intentions. I also test whether RP had an impact on school climate as a potential mediator of this relationship.

Literature Review

Teacher Turnover: The Problem and its Causes

Teacher turnover rates in the United States are high and only growing, particularly at schools in traditionally underserved communities. Nationally, 13% of teachers leave the profession each year, with rates of at least 20% in urban, high-poverty schools (Ingersoll, Merrill, & Stuckey, 2014). Fewer teachers remain until retirement, resulting in a workforce that is greener (younger) and in schools with less teacher pedagogical and organizational expertise. Schools' loss of human capital additionally translates into increased financial costs replacing teachers who leave every year and means they cannot offer their students high quality learning opportunities afforded by more experienced teachers and more stable schools (Ingersoll & Merrill, 2017; Ronfeldt et al., 2013).

Some researchers debate the harmfulness of national rates of turnover, but few argue against the urgency of the higher rates found in most under-resourced and high-poverty urban schools: on average, double that found in other schools (Ingersoll, 2004; Papay et al., 2017). Almost half of all public school teacher turnover occurs in a quarter of public schools (Ingersoll, 2004). Much of this turnover occurs between schools as teachers systematically sort away from certain schools; more qualified teachers leave the most challenged schools, creating an unequal distribution of teacher experience and quality (Clotfelter, Ladd, & Vigdor, 2011; Goldhaber, Quince, & Theobald, 2017).

Analyzing teacher turnover in high poverty schools, researchers have previously used students' characteristics to explain the higher rates – suggesting students from higher poverty and minority racial backgrounds create more difficult and thus undesirable teaching environments (Hanushek et al., 2004b; Scafidi, Sjoquist, & Stinebrickner, 2007). More recently, however, researchers have focused on the role of working conditions in high poverty schools, which simultaneously often experience lower quality leadership, less collegiality, and generally less positive school climates (Simon & Johnson, 2015). Many studies have shown that teachers tend to leave schools with negative school climates (e.g., Kraft et al., 2016), but none of these studies have been able to incorporate randomized designs for stronger causal evidence.

School Climate. Researchers and stakeholders in education use the term school climate to mean many different things related to the school environment. The most widely used definition for school climate (which comes from the National School Climate Center [NSCC] and which I use here) describes school climate as *the quality and character of school life*. More specifically:

> *School climate is based on patterns of students', parents' and school personnel's experience of school life; it also reflects norms, goals, values, interpersonal relationships, teaching and learning practices, and organizational structures. A sustainable, positive school climate fosters youth development and learning necessary for a productive, contributing and satisfying life in a democratic society* (NSCC, 2007, as cited in Thapa, Cohen, Higgins-D'Alessandro, & Guffey, 2012, p.2).

Figure 2.1. *Dimensions of School Climate*

Note. Based on theoretical model of school climate in Thapa et al. (2013).

This definition is grounded in ecological theory which models a school's environment as a hierarchy of many, mutually influencing layers (Bronfenbrenner, 1977; Kohl, Recchia, & Steffgen, 2013; Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013). According to ecological theory, school environments are comparable to eco-systems — they contain layers of systems that influence each other. The five main systems contributing to a school's climate are: safety, physical environment, teaching and learning, relationships, and leadership and staff relations (shown in Figure 2.1; Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013).

A more positive school climate is associated with most desired schooling outcomes, including: higher student achievement, better attendance, less violence and aggression, and more positive social and emotional health (Astor, Benbenishty, & Estrada, 2009; Berkowitz, Moore, Astor, & Benbenishty, 2016). Teachers in schools with more positive school climates are more likely to be satisfied with their job, show greater commitment, and are less likely to leave their school (Guin, 2004; Kraft et al., 2016). The pervasive and important consequences of school climate have spurred development of many interventions aimed at improving school climate. School Wide Positive Behavior Incentives and Supports (SWPBIS) is one such intervention which has been shown to improve school climate (Bradshaw, Koth, Bevans, Ialongo, & Leaf, 2008; Horner et al., 2009). Opponents of PBIS, however, critique its use of extrinsic rewards and its weak Tier 3 responses to more serious issues (Swain-Bradway, Maggin, & Buren, 2015; Wilson, 2015). They also worry that PBIS does not help wrongdoers understand the impacts of their wrongdoing on others and internalize new norms. Additionally, no

studies have tested the effects of PBIS or other school climate interventions on teachers' commitment or turnover.

A Restorative Practices Solution?

Restorative Practices (Costello et al., 2009*)* is another intervention, growing in popularity, that seeks to improve school climate and reduce suspension rates and the racial disciplinary gap (Anyon et al., 2016), and which may have the potential to improve teacher retention as well. This intervention, also known as restorative justice practices, is an alternative approach to school discipline, culture, and community building grounded in an ethos of reparation and rehabilitation (Gonzalez, 2012). The more traditional, punitive approach to discipline and justice found in the United States (education and justice systems) emphasizes imposing a fitting punishment on wrongdoers. In contrast, a response based in the restorative approach emphasizes a process of dialogue that includes the voices of victims, wrongdoers, their families, and other members of the school community that aims to repair harm and enable repentance, reparation, and reconciliation. This dialogue helps the wrongdoer understand the harm he or she has produced and also helps others understand what the wrongdoer was thinking and feeling at the time of the incident. The dialogue provides an opportunity for the wrongdoer to express remorse, to suggest ways of beginning to repair the harm, and to work collectively with the others involved in the dialogue to reach an agreement on how the wrongdoer can help make things right, how the relationships can be restored, and the wrongdoer can be reintegrated into the community (Braithwaite, 1999; Evans & Vaandering, 2016; Zehr, 2015).

There are many different programs that implement a restorative approach in schools (Evans et al., 2013). These programs share the goal of proactively establishing a

caring, supportive, and accountable environment that addresses, rather than ignores, inappropriate behaviors and promotes a fair process of participatory decision-making and student learning. RP programs build this environment through proactive empathy and community building exercises such as proactive circles that regularly encourage students (and teachers) to share goals, thoughts, or feelings with one another. For example, teachers may give students the opportunity during their brief (about five to ten minutes) daily circle time to share with their classmates about someone they consider a hero; or, teachers could even use the circle structure to give students time to reflect on a homework reading.

RP programs sustain this environment through their response to situations where negative actions or behaviors have impacted others and harm has been done to the school community and/or its members. These responses encourage all members of the school community to reflect on and heal the harm: using affective statements to express how they are impacted by others' behaviors, asking restorative questions of both wrongdoers and those harmed to increase understanding of who has been harmed and what harm has been done, and giving both wrongdoers and those impacted a say in what needs to happen to make things right. For example, if one student continually disrupted class, students in the class could circle up to each share how the disruption affected them. After listening to their classmates, the disruptive student would then devise a way they could make up for their negative effect on their classmates, such as helping their fellow students with notes to make up for class time lost and prevent future disruptions, which the whole class discusses and then adopts. These responses help members of the school community to develop compassion for and understanding of each other and to build, or rebuild,

supportive relationships. In addition to using affective statements and restorative questions, RP programs often feature small impromptu mediation conferences to address misbehavior between students, responsive peacemaking circles, and formal restorative conferences that seek out appropriate and productive restorative sanctions to repair harm while providing ways for the offenders to be reintegrated into the school community and reclaim their good name (Evans et al., 2013).

Much of the current RP research has focused on the effects of RP on school disciplinary and student outcomes (S. Darling-Hammond et al., 2020; Trevor Fronius et al., 2016). Observed impacts of RP on school discipline statistics include: an 87% drop in out-of-school suspensions in San Antonio, Texas (Armour, 2015); a 52% drop in violent acts in Philadelphia, PA (International Institute for Restorative Practices, 2009); and a 57% drop in discipline referrals in Minnesota (Riestenberg, 2003a). Anecdotal and descriptive research results have illustrated that RP generates greater student connectedness, student self-efficacy (in Oakland, CA; Jain et al., 2014), and generally positive perceptions of students and teachers regarding RP (in Minneapolis, MN; McMorris, Beckman, Shea, Baumgartner, & Eggert, 2013).

Most of this initial evidence, however, does not permit strong causal inferences due to a lack of control or comparison groups (Fronius et al., 2016). To date, the few published results from randomized control trials show potentially positive but mixed results. In a study of 44 schools in Pittsburgh, PA (Augustine et al., 2019), assignment to RP significantly reduced suspensions but had no significant effect on student attendance or arrests. Additionally, assignment to RP had a negative impact on teacher performance (as measured by student reports and value-added) and a marginally significant negative

effect on student achievement in grades 3-8 (but not in high school grades). Augustine and colleagues posit, from supplementary probing analyses, that these negative findings can be attributed to the quality of implementation of RP (teachers and schools with low usage of RP). In a study of 13 middle schools in Maine, Acosta et al. (2019) found no significant impact of assignment to RP, but only improvements when students reported more experiences with RP. A soon-to-be-submitted manuscript (Grant et al., in preparation) reports results from the main study of this RCT that found that RP had significant impacts on that study's two primary outcomes related to student misbehavior: RP schools had less prevalence of severe disciplinary problems than control schools (as reported by students), and students in RP schools were 34% less likely than students in control schools to be suspended 3 days or more.

The Promise of RP to Change School Environments

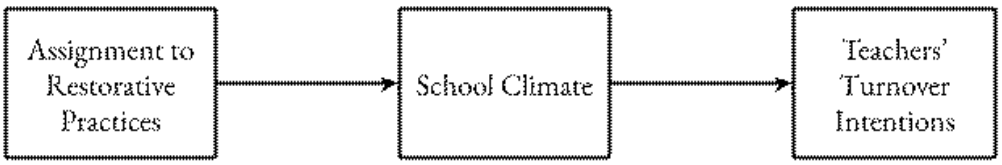
Do the positive effects of RP extend to the whole school environment as intended? The whole-school RP model (advocated for by many RP researchers and developers, e.g., Costello et al., 2009; Evans & Vaandering, 2016) emphasizes that if the goal is to improve the whole school climate, RP must be implemented to include the whole organization. Theoretically, principals should lead RP with staff, promoting relationship development and community throughout the school. In accordance with this theory, Mirsky and Wachtel (2007) found in their case study of alternative schools in Pennsylvania that RP could improve the whole school climate (measured by student behavior and reported prosocial values). Jain et al. (2014) found that 70% of teachers in 24 Oakland schools implementing RP reported that RP seemed to be improving school climate (via a single reported item). Gregory et al. (2016), in an observational study of

two schools in their first year implementing RP, similarly noted that more restorative approaches improved student-teacher relationships. However, the apparent evidence that RP improves the overall school climate remains limited to a few studies, has not rigorously measured all aspects of school climate, and largely does not meet rigorous evidence standards because of weak research designs (Armour, 2016; S. Darling-Hammond et al., 2020; Hurley et al., 2015). In the few published randomized control trials, Augustine et al. (2019) found that teachers at RP schools reported a more positive school climate, but students reported a more negative classroom level climate (and less student engagement, as measured by the Tripod student survey), and Acosta et al. (2019) found no statistically significant differences in school climate between schools assigned to RP and those assigned to the control condition. Looking at an RCT of an holistic SEL intervention incorporating RP, Bonell et al. (2018) found significant decreases in bullying but not in aggression.

School climate is an important ecological factor that strongly predicts improved teacher retention, student achievement, and school functioning (Kraft et al., 2016; Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013). If RP can improve the school climate and working conditions of schools, then this improved work setting should induce teachers to want to stay at their school. Currently, no whole school interventions that target school climate have been investigated for their influences on teacher turnover (e.g., School-Wide Positive Behavior Intervention and Supports and Cultivating Awareness and Resilience in Education: Bradshaw et al., 2008; Jennings et al., 2017). Similarly, although RP has apparently produced strong outcomes for students, its effect on teachers is less clear; no studies have yet examined how RP may influence teachers' morale or

perceptions of their job, particularly their intentions to stay. As previously discussed, school climate is one of key drivers of teachers' satisfaction and retention at their schools. I hypothesize that if RP is able to improve school climate, it will also improve teachers' intentions to stay.

Figure 2.2. *Hypothesized model of the relationship between RP and teachers' turnover intentions*



This Study

In this study, I analyze data from a randomized control trial of RP, in combination with Diplomas Now, to assess the effect of RP (and Diplomas Now) on teachers' turnover intentions. The random assignment in this dataset allow me to generate results and conclusions about the effects of RP (in combination with Diplomas Now) that have greater internal validity and stronger causal inference than most currently published studies of RP which rely on observational research designs. Random assignment to treatment eliminates any potential unobserved influences that affect both assignment to treatment and the observed outcome (and which thus introduce bias into the estimate of the impact of treatment). Additionally, the sample of this study, middle and high schools

from districts across the country, adds to evidence of the effect of RP on school climate from the Pittsburgh study. This study also contributes the first evidence about the effect of RP on teachers' career decisions.

I test the theory of RP and teachers' turnover intentions described above and shown in Figures 2.2 and 2.3. Based on the literature on teacher turnover and organizational working conditions, if RP can improve school climate (and can impact other related but unmeasured factors such as improving communication, enabling a fairer, more humane process of decision-making and conflict resolution, and deepening relationships within the school community), then teachers should be more likely to stay. This inquiry is guided by two hypotheses:

Hypotheses:

1) *Teachers in Restorative Practices' schools will report more positive perceptions of school climate.* Restorative Practices program theory suggests that it should improve perceptions of school climate via improved relationships and community building and also a more holistic and humanistic approach to resolving discipline problems.
2) *Teachers in Restorative Practices' schools will report lower intentions to leave their school.* Restorative Practices program theory also suggests that teachers in RP schools may be more likely to intend to stay in their current school than teachers in control schools, presumably because RP improves key working conditions that teachers consider when deciding to leave their school. The improved working conditions presumably include not only an improved overall school climate, but fairer processes, more just responses to wrongdoing, more

productive accountability and authentic communication, more positive relationships among teachers, more positive relationships among teachers and school leaders, more positive relationships with families, greater shared decision-making and voice, more listening to victims and offenders and bystanders, etc.

Methodology

Procedures

Recruitment of schools

The data analyzed here were collected in a specially-designed sub-study of Restorative Practices (RP) that was added as a 2-year extension to the multi-year randomized validation study of the Diplomas Now intervention. Specifically, in selected randomization blocks, the treatment schools from the validation study agreed to add RP to their implementation of Diplomas Now as an extension of the original study and the business-as-usual control schools agreed to extend their participation in the validation study's data collection activities so that RP's short-term impacts on student's and teacher's outcomes could be determined. Diplomas Now is a whole-school reform model — featuring components provided by Talent Development Secondary, City Year, and Communities in Schools — that aims to reduce secondary school students' development of early warning indicators of dropout risk in order to help students earn on-time promotion and graduation in high poverty middle and high schools. Schools were originally recruited for the Diplomas Now i3 validation study in two waves to begin in Fall 2011 and 2012 (for full information on the Diplomas Now model and initial experiment see Corrin et al., 2014; Sepanick et al., 2015; and Corrin et al., 2016).

Recruitment focused on low-performing middle and high schools in large urban districts across the United States (in accordance with the specific goals of the Diplomas Now intervention to keep 6th and 9th grade students on track to graduation and facilitate school turnaround efforts to support these students). Recruitment also focused on the many school districts that were already receiving services in some of their schools from Communities in Schools and City Year (in order to reduce the costs that would have been involved in opening and staffing new CIS and CY field offices just for the purposes of the validation study).

Randomization

The original Diplomas Now Validation Study utilized a cluster randomized control trial that incorporated a block design for assignment to treatment. District leaders nominated schools to participate. Leaders from nominated schools attended awareness sessions to learn more about the Diplomas Now model and about the randomized evaluation study. Once schools agreed to participate, they were organized by the third-party- evaluator (MDRC) into blocks by school district, school level (middle or high school), and month and year of recruitment. A couple of nominated schools were eliminated from the study prior to randomization by MDRC because these schools' baseline state test scores and preprogram demographic characteristics were not similar to the other nominated schools in their district and school level (Corrin et al. 2014). Within each block, all of which had at least two schools, schools were randomly assigned via a lottery to one of two conditions: the Diplomas Now treatment or "business as usual" control group. Randomization occurred at the school level because Diplomas Now's interventions are implemented at the school level. Possible contamination and spillover

effects were still possible at the district level (within blocks) if districts advocated for policies and programs similar to Diplomas Now's components.

Restorative Practices Sub-study

From within the Diplomas Now Validation Study sample, schools were recruited in 2014 to participate in a 2-year follow-up study of the combined impact of Restorative Practices and Diplomas Now. Many district and school leaders (and also Diplomas Now's and IIRP's leaders) view Diplomas Now and Restorative Practices as complementary whole school interventions that can be fruitfully combined. Thus, there was considerable interest from district and school leadership in the follow-up study. Leaders of treatment schools from 12 of the randomization blocks (from 8 districts) agreed to begin implementing Restorative Practices in addition to Diplomas Now. Leaders of control schools in these blocks agreed to the participation of their schools' staff and students in follow-up data collection while their schools continued to implement other improvement efforts ("business as usual").

Sample of Schools

A total of 62 schools agreed to participate in the original Diplomas Now study from 11 districts (creating 23 blocks by school level, district, and time of randomization). This dissertation study focuses on the 12 blocks, including 33 schools, that later agreed to participate in the Restorative Practices sub-study. These 33 schools come from 8 districts, 7 of which are among the top 100 largest districts in size according to number of students and represent the New England, Northeastern, Southeastern, South Central, Midwestern, and Western regions of the United States (Sable, Plotts, & Mitchell, 2010). Table 2.1

provides descriptive characteristics for the sub-study schools in 2011 or 2012 (depending on the time of initial recruitment and randomization).

Attrition and Analytic Sample

Attrition is defined at the school level as schools that either closed or did not respond to this study's outcome year teacher survey (in Spring 2016). Attrition is defined at the school level because treatment was assigned at the school level and because individual teachers and students are not uniquely identified in data collection and cannot be tracked over time. Table 2.2 reports the response of schools and teachers across blocks and conditions. For example, in the "incomplete" New England MS block, only one school's teachers responded to the survey (the treatment school). Overall, six schools did not respond to the 2016 teacher survey (two treatment and four control schools).

The reduced analytic sample for this study includes only "complete" blocks where teachers from at least one control and one treatment school responded to the Spring 2016 survey (which contained the measure of the primary outcome variables). For example, Table 2.2 shows that the previously discussed New England middle school block was not included in experimental impact analyses as the comparison cannot be made within the block (as specified in the study design). This reduced sample includes teachers in 9 of the 12 blocks and 25 of the 33 schools. The 8 sub-study schools which were excluded from the final analytic sample (due to school closure and/or non-response to the teacher survey producing incomplete or empty blocks) were split evenly among treatment and control groups (4 in each). Within the 9 complete blocks, 686 teachers responded; Table 2.3 provides descriptive characteristics for the teachers in the analytic sample. (Threats to the

validity of the experiment from attrition are further evaluated in the first part of the Results section.)

Intervention

The main focus of this chapter is the combined impact of Diplomas Now and Restorative Practices on school climate and teachers' turnover intentions (Outcomes 6 and 8 in Figure 2.3). The figure provides the logic model for the combined intervention, embedding Restorative Practices within Diplomas Now, and shows how the Restorative Practices and Diplomas Now components of the combined intervention and intended outcomes relate to each other. The Diplomas Now model rests upon four pillars of practices to support whole school transformation: integrated on-site supports, tiered student supports and interventions guided by an early warning system, strong curriculum and instruction with professional development, and strong learning environments. The practices in these four pillars mutually support each other and support school functioning and improvement aimed at improving student attendance, achievement, and graduation outcomes. Of particular note, Diplomas Now implementation was supported by a team of Talent Development, City Year, and Communities in Schools staff working together at the school, as well as regional and national Diplomas Now implementation support teams combining staff from these three organizations. (For more details on the Diplomas Now intervention and its components see: Corrin et al., 2014; Corrin et al., 2016; Sepanik et al., 2015). Restorative Practices professional development, consulting, coaching and implementation was supported by staff members from the International Institute of Restorative Practices.

<table>
<tr><th>INPUTS</th><th>OUTCOMES</th></tr>
<tr><td>Restorative Culture and Climate (RP)
• Professional development and manuals on: basic restorative concepts and skills, using circles effectively, facilitating restorative conferences, & restorative family engagement
• Ongoing consulting, coaching, and professional learning groups on restorative practices to refine skills and build sustainability and self-management
• Use of Essential Elements of Restorative Practices (See also Table A1)
o School-wide use of affective statements, restorative questions, and small impromptu conferences
o Broad-based use of proactive circles and responsive circles
o Targeted-use of restorative conferences
o School-wide use of fair process and reintegrative management of shame
o A restorative staff community that models and consistently uses restorative practices with each other
o A restorative approach to family and community involvement
o Inappropriate behavior is not ignored but is addressed restoratively
• Training of local school staff and partners to become licensed IIRP trainers</td><td rowspan="2">Early Outcomes
□ 1. Higher use of Restorative Practices
□ 2.Higher use of tiered supports for students who exhibit early warning indicators of dropout risk
Intermediate Outcomes
□ 3. Lower prevalence/severity of disciplinary problems in the school (bullying, fighting, out-of-control classrooms, verbal or physical abuse of teachers or staff, vandalism, weapons possession, use of drugs/alcohol, and gang involvement)
□ 4. Lower probability that students will be suspended for 3 days or more
□ 5. Lower chronic absenteeism rates
□ 6. More positive school climate
Primary Long-term Outcomes
□ 7. Higher student graduation rates
□ 8. Higher teacher retention (as indicated by increased % of teachers intending to remain in the school)</td></tr>
<tr><td>Diplomas Now (DN)
1) Integrated Onsite Support for School Transformation
o (e.g., on-site team from Talent Development Secondary, City Year, and Communities in Schools)
2) Tiered Student Supports and Interventions Guided by an Early Warning System (EWS)
o Tiered Intervention Model with EWS response meetings
o Tier II Student Supports
o Tier III Case-Managed Supports for highest needs students
3) Strong Curriculum and Instruction with Professional Development
o Professional development, instructional coaching, & professional learning groups for math & English faculty
o Curriculum for College Readiness
4) Strong Learning Environments
o (e.g., teacher teams with common planning, SLCs, extended class periods)</td></tr>
</table>

Figure 2.3. *Diplomas Now and Restorative Practices Logic Model*

Source: Adapted from MacIver at al. (2018). This logic model was put together by the RP/DN research team at Johns Hopkins and shows the integration of the RP and Diplomas Now programs. Primary outcomes considered in this chapter are highlighted in bold.

In treatment schools, RP was integrated into the Diplomas Now model to promote relationship building and provide an alternative approach to school discipline. This study specifically examines the model of Restorative Practices from the International Institute for Restorative Practices (IIRP), also called *SaferSanerSchools Whole School Change Program.* Unlike some RP programs that emphasize only certain practices or focus on parts of the school structure, the IIRP's model promotes an approach that involves whole school change. The IIRP model (Costello et al., 2009) specifies 11 essential elements for full implementation (described fully in Appendix Table A1), e.g., affective statements ("personal expressions of feelings in response to specific behaviors") and restorative staff community ("a staff that models and consistently uses restorative practices with each other to build and maintain healthy adult relationships").

Intervention Implementation

Implementation of the *SaferSanerSchools Whole School Change Program* involved: introductory trainings, school administrator and personnel training, teacher trainings and learning groups, and follow-up supports. Representatives from each school district in the study attended an introductory training session in Spring 2014 (for either 1, 2, or 4-days) given by IIRP. Intervention staff (from the already in place Diplomas Now program) and school administrators attended additional trainings on the IIRP model (Introduction to Restorative Practices, Using Circles Effectively, and Facilitating Restorative Conferences). Teachers and staff attended up to four trainings (professional development days) from IIRP and participated in a "start up session" to organize staff professional learning groups (which thereafter were designed to meet twice monthly

check in on implementation). Schools and teachers received additional implementation support via up to four days of on-site consultations from IIRP staff, monthly calls with school leadership, and IIRP developed materials (manuals, books, and videos). The control group, defined as "business as usual" schools, were able to implement other school improvement approaches and were given a modest stipend for participating in the data collection. Activities and programs in both treatment and control schools were monitored through surveys of school-based personnel. (Full description and measurement of implementation components can be found in Chapter 3.)

Implementation proved difficult in some schools in this study, with variation in the number of RP training sessions held and program supports received among treatment schools. (I complete a more detailed investigation of the variation in implementation and its impact in the next chapter.) Of the 17 schools randomized to implement RP, five schools dropped out of full program supports from IIRP after Year 1, but these schools did not leave the study: they responded to the 2016 survey and are represented in the analytic sample. Anecdotally, these schools cited local supports as sufficient to maintain their RP program or indicated a change in leadership had led to new priorities for professional development in Year 2. Of the other 12 treatment schools, IIRP rated seven schools at having reached just a baseline level of implementation at the end of Year 1 and targeted these schools for more intensive supports in Year 2.

Real-world implementation challenges affect an intervention's ability to have the full impact that it might otherwise have had under the extremely rare condition of ideal implementation (O'Donnell, 2008). It is essential to know "what works" in the real-world of less than ideal implementation in the underfunded and overburdened schools that

populate large urban districts. Thus, this chapter provides an intent-to-treat analysis of the causal impact that assignment to treatment had on school climate and teachers' turnover intentions. That is, the analysis compares the mean outcomes in the RP schools with the mean outcomes in the non-RP schools, ignoring the variation in the level of implementation achieved in the various RP schools. Thus, the analysis provides conservative real-world estimates of the causal impacts of the treatment — as the treatment was actually implemented in this sample — even though implementation in some schools was weaker than program leaders may have hoped.

Data Collection

At all schools in the original Diplomas Now study, teachers, students, principals, and assistant principals were invited to take a paper survey each Spring, from 2012-2016. DN staff also completed surveys reporting on the practices being implemented in the treatment schools. Consent procedures (active or passive) varied by district according to each district's standards. No individually identifying information was collected which helped assure confidentiality. Surveys asked about the use of promoted practices from the Diplomas Now and Restorative Practices interventions, school-climate related issues, and teaching practices. This analysis focuses on the Spring 2016 survey results for teachers and students because full training and implementation of the IIRP model of Restorative Practices, which began in Fall 2014, requires two school years to complete.

Measures

Turnover intentions

This study focuses on the outcome of teachers' turnover intentions. Previous studies have found strong relationships between employee's job intentions and their

satisfaction, commitment, and actual turnover (155 studies reviewed by Tett & Meyer, 1993); Ladd (2011) observed this relationship among teachers in particular. Turnover intentions can also potentially capture teachers who are disengaged and seeking to leave but remain at their jobs due to external constraints (e.g., micro and macro-economic forces).

Teachers self-reported their intentions for the coming school year in response to the following question: "Which best describes your future intentions for your professional career?" Teachers' selections were coded in two ways (based upon customary practices in the teacher turnover literature). First, teachers' responses were coded into a binary variable of *intending to stay at their schoo*l: *stayers = 1* ("remain in this school") and *school leavers = 0* (all options involving a departure from the school, including transferring schools, districts, sectors, or leaving teaching). Intending to stay at the school was pre-specified as the **primary** turnover-related outcome in this study.

A second turnover-related outcome was pre-specified as an exploratory outcome. For this *exploratory* outcome, the same responses were coded into another binary variable of *intending to stay in the profession*: *profession leavers = 0* (one option involving a departure from the teaching) and *stayers = 1* (all other options).

School Climate

Teachers responded to 17 items and students responded to 33 items which asked them to rate their school climate. (A full listing of the items is included in the Appendix.) Teachers' reports were examined at the individual level, and students' responses were aggregated to the school level. My measurement approach for school climate, using a factor analysis, is described in more detail below. In brief, I modeled school climate as a

composite of all the items by each respondent (i.e., *teachers' school climate rating* overall and *students' school climate rating* overall) and as three separate factors. The composites and factors all showed high internal consistency, Cronbach's alpha = .88 for all 17 teacher-reported items (scales .83 – .89) and Cronbach's alpha = .87 for all 33 student-reported items (scales .79 – .91).

Problematic Teacher Absenteeism

Teachers responded to the question, "To what extent was teacher absenteeism a problem in your school during the 2015 – 2016 school year?", on a scale from 1 (*not a problem*) to 4 (*serious problem*). This outcome was included as an ancillary outcome to teacher turnover as an imperfect indicator of how many teachers in the school already have "one foot out the door" and/or are so stressed by the school environment, working conditions, students, and leadership that they are having to take sick days and/or "mental health" days (Mowday, Porter, & Steers, 1982). Greater teacher absenteeism is hypothetically linked with greater teacher disengagement and lower satisfaction.

Assignment to Restorative Practices. Assignment was coded as 1 for teachers in schools assigned to implement Diplomas Now and Restorative Practices. Teachers at control schools were coded as 0 for this variable

Adjustment Variables. Although schools were randomly assigned to treatment status, I tested adjustments for some pre-treatment demographics to potentially provide more precise estimates. I tested the following groups of adjustment variables for inclusion: teacher characteristics (experience in teaching at the school, certification status, education level, full-time status, and subject taught), school grade level (middle or high school) and school composition (student enrollment, proportion of students enrolled

in free- and reduced-price lunch programs, and proportion of students from a minority ethnic or racial background).[8]

Analytic Plan

The intent-to-treat analysis[9] tested the previously mentioned hypotheses by answering two primary research questions using the following measures of the outcomes of interest:

2.1 Did assignment to the treatment, RP/DN, positively impact school climate?

- **Primary measure**: Teachers' individual perceptions of school climate
- **Secondary measures**: Students' collective perceptions of school climate, teachers and students' perceptions of three school climate factors

2.2 Did assignment to treatment, RP/DN, increase teachers' intentions to stay?

- **Primary measure**: Teachers' intentions to remain at their school
- **Secondary measures:** Teachers' intentions to remain in the teaching profession, teachers' perceptions of problematic teacher absenteeism

The analysis was divided into four main steps: analytic setup and sample description, school climate factor analysis, intent-to-treat analysis on school climate (research question 2.1), and an intent-to-treat analysis on teachers' turnover intentions (research questions 2.2). All analyses were performed in Stata 14.0.

[8] The small number of schools in the sample (limited power) and goal of parsimony suggest a model that does not include all of the adjustment variables.
[9] I use the conventional alpha level of $p < 0.05$ to describe statistically significant results (Orr, 1999).

1) Analytic Setup and Sample Description

I first assessed the internal validity of the experiment by testing statistical assumptions necessary for the final models, including: normality, multicollinearity, and missing data patterns. To assess the integrity of the experimental design I also assessed the evidence for any threats to the internal validity of the experiment. Because this intervention was implemented at the school level and the students and teachers at the schools were anonymous in each year of the study, I cannot investigate attrition of individuals. Table 2.2 provides a summary of the number of schools in the sample and who responded to the Spring 2016 survey. Additionally, I assessed baseline equivalence in available background and analytic variables between treatment and control schools to test whether randomization resulted in balanced groups (using data from the Spring 2012, prior to the implementation of RP).

2) School Climate Factor Analysis

I sought to identify the number of unique factors, or underlying constructs, present among school climate related items from the student and teacher surveys. I conducted an exploratory factor analysis on a subset of 52 questions surrounding the five components of school climate as theorized above. In the sample, teachers and students responded to how much they agreed with statements describing their school or how prevalent certain practices were at their school. Scales varied from 4 to 7 points, so I standardized responses, allowing the responses to be compared according to their z-score.

From a surface analysis of the items and based on prior theory, I hypothesized that there would be five factors: safety, teaching and learning, relationships, physical environment, staff and school improvement (in accordance with theory on school climate

composition, Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013). To test this hypothesis, I conducted an exploratory factor analysis of five steps (Williams, Onsman, & Brown, 2010). First, I assessed the characteristics of the data (i.e., distributions) and confirmed its suitability for a factor analysis using: the correlation matrix (with many items' correlations above .3), Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (.92 indicating "marvelous"; Kaiser & Rice, 1974), and Bartlett's test of sphericity, $p <$ .001 (Hair, Black, Babin, Anderson, & Tatham, 1998). Second, I extracted the factors using principal axis factoring (PAF), based upon observations from step one that the items were the not fully normally distributed and potential non-commonality among items (Fabrigar, Wegener, MacCallum, & Strahan, 1999). Third, I determined the number of factors based on an examination of the eigenvalues (approaching or greater than one), scree plot, and a parallel analysis (Fabrigar et al., 1999). Fourth, I applied an oblique rotation because the factors were correlated (Ford, MacCallum, & Tait, 1986). I also iteratively tested alternate numbers of factors before selecting the final three factor solution and finally reporting the results, including factor loadings and which items loaded onto the factors, described further in the Results section (and in Tables 2.6 and 2.7).

3) Intent-to-Treat Analysis on School Climate

I conducted a two-level multilevel model incorporating block fixed effects for the intent-to-treat analysis, using STATA 14.0 (command *mixed)*. I theoretically selected a multilevel modeling approach because the data are from teachers clustered within schools and my research questions ask about a school-level intervention (Raudenbush & Bryk, 2002). I confirmed that cluster effects existed within the observed data by examining the

intraclass correlation coefficients (ICC) of the analytic variables. The ICC values describe how much of the variation in these variables exists between schools (and blocks) compared to between individual teachers within schools and blocks. I also examined whether the cluster sizes were sufficient for a multilevel analysis. (For instance, I could not pursue a three-level model to analyze the clustering within blocks or districts because several of the blocks or districts contain only two participating schools, which is too small for accurate estimation of a model of that type.)

I provide the equations for the continuous school climate outcome below. Equation (2.1) describes the level 1 model for the relationship between perceptions of school climate and teachers' individual characteristics. Equation (2.2) describes the level 2 model for the relationship between school-level school climate and their block, treatment status, and student composition. Finally, equation (2.3) describes the composite model where model (2.2) is substituted into model (2.1) to get one equation that models perceptions of school climate in terms of all the analytic variables. I also estimated all regression models using robust standard errors to account for heteroscedasticity. No adjustments were used to account for multiple testing because only one primary outcome was selected for each domain of outcomes.[10]

$$y_{ij} = \beta_{0j} + \sum \beta_{1i} \boldsymbol{X}_{ij} + \varepsilon_{ij} \tag{2.1}$$

$$\beta_{0i} = \gamma_{00} + \gamma_{01} T_j + \sum \gamma_{02k} \boldsymbol{D}_k + \sum \gamma_{03j} \boldsymbol{W}_j + u_{0j} \tag{2.2}$$

$$y_{ij} = \gamma_{00} + \sum \beta_{1i} X_{ij} + \gamma_{01} T_j + \sum \gamma_{02k} D_k + \sum \gamma_{03j} W_j + u_{0j} + \varepsilon_{ij} \tag{2.3}$$

[10] Supplemental analyses confirmed the significance of all tests using the Benjamini-Hochberg Procedure to adjust for multiple outcomes (Thissen, Steinberg, & Kuang, 2002).

In these equations, subscripts refer to teacher *i*, in school *j*, which is in block *k*. Thus, y_{ij} represents the school climate rating for teacher *i*, in school *j*. In equation (2.1), $\boldsymbol{X_{ij}}$ are the set of teacher level covariates for teacher *i* in school *j*. Equation (2.2) models β_{0j}, each school's average school climate rating. T_j is the binary indicator for school *j* that indicates if the school is in the treatment or control experimental condition. $\boldsymbol{D_k}$ are the set of binary indicators for the block *k* in which a teacher's school resides.[11] The coefficients can then be interpreted thus: γ_{00} is the school level school climate rating in the control schools in the first block; $\gamma_{01}$is the average treatment effect (ATE) on school climate, and γ_{02k} are the effects on school climate of being in each block *k*. $\boldsymbol{W_j}$ are the set of school level covariates for each school *j* that adjust for potential differences in schools' student composition. The residual variation is divided in two parts: ε_{ij} is the individual, teacher level random effect (for teacher *i* in school *j*) and u_{0j} is the school level random effect for each school *j*. Both random effects are assumed to have a mean of 0 and variance σ^2 (representing the variability within schools) and τ_{00} (representing the variability between schools) respectively.

In each set of models, I tested the whole set of adjustment variables described above to help improve the precision of my estimates of the treatment effect. To retain a more parsimonious model (and due to the limited sample size) I only retained the

[11] An alternate model specification including treatment variation by block looks like:

$$\beta_{0i} = \gamma_{00} + \gamma_{01}T_j + \sum \gamma_{02k}T_j\boldsymbol{D}_k + \sum \gamma_{03j}\boldsymbol{W}_j + u_{0j} \quad (2.2a)$$

$$y_{ij} = \gamma_{00} + \sum \beta_{1i}\boldsymbol{X_{ij}} + \gamma_{01}T_j + \sum \gamma_{02k}T_j\boldsymbol{D}_k + \sum \gamma_{03j}\boldsymbol{W}_j + u_{0j} + \varepsilon_{ij} \quad (2.3a)$$

In this model, the treatment effect can be estimated within each block, incorporating a dummy indicator for each block (besides the first) and a treatment by block interaction. I then estimated an average treatment effect based on these interaction terms that is weighted by the size of each block (in number of schools).

covariates in each model which had a significant effect on the outcome. I incorporated block fixed effects to account for the experimental design (random assignment to treatment within blocks). Additionally, accounting for blocks as fixed effects allowed me to examine differences between blocks. I calculated effect sizes using Glass's delta, which presents the effect in terms of the standard deviation units of the control group (Glass, Smith, & McGaw, 1981; Rosenthal & Rubin, 1986):

$$Glass's\ \Delta = \frac{\widehat{Difference}_{weighted}}{SD_{control}}.$$

I chose this effect size measure due to its ease in interpretation and more importantly because I am comparing the observed effect to the variation observed in the counterfactual, or the situation without this specific intervention.

4) Intent-to-Treat Analysis on Turnover Intentions

Similar to step two, I regressed assignment to RP on teachers' reported turnover intentions in order to test whether assignment to treatment had an effect on teachers' turnover intentions. This regression is similar to the one performed in the previous step but incorporates a logarithmic link function (command *melogit)* to predict the binary turnover outcomes (e.g., *stay in current school = 1* or *leave current school = 0*). Equation 2.4 below presents the equation for this model.

$$\log\left(\frac{\pi_{ij}}{1-\pi_{ij}}\right) = \gamma_{00} + \sum \beta_{1i}\boldsymbol{X_{ij}} + \gamma_{01}T_j + \sum \gamma_{02k}\boldsymbol{D_k} + \sum \gamma_{03j}\boldsymbol{W_j} + u_{0j} \qquad (2.4)$$

π_{ij} is the proportion of teachers reporting intentions to leave their current school. $\frac{\pi_{ij}}{1-\pi_{ij}}$ therefore equals the odds that a teacher will intend to leave their current school. (A similar equation was used to predict the proportion of teachers intending to remain in the profession.) The logarithmic linking function accounts for the non-normal distribution of

the binary outcome by presenting the results in terms of log odds. (In reporting results I also translated log odds into the more easily understandable relative risk ratio and probability units.) Additionally, regressions using the logarithmic link function have no individual error term because it predicts the actual observed ratio of teachers reporting intentions to leave compared to those who did not (Agresti, 2002).

Results

In this section, I first assess evidence for the validity of the experiment (attrition, experimental group comparison) and test the assumptions behind the statistical models estimating treatment effects (missing data, variable distributions). Subsequently, I describe the results of the models estimating the impact of RP on school climate and teachers' turnover intentions.

1) Internal Validity Assessments, Analytic Setup, and Sample Description

Baseline equivalency analysis

Prior to the main analysis, I first examined baseline equivalency, testing the internal validity of the experiment and justification for the intent-to-treat analyses that follow. I specifically tested the comparability of schools in the treatment and control groups before the experiment began with randomization (in 2010-11 or 2011-2012, depending upon the block's randomization date). Table 2.4 compares treatment and control schools in the analytic sample at baseline. Tests of differences between the experimental groups in enrollment, percent free and reduced-price lunch, percent minority, percent special education, attendance, and exclusionary discipline days, revealed no significant differences ($p < .05$). Thus, at baseline, before implementation of

Diplomas Now or Restorative Practices, randomization was effective in ensuring intervention and control groups were well balanced.

Differential attrition (and non-response) analysis

I analyzed attrition at the school level, the level of assignment. Six schools did not respond to the Spring 2016 survey and thus are not present in the analytic sample, representing an overall attrition rate of 18.18% (i.e., 6 schools out of 33 schools total). There was much greater attrition from the control group (25% versus 11.76% in treatment). More relevant for the analysis, I only included schools in blocks where there was at least one treatment and control school because modeling the effects within blocks was essential to the original experimental design and thus to my analysis. Although this results in loss of sample size (and power), it reduces the potential for bias from potentially systematic non-response in certain blocks. In the analytic sample, two more treatment schools are dropped (since the corresponding control school did not respond) for an overall attrition rate of 24.24% (8/33 schools). Attrition was much more comparable with these exclusions: 23.5% (4/17 schools) in treatment and 25% (4/16 schools) in control, for a differential attrition rate of 1.47%. These attrition levels qualify as low attrition according to What Works Clearinghouse standards (Sciences, 2014).

Appendix Table A2.1 compares schools in the full sub-study and schools in the analytic sample. Smaller schools and schools with a greater proportion of low-income students were more likely to remain open and participate in outcome year data collection and thus remain in the analytic sample.

It can be easily assumed that both teachers and students entered and exited schools in the study over the years these schools were involved in the study. The study

did not track individuals and therefore it is difficult to calculate the exact number of "joiners" (post assignment) or to estimate the risk of bias from these joiners (at the student or teacher level). One approach to capturing joiners is the number and characteristics of new teachers in a school (based on survey responders).

Joiners would only pose a risk if they knew about the intervention and selected into schools because of the intervention. Although a whole school turnaround intervention is high profile, all of the schools in the sample were labeled as in need of turnaround, facing closures, and were therefore likely to be implementing other types of school reform interventions. This assumption is supported by the fact that comparable numbers of teachers in treatment (67.47%) and control (72.96%) reported receiving training on positive behavioral supports (another whole school intervention). Therefore, the treatment of focus in this study may not have stood out enough to differentially draw in new teachers and students. Additionally, Appendix Table A2.2 compares late joiners to the schools (teachers who started in the school in the past year) between treatment and control schools. None of the differences between joiners to control and treatment schools are significant.

Another risk to the integrity of assignment would be systematic non-response. If teachers who did not respond to the survey differed systematically from those who did respond, the results could be biased. Because individuals were not tracked over time I cannot say anything about individual non-responders. At the school level, I estimated logistic regression models to predict a school appearing in the analytic based on baseline characteristics. No factors were significant predictors in these models.

Variable analysis

Next, I examined the distributions of main variables for skewed (non-normal) distributions, outliers, multicollinearity, and adequate variability and found no substantial variation from normality (in continuous variables). Additionally, all scales exhibited high internal consistency (Cronbach's alphas .87 and .94) suggesting the items in each scale related with one another. I also assessed covariation between the main variables of interest using a correlation table. Table 2.5 shows that while most of the correlations are modest in magnitude, there are some significant correlations: enough to proceed with a multivariate analysis.

Describing Schools, Teachers, and Missingness in the Analytic Sample

Table 2.3 describes the characteristics of teachers in the analytic sample, and Table 2.4 describes the characteristics of schools in the analytic sample. These tables also provide the number of cases for each variable. At the school level, all demographic variables were complete. A small number of cases (7%) were missing information on one of the outcome variables and 6% of cases were missing at least one of teacher level covariates. No patterns of missingness were detected via models predating the likelihood of missing, and I assume the values are missing at random.

2) School Climate Factor Analysis

I conducted a series of factor analyses to test the hypothesized five-factor school climate model and to identify the core school climate constructs among the 52 questions asked of teachers and students about their perceptions of their school environment. All items were standardized (to account for differing response scales). I then separately analyzed teacher response items and student response items, using the whole sample of

respondents in 2016 (including schools in all blocks involved in the original Diplomas Now Validation Study — not just the blocks involved in the RP sub-study).

The exploratory factor analyses results suggested a three-factor solution in both the teacher and student reports (with eigenvalues > 1, confirmed by Horn's Parallel Analysis, Horn, 1965), mirroring the grouping of the items as they appeared in the original surveys. (These teacher and student surveys, designed by MDRC in 2010 for the Diplomas Now validation study, did not emphasize all five subdimensions of school climate subsequently described by Thapa et al. in 2013). I used an oblique rotation due to the correlations among factors.

For the teacher items, model fit from a confirmatory factor analysis was adequate (Browne & Cudeck, 1993): $\mathcal{X}^2(149, N=1{,}288) = 1156.56$, $p < .001$, RMSEA = .072, CFI = .919. Table 2.6 shows the factor loadings for the three-factor teacher survey solution, with all items loading at high levels above .6, and with no cross-loadings above .3. One of the original items ("Rules for student behavior were consistently reinforced by other teachers") was dropped because: its content was unique from other items on Factor 1, its loading was low (.43), and inclusion of the item had a negative influence on the reliability of the corresponding scale and on model fit. The three factors can be described as, 1) supportive environment (measured by 3 items, the highest loading item being "There was an atmosphere of trust and mutual respect within the school"), 2) professional learning and collaboration (6 items, "You met with non-teaching professionals…to identify at-risk students and/or plan interventions for those students"), and 3) problematic behaviors (7 items, "To what extent was…students fighting…a problem in your school"). An informal comparison of these factors to Thapa et al.'s school climate dimensions

(Figure 2.1) suggests that the *supportive environment* factor may fit best with the their "leadership/staff" and "relationships" subdomains, the *professional learning and collaboration* factor may fit within "teaching and learning", and the *problematic behaviors* factor within "safety".

The student survey items model fit from a confirmatory factor analysis was adequate (Browne & Cudeck, 1993): $\mathcal{X}^2(419, N = 5{,}989) = 6068.19$, $p < .001$, RMSEA = .047, CFI = .929[12]. Table 2.7 shows the factor loadings for the three-factor student survey solution, with most of the items loading at adequate levels above .5, and with no cross-loadings above .3. One item ("I would switch to a different school if I could") was dropped because it did not associate with the other items on Factor 1 (likely due to its negative wording), which is indicated by its low loading (.3) and negative influence on the reliability of the corresponding scale and on model fit. The accepted solution had a three factor structure: *supportive social environment* (15 items, "My teachers really listen to what I have to say" as the highest loading item), *responsive instructional practices* (6 items, "teachers asked me to use critical thinking and reasoning to complete tasks or solve problems"), and *problematic behaviors* (10 items, similar to the teacher scale of the same name, "How much of a problem is…students bringing weapons like knives and guns to school"). Comparing to the Thapa et al.'s school climate dimensions (Figure 2.1), the *supportive social environment* factor fits best within the "relationships" domain, *responsive instructional practices* within "teaching and learning", and *problematic behaviors* within "safety".

[12] This CFA model also included 12 covariances between items on the same factors.

Additionally, I compared student and teacher responses on similar items related to school climate. I specifically compared standardized school-level averages from each respondent group. Appendix Table A2.3 shows that there is a significant correlation (r = .49) between the composite school climate factors based on student and teacher ratings. On individual items about the prevalence of school problems, which were identical on both surveys, there were modest correlations (r = .52 – .71). There was also a moderate correlation between individual teachers' ratings and the school average rating of their colleagues (r = .43). There was almost no correlation between teacher reports of *professional learning and collaboration* and student reports of *responsive instructional practices* (r = –.02) and there was a positive correlation between teacher and student reports of *problematic behaviors* (r = .41).

3) Intent-to-Treat Analysis on School Climate.

Prior to estimating the hypothesized multilevel models for the main analysis, I examined the partitioning of the variance (ICC or intraclass correlation) in each outcome according to each cluster level: school or block. Table 2.5 shows that in the composite school climate variable, as perceived by teachers, 28.4% of the variation resides between individual teachers in the same schools, and 14.2% resides between teachers in the same blocks. Among students, 5.3% of the variation in the outcome resides between students in the same schools, and 8.2% between students in the same blocks. The moderate ICC values among teachers suggests a hierarchical modeling approach would be most appropriate, to account for the non-random distribution of the variance. Although the values are lower for students, I also employed a hierarchical model for this outcome to

avoid potential Type I error which could still be present at even these low ICC values (Musca et al., 2011).[13]

Table 2.8 shows the results from final models estimating the effect of assignment to treatment (RP) on teachers' and students' perceptions of school climate overall. These models, accounting for significant covariates and blocks with dummy variables, were chosen as having the best model fit using the likelihood ratio test ($p < .01$; this test compares the explanatory power, model log likelihood, to the prior model). Estimates of the treatment effect were generally consistent across multilevel model specifications. On average, teachers in schools assigned to RP reported .17 standard deviation more positive perceptions of school climate overall, compared to teachers in control schools ($p < .1$), adjusting for teachers' fulltime status, the only significant covariate. Similar patterns emerge among the secondary outcome: students' reports about school climate. The final model suggests that a student in an RP school reports that their school's climate (overall) is .07 standard deviation units more positive than a student in a control school ($p < .05$), adjusting for students' age, grade, and Hispanic race/ethnicity.

Additionally, I examined the variation in treatment effect by school climate factors. Table 2.8 shows the impact of assignment to RP/DN on the three school climate factors from the factor analysis. Teachers in RP schools generally have more positive perceptions of the support in their school environment, of their professional learning and collaboration, and report fewer problematic behaviors compared to their peers in control schools. Only the effect of treatment on professional learning and collaboration climate is

[13] A 3-level model, modeling schools nested within blocks, was not used or tested because block sizes were not large enough to support a hierarchical analysis at that level.

statistically significant, where on average, teachers in RP schools report .15 standard deviations more professional learning and collaboration compared to teachers in control schools ($p < .05$). According to students' reports, the estimated treatment effects are all positive but slightly smaller in magnitude, compared to teachers. Students in RP schools generally report more supportive social environments, more responsive instructional practices, and fewer problematic behaviors. On average, students in RP schools report .10 standard deviations less prevalence of problems compared to students in control schools ($p < .05$), and .08 standard deviations more supportive social environment ($p < .10$).[14]

4) Intent -to-Treat Analysis on Teachers' Turnover Intentions

As with the school climate outcomes, I first examined the partitioning of the variance (ICC or intraclass correlation) in each outcome according to each cluster level: school or block. Table 2.5 reveals small ICC values (proportions of variation) at the cluster level, indicating that most of the variation in the turnover outcomes resides between individual teachers in the same school or block rather than due to clustering effects: only 3.1% of the variation in school turnover intentions is due to school level variation. Less than .001% of the variation in profession turnover resides between teachers in the same school.

Table 2.8 shows the results of the models estimating the effect of assignment to RP/DN on teachers' turnover intentions. Grade level (middle more than high school) was the only significant covariate in both models, and being an experienced teacher at the school was additionally significant in the professional turnover model (predicting a lower

[14] Greater statistical significance among student school climate factors with smaller magnitude of effects is likely due to the larger sample size and thus, greater power.

likelihood of intending to leave). The effects of assignment to RP/DN on teachers' intentions to stay at their school and in the profession were negative but not statistically significant, consistently across model specifications, indicating that RP/DN assignment was slightly associated with reductions in teachers' likelihood of staying in their position and the profession. These small, insignificant impacts on teachers' intentions suggest that RP/DN program did NOT have the hoped-for effect of encouraging teachers in high-turnover high-poverty urban schools to make a commitment to stay for an extended tour of duty.

However, there is evidence that RP/DN did encourage teachers to be "present and accounted for" at school more often during the current school year. Specifically, I tested the effect of being in an RP school on the extent to which teachers reported that teacher absenteeism is a problem at their school. In the multilevel model incorporating block fixed effects, teachers in RP schools reported less teacher absenteeism among their peers than did teachers in control schools ($p < .05$, $ES = –0.37$).

Discussion

This chapter presented results from the intent-to-treat analysis of a cluster randomized control trial across several U.S. cities of Restorative Practices (RP), in the context of another whole school reform (DN). Although many studies have looked at the relationships between RP and the school environment, the results from this study provide some of the first rigorous, causal quantitative evidence about the impact of Restorative Practices on teachers' perceptions of their schools and their turnover.

The potential of this intervention to improve school climate is an important finding of this study. While the magnitude of the effect sizes of the RP/DN intervention

on teacher and student perceptions of school climate are relatively modest, they are large enough to suggest that the treatment made a noticeable difference. Specifically, the significantly more positive perceptions of school climate at RP schools implies that RP successfully changed student behavior and cultivated a more supportive social environment. Based on survey responses, treatment schools had more positive student interactions and fewer conflicts such as fights and bullying, which are particularly salient for students' enjoyment of school and feelings of safety and belonging there. These findings are consistent with the hypothesized theory of Restorative Justice and RP for schools, which posits that the use of this whole school reform can creating a more positive, welcoming environment, through improved interactions and relationships (Mirsky, 2007). This finding also builds upon the significant beneficial effects on primary outcomes found in the main study of this randomized control trial, where researchers found that RP reduced the probability of students being suspended for 3 days or more by 34%, and reduced severity of disciplinary problems in RP schools by more than one eighth of a standard deviation (Grant et al., in preparation). The finding of the positive effects of RP on school climate are also consistent with prior research from many observational and case studies (e.g., Anyon, 2016; Jain et al., 2014; Lewis, 2009).

The results from this study suggest that schools assigned to implement Restorative Practices, in the context of other whole school reforms, can expect a positive effect on school climate, as perceived by both students and teachers, on average. However, RP did *not* significantly impact teachers' turnover intentions in our sample of high-need, high-turnover schools. On the other hand, RP did reduce perceived

problematic teacher absenteeism. These findings and their implications are discussed in more detail below.

Impact of RP on School Climate

In response to the first research question, *Did assignment to the treatment, RP/DN improve school climate, as reported by teachers and students?,* I found that **teachers** reported a positive impact on school climate, similar to the only other published randomized study of RP, in Pittsburgh (Augustine et al., 2019). The findings in this study, however, have slightly smaller effect sizes (.27 overall compared to .31 on their main outcome) and only one of the three subscales was statistically significant (whereas four of their nine subscales has significantly positive findings).

In contrast to the study from Pittsburgh, however, we found that RP had a positive impact on **students'** perceptions of school climate. In Pittsburgh, students in RP schools reported a .19 ES more negative school climate (on their Tripod composite score). In this study, I found that students in RP schools reported a .15 ES more positive school climate overall. Further, in the current study, the estimated impact was positive for all three subscales (with one statistically significant), where the estimated impacts for all 12 subscales in the Pittsburgh study had negative effects (with 9 statistically significant). The difference in findings between this study and the one in Pittsburgh could be due to the different samples in location (one city, Pittsburgh, versus many cities across the U.S.) or grade level (most of the Pittsburgh study were elementary schools, in contrast to the middle and high schools in this sample). Potentially older students may be able to understand and thus fully participate in RP — for example, adolescent age students may

be more likely to engage in deeper reflection in response to restorative questions, reflecting on their behavior, its consequences, and appropriate restorative solutions.

Exploratory analyses on the 3 climate subfactors revealed that the positive impact of the treatment on **teachers'** overall ratings of school climate was largely due to how the treatment significantly enhanced *Professional Learning and Collaboration* in RP schools ($d = .20$, $p < .05$) and how it led to fewer problematic behaviors in some of the RP schools ($d = .20$, but not significant due to large variation among teachers' reports). The positive impact of the treatment on **students'** overall climate ratings was driven both by the fewer problematic behaviors ($d = .12$, $p < .05$) and more supportive social environments ($d = .15$, $p < .10$) reported by students in RP schools. The magnitude of these effect sizes are relatively modest, but are large enough to suggest that the treatment made a noticeable difference in the climate of RP schools compared to those of the control schools. Specifically, RP successfully changed student behavior and cultivated a more supportive social environment where there are more positive student interactions and fewer conflicts such as fights and bullying, which are particularly salient for students' enjoyment of school and feelings of safety and belonging there.

Impact of RP on Teachers' Turnover Intentions

Regarding the second research question, *Did assignment to RP/DN, increase teachers' intentions to remain at their school?*, this study reports no statistically significant findings. The impact estimates are negative in direction, indicating teachers are more likely to leave schools assigned to RP ($OR = .78$). The lack of statistical significance of these estimates should be interpreted with caution due to potential statistical power limitations. The consistent negative directionality of these results

suggest that this is likely not a null finding and that teachers in schools assigned to RP may be more likely to leave than their peers in schools with other reforms.

Although there was no significant impact on intentions to leave the profession, the findings were similar to intentions to leave the school (confirmed by the lack of a multinomial trend in the data per the Hausman test). In other words, teachers who are leaving RP schools are just as likely to leave the profession as a whole as to seek a different type of school. These similar results could suggest that teachers are not leaving RP schools to get away from RP, but are seeking to get away from the profession as a whole.

Interestingly, I found that teachers in schools with RP reported that teacher absenteeism was less of a problem, compared to their peers in non-RP schools. This exploratory finding raises questions about the complex relationship between absenteeism and teachers' turnover intentions, which has been largely underexplored. One potential explanation for this pattern of findings could be teachers' experiences of moral injury, and related psychosocial feelings (Bryan et al., 2016; Levinson, 2015; Sugrue, 2019). Teachers working in the set of schools in this study are likely to encounter many contextual and societal injustices, such as the high prevalence of trauma, poverty, and racial segregation. Although RP is set up to help students and teachers become critical of injustice, and they may appreciate working in schools with RP, it may also lead to an increased moral sensibility, or awareness of these injustices. Teachers facing the immovable injustices mentioned above, can then feel a moral injury and powerlessness, which has been shown to predict greater intentions to leave (Sugrue, 2019).

The nonsignificant but negative impacts on turnover intentions may also partially reflect the limited time frame of the study: the first two years of RP implementation. Higher turnover intentions during this initial implementation period may reflect the resistance of teachers to a large change in the approach of the school or their resistance to the counter-cultural mindset change of Restorative Justice compared to traditional punitive approaches (Vaandering, 2013). Potentially, teacher turnover (and turnover intentions) may level off after these initial years when teachers who disagree with RP have left. Additionally, as teachers witness the positive impacts of RP (such as improving the school climate) they may be more willing to buy in to this large mindset change and be more likely to stay. Future studies could look into the dynamic relationship between RP implementation and teachers' satisfaction and turnover over time to examine whether this hypothesis holds.

Finally, these findings add to the nascent literature on the impact of whole school reform on teacher turnover and are some of the first published findings about the effect of RP on teachers' job attitudes and turnover. Most whole school reforms acknowledge the importance of teachers in instruction and implementation but less often evaluate how these reforms impact teachers and the teacher workforce in schools. Future studies are needed that collect both quantitative *and* qualitative data from teachers to evaluate the impact of whole school reforms on their satisfaction and retention. Regarding RP in particular, future studies could investigate teachers' experiences of RP, including its psychological impacts and social validity, adding to the literature on teachers' perceptions of its implementation and true "justice" orientation (Lustick, 2017a; Rainbolt, Fowler, & Mansfield, 2019). Additionally, the interesting pattern of findings between

problematic absenteeism and turnover intentions call for future studies examining these aspects of teachers' experiences. Teacher absenteeism is often perceived as a precursor of turnover and signal of burnout (Mowday et al., 1982) that is costly to school budgets and instruction (Bruno, 2002). Descriptively, in this study, I found only a weak correlation between school-wide problematic teacher absenteeism and individual teachers' turnover intentions. More research is needed to identify how prevalent problematic absenteeism is among teachers in underserved schools and how school level and individual teachers' absenteeism relates to teacher turnover and attempts at whole school reform.

Limitations and Next Steps (Tensions and Tradeoffs)

There are several limitations to this study that deserve extended comment. It was not possible to test whether the randomized design of the study succeeded in achieving baseline equivalence in school climate and teacher turnover intentions between the groups of schools, though there was evidence of baseline equivalence on school characteristics. And though the study involves schools from large urban districts across the country, the non-random sampling of schools does not allow for robust generalizability to schools outside the sample. At the same time the sample includes schools from seven large urban districts across the country that all faced a diverse set of challenges, serve large shares of low-income students, and who are thus the most frequent target for reforms. One question to be addressed in Chapter 3, is whether these schools were able to fully implement RP or if they seemingly lacked the organizational capacity and resources to actualize the intervention.

As with many long-term whole school randomized control trials, there were difficulties in following the entire sample through the extended years (Years 4 and 5)

which are the focus of this study. The reduced analytic sample, representing nine or ten of the twelve blocks depending upon the outcome measure, appears balanced but is likely not representative of the original sample, potentially retaining only schools with more interest in reform or greater organizational capacity. Additionally, the reduction of the analytic sample produced power issues that may have limited my ability to detect statistically significant effects, particularly among the teacher sample and prevented me from a full investigation of the variation by site. Future replication in larger samples can address these potential issues.

The examination of RP in nine randomization blocks across six U.S. cities is one the strengths of this study. The results may prove to be generalizable to other similar large, urban school districts in the United States. But, there was substantial variation in the impact estimates across blocks. This suggests that future causal studies with a larger sample of schools and districts will be able to add to the results presented here and test how they do or do not hold across different contexts and types of schools.

The findings from this study are specific to RP in the context of another whole school intervention (DN in this case). Although we know that there was not a significant effect of DN on reducing exclusionary disciplinary and problematic behavior in the years prior to the introduction of RP (Corrin et al., 2016), the emergence of such impacts after RP was added to the DN intervention in Years 4 and 5 (Grant et al., in preparation) does not tell us if RP would have had the same impacts if it had been implemented without the foundational school reforms that DN provided. I am unable to adjust for the Diplomas Now intervention because of the complimentary and combined nature of these two interventions in treatments schools in this study and the pre-specified intent-to-treat

analysis of the combined interventions. The next chapters will attempt to disentangle the effects from these interventions and their constituent components (or associated practices). This experimental situation, however, is in some ways more realistic than attempting to study RP in isolation, since no school is a lab or controlled environment that is able to hold all else constant. Particularly in turnaround schools, many interventions are running simultaneously, so this study enables us to identify and study particular interventions in combination, and RP in a particular instructional context.

There is the potential for selection bias in my impact analyses of teachers' outcomes (due to teachers selecting in and out of schools during the study period) which I cannot adjust for or quantify in these anonymous teacher data. For example, it is possible that teachers who were unhappy with the reforms implemented in study schools — the RP/DN reform program in treatment schools, and/or the variety of other reforms in control schools — left study schools prior to the time our outcome measures were collected in the final year of this extended study. If so, the negative but nonsignificant impacts of RP on teachers' turnover intentions reported here may be misleading. Nonetheless, our results are an illuminating snapshot of the current faculty's turnover intentions at the end of the second year of RP implementation.

Finally, the turnover intentions variable, compared to actual turnover, reflects teachers' prospective plans. Their final decisions to stay or leave (not available in these data) were undoubtedly impacted by the opportunities and constraints they encountered in the job market.

Conclusion

The evidence from this study of the positive impact on school climate of the combined Restorative Practices/Diplomas Now intervention should be useful as school leaders make decisions about interventions to improve their school environments and the outcomes for their students. In addition to the impact of the combined interventions on student disciplinary outcomes (Grant et al., in preparation), the positive effect on school climate found in this study is important in its own right. Future studies that examine the impacts of implementing RP on its own (without another whole school reform occurring simultaneously) in a large sample of schools will be important for expanding the evidence base for this intervention. It is also important to pursue future investigations of the more complex relationship between RP and teacher attitudes and outcomes (including their career intentions and actual turnover decisions). Improving the school experience for both teachers and students is a critical measure of positive educational change. Preparing future citizens to resolve conflicts in ways that repair harm and restore relationships is a goal worthy of more focused research attention.

Chapter 3 — Are Teachers Actually Getting Restorative? Variation in Restorative Practices Implementation and Its Impact on School Climate and Teachers' Turnover Intentions

Educational equity in America remains elusive as opportunity, school climate, and disciplinary gaps persist in schools across the nation (L. Darling-Hammond, 2015; Gregory, Skiba, & Noguera, 2010; Voight, Hanson, O'Malley, & Adekanye, 2015). Many schools experiencing these disparities are also racially and economically segregated, struggling to operate organizationally with fewer resources, and have warning signals of high teacher turnover, low school climate ratings, and poor student performance (Ladson-Billings, 2006; Papay et al., 2017). Restorative Practices (RP) is one intervention that intends to address these issues. As Restorative Practices primarily targets high poverty, high needs schools, where teacher turnover is also high, it is imperative to know how this program affects teachers' commitment to their schools.

The whole-school RP model is hypothesized to improve the overall climate of the school, which should lead to better working conditions for teachers that would induce them to stay (Costello et al., 2009; Simon & Johnson, 2015). However, implementation of RP has been found to vary and critics of RP question whether it can actually accomplish this ambitious goal where so many other interventions have failed before (Augustine et al., 2019; Dominus, 2016; Gottfredson & Gottfredson, 2002; Gregory & Evans, 2020). Whole-school interventions generally face issues in implementation and buy-in that prevent real differences in the amount of actual services received by

participants. Dobson and Cook (1980) therefore suggest that the amount of service received by participants should be measured and incorporated in analyses of program outcomes. Otherwise, the evaluator may make a "Type III error," judging a program ineffective even if it has significant beneficial effects on those teachers and students who receive adequate service (Scanlon, Horst, Nay, Schmidt, & Waller, 1977). The service contrast resulting from being assigned to implement RP may vary within and across participating sites due to differences in individuals' and schools' readiness to make the ideological and cultural changes that underlie these practices (Lustick, 2017b; Wadhwa, 2015).

In this study, I examine how the variation in the implementation of the RP intervention was associated with variation in its effects on teachers' perceptions of school climate and teachers' turnover intentions. Herein, implementation refers to both uptake of the intervention (also called fidelity to the intervention; e.g., training according to the program model) within the treatment schools, as well as usage (also called fidelity to implementation of the interventions' practices, captured in both the treatment and control schools). I specifically examine how RP was implemented in conjunction with another whole school intervention, Diplomas Now, in a randomized control trial of 33 schools (including 17 treatment schools) across 8 urban districts in the United States. I then examine whether the extent of implementation helps to explain how RP influences school climate and teachers' turnover intentions.

Literature Review

Teacher Turnover Interventions

Teachers play a pivotal role in the classroom — when teachers leave their schools their students lose the benefit of their experience and skills as their school faces the burden of replacement and loss of organizational knowledge (Barnes et al., 2007; Ronfeldt et al., 2013). High teacher turnover rates in U.S. schools and fears of teacher shortages have prompted policy interest in interventions to improve teacher retention (Sutcher et al., 2016). Pay initiatives, for performance or otherwise, have shown mixed, but ultimately limited results (Clotfelter et al., 2008b; Pham, Nguyen, & Springer, 2020). For example, Glazerman, Protik, Teh, Bruch, and Max (2013) found that incentive pay attracted a small portion of high performing teachers to move to lower performing schools, but the effects on turnover only lasted the two years that the pay incentive was being paid out. Similarly, Clotfelter et al. (2011) analyzed teacher data from North Carolina and concluded that the pay increases needed to induce teachers into high-poverty and majority minority student populations are too large to be practical. Mentoring for new teachers has also shown promising but mixed results (Glazerman et al., 2010; Ingersoll & Strong, 2011).

There has been a specific focus on retaining teachers in hard-to-staff schools, where a) turnover can be almost double the rate of the average school (Ingersoll, 2004), and b) there is already a lower distribution of high quality and experienced teachers (Lankford et al., 2002). Thus far, few interventions aimed at improving traditionally under-resourced schools have evaluated their effects on teacher turnover. A few have even promoted the fact that although they induced more teacher turnover, the teachers

who left were of lower quality, implying that the turnover was a positive outcome (e.g., DC IMPACT, Adnot, Dee, Katz, & Wyckoff, 2016). However, it remains unclear whether this loss over the long term is productive for schools who bear the burden of replacement and churn, and whether this "productive" but high turnover is sustainable. When implementing new programs in schools, it is important to know not just how they affect student outcomes, but also how they affect the organizational functioning of the school and teachers' experiences. Interventions that help students in the short term, but harm teachers and the school's capacity in the long term may not be worth the investment.

The Interventions: Restorative Practices with Diplomas Now

Restorative Practices is one intervention which aims to improve not only student outcomes (including behavior), but also the whole school culture and learning. The present study draws on data from a randomized control trial of two whole school interventions: Restorative Practices (RP), also known as restorative justice practices, in combination with Diplomas Now (DN). Diplomas Now is a whole-school transformation intervention aimed at improving graduation rates and school perseverance in the lowest performing and highest poverty schools by identifying and addressing early warning indicators (Corrin et al., 2014; Corrin et al., 2016; Sepanik et al., 2015). Within the Diplomas Now framework of academic and organizational supports (see Figure 2.4 in Chapter 2), the RP components additionally seek to build a positive school culture and community rooted in the belief that all people are worthy and relational, i.e., everyone deserves respect and dignity and seeks a sense of belonging and mutual concern with others in our community (Evans & Vaandering, 2016; Gonzalez, 2012). RP is both a) an

alternative approach to school discipline (in contrast to traditional punitive models) which emphasizes repairing relationships and restoring wrongdoers to the community, and b) an approach to positive school culture (and individual) development (Costello et al., 2009). The integration of these support systems is theorized to lead to better outcomes through a more holistic approach with additive program effects (Domitrovich et al., 2010).

Some individual teachers or schools have adopted individual RP practices (e.g., Restorative Circles, RC; Ortega, Lyubansky, Nettles, & Espelage, 2016), but the whole-school RP model is gaining in popularity and advocated as the more effective approach (Trevor Fronius et al., 2016; Gregory & Evans, 2020). The whole school model has shown potentially greater promise to improve the whole culture and climate of a school (Armour, 2015; Jain et al., 2014). Because RP involves such a culture change from the norm in most schools, systems and shared practices and approaches from all teachers and students can reinforce one another's efforts to adopt and practice a restorative ethos.

The *SaferSanerSchools* model, from the International Institute for Restorative Practices (IIRP), is one of the leading whole school approaches being adopted by schools across the United States and is the model which is studied here. The *SaferSanerSchools* model articulates 11 essential practices: 1) affective statements, 2) restorative questions, 3) small impromptu conferences, 4) proactive circles, 5) responsive circles, 6) restorative conferences, 7) fair process, 8) reintegrative management of shame, 9) restorative staff community, 10) restorative approach with families, and 11) fundamental hypothesis understanding. Costello et al. (2009) provides more information on all of these practices, and a summary of their guide is provided in Appendix Table A1 (also see the IIRP

overview: *SaferSanerSchools: Whole school change through Restorative Practices*, 2020).

Connecting to prevention research models, these practices can be implemented in a three-tiered system of supports (González, Sattler, & Buth, 2019; Mirsky, 2011; Morrison, Blood, & Thorsborne, 2005). Popular in public health and prevention research, breaking down interventions into tiers can help to target efforts within a whole school intervention (Bradshaw, 2013; Walker et al., 1996). Some practices occur among all school members, while certain, more time consuming or intensive practices focus on those classrooms or students where harm-producing offenses and conflicts are most prevalent and/or severe. Primary prevention practices are those implemented school-wide among all staff members and students; these practices seek to establish an overall culture and ethos of restoration and caring. Affective statements, the most informal practice, encourage school members to reference their feelings and caring when speaking to one another. Secondary practices are those practiced among smaller groups – among classrooms or with an RP coordinator - that respond to conflict as situations arise. Responsive circles, for instance, are a more formal circle process designed to address conflict or harm among individuals involved in a specific situation or incident. Finally, targeted or tertiary practices are reserved for particularly serious or harmful events. Restorative conferences, one of the most formal practices, involve all affected individuals and are led by a trained RP facilitator who follows a script. A school employing RP has several approaches to the issue of bullying, for example; all students may engage daily in proactive circles in their classroom to discuss how bullying makes them feel, but they will only occasionally participate in a restorative circle to address an instance of bullying,

and likely only a small portion of students will ever participate in a restorative conference about a major incidence of bullying that had large consequences.

Whole School Interventions

RP is one of many school interventions which were developed to be implemented at the whole school level, in accordance with organizational theory (Bryk et al., 2010; Desimone, 2002). Because the school is a larger system composed of several interdependent systems (e.g., curriculum, discipline policy, parents, community), discrete interventions which only target one of these systems may not have an impact because the other untargeted systems still affect the school's system overall (Bryk et al., 2010; Davis, Sumara, & Sumara, 2006; Holme & Rangel, 2012). For instance, RP is sometimes implemented as only a disciplinary system, used to respond to conflict and misbehavior; this limited implementation model is more likely to fail because it lacks the reinforcement from the proactive, community building elements of RP that both prevent incidents of conflict and facilitate the restorative process (Mirsky, 2011).

RP is often compared to school-wide positive behavior interventions and supports (SWPBIS), a more widely researched and implemented program that emphasizes recognizing and celebrating positive behavior (rather than emphasizing negative consequences for misbehavior). Both interventions seek whole school change and can be described as providing an alternative approach to discipline, aiming to reduce the number of disciplinary offenses and improve school climate. Research has shown SWPBIS improves school climate and decreases bullying and problem behaviors (Bradshaw et al., 2008; Bradshaw et al., 2015; Waasdorp, Bradshaw, & Leaf, 2012). Additionally, a few studies have shown that SWPBIS's positive effects extend to teachers — for example,

reducing burnout and improving their self-efficacy (Ross, Romer, & Horner, 2011; Ross et al 2012) — but many of these findings have not been replicated. Shelby (2016), for example, found that teachers in SWPBIS schools reported higher levels of emotional exhaustion.

In SWPBIS, as in RP, staff members implement a tiered model of supports to encourage positive school climate and behaviors. Unlike RP, however, SWPBIS uses a system of rewards and incentives to encourage positive behavior and retains a fairly traditional system of consequences (at various levels to match the severity of any offenses or violations committed). SWPBIS is grounded in behavioral theory, specifying behavior changes (i.e. teachers recognizing and rewarding positive behavior) that produce more desirable behavior outcomes (i.e., student compliance; Swain-Bradway et al., 2015).

RP also employs corrective consequences but focuses first on the people involved in an incident: victims, offenders, and their support systems. RP aims to develop a consensus among these people regarding what needs to happen to "make things right." RP builds this consensus by engaging in a timely dialogue process where the offending students (and faculty/staff) are held accountable for their behavior and come to better understand the impacts of this behavior on others. Additionally, the offender recieves help to productively manage feelings of shame and stigmatization and to pursue restitution, harm reduction, improved relationships, and reintegration into the school community. RP is a model that seeks to change the whole school culture, or "way we do things around here", which are the deeper roots that support a positive school climate (Deal & Peterson, 2016; Evans & Vaandering, 2016).

RP Outcomes for Schools and Teachers

Overall, RP aims to create a positive learning environment, cultivate healthy relationships, and heal and repair conflict in a school community (Evans & Vaandering, 2016). Thus far, schools implementing RP have shown large drops in negative behaviors (such as violent acts, International Institute for Restorative Practices, 2009) and the use of punitive and exclusionary disciplinary responses (office referrals, suspensions, and expulsion, Armour, 2013; Riestenberg, 2003b). Additionally, RP schools have witnessed growth of more positive learning environments (including prosocial views and less disruptive behavior, Mirsky & Wachtel, 2007), relationships (student connectedness and student-teacher relationships, Gregory et al., 2016; McMorris et al., 2013), and individual development (student self-efficacy, Jain et al., 2014).[15]

Although RP seems to be producing strong outcomes for students, its effect on teachers is less clear. Case studies and mixed methodology studies have found generally positive reactions from teachers surrounding RP (Guckenberg, Hurley, Persson, Fronius, & Petrosino, 2016; Jain et al., 2014; McCluskey et al., 2008). Gregory et al. (2016) found a positive association between teachers' use of RP and their relationships with their students and Augustine et al. (2019) found that teachers in schools assigned to implement RP reported more positively about their school environments. Yet, no studies have examined how RP may influence teachers' perceptions of their job, particularly their intentions to remain at their school. Teacher turnover can be a costly and substantial problem for many high poverty schools; it is unclear whether increased burden on

[15] See S. Darling-Hammond et al. (2020) for the most recent review of the evidence about RP in U.S. schools.

teachers from implementing RP would induce further turnover or if improved student and school outcomes from RP would encourage teachers to stay (Hurley et al., 2015).

Implementation Matters

Experimental studies with random assignment can provide the most robust evidence in support of the efficacy of such whole school interventions (Shadish, Cook, & Campbell, 2002). However, social experiments requiring humans to comply with treatment assignment and implementation often veer from the intended intervention and evaluation plan (Orr, 1999). Fidelity of implementation (also called treatment integrity or adherence) captures how core components of the program are delivered and followed by participants (according to assignment, when applicable; Dusenbury, Brannigan, Falco, & Hansen, 2018). Schools are one of the most common sites for interventions, but program implementation in schools is generally low due to the complexity of school organizations, with their many dynamic systems, as discussed above (Gottfredson & Gottfredson, 2002). Whole-school interventions aim to provide a holistic approach that acknowledges the many layers of a school; yet, they can be more prone than discrete interventions to low implementation due to their many moving parts and the diffusion of responsibility for action among members of the school community (Dusenbury et al., 2018).

The common presence of implementation issues makes it necessary to gather and analyze information about the implementation for valid evaluations of interventions. First, measuring implementation provides descriptive information about what is actually happening. With such great variability between (and even within) schools, implementation measures can document and evaluate the role of this variability in the desired outcomes. Second, fidelity of implementation often relates to the impact an

intervention has on the desired outcomes (Durlak & DuPre, 2008; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Without measuring and accounting for implementation, an intervention may appear ineffective, when it is really not being implemented. This is an example of Type III error – correctly rejecting (or not rejecting) the null hypothesis but for the wrong reasons. If an intervention was never implemented in the first place (or was not implemented as assumed by assignment), researchers' statistically correct conclusions about the efficacy of an intervention will be invalid (Scanlon et al., 1977). Finally, measures of implementation and how they relate to the effect of an intervention on its desired outcomes provide information that aids future replications. This information helps to further develop program theory which can ultimately help to improve the intervention and provide greater impacts in future iterations.

Models of Implementation

RP theorists have thus far applied the *Diffusions of Innovation* theory to help explain RP implementation (Blood & Thorsborne, 2006; Costello et al., 2009). Diffusions of innovation theory posits that implementation of new interventions is foundationally a social process whereby participants pass along the intervention and various groups take up or join in the intervention over time (Beets et al., 2008; Rogers, 2003). These groups include innovators, who are always seeking new ideas and first pick up the intervention. Then, if they succeed, the intervention will then spread to the early majority (pragmatists who see it can work), late majority (more conservative group against upsetting the status quo), and finally to the laggards (more cynical resisters to any sort of change). In an implementation of RP, for example, although all teachers may receive training

simultaneously, only a portion of teachers may actually implement proactive and restorative circles regularly. If these teachers seem to be achieving success with their students, then other teachers who were more hesitant may also begin to try more circles with their students.

This model of implementation can be operationalized into measurable components that identify specific aspects of RP implementation. Many implementation researchers posit five dimensions of implementation: adherence (the number of components delivered as prescribed), dosage (frequency or duration of the program), quality of delivery (how program components are delivered), participant responsiveness (how much participants engage with and positively perceive the intervention), and program differentiation (the unique features of the treatment which are essential for its successful implementation; Dane & Schneider, 1998; Durlak & DuPre, 2008; Dusenbury et al., 2018). An alternative framework for treatment integrity simplifies these five components into three: structural fidelity (or delivery; did leaders provide time and space for circles?), dosage fidelity (receipt; did teachers attend RP PDs?), and process fidelity (enactment; did teacher use RP with their students? Hill & Erickson, 2019; Schulte, Easton, & Parker, 2009).

Nested within schools, teachers' implementation of RP within their classrooms and other school areas is inherently affected by their administrators' implementation of RP training and support. Fidelity can thus be divided into two parts: 1) fidelity to implementation (leaders' set-up and facilitation of the intervention, also called uptake, encompassing delivery and receipt of the intervention) and 2) fidelity to the intervention (teachers' and students' usage of the interventions, or enactment and process fidelity;

Hulleman, Rimm-Kaufman, & Abry, 2013). Similar to how implementation of RP with students relies on teachers, provision of RP to teachers relies on principals and their designated RP leaders. Although many studies assume complete training is delivered or occasionally evaluate training delivery as an external moderator (e.g., Durlak & DuPre, 2008), few have examined potential multi-dimensions of this factor. For example, exposure within the school can be measured in part by the number of circles, but at the whole school level could be measured by the number and length of training sessions teachers, staff, and other community members receive (as organized by the principal and RP leadership). Additionally, teachers' use of circles can be theoretically described as their responsiveness to the training, facilitation, and modeling that the administrator provided.

RP Implementation

As a newer intervention, systematic and rigorous evidence about the implementation of RP remains limited (S. Darling-Hammond et al., 2020; Gregory & Evans, 2020). Among case studies, researchers have notes that implementation of RP remains difficult and varied and may also be affected by a school's climate and structural capacity (Anyon, 2016; McCluskey et al., 2008). Recent results from a randomized control trial among grades 6 and 7 revealed large difficulties implementing RP as designed, resulting in no impact findings via an intent-to-treat analysis, but descriptive impacts based on RP usage (Acosta et al., 2019). Teachers play a key role in the implementation of RP and often voice the importance of and needed improvement in implementation support, particularly staff training (Gregory et al., 2016; Gregory & Evans, 2020; Mayworm et al., 2016). The modest body of RP implementation studies

describes several challenges teachers and schools face in this process. Augustine et al. (2019) found that lack of time, student behavior, and unclear school policies related with the implementation of RP in their RCT in Pittsburgh, reflecting themes found in other observation studies of RP (Blood & Thorsborne, 2005; Evans et al., 2013; Jain et al., 2014; Morrison et al., 2005).

Conflict with previous practices can create resistance and hinder the buy-in necessary from staff members. For instance, many schools implementing SWPBIS have recently begun adopting RP; however, a potential clash in values between these programs could prevent the full integration of restorative justice into the school culture (Swain-Bradway et al., 2015; Vaandering, 2010b). For example, creating a system of rewards and incentives is an essential component of SWPBIS, but rewards and incentives are NOT elements of RP. Instead, RP relies on ongoing, systematically-structured communications of expectations, accountability, feelings, and ideas, e.g., personal expressions of feeling in response to behavior, restorative questioning in small impromptu conferences or responsive circles to resolve lower-level incidents, and structured restorative conferences in response to serious or recurring incidents. RP also relies on the development of caring relationships and transparent fair processes that assure people that their expressed feelings and ideas are being taken into account.

Thus, the "first response" of SWPBIS and of RP to incidents is often quite different. For example, "increasing the number of Caught in the Act reward tickets issued during Advisory" (to students who display well-behaved active participation) is a typical SWPBIS response to unacceptable levels of disruptive behavior in morning advisory periods (Baker & Ryan, 2014, p. 90). In contrast, RP's recommended response has

teachers of affected advisory periods facilitate a responsive circle with their class that places responsibility on each advisory's students for analyzing and solving the problem. Likewise, when offenses and violations occur despite schoolwide efforts to support positive behaviors, some schools implementing SWPBIS fall back upon a fairly standard set of increasingly punitive levels of corrective consequences for the students who are not responding to the school's reward system. Whereas, the RP approach explicitly customizes consequences and restitution agreements based upon dialogue and consensus obtained during restorative circles or conferences in which the students and adults involved systematically reflect on the incident together — its causes and impacts — and then propose ways of healing the damaged relationships and the other harms the incident caused. The RP approach is designed to help offenders hear the voices of those they have negatively impacted and embrace meaningful, authentic consequences and restitution efforts to make things right and help the offenders recover their good name and good standing in the school community.

Experimental studies of SWPBIS implementation, which has a greater evidence base of rigorous research, found that implementation varied (Bradshaw et al., 2015), and, where implemented below expectations, resulted in less marked behavioral and academic changes (Cook et al., 1999; Jolivette et al., 2014). Notably, Cook and colleagues (1999) found that SWPBIS did not improve student achievement if it could not change school climate. This variation in implementation can be partially explained by school and classroom characteristics. Features like size and grade-level, leadership support, and teacher efforts matter (Kam, Greenberg, & Walls, 2003; Pas, Waasdorp, & Bradshaw,

2015). Previous studies of RP have found that the high school environment presents more difficulties and leads to more variable results (McCluskey et al., 2008).

A Mediation Model of Implementation

Studying indirect effects of programs, sometimes called the mechanism or mediator, provides valuable information about program effectiveness (MacKinnon, 2012; MacKinnon & Dwyer, 1993). There are several strengths to a path analysis approach to the study of implementation as the mechanism by which a program realizes its effects. First, a mediation analysis can test whether a program had effects on the constructs and processes it was designed to change. Assignment to RP trainings should result in greater experienced trainings for teachers in RP and their increased use of actual RP practices. However, researchers have continually demonstrated the difficulty of implementing large scale, whole school reform models: providing the actual training, sustaining the support, and observing changes in the school and teacher practices (e.g., Acosta et al., 2019; Botvin, 2004; Flannery, Fenning, Kato, & McIntosh, 2014).

Second, this process analysis, examining the mechanisms for a program's effects, helps to identify which program components are most effective or which need further development or measurement (Russell, Kahn, Spoth, & Altmaier, 1998). Third, a process analysis can help examine and explain null effects of either the mediating variable or of the program itself and examine the impact of crossover cases (i.e., uptake of RP in control schools). Fourth, a mediation analysis can test the significance of particular mechanisms in explaining the observed program effect. For example, classroom circles may or may not have a greater effect on teachers' experiences than the use of affective statements. Finally, a path analysis, or structural equation modeling, approach

specifically allows me to simultaneously test multiple implementation components and multiple outcomes (incorporating their collinearity into the model rather than having to reduce them to a single variable; Kline, 2016).

Figure 3.1. *Hypothesized Causal Chain (Treatment Theory)*

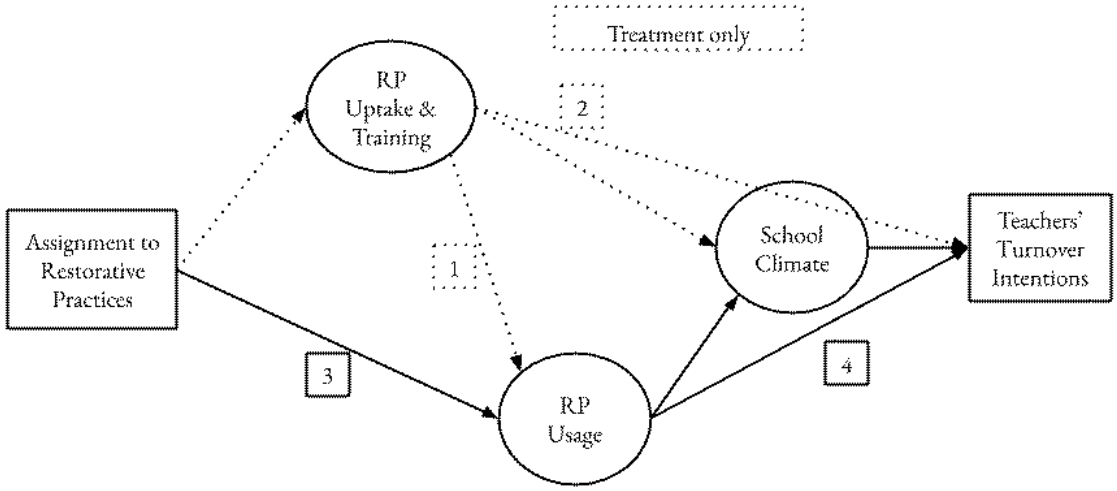
Overview of the Current Study

This study uses a process analysis, involving a series of path analyses, to test the hypothesized causal chain connecting assignment to RP and teachers' turnover intentions, as described above and in Figure 3.1. This study adds to the literature base around RP by examining the direct and indirect effects of assignment to RP (with Diplomas Now, RP/DN) on school climate and teachers' turnover intentions via implementation: (a) uptake among treatment schools and (b) usage in both treatment and control schools. I specifically investigate the following research questions (also summarized in Figure 3.2):

1) Among schools assigned to RP/DN, how does variation in uptake relate to variation in RP usage?
2) Among schools assigned to RP/DN, how does variation in uptake directly relate to variation in school climate and teachers' intentions to remain at their school and indirectly through RP usage?

3) Did assignment to RP/DN increase the usage of RP in treatment schools, compared to control schools?
4) How does variation in usage of RP help to explain the impact of RP/DN on school climate and teachers' intentions to remain at their school and does RP usage help to explain this relationship?

Figure 3.2. *Conceptual Model of RP Assignment, Implementation, and Teachers' Turnover Intentions*



Note. The numbers in the figure above refer to the research question associated with a given path (or pair of paths) in the model.

Method

Study Design

Data for this study came from a larger five year randomized control trial (RCT) evaluation of the Diplomas Now intervention which focuses on supporting students to graduate by monitoring and improving the ABC early warning indicators: attendance, behavior, and course performance (see Corrin et al., 2014, for full information about the first phase of the Diplomas Now RCT). Implementation of Diplomas Now in the

treatment schools of the larger study began in 2011 (Wave 1 Schools) and 2012 (Wave 2 schools). The sub-study of Restorative Practices began in 2014 when treatment schools in a subset of the larger study's randomization blocks began implementing RP (i.e., combining RP with their ongoing implementation of DN). In this chapter, I examine school climate and teachers' turnover intentions in the final year of the sub-study (2016) as my dependent variables of primary interest.

School Sample and Recruitment

Sixty-two schools agreed to participate in the original Diplomas Now study based on interest expressed at the district and principal levels. Recruitment focused primarily on schools in districts that already had partnerships with Communities in Schools and City Year to facilitate the startup of the Diplomas Now program (due to a short turn around time between recruitment and the beginning of implementation). Schools were divided into blocks based on their district and school level (middle or high school). Within blocks, schools were then randomly assigned to treatment (Diplomas Now) or control (business as usual) conditions, resulting in 32 schools being assigned to the Diplomas Now intervention. Assessments of baseline equivalence at the point of randomization confirmed a balance between the two groups within each block on student demographics, teacher preparation, and student achievement (with the exception of small but significant differences in the proportion of Hispanic students, high school English proficiency on state tests, and teachers experience, Corrin et al., 2014).

In 2014, 33 schools (all of the schools from 12 of the original blocks from the Diplomas Now study, representing eight districts) agreed to participate in the Restorative Practices sub-study based on expressed interest from leaders of the treatment schools in

these blocks (excluding one school that agreed but then closed before the beginning of the study). In these blocks, all 17 treatment schools were additionally assigned to Restorative Practices (training, support, and implementation which began in 2014-2015 in 16 of these schools and began in 2015-2016 in 1 of these schools) and all 16 control schools remained in the business-as-usual control condition. Table 2.1 in the previous chapter (2) provides descriptive statistics for the schools in the sample, disaggregating by treatment status. Full information about and testing of baseline equivalence is provided in the previous chapter (2) and the report from Corrin and colleagues.

Participants and Analytic Sample

This study particularly looks at teacher and student surveys from the second year of the Restorative Practices study (Spring 2016). The analytic sample for this study includes blocks where teachers from at least one control and one treatment school responded to the Spring 2016 survey (which contained the measure of the outcome variable). This reduced sample includes teachers in 9 of the 12 blocks and 25 of the 33 schools. Within the 9 "complete" blocks, 686 teachers responded.[16] Table 3.1 provides school and teacher characteristics for the two treatment conditions in the analytic sample at the time of the Spring 2016 survey. Per school, an average of 35 teachers responded to the survey (with observed number of teacher responses ranging from 5 to 122), and an average of 194 students responded to the survey (ranging from 55 to 813).[17]

[16] Treatment school only analyses were conducted with respondents in the 11 schools in the reduced analytic sample (for which there is also data from the control schools) and were also replicated with respondents in the full sample of 15 treatment schools.

[17] Student surveying was targeted at students in the grades especially targeted by Diplomas Now, specifically grades 6 and 9.

Attrition

Attrition is defined at the school level as schools that either closed or did not respond to the 2016 teacher survey. Attrition is defined at the school level because treatment was assigned at the school level and because individual teachers and students were not uniquely identified in data collection and cannot be tracked over time. Table 2.2 provides an overview of the sample response numbers within each block. Several schools did not respond to the Spring 2016 survey, including two of the treatment schools and seven of the control schools in the Restorative Practices sub-study. Anecdotally, these schools had zero or low response rates due to surveying fatigue (e.g., administrators choosing not to permit surveying in 2016 or conveying to staff that it was a low priority). The 2016 survey was the sixth year of surveys for some schools who had expected only four years at the onset of the original DN evaluation study. Baseline equivalence analysis in the prior chapter established the equivalence between treatment and control groups in the analytic sample (see Table 2.4).

Measures

Exogenous Variable: Assignment to Restorative Practices and Diplomas Now (treatment)

This was a binary variable, coded as 1 for all teachers in schools randomly assigned to Restorative Practices as part of the RCT (including schools that received training for only one of the two years), and 0 for teachers in schools that were not randomly assigned to Restorative Practices.

Endogenous Variables: Outcomes

Teacher's intentions to stay. Turnover intentions was coded based on individual teacher's response to one item, "Which *best describes* your future intentions for your professional career?" For the discrete (binary) outcome, intentions to remain in their school, teachers' responses were coded into two categories: *stay* ("remain in this school") or *leave* ("transfer to a different school in the district," "transfer to a different district," "find a job in a private school or a charter school," or "leave the teaching profession"). This variable was coded: *leave = 0*, *stay = 1* so that this variable can be interpreted as teachers intending to stay at their current school.

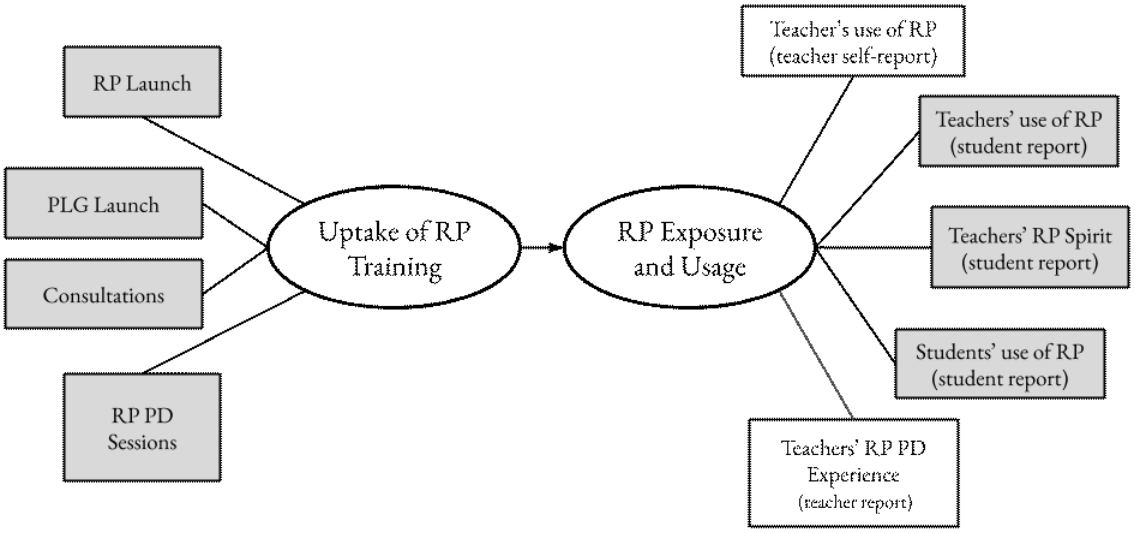
School Climate. Teachers responded to 17 items which asked them to rate their school climate. (A full listing of the items is included in the Appendix.) Teachers' reports were examined at the individual level. My full approach to measurement of school climate, using a factor analysis, is described in more detail in the prior chapter. In brief, for this chapter, I modeled school climate as a composite of all the items (i.e., *teachers' school climate rating* overall). Individual items were standardized to account for different scales across items asking about environmental supports, professional learning and collaboration, and problematic behaviors. The composite showed high internal consistency, Cronbach's alpha = .88 for all 17 teacher-reported items.

Endogenous Variables: Implementation Mechanisms

Two aspects of implementation were measured: uptake of the intervention's training and professional development regimen and exposure to and use of RP reported by teachers and students. *Uptake of the intervention's training and professional development regimen* (herein referred to as uptake) assessed leadership's uptake of the

intervention (i.e., fidelity to the training regimen, implementation of program components). *Exposure and use of RP reported by teachers and students* (herein referred to as usage) assessed the amount of RP related practices that teachers and students observed at their school or used themselves (similar to the concepts of teachers' and students' fidelity to the intervention's practices in the implementation literature; O'Donnell, 2008)**.** Exposure and usage was measured in both the treatment and control schools.

Figure 3.3. *Model of Implementation Measures - Uptake and Usage Components*



At the time of the study there were no validated measures of uptake or usage of Restorative Practices that could be used in both treatment and control schools (i.e., did

not contain RP specific terminology).[18] Therefore, these measures draw on trainer observed compliance measures and study designed self-reported items from students and teachers about the prevalence of practices similar to RP. The components of uptake and usage are summarized below and in Figure 3.3.

Uptake of Training was designed to capture (within treatment schools) each school's fidelity to the model of training that they agreed to at the beginning of the intervention and which is suggested by IIRP for the RP model assessed in this study. Most implementation studies focus on the prevalence of practices, which forms my second measure of fidelity. Due to the observed variation in training received during the experiment, I believed it was important to additionally examine the role played by uptake in addition to usage. Durlak and DuPre (2008), along with other implementation theorists, often theorize uptake as a predictor of usage of the program. I thus model this implementation variable as preceding the second implementation variable.

Uptake was measured by four variables describing the amount of RP training that was delivered[19] to the school as part of the trial (described below), which are all reported at the school level by the RP facilitators (trainers) who worked with each school. These measures were used to by training and research staff to measure each school's participation in training and to diagnose which schools needed further outreach and supports from program staff during the intervention's two years of formal intervention

[18] More recently, Gregory and colleagues have investigated checklist and observation based measures of intervention fidelity (Gregory, Gerewitz, Clawson, Davis, & Korth, 2013; Gregory, Ward-Seidel, & Carter, 2019).

[19] Delivery, thus, differs from receipt of supports, as some schools received RP supports through other sources (such as their central district office).

supports (in order to establish the foundation of practices that would sustain beyond these two years).

1) **RP Launch (Green)** reflects the rating given to each school by RP training staff at the end of year 1 of implementation of RP in order to identify which schools would need the most targeted assistance in Year 2 of implementation. This is a measure of adherence to the program in the first year (and could also be called structural fidelity; Hill & Erickson, 2019). Schools were rated as "green" if they were using RP at high levels after the first year trainings and would be focusing on sustainability in Year 2. Schools were identified as "yellow" if they were performing at baseline at the end of Year 1, aiming for more consistency in Year 2, and were targeted for more intensive supports from the training team in Year 2. Finally, schools were labeled "red" if they refused Year 2 supports, discontinuing their training, and or (in the case of one school) were not able to launch training or RP implementations until the beginning of year 2. The RP Launch variable was coded to identify schools who had a strong launch (rated green): *green* = 1, *yellow* or *red/discontinued/other* = 0.
2) **Professional learning groups (PLG) launch** assesses whether schools had received support (via a training session) to begin their professional learning groups and is a measure of the RP dosage. This item was coded 1 for a school which the trainer reported had begun their PLG meetings and 0 for schools which had not.

3) **Professional development (PD) Sessions** is a count of how many IIRP sessions the trainer delivered to the school. The whole-school change model from IIRP includes four day-long, on-site professional development sessions for all teachers and staff: Introduction to RP, Using Circles Effectively, and Facilitating Restorative Conferences, and Family Engagement. For each training, a school was coded 1 for having received the professional development and 0 for not having received it from IIRP staff.[20] The four items were then summed (in an index) to get scores in the range of 0 to 4; their internal reliability was adequate (Cronbach's α = .71). As IIRP specifies all four PD sessions as part of the treatment plan, this was used as the threshold for the index.
4) **Consultations** records the number of consultation visits from an IIRP training staff member to help the school develop and refine their practices (and is also a measure of dosage). The reported number of consultations ranged from 0 to 4[21] and was treated as continuous. Four consultations were included in the original treatment plan as the suggested number to support implementation and was thus used as the threshold in the binary item.

Finally, I also model uptake as an index (sum) of a binary version of variables two through four (all measures of dosage, each coded as 0 = *did not meet threshold*, 1= *met*

[20] It is worth noting that a few schools from one district declined these trainings from the IIRP staff in this experiment, and are thus coded as 0, because they were receiving similar trainings from their district's Office of Restorative Justice..
[21] One outlier school received seven consultations; this school's value was recoded to four to facilitate data analyses.

threshold). The three items were summed to get scores of the number of uptake components completed, ranging of 0 to 3 (Cronbach's α = .70).

RP Exposure and Usage captures how much RP (the intervention) was used in treatment schools and control schools. Sometimes called process fidelity (Hill & Erickson, 2019), usage was measured by 9 teacher and 20 student survey items. Many of these items specifically asked about practices related to the 11 essential RP elements (e.g., proactive circles, restorative circles, feelings expression, restorative questioning, and opportunities for reparation. The full list of items is provided in Appendix Table A3.1.)

1) **Teachers' (self-reported) use of RP** reflects whether teachers implemented the 11 essential elements, or teachers' self-perceived adherence to the RP model of interactions. A scale was created from six items which asked teachers how frequently they use practices associated with RP (from 1 = *never* to 5 = *always*)For example, "How often do you… facilitate dialogue circles to provide opportunities for my students to share feelings, ideas, and experiences?", assessed whether teachers regularly used proactive circles. (Reliability of the 6 teacher-reported items was high, Cronbach's alpha = .84.)
2) **(Students' reports of) Teachers' use of RP** measures students' perceptions of how often teachers used RP approaches, or the dosage of RP they received from their teachers. This concept captures not only whether teachers used RP practices, but how frequently and consistently they employed them. Students responded to five questions about how often teachers employed or modeled RP practices on a scale from 1 = *not at all* to 5 = *always*. For example, "How

often...do your teachers talk about their feelings?" assessed students' perceptions of how often teachers' use affective statements. The 5 items had high internal reliability, Cronbach's alpha = .93.

3) **(Students' reports of) Teachers' RP Spirit** measures more specifically *how* teachers delivered RP practices, including their attitude, interest, and ethos in how teachers employed RP. (This could be called quality of delivery; Dusenbury et al., 2018.) For instance, a teacher could frequently ask students restorative questions, but ask them in a way that showed the teacher is not listening or interested in the student's response. An example item related to this asked students how much they agreed that, "When someone misbehaves, do your teachers…ask questions in a respectful way?" Students reported on 6 items on a scale from 1 = *not at all* to 5 = *always*, (Cronbach's alpha = .91).
4) **Students' (self-reported) use of RP** assesses how much students acquired, adopted, and employed RP practices themselves, which could be labeled participant responsiveness: one element of process fidelity (Dusenbury et al., 2018; Hill & Erickson, 2019). Students reported on 5 items that asked how frequently over the past year did their behavior in response to conflict reflect a restorative ethos, on a scale from 1 =*never* to 5 = *7 or more times*. For example, "How many times did the following things happen this year?…I supported students who I saw being hurt, even if there were no adults around." The 5 items had high internal reliability, Cronbach's alpha = .88.
5) **Teacher's (self-reported) RP professional development (PD) experiences** captures whether teachers were ever exposed to professional development

about RP. This measure (across both treatment and control groups) assesses the diffusion of the intervention and could also be called program differentiation (Dusenbury et al., 2018). It was created from three items reported by teachers about the professional development they have ever received related to RP, including: Restorative Practices, dialogue circles, and facilitating conferences to respond to wrongdoing. These items were coded 1 for ever having received this professional development and 0 for never having received. The three items were then summed to get scores in the range of 0 to 3. Internal reliability was adequate (Cronbach's α = .71).

I originally hypothesized that these 29 items would load onto five factors reflecting Dan & Schneider's (1998) five components of program integrity: adherence, dosage, quality of delivery, responsiveness, and differentiation. I attempted to model uptake and usage as latent variables composed of sub-scales through an exploratory factor analysis of the items discussed above and a confirmatory factor analysis of the scales above (to model and account for measurement error and allow for the correlation between the factors, Kline, 2016). The models did not converge on a solution or the solution had poor model fit. Thus, I pursued the index of uptake thresholds (which were correlated), but treated usage measures independently because of their low correlations with one another (and distinct variation; see Table 3.2b for the correlations).

Covariates

I adjusted for a set of teacher and school characteristics to account for factors that relate to implementation and the primary study outcomes that might introduce bias into my estimates. To retain a more parsimonious model, I only retained covariates which

significantly related with at least one endogenous variable in the model (i.e., usage variables, school climate, or turnover intentions). To account for teachers' characteristics, I included binary variables for experience (1 = *new to the school*), non-traditional certification (1 = *alternative or emergency certification*), advanced educational attainment (1 = *advanced degree, Master's or greater*), and role (1 = *full-time classroom teacher*). Regarding school level characteristics and demographic makeup, I adjusted for school grade level (1 = *middle school*, 0 = *high school*), enrollment (number of students), proportion of students from racial and ethnic minority backgrounds, and proportion of student from low-income backgrounds, via eligibility for free and reduced-price lunch). I also included a covariate for the instances of exclusionary discipline to adjust for the prevalence of student misbehavior prior to the start of the trial. This measure comes from data reported by the administrators to the Civil Rights Data Collection (CRDC) for the 2013-14 school year; I summed the total number of out-of-school suspensions and expulsions and used a logarithmic transformation of this sum (to account for the extreme left skew; i.e., many low values near 0 and few high values). Finally, I included a set of dummy variables (i.e., fixed effects) in the full sample models to adjust for the blocks in the experimental design.

Analytic Approach

I used a structural equation modeling (*sem* in Stata 14.0) approach to answer my research questions. Also called path analysis, SEM allows me to simultaneously estimate direct, indirect, and total effects among the variables of interest in my research questions. I calculated the indirect effects using the product of coefficients method (Hayes, 2009; MacKinnon, 2012). This method allows me to statistically examine and test the

significance of the whole indirect effect and also to examine all of the individual pathways in the absence of statistical significance for certain paths.

Prior to the main path analysis, I examined the distributions of and correlations between the main variables of interest (see Tables 3.2a and 3.2b and Figures 3.4 and 3.5), testing for normality, skewness, kurtosis, and linearity. Although the uptake variables were not normally distributed (see Figure 3.4), being partially discrete in nature, I did not transform the continuous variables into binaries based on specification tests which revealed that more information was lost with that approach. The continuous RP usage variables (Figure 3.5) and school climate appeared to be normally distributed. In simultaneous models predicting the continuous RP usage and school climate measures I thus used a linear regression estimator.

The outcome of turnover intentions, an endogenous variable in the proposed model, is discrete in nature, and therefore inherently non-normal. In this case, ordinary least squares or linear regression would generally be inappropriate for the model of turnover because the outcome variable is discrete, violating the OLS assumptions of homoscedasticity and normal distribution, which could result in predicted values outside the actual 0 – 1 range (MacKinnon, 2012). However, it can be appropriate to use a linear probability model (i.e., a linear regression function for a binary outcome) in a path analysis when predicting multiple paths (Hellevik, 2007), and when the predicted probabilities for the binary outcome are not at the extremes (near 0 or 1). In this case, the distribution of the predicted outcome is near normal and the linear probability model is thus preferred (Heckman & Snyder Jr, 1996). I chose to pursue this more parsimonious and more easily interpretable estimation method because of the heavier burden logistic

regression modeling would have placed on the estimation within the structural equation modeling framework (due to the greater number of paths and variances estimated).

I tested the fit of the model and strength of covariances and components, to ensure the models were over-identified, with model $df \geq 1$. I assessed the fit of the models based on the following criteria: Root-mean-square error of approximation (RMSEA) less than .06, comparative fit index (CFI) and Tucker-Lewis indicator (TLI) greater than .95 (.9 for adequate fit), and Standardized Root Mean Square Residual (SRMR) < .08 (Browne & Cudeck, 1993; Hooper, Coughlan, & Mullen, 2008; Hu & Bentler, 1999; Kline, 2016) I also report the chi-squared fit test (X^2), but was cautious in using this statistic for modeling choices because it is sensitive to sample sizes above 400 (which my sample for research questions 3 and 4 is). I also tested model modifications to eliminate insignificant paths and achieve greater parsimony.

The results from the final estimated model are presented in standardized coefficients to aid interpretability of the results by standardizing the scales across variables enabling the comparison of estimated path coefficients. I also used a resampling with replacement method of 5,000 bootstrap samples to obtain a more precise measure of the standard errors for the indirect paths. This bootstrapping method generates and averages many estimates of the indirect paths to prevent any bias due to the potential non-normality of the product coefficient and difficulty of accurately measuring this path (e.g., low power, MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

Model Specification: Clustering and Missing Data

All of my structural equation models account for the clustering of teachers within schools by estimating cluster-robust standard errors (Stata option *vce[cluster school*]). It

is important to account for the non-independent groupings of teachers to avoid Type I error from artificially reduced variation due to this clustering. I chose to account for clustering via standard error adjustment rather than using a multilevel SEM (MSEM) because MSEM models incorporate additional estimation burdens, estimating each path at each level, that would make convergence difficult with the sample size in this study and the number of paths in my models. (Kline, 2016). The unique effects at each level were not the focus of this study, and thus, I preferred the method that would appropriately adjust for the clustered structure of the data without adding unnecessary complexity to the models.

Analyses that ignore cases with missing values using listwise deletion (analyzing only complete cases) can introduce bias into their estimates. Thus, I account for missing data using full information maximum likelihood (FIML) estimation via the Stata estimator for maximum likelihood missing values (option *method[mlmv*]). FIML estimation incorporates information from all cases on the variables where they are observed without imputing values for missing variables. This modeling approach assumes multivariate normality and that missing values are missing at random or missing completely at random. However, because this assumption is not fully testable, I also tested the robustness of this choice by also examining models without this option, using listwise deletion instead.

Part 1: Treatment only schools

Research Question 1: Among schools assigned to RP/DN, how does variation in uptake relate to variation in RP usage? After descriptively exploring the variation in uptake of the program in treatment schools, I compared the variation in uptake of RP

training among treatment schools with their actual usage of RP by examining the descriptive results of uptake and usage measures with cross tabulations, visual comparisons at the school level, and separate OLS regression models to examine the effects of each uptake variable (RP Launch, PLG Launch, consultation, and PD sessions) on each usage variable (teachers' self-reported use, students' reports of teacher use, students' reports of teachers' RP spirit, students' self-reported use, and teachers' RP PD experiences).

I present and discuss below the results from my final, structural equation model of the relationships between uptake and usage, which allowed me to model all of the usage variables as outcomes simultaneously. In the initial model building phase, I tested several operationalizations of the uptake variables (e.g., as binaries, as an index of binaries) and several model structures (e.g., usage and uptake as latent variables). I chose my final operationalizations and structures based on the model fit (i.e., data) and what was most meaningful or relevant (i.e., according to the literature). Additionally, I tested models excluding the RP Launch variable, specifying the RP Launch variable grouping yellow with green, or and as the three categories separately, as it captures, in an alternate way, some of the same data captured in the other uptake measures. These models had slightly worse model fit and results were generally consistent across modeling choices, so I chose the most parsimonious, single model and variable solution.

The final model includes school level covariates predicting all endogenous variables (the usage variables in this model), covariations between the student-reported usage measures (student-reported teacher use and student-reported teacher RP spirit, student-reported teacher RP spirit and student self-reported use, and student-reported

teacher use and student self-reported use). Additionally, teachers' RP spirit (as reported by students) and their self-reported RP PD experiences predicted their own usage of RP. I retained these paths and the correlations in the models to answer research questions 2 – 4 as well.

Research Question 2: Among schools assigned to RP/DN, how does variation in uptake directly relate to variation in school climate and teachers' intentions to remain at their school and indirectly through RP usage? I first examined the descriptive results from cross tabulations, visual comparisons at the school level, and regression models predicting the effect of uptake (as an index) and usage on school climate and teachers' turnover intentions. To answer the second research question, I estimated a structural equation model to simultaneously estimate direct, indirect, and total effects among these variables. I specifically estimated the direct effect of uptake on usage, school climate, and teachers' intentions to stay and the indirect effect of uptake on school climate and teachers' intentions to stay via RP usage. I similarly specified the model details and estimation as described to answer research question 1, with the same set of covariates (again predicting all endogenous variables: here usage, school climate, and turnover intentions), correlations, and paths among the usage variables.

Part 2: Treatment and Control Schools

Research Question 3: Did assignment to RP/DN increase the usage of RP components in treatment schools, compared to control schools? Research Question 4: How does variation in usage of RP help to explain the impact of RP/DN on school climate and teachers' intentions to remain at their school and does RP usage help to explain this relationship? I used one structural equation model to simultaneously

estimate direct, indirect, and total effects to answer research questions 3 and 4. I specifically estimated the: (a) total effect of RP assignment on each outcome and total combined indirect paths through RP usage, (b) direct paths from RP assignment to each outcome (accounting for RP usage) and to RP usage, and from RP usage to each outcome, and (c) indirect paths from RP assignment to each outcome through RP usage. To test these effects I also estimated a series of models excluding each of the paths specified. I then compared the fit of the models using a likelihood ratio test. More parsimonious but significantly different models (based on the likelihood ratio test statistic) indicate that the less parsimonious model is preferred because less explanatory information is lost. I also report the Bayesian Information Criteria (BIC) value: higher BIC values also indicate that more information is lost in the fitted model.

Results

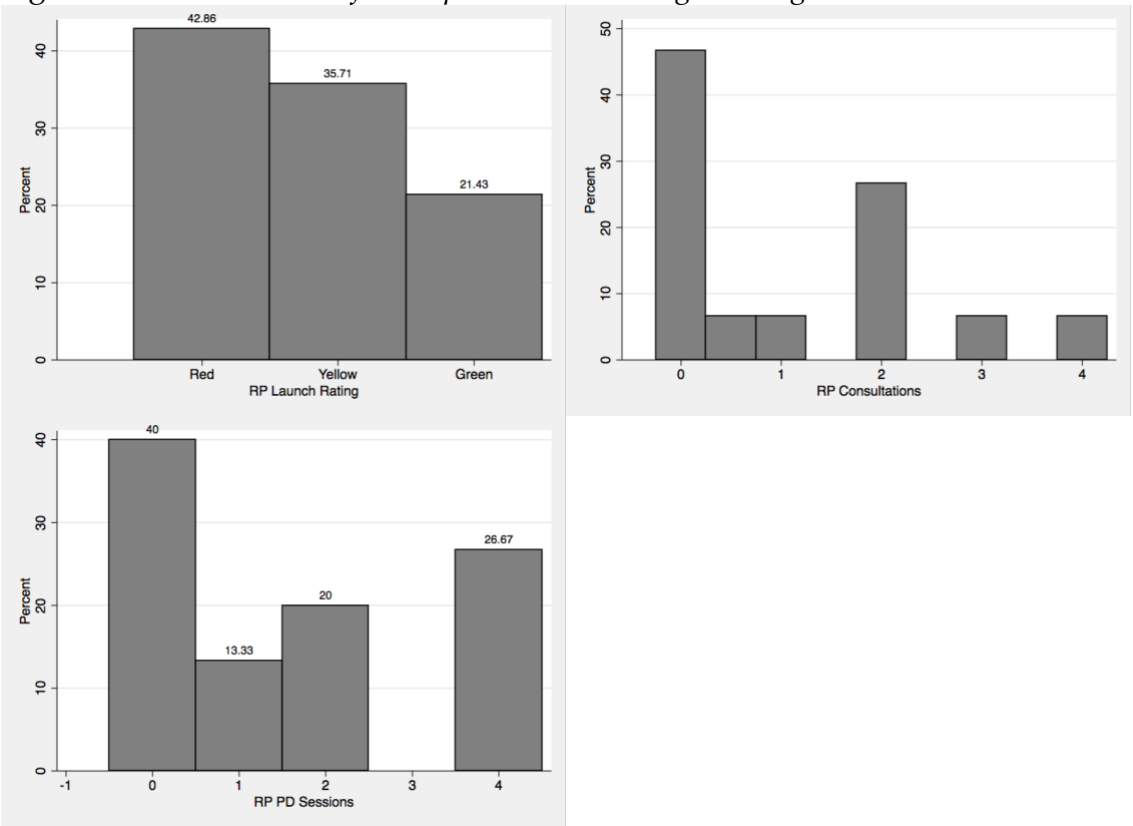
Descriptive Results

Schools were randomly assigned to their treatment condition in 2010 or 2011 and were balanced at that time (as described in the prior chapter). Table 3.1 describes the school and teacher characteristics of the teachers in the analytic sample for this study in 2016. School demographics remain similar, but at the individual teacher level, teachers in control schools appear to be more likely to have more teaching experience (in the profession and at their school), less likely to have an advanced degree, and more likely to be in a full-time classroom teaching role or SPED teaching role.

The correlations in Tables 3.2a and 3.2b provide evidence for the relationships of interest in my research questions, justifying my pursuit of the more complex analyses that follow. These also show that the continuous measures have adequate reliability and

substantive variation for the structural equation models. In brief, Table 3.2a's analysis of teachers in treatment schools, implies a negative relationship between uptake measures and the outcomes of interest, and a mix of positive and negative associations between usage measures and the outcomes. Both tables also confirm a positive association between school climate and turnover intentions. Among the whole sample in Table 3.2b, RP usage measures related only to school climate. Although some of the expected relationships are not large (e.g., $r = -.02$, $p > .1$, between teachers' RP spirit and teacher's intentions to stay), I pursued my next multivariate model due to several substantive and statistically significant associations and to test my hypotheses.

Figure 3.4. *Distributions of RP Uptake and Training (Among Treatment Schools)*



Note. Trainer reports in exact percentages of schools are provided above each bar in the graphs.

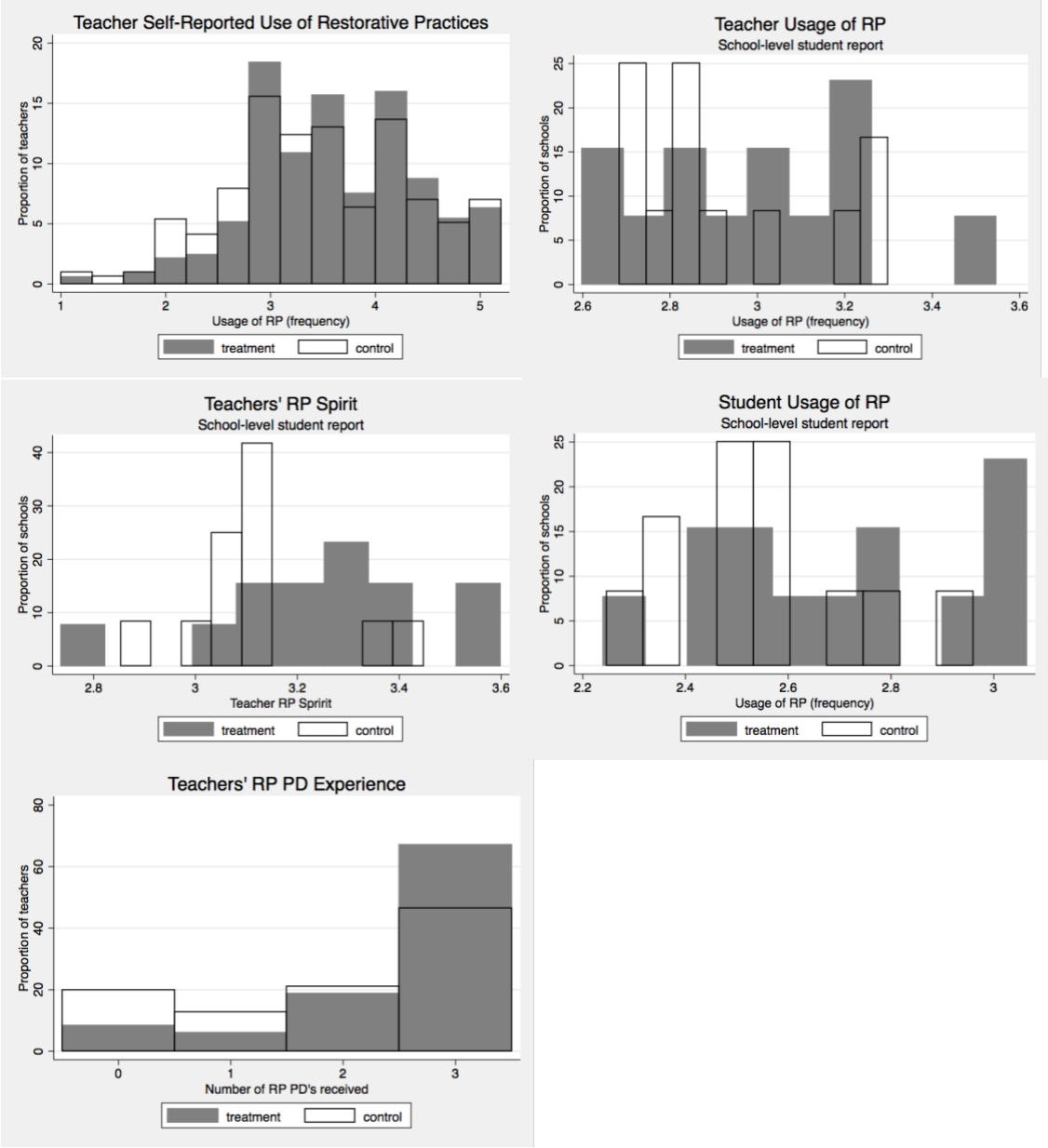
Figure 3.4 illustrates the distribution of uptake and training of RP (delivered via the intervention program as part of the randomized control trial) among treatment schools, as reported by program staff. The graphs illustrate wide variability in the supports received by each of the treatment schools in the study. After the first year of implementation, only 21% of schools were identified by program staff as fully implementing RP looking to develop sustainability in their second year. After the second (and final) year of implementation supports, 72% of schools had started their professional learning groups, almost half (47%) of the schools had received no consultations, and only one treatment school had received the recommended four. Finally, only 27% of the schools received all four RP PD sessions from the training staff, with 40% of schools receiving none of the RP trainings from RP staff as part of the trial.[22]

Figure 3.5 next describes the actual usage of RP practices, comparing teachers in the treatment and control groups. Overall there are observable differences between the treatment and control groups in RP usage but these are not as large as might be expected. Looking more closely at each measure of usage, most teachers self-reported frequently using RP, averaging around 3 or 3.5 (between sometimes and often), though more teachers in the control group reported using RP infrequently (below sometimes, 3 on this scale). The graphs of teachers' usage of RP and RP spirit, as reported by students at the school level, show the greater proportion of treatment group schools fall at the higher

[22] As previously mentioned, some of these schools refused these trainings from the trial because they received similar ones at the district level.

end of the frequency scale (though, of note, the lowest school on each student-reported usage scale was a treatment school). Finally, individual teachers' reports of their RP PD experiences do indicate a trend where teachers in treatment schools were more likely to receive PD on RP; however, over 50% of teachers in the control group reported they had at some point received PD on all three RP training topics.

Figure 3.5. *Distributions of RP Usage by Treatment Group*



My final descriptive analysis illustrates the variation in the treatment effect estimates on school climate and teachers' intentions to stay (Appendix Figures A3.1 and A3.2). These estimates are based on the intent-to-treat analysis in the prior chapter, probing potential block-treatment interactions. Although the sample size was not adequate to pursue this model in the prior chapter, these exploratory visuals of the block-treatment variation provide further impetus for this chapter's investigation of the potential reasons behind this substantial variation in treatment effect, by examining the potential explanatory role of RP uptake and usage.

Measurement Models

No measurement models were included in the final models addressing the study's research questions. I tested measurement models for the items and scales measuring uptake and usage, as implied by Figure 3.4, but the measurement models had poor fit. For parsimony's sake, I utilized an index of uptake (a sum of the binary measures of whether schools met pre-specified thresholds on the uptake variables) that had high reliability and when put in the structural models produced a good fit. Additionally, to be consistent with the prior chapter's analysis of school climate, I modeled school climate in this chapter as an observed variable (and composite).

Structural Equation Modeling

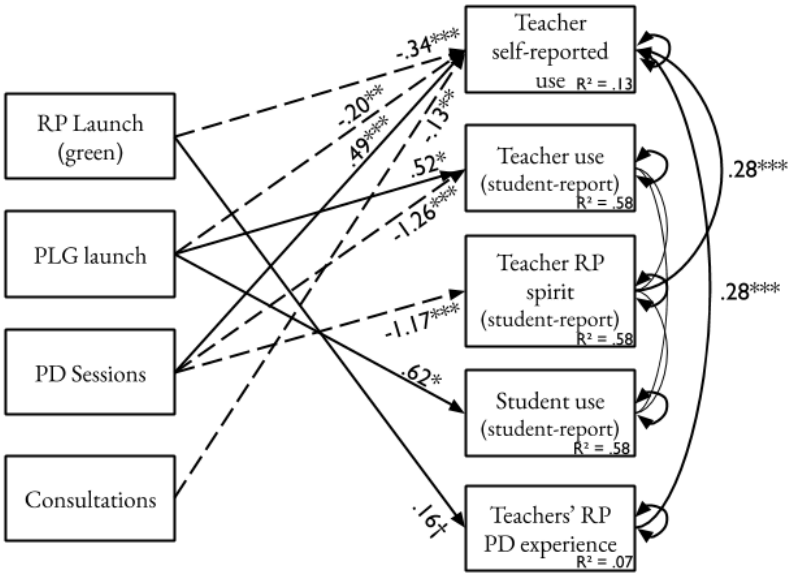
Research Question 1 – Uptake and Usage among Treatment Schools

I confirmed the adequacy of the uptake and usage variables (e.g., variation, reliability, distributions, correlations) and the sample. Figure 3.6 illustrates the structural model of the relationships between the uptake and usage variables, accounting for missing data, the nesting of teachers within schools, and school-level covariates. Model

fit was good, as confirmed by several indices: X^2 (5) = 8.5, RMSEA = .05 [.00, .10], CFI = 1.0, TLI = .98, SRMR = .02, model R_2 = .98.

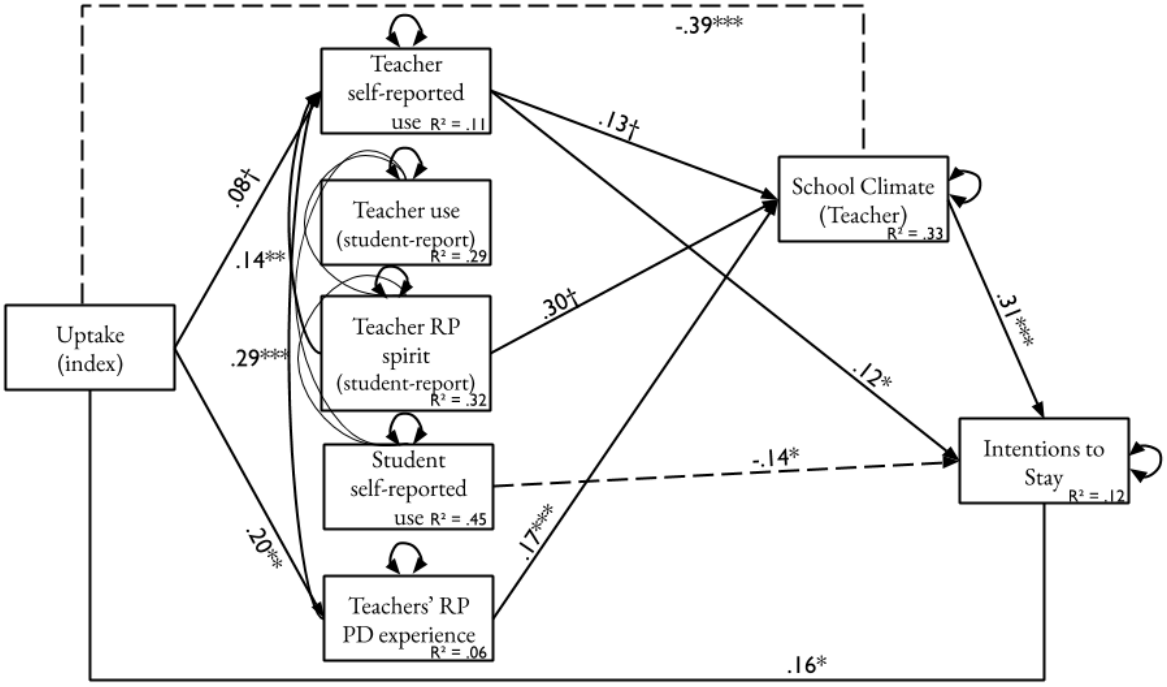
Figure 3.6 illustrates the varied relationships between the uptake and usage measures. All of the uptake measures, for instance negatively predicted at least one usage variable, and all but consultations positively predicted at least one more usage variable. All uptake measures predicted individual teachers' self-reported use of RP, but three of the nine paths were negative (more uptake predicting less usage).

Figure 3.6. *Path Analysis Between Uptake and Usage - Treatment Only*



Note. N = 353, using maximum likelihood with missing values estimation. RP = Restorative Practices; PLG = professional learning groups; PD = professional development. Only statistically significant paths are shown. Dashed lines indicate negative, statistically significant paths. Standardized coefficients are reported. Covariates include school-level demographics: % students on FRL, % students from racial/ethnic minority background, and school enrollment. Standard errors were calculated to adjust for the clustering at the school level. Model fit indices: X^2 (5) = 8.51 (p = .13), Root mean square error approximation (RMSEA) = .05 [.00, .10], comparative fit index (CFI) = 1.00, Tucker-Lewis index (TLI) = .98, Standardized Root Mean Square Residual (SRMR) = .02, Model R_2 = .99.
†p < .10; *p<.05; **p<.01; ***p<.001

Figure 3.7. *Path Analysis between Uptake, Usage, and Outcomes - Treatment Only*



Note. N = 353, using maximum likelihood with missing values estimation. RP = Restorative Practices; PD = professional development. Only statistically significant paths are shown. Dashed lines indicate negative, statistically significant paths. Standardized coefficients are reported. Covariates for all endogenous variables include use of exclusionary discipline prior to the launch of RP in treatment schools (logged count of out-of-school suspensions and expulsions) and school-level demographics: % students on FRL, % students from racial/ethnic minority background, and school enrollment. Standard errors were calculated to adjust for the clustering at the school level. Model fit indices: X^2 (5) = 10.07 (p = .07), Root mean square error approximation (RMSEA) = .06 [.00, .11], comparative fit index (CFI) = 1.0, Tucker-Lewis index (TLI) = .96, Standardized Root Mean Square Residual (SRMR) = .02, Model R_2 = .99.
†p < .10; *p < .05; **p < .01; ***p < .001

Specifically, teachers a school receiving a green rating reported receiving more PD but lower personal usage of RP. Launch of the professional learning groups (PLG) also predicted lower teacher self-reported usage but higher teacher use and student use (from the student perspective). Interestingly, PD delivery via the IIRP trainers was not related to PD receipt as reported by individual teachers (p < .10). The number of trainer-

reported PD sessions delivered to the school as part of the intervention did positively predict greater teacher self-reported RP usage, but predicted much lower student-reported teacher use and teacher RP spirit. Finally, the number of RP consultations was only associated with less teacher self-reported usage of RP. Among the usage variables, teachers' self-reported PD experiences and student-reported RP spirit predicted their own self-reported RP usage. Student self-reported use of RP was correlated with students' perceptions of how often teachers used RP and teachers' RP spirit.

Research Question 2 – Uptake Path Analysis among Treatment Schools

Identifying the path model. The next path analysis, presented in Figure 3.7, estimates how uptake (now modeled as an index) related with the outcomes of interest and how the usage variables helped to explain these relationships. Uptake in this model assessed the number of thresholds met for the various measures included in the prior model; for example, instead of accounting for the number of consultations, this measure assessed whether schools met the recommended number of four consultation visits. This model included paths between uptake and all usage variables and outcomes, between all usage variables and both of the outcomes, and the three correlations and two extra paths specified in the prior model (e.g., the path from teachers' PD experiences and teacher self-reported use of RP). The over-identified model ($df = 5$) had good fit: X_2 (5) = 10.07, p = .07; RMSEA = .06 [.00, .11]; CFI = 1.0; TLI = .96; SRMR = .02.

Total, direct, and indirect effects. Total, direct, and indirect effects related to the research question are presented in Table 3.3 and Figure 3.7. Most paths and estimates are in the expected, positive direction: the more RP uptake, the more RP usage, positive the school climate and greater likelihood of teachers' intending to stay. The exceptions to this

included a negative path (and total effect, both $p < .05$) between students' self-reported use of RP and teachers' intentions to stay; however, the total effect of uptake on teachers' intentions to stay was not statistically significantly negative ($p > .10$). Additionally, the residual direct effect of uptake and total effect of uptake on school climate were both statistically significantly negative ($p < .01$).

The total effect of uptake was significantly positive only on teachers' RP PD experience, ($\beta = .20$, $p < .01$). Dividing the negative total effect of uptake on school climate into direct and indirect components, uptake positively related with school climate through teachers' RP PD experiences ($\beta = .02$, $p < .01$) but had a significantly negative residual direct effect ($\beta = –.39$, $p < .001$). Regarding the effect of usage on the outcome of teachers' intentions to stay, although the total effect was not significant, uptake positively indirectly related with intentions to stay through teachers' RP PD experiences and school climate ($\beta = .005$, $p < .05$), and there was a positive residual direct effect ($\beta = .12$, $p < .05$). Among the usage variables, teachers' self-reported use positively predicted both outcomes of interest directly ($\beta = .13$; .12). Additionally, teachers' RP Spirit and RP PD experiences directly predicted greater teacher self-reported use and school climate ($\beta = 30$, $p < .10$; $\beta = .17$, $p < .05$).

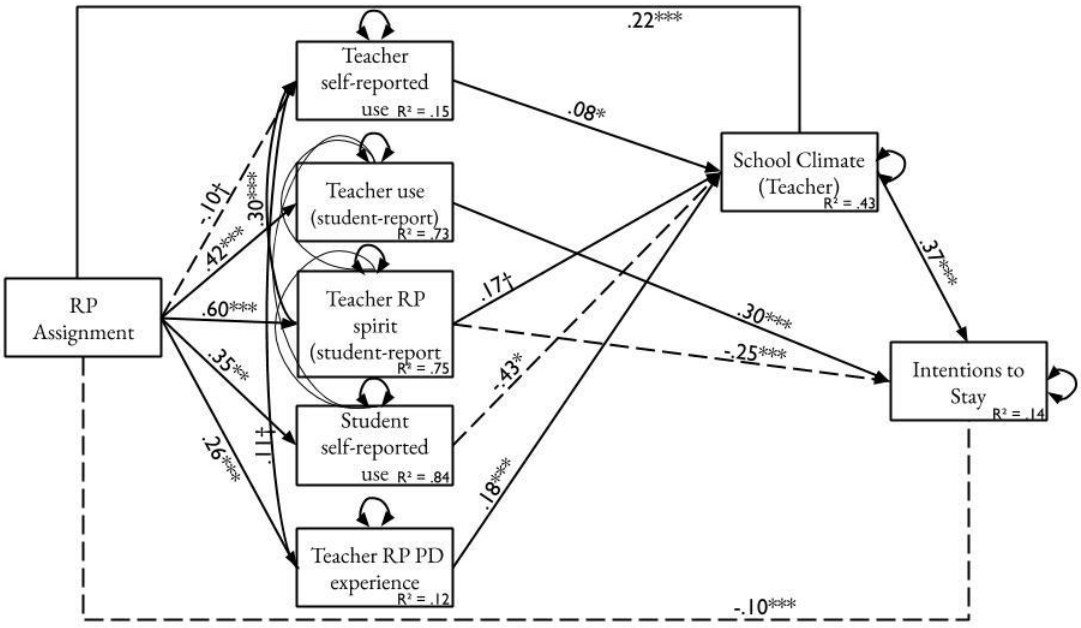
Research Questions 3 and 4 – Usage among Treatment and Control Schools

Identifying the model. Figure 3.8 next shows my specified model that examines the direct and indirect effects of assignment to RP on school climate and teachers' turnover intentions, including the hypothesized usage mechanism variables. This model is over-identified with model $df = 5$ and includes three covariances between the errors of the usage variables as shown in the prior model. This model also includes the same internal

paths as the prior model and adds additional covariates to adjust for teachers' background and role (middle grades school level, new teacher status, advanced education, nontraditional certification, and full-time classroom role) which I am able to do in this model due to the increased sample size. The model fit was adequate: X_2 (5) = 12.57, p =.03; RMSEA = .05 [.02, .09]; CFI = .1.0; TLI = .94; SRMR = .01.

I compared this full model (1; as shown in Figure 3.8) to a model (2) without the b paths (paths from usage variables to the outcomes) to test the significance of the indirect impact of the usage variables (i.e., how well the usage variables help to explain the relationship between assignment to RP and school climate and teachers' turnover intentions). Table 3.4 shows the model fit comparisons which confirm the significance of these combined mediating paths: removing these paths from the model statistically significantly decreases the model fit. Comparison of the full model with model 3, which removes the c' path (the residual direct effect of RP assignment on turnover intentions and school climate after adjusting for RP usage) indicates a comparable model fit, meaning that the residual impacts of RP assignment on the outcomes (the part which is not explained by RP usage) is not large; removing these paths does not statistically significantly reduce the model fit (compared to model 1). Finally, in model 4, I tested the removal of insignificant b paths (those not marked with a line in Figure 3.8): the fit statistics here are unclear which led me to retain these paths and prefer model 1 due to my theoretical questions.

Figure 3.8. *Path Analysis Between RP Assignment, Usage, and Outcomes*



Note. N = 686, using maximum likelihood with missing values estimation. RP = Restorative Practices; PD = professional development. Only statistically significant paths are shown. Dashed lines indicate negative, statistically significant paths. Standardized coefficients are reported. Covariates for all endogenous variables include block fixed effects, use of exclusionary discipline prior to the launch of RP in treatment schools (logged count of out-of-school suspensions and expulsions), school-level demographics (% students on FRL, % students from racial/ethnic minority background, and school enrollment), and teacher background (grade level, new teacher status, advanced education, alternative certification, and full-time classroom role). Standard errors were calculated to adjust for the clustering at the school level. Model fit indices: X^2 (5) = 12.57 (p = .03), Root mean square error approximation (RMSEA) = .05 [.02, .09], comparative fit index (CFI) = 1.0, Tucker-Lewis index (TLI) = .94, Standardized Root Mean Square Residual (SRMR) = .01, Model R^2 = .99.
†$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$

Total and Direct effects. After confirming model 1 as the preferred model, Table 3.5 and Figure 3.8 present the estimated results from this model. Path coefficients are standardized (to facilitate comparison of effects across different measurement scales). Unlike the prior model with uptake in Figure 3.7, the effect of the main predictor, here assignment to RP, retained a statistically significant negative direct effect on teacher's

intentions to stay (β = – .10; p < .001), after accounting for mediating variables measuring usage. In contrast, the effect (total and direct, after accounting for usage) of assignment to RP on school climate was statistically significantly positive (β = .27, .22; p < .001).

Assignment to RP also had a statistically significant positive direct (and total) effect on all of the usage variables, excepting teachers self-reported greater RP use, which has a negative direct effect but insignificantly positive total effect due to the significantly positive indirect effect through teachers' RP PD experience (β = .12; p < .001). Teachers in RP schools reported more RP professional development experiences (β = .26; p < .001) and students in RP schools reported more self-use of RP (β = .35; p < .01), more teachers with RP spirit (β = .60; p < .001), and more teacher RP usage (β = .42; p < .001).

In turn, looking at the usage variables, teacher self-reported use, students' reports of teacher use, and teachers' RP PD experiences predicted significantly positive direct and total effects on school climate and teachers' intentions to stay. The exceptions to this positive trend were students' self-reported use of RP, which was associated directly with less positive school climate (β = –.43, p < .01) and students' reports of teachers' RP spirit, which was associated negatively directly and overall with teachers' intentions to remain (β = –.25, –.43; p < .01),

Indirect Effects. The total positive effect of RP assignment on school climate includes indirect effects via teachers' RP spirit (as reported by students; β = .18; p < .05) and teachers' RP PD experience (β = .05; p < .001). Interestingly, RP assignment has a negative predicted indirect effect on teachers' intentions to stay through teachers' RP

spirit; however, the indirect effect via both teachers' RP spirit and school climate was positively significant ($\beta = .05$; $p < .05$). There were two other significant indirect effects of RP assignment on turnover intentions via usage and school climate: a positive indirect effect through more professional development ($\beta = .01$, $p < .001$) and a negative indirect effect through student use ($\beta = –.08$, $p < .01$). Thus, students' self-reported use of RP was negatively directly related with school climate and negatively indirectly related with teachers' intentions to stay; its effect on school climate was consistently negative in direction, however the direct (non-significant) path from students' RP use to teachers' intentions to stay was positive.

Covariates

Although the covariates are not the primary focus of this study, they can help to start explaining some of the variation observed in these models (as evidenced by their boosting of the models' fit). Significant covariate paths are presented in Appendix Table A3.2. Across models, larger student enrollments consistently predicted less RP (PD and student self-reported use) and more negative outcomes. Teachers' with non-traditional certification and teachers in full-time classroom roles were similarly less likely to have RP exposure or usage. In contrast, teachers in schools with more students from racial/ethnic minority backgrounds seem more likely to have exposure to and use RP (per their own self-report). Findings were more mixed about schools' socioeconomic makeup (i.e., the proportion of students from low-income). Interestingly, the findings were also mixed about prior use of exclusionary discipline – schools previously using more exclusionary discipline prior to RP implementation were not necessarily less likely to use RP.

Specification Tests

To test the robustness of the above results to modeling choices and specifications, I conducted a series of specification tests of variable inclusion, variable construction, and model specification.

To test the time order of the effects, I attempted a final model with usage variables of 2015 school-level measures for teachers' usage and RP PD experiences. (I only had access to teacher-reported outcomes at the school-level in 2015.) In this model, the effects had similar direction. Not surprisingly, due to this being only one year into RP implementation, the effect of assignment and usage were not statistically significant. Therefore, I used 2016 measures in my final model because more these measures were more relevant to teachers' evaluations of their jobs in that school year (their intentions to stay). These measures also better capture what is happening at the end of the experiment, after "full" implementation of RP.

I tested the inclusion of a covariate to account for student behavior in the school. I specifically tested using the 2015 teacher-reported scale of student behavior problems as a covariate in the place of the CRDC measure. This model had similar results and similar model fit. I ultimately chose the CRDC measure as it was based on administrative reports, which provides an additional source of information about the school, and being external to student and teacher perspectives might bring in a more objective measure of behavior and behavioral responses in the school. Additionally, the CRDC variable measures pre-RP responses, adjusting for any potential differences in behavioral responses prior to RP implementation.

To make the model more parsimonious, I tested the removal (and reduction) of non-significant mediators (e.g., student-reported teacher RP use). Similar to my finding with removing the non-significant b paths (model 4 in Table 3.4), this resulted in an inadequate model fit, implying that this measure added unique information to the path analysis describing the relationships between RP assignment, usage, and the outcomes, even if it did not contribute to statistically significant paths to the outcomes of interest.

I additionally tested the inclusion of two more outcomes: school climate as reported by students at the school level and teacher's individual reports of problematic teacher absenteeism. I observed similar patterns as with the outcomes in the main model (school climate as reported by teachers and teacher's intentions to stay). The relationships with student-reported school climate was somewhat weaker, potentially due to the less shared variation in experience and perception. I chose not to include these outcomes in the final model to retain a more parsimonious model.

As discussed above, I attempted to model the usage and uptake variables as latent variables but this ultimately resulted in poor model fits, suggesting that the individual components are too unique to be combined into a latent factor. Additionally, I attempted to model school climate as three separate factors, but this model also had poorer fit than the final model (using school climate as one composite score).

Finally, I tested the model specification choices: including linear probability modeling instead of logistic regression, cluster robust standard errors instead of multilevel modeling, and the MLMV accounting for missing data. The logistic regression model produced somewhat different results; however, this model could not be run with the MLMV or cluster standard error specifications. Additionally, irregular standard error

estimates indicated that there was likely sparseness, especially including the block fixed effects. I chose the linear probability model to allow for more model flexibility (such as including the more robust set of covariates). When using a multilevel generalized SEM (modeling the school as a latent variable), a similar pattern of results emerged, although there were less significant results predicting teachers' turnover intentions. I ultimately retained the cluster-robust error estimation because the effects of the school latent variable were not significant or the focus of this study. I also tested the final model without the use of MLMV, instead using listwise deletion, and came to the same conclusions. I therefore retained MLMV to protect against bias from dropped incomplete cases and retain as much information from the data as possible.

Discussion

The results from this study can add to our understanding of the implementation of RP and the effect of assignment to RP on school climate teachers' turnover intentions, after accounting for implementation. While studies of RP have documented the promising impacts on discipline inequities and school climate, no previous studies have examined the effect of RP on teachers' views of their job and future plans. My findings suggest that RP has a positive impact on teachers' perceptions about their school and could increase their intentions to remain at their school. Important to note, however, the positive impact on teachers' turnover intentions is mediated by the actual usage of and exposure to RP at the school, reinforcing the importance of robust supports for implementation of RP.

Evaluating RP Program Theory

My findings generally support the hypotheses in the literature about the positive impacts of RP, via assignment, uptake, and usage. Overall, I found that RP had a positive

effect in schools on the organization and environment and, in part, on teachers and their intentions to remain at their school. The positive direction and substantive magnitude of the effects of RP assignment on school climate was clear and consistent in this study. Whereas, the positive effects on teachers' turnover intentions were only indirect (through usage and school climate) and more modest in magnitude. This contrast likely points to the direct relationships between RP and school climate improvements, but the more complicated relationship between RP and teachers and their turnover intentions.

In this vein, my findings also confirm the hypothesized mediating roles of RP usage and school climate to explain the relationship between RP assignment (and policies) and teachers' intentions to stay. This study identifies the key role that usage of RP plays in significantly explaining this relationship. Yet, the role that usage plays is also a complicated story. Different measures of usage — from different reporters and covering different aspects of RP culture — have different, unique patterns of findings. The variability in the relationships I observe with the different usage variables highlight the importance of including multiple voices to assess implementation of RP and to measure multiple dimensions and layers of implementing complex "programs" like RP, which may be better called a cultural and mindset conversion (Loomer, 2017; Okonofua, Paunesku, & Walton, 2016).

Amongst the measures of RP usage and exposure, PD receipt (teachers' RP PD experiences, or exposure) was the most consistent mediator between uptake and usage and the outcomes of interest. Teachers' PD exposure functioned as a mediator between RP assignment and their own self-reported RP usage, implying that assignment affects individual teachers practices through more exposure to PD. This finding is not surprising

given the reliance on PD as a primary intervention delivery approach. This finding does underscore the urgent need for more PD for teachers being asked to implement RP as it has also been well documented that teachers in RP schools are continually requesting more training (Fronius et al., 2019; Guckenberg et al., 2016; Mayworm et al., 2016). PD sessions are likely the most salient support for teachers: a break from their work in front of the classroom that gives them the time to experience RP themselves in a tangible and visible way. School PD sessions also clearly signals a school's commitment to RP (letting teachers know it is not just a passing fad and is, thus, worth committing their own development towards).

Complicated Findings

My results about the measurement of uptake and its relationship with RP usage are less clear. There was no clear, strong link between the various uptake measures and the use of RP. All four uptake measures related with teacher usage, but overall there was a mix of direction, positive and negative effects, which do not lend themselves to clear explanations. For example, consultations and PLG launch had a negative direct effect on teachers' self-reported use of RP. This finding could reflect the overall low number of consultations used by many of the treatment schools. Alternatively, this finding indicates that my measures are not fully capturing uptake of RP. PLG meetings artificially imposed might be more of a burden than a help for teachers. Instead of merely capturing the startup session, measures of the frequency or usefulness of PLG meetings might be more informative.

The lack of clarity among uptake and usage relationships is particularly highlighted in the lack of relationship between PD delivery and receipt, which may be

due to external trainings, which would be good to also measure, and provides some evidence of non-compliance with the experimental design. PD delivery's negative effect on students' reports of teacher usage and RP spirit may reflect the fact that more localized supports for RP schools are more effective, as shown in the difference in findings between the Augustine et al. (2019) and Acosta et al. (2019) randomized studies of RP. Finally, uptake had a positive residual direct effect on teachers' intentions to stay, which might reference the fact that schools that cooperated with the IIRP program components are also more likely to support their teachers. These schools might be functioning better organizationally and their teachers may feel more supported through full uptake of the IIRP components, even if they are not yet translating into practices.

One potentially surprising finding from this study is the negative total and residual direct effect of uptake on school climate. This could be due to reverse causation: schools with worse climates taking up RP supports more. Also unexpected were the negative relationships between student self-reported RP use and school climate, and teacher RP spirit and teachers' turnover intentions. These paths were consistently negative across models and modeling specifications, including the testing of other covariates. Examining the decomposition of these effects, teachers' RP spirit only has a negative effect on their intentions to stay when their RP spirit is not also affecting school climate. This finding emphasizes the central role of school climate and teachers' working conditions in their turnover intentions. Also, student self-reported use may be picking up on the greater prevalence of negative student behaviors due to the way the item is worded; it asks students how frequently they use RP in response to problematic incidents. Although I tried to adjust for student behavior through CRDC covariate (and also tested

problems scale from prior year), a true measure of student behavior might be needed to fully adjust for this factor.

Describing RP Uptake and Usage

Descriptively, there was wide variability in uptake among treatment schools: 72% of schools had the PLG startup, but only 27% of schools received all four PD's and 8% received all four consultation visits as designed in the IIRP system of supports. These numbers reveal that the program was not taken as designed and point to the difficulty of doing efficacy studies of programs "in the real world." In real school settings, programs often get adapted and translated and it may be hard to figure out how to capture this adaptation a priori. In this study, I am limited thus by my measures. Additionally, with these lower compliance levels, it seems as if schools may be self-selecting into uptake which might confuse the relationships we would expect to see. For example, schools might have sought out more consultation visits if they were particularly struggling to implement or get buy-in from their teachers, which is in turn reflected in the negative relationship between consultations and teacher self-reported use.

The contrast in RP usage between teachers in treatment and control schools was statistically significant. Teachers in schools assigned to RP did experience more RP in their schools and have more experiences with RP PD. However, the impact of RP assignment on their own self-reported practices was indirect (assignment only had a positive effect on teacher practices if teachers received PD) which may reflect that teacher practices (and self-perceived and conceived practices per self-report) are the hardest to change. It is worth questioning the practical significance of the effects of assignment on usage — did assignment really move the needle as much as might be

expected? Culture change is hard and diffusion of practices takes time (Blood & Thorsborne, 2005; Morrison & Vaandering, 2012; Vaandering, 2010b). More encouraging may be the fact that many teachers in the control condition report exposure to RP PD: over 50% of teachers in the control group reported they had at some point received PD on all three RP training topics. Although this does make it more difficult to estimate the effects of random assignment and treatment contrast from a researcher perspective.

If not uptake, what predicted usage? Among the covariates, it is worth highlighting those teachers who use RP less: full-time classroom teachers and those with an untraditional certification. Among those who use RP more are schools with more minority students, which is encouraging considering the possibility for RP to address racial injustices for students from traditionally marginalized racial and ethnic backgrounds (Mansfield, Fowler, & Rainbolt, 2018; Payne & Welch, 2013). Finally, schools with larger student enrollments were less likely to implement RP (and have less positive school climate and turnover intentions outcomes). Larger schools may particularly find it difficult to organize and disseminate PD to all their staff and may find it hard get all of their staff on the same page to create a change in the culture.

Implications for Research, Policy, & Practice

The finding from this study provide implications for RP practically. The positive impacts on school climate (and teachers' turnover intentions to a lesser degree) provides more evidence to support the continued adoption and sustaining of RP. For research on RP and other whole school interventions, this study is one of the first to examine teacher outcomes. I argue that teacher turnover (and their turnover intentions) is an important

outcome to examine in relation to whole school interventions that are usually aimed at schools that already struggle to maintain and hire teachers. Future research should continue examining teachers' relationship with RP. Future studies could additionally examine actual teacher turnover, teacher commitment, and teachers' psychological well-being.

Policy-wise, this study documents the difficulty of RP implementation — both of school taking up the training and teachers and students using the practices. Of particular note for schools and districts interested in implementing policies that "impose" RP on schools and teachers (versus a ground-up approach), uptake was rather low and the links between officially documented uptake and usage were very mixed. Although it is possible to implement RP as a policy from the top-down, it is likely worth working with schools and teachers to develop a bottom-up approach. Particularly interesting, PD delivery was not related to PD receipt or exposure. These findings suggest RP implementation policies that acknowledge and embrace local translation, and seek to actively incorporate these into a model of implementation (Castro, Barrera, & Martinez, 2004; Elliott & Mihalic, 2004).

Part of this process involves developing measures for uptake and usage — to track and potentially create a continuous improvement cycle. Planning and assessing implementation components lead to better results (Domitrovich & Greenberg, 2000). Gregory et al. (2013) have worked on developing rigorous and systematic qualitative measures of implementation which give teachers and students voice in the implementation process. However, it is also necessary to generate quantitative, more easily and quickly interpretable data to spur rapid response during implementation

(Domitrovich & Greenberg, 2000). It would also be interesting to see future research incorporating quantitative measures for typical barriers to implementation such as time limitations, teacher culture and buy-in, perceived administrative support and consistency (Augustine et al., 2019; Jain et al., 2014). Relatedly, the findings from this study note the unique role of different measures (and reporters) of usage. Future studies can continue to examine which aspects of RP implementation occur more and have the most effect on the desired outcomes.

Important to note alongside the difficulty of RP implementation is the essential role implementation plays in improving the desired outcomes of RP. Where RP assignment (and uptake) translated into usage, it almost always translated into better outcomes. The next practical question from this is, of course, how do we improve implementation and translation of RP policies into practices? My findings emphasize the need for more supports for teachers implementing RP, and in particular, the essential role of teachers' PD experiences with RP. Sadly, many teachers in RP schools frequently decry the lack of training and ask for more (Gregory & Evans, 2020). One of the unique qualities about RP as an intervention is its applicability beyond the school setting (Zehr, 2015). Trainings and development sessions could think outside the traditional PD box to work with local community organizations, and make it clear to teachers how applicable and useful RJ is for them in their classroom and beyond.

Particular practices beyond training that produce better implementation for school-based programs include integration into routine school activities (Domitrovich & Greenberg, 2000). This study begins to tackle questions of program integration by explicitly integrating RP into another whole school intervention (Diplomas Now).

Program implementation can also be improved by local involvement, standardization of materials, support via leadership, supervision, retaining external supports and monitoring the integrity of the intervention to observe how it operates in the school environment and what obstacles it encounters (Domitrovich & Greenberg, 2000; Horner et al., 2009; Jolivette et al., 2014). RP programs in particular are significantly more likely to be implemented and sustained when they are grounded in a clear, articulated vision, rather than viewed as isolated experiences divorced from school culture (Morrison & Vaandering, 2012).

For the research and evaluation field, this study adds to the collection of studies that illustrate the importance of examining in more detail the complex relationships that underly overall program effects in the context of experiments, particular to help understand surprising or null findings (and avoid Type III error). In the prior chapter and in this study, RP assignment appears to increase turnover intentions, when not accounting for implementation. However, after accounting for implementation, the total effect of assignment to RP on teachers' turnover intentions was reduced to almost zero. Indeed, accounting for RP usage revealed the positive indirect effects of RP assignment through usage and school climate.

Limitations

The findings from this study should be interpreted with caution. Although the exogenous variable in the final model was randomly assigned, causal inferences are limited as teachers and schools were not randomized to levels of implementation: the mechanism variables of interest. A confounding variable, rather than RP assignment, could be producing the observed indirect effects of assignment on turnover intentions.

Future studies could estimate a complier average causal effect, using random assignment as an instrumental variable to isolate the exogenous variation in compliance (Angrist, Imbens, & Rubin, 1996; Jo, Asparouhov, Muthen, Ialongo, & Brown, 2008; Schochet & Chiang, 2011).[23]

It should also be noted that though there was some time ordering among variables, many of the measures in my path analyses come from a survey at one time point (Spring 2016). This lack of time ordering in the variables could mean that some of the observed relationship operate in reverse order; for example, in schools with more problematic school climates, students might need to use RP more rather than the implicit conclusion currently that students using more RP leads to worse school climate. However, as discussed above, I tested prior year survey measures and student reported measures of school climate which ultimately led to the same conclusions.

Although I am able to model several aspects of implementation, my measures are imperfect, as partially discussed throughout the chapter. First, my uptake measures capture RP training delivered via the program only and do not include trainings received at the district level and thus can only be interpreted as the effect of trainings given as part of the official experiment, rather than the effect of trainings overall. It would be valuable, in future studies, to be able to fully capture the extent of training received as part of an official program and also what is occurring at the more local level (from individual classrooms, to schools, to the district). Also, future research could validate (and

[23] I attempted this modeling approach but struggled to find an adequate measure of compliance. As discussed in this chapter, uptake measures showed limited compliance and were potentially incomplete which precluded identification of true compliers and thus a robust estimate of the effect for compliers. It should also be noted that the CACE estimates are also limited in their generalizability and application.

potentially improve) the measures of RP usage to help clarify some of the unexpected findings about student RP usage in this study. Additionally, further investigation of the specification of the implementation variables used in this study could potentially shed further light on the role of implementation in the relationship between RP assignment and teachers' turnover intentions.

Future studies of RP and teachers would also do well to look past the two year mark. Although implementation supports end after two years within the IIRP framework, culture change likely takes longer than this. Additionally, it will be important to look beyond the two year mark, to see how often RP actually takes root and becomes part of an enduring school culture. Future extensions from this study could also investigate a categorical turnover intention outcome, dividing up "leavers" into "movers" (within education to other schools) and "leavers" (from the field of education).

Conclusion

This study used a path analysis to examine the implementation and outcomes of RP within a randomized control trial across 25 middle and high schools across 6 U.S. cities. Specifically, this study examined implementation of RP integrated into another whole school intervention (Diplomas Now). This process evaluation adds to our knowledge about how RP works as a policy, highlighting the important role of PD and providing other guidance for policymakers interested in the potential of RP for their school or district. Although the results from this study reinforce the complexity in implementing RP, they also illustrate the payoff that can accompany it, particularly in regards to teachers' perceptions of and commitment to their schools. The possibilities of

RP are strong for those schools and teachers with the persistence and dedication to fully embrace and implement it.

Chapter 4 — The Relationship Between Restorative Practices and Teachers' Turnover Intentions: Evidence from a Multi-city Sample

Stakeholders in large urban districts and researchers agree: teachers leave high poverty, urban schools at high rates that undermine the functioning and budgets of these schools (Guin, 2004; Kraft et al., 2012). The greatest concern surrounds urban schools serving students from traditionally underserved backgrounds, i.e., low-income, racial and ethnic minorities. Although previous research has linked many factors with increased risk of turnover, schools' social working conditions have emerged as the primary (and most easily manipulable) driver of turnover (Simon & Johnson, 2015).

Restorative practices (RP) is a quickly growing intervention in urban districts around the United States showing promising results for improving school climate, a key social working condition (e.g., Anyon et al., 2016; Augustine et al., 2019; Grant et al., in preparation; Jain et al., 2014). Most school districts that adopt RP are focused on reducing the reliance on exclusionary discipline and improving school climate, but how are teachers reacting to this shift in school policy and practice? Teachers opinions are mixed on the efficacy of RP and its ability to be implemented. No studies have yet examined how the usage of RP is then translated into teachers job-related beliefs and behavior, such as their turnover intentions and absenteeism.

This study seeks to fill this gap by looking at how teachers' usage of RP (and the schoolwide restorative culture) relates with teachers' turnover intentions and perceptions of problematic absenteeism. I examine these relationships within a sample of urban teachers working in turnaround schools from multiple U.S. school districts. One of the

few prior teacher turnover studies to examine teachers across multiple U.S. cities, Papay et al. (2017), found that school characteristics were not predictive of turnover when looking across districts. This study thus utilizes a unique, though non-random, sample of teachers from a randomized control trial in nine urban areas in the United States to examine how teachers' usage of RP and the school's restorative culture is associated with teachers' turnover intentions and problematic teacher absenteeism.

Literature Review

The Problem of Teacher Turnover

High rates of teacher turnover create problems for America's schools. Annually, approximately half a million teachers leave their school, and 40% of these leave the teaching profession entirely (Carver-Thomas & Darling-Hammond, 2017; Ingersoll, 2001). Turnover raises a basic concern of teacher shortages – not having enough teachers to replace those leaving and to fill new positions, particularly in specific subject areas such as Math and Science (Cochran-Smith et al., 2011; Ingersoll & Perda, 2008, 2010; Sutcher et al., 2016). Schools with trouble hiring replacements can be forced to hire out-of-field teachers (i.e., certified English teacher for a Math class) or even hire long-term substitute teachers, particularly for teachers who leave during the school year (Donaldson & Johnson, 2010; Ingersoll, 2002).

Beyond the fear of shortages, the mountain of turnover costs far outweigh any potential retention costs (Abelson & Baysinger, 1984). The fiscal cost of teacher turnover adds an estimated $2.2 billion every year to education budgets across America (Barnes et al., 2007; Alliance for Excellent Education, 2014). This estimated cost includes recruitment (advertising and hiring incentives) and new employee training and induction.

The $2.2 billion does not factor in additional costs which are harder to measure such as: separation costs (such as sick leave payout or time costs), administrative time costs (in paperwork and tasks associated with recruitment, hiring, and separation), and loss in productivity (Watlington, Shockley, Guglielmino, & Felsher, 2010).

Beyond schools' budgets, higher turnover undermines schools' abilities to provide high quality teaching to all students. Increasing rates of teacher turnover have led to a less stable teaching force and an overall "greening" of the teaching workforce: shockingly, a frequency distribution of current teachers' experience reveals that the most frequently occurring category is *teachers in their very first year of teaching* (Ingersoll & Merrill, 2017). Although new teachers can bring greater energy and innovation, a less experienced workforce is less effective in the classroom, resulting in lower student achievement (Carver-Thomas & Darling-Hammond, 2019; Rivkin et al., 2005; Ronfeldt et al., 2013). Schools who lose teachers also lose their associated human capital. Hanushek et al. (2016) found that in Texas, for example, about a third of teachers are in their first year, without the benefits of experience on the job. This study also found that new hires are from the lower end of the distribution in quality, replicating previous findings that turnover reduces the overall "composition" of teacher quality (Ronfeldt et al., 2013).

Teacher turnover also affects the work of the remaining teachers. Teachers who are "left behind" often get shuffled into another position (based on seniority, tested subject coverage, etc.), where they are likely to be less effective as they transition (Grissom, Kalogrides, & Loeb, 2017; Kalogrides, Loeb, & Béteille, 2012; Ost, 2014). The reduced school-level pool of teacher quality described above also affects the

colleague composition from which teachers can draw to increase their own productivity; programs like mentoring or Professional Learning Communities (PLC's) rely on colleagues' expertise (Jackson, 2009; Kraft, Blazar, & Hogan, 2018). Additionally, although teachers are often described as working alone in the "egg-crate" school model, staff collegiality and relationships are strongly tied to school effectiveness (Bryk & Schneider, 2002). Turnover disrupts the interactions and relationship building between teachers that enables them to achieve greater effectiveness (Guin, 2004). In this way, turnover can also take an emotional toll on the teachers left behind, depriving teachers of close collegial relationships and sources of support (Hakanen, Bakker, & Schaufeli, 2006; Nieto, 2003)

At the school level, teacher turnover also disrupts the school organization (Guin, 2004). Schools are complex institutions, made up of many inter-related systems that instability from turnover disrupts (Bryk et al., 2010; Hanselman, Grigg, K. Bruch, & Gamoran, 2016). For example, coherent instructional programs across all grades require teachers to know not only their own grade's curriculum, but also their colleagues' content to prevent overlap or gaps and provide consistency. Programs like the Common Core State Standards seek to minimize this particular obstacle, but many schools still retain a variety of customs, practices, and basic processes (institutional knowledge) that must be acquired by new teachers (and passed on by remaining teachers and administrators; Hopkins & Spillane, 2014)

Teacher Turnover in Urban, High-Poverty Schools

The effects of turnover are felt across all schools, but schools serving more historically disadvantaged populations carry a disproportionate weight of this burden.

Former Education Secretary Arne Duncan (2009) pinpointed the larger policy issue: "The challenge to our schools is not just a looming teacher shortage, but rather a shortage of great teachers in the schools and communities where they are needed the most, and that have been historically underserved." The schools serving these populations have received many labels: turbulent (Guin, 2004), unstable (Holme et al., 2017), revolving door (Hanushek, Kain, & Rivkin, 2004a), hard-to-staff (Johnson, 2006), high need (Johnson et al., 2012), high poverty and racially segregated (Djonko-Moore, 2015), and disadvantaged (Grissom, 2011).

Labels like turbulent, unstable, and revolving door reflect the higher rates of turnover found in this subset of schools. The national annual turnover rate of 13% jumps up to 20% in schools serving a majority of students from high-poverty backgrounds (Carver-Thomas & Darling-Hammond, 2017; Ingersoll, 2001). This annual turnover, however, masks the even more staggering cumulative turnover numbers: in Chicago, for instance, many schools serving predominantly low-income, minority students turn over half of their teaching staff every three years (Allensworth et al., 2009). Similarly, in Philadelphia, Useem, Offenberg, and Farley (2007) found that only 16% of new teachers remain in their school after six years. Overall, nearly half of all teacher turnover in public schools is concentrated in a quarter of the schools — schools which generally serve more high-poverty, high minority, urban, and rural populations (Ingersoll & May, 2011). Among a sample of Texas teachers, Holme et al. (2017) found that high-poverty, high-minority, and low-performing schools are all more likely to struggle with numerous types of instability among their teacher corps: multiple years of high turnover rates, greater

cumulative loss over several years, and a greater likelihood of becoming a high turnover school, even if they currently have moderate to low turnover rates.

The hard-to-staff label reflects the abundance of open teaching positions high turnover creates and which schools have difficulty filling. Schools serving high proportions of students from high-poverty backgrounds have four times greater number of uncertified teachers compared to the average, 1% (Carver-Thomas & Darling-Hammond, 2017). High need schools such as these often serve greater proportions of students with special needs, such as students with learning disabilities and Individualized Education Plans (IEP's) or students learning English as a second language (ELL). These schools require greater numbers of teachers with these specific specializations, yet, these positions are often some of the hardest to fill and keep filled (Billingsley, 2004).

The greater prevalence of "high needs" in these schools ultimately reflects deeper structural roots but also highlights the greater need for quality teaching (Clotfelter et al., 2011). Current high-poverty schools are often situated in cities and neighborhoods with legacies of segregation and social structures which have created the current segregation of students from marginalized backgrounds in certain schools (Alexander, Entwisle, & Olson, 2014; Kozol, 2012). The label "disadvantaged" reflects this history and the resulting social inequalities which currently create greater "needs" in these communities and which place greater demands on those schools: from food programs to safety concerns to student mobility (Holme & Rangel, 2012). High turnover adds one more layer of demands on these schools which are already more vulnerable, dealing with many other risk factors and having fewer buffers and resources to draw from (Mehta, Atkins, & Frazier, 2013). Unsurprisingly, turnover has an even greater negative effect on student

achievement in low achieving and high minority population schools (Ronfeldt et al., 2013).

A few studies (Hanushek & Rivkin, 2010; The New Teacher Project, 2012) have estimated that the teachers leaving high-poverty schools are of lower quality, suggesting that turnover could be potentially positive for these schools. However, this revolving door of exiting teachers does not bring higher quality teachers in the entrance. More new teachers (rather than more experienced transfers) are recruited to high poverty schools (Hanushek et al., 2016); thus, these "low quality" but more experienced teachers are likely to be replaced by an even lower quality teacher.

Extremely high rates of turnover create an "unstable" teacher workforce which magnifies the disruptive effects of teacher turnover. In some high-poverty and low-achieving schools, where most of their staff may turnover every five years, a third year teacher could suddenly become a "veteran" teacher, in charge of mentoring new teachers (Johnson et al., 2014; Papay et al., 2017). The increased burden on other teachers can be huge when there are large groups of new teachers every year, causing "resentment for having to do their jobs, as well as continually having to take on responsibilities for new teachers and their students" (Guin, 2004, p.11).

The disruption of teacher turnover creates instability that undermines school efforts for improvement. High-poverty and low-performing schools are more likely to be implementing new programs and reforms aimed at improving their school, including accountability measures (Clotfelter, Ladd, Vigdor, & Diaz, 2004; Holme & Rangel, 2012). To take hold, these programs require greater stability that turnover undermines; instead of gaining mastery and sustainability in a program of practices, retraining is

required each year for new teachers. Additionally, schools in traditionally underserved communities are also more likely to face greater budget constraints and cuts that teacher replacement exacerbates. Turnover costs can steal funds which could be used to support the implementation of school programs for improvement and provide more supports for students and teachers (Watlington et al., 2010).

Causes of Turnover in Hard-to-Staff Schools – Who's Leaving and Why?

Facing proposed teacher shortage crises, many researchers have investigated the factors the contribute to teachers' exodus from the classroom (see reviews from Borman & Dowling, 2008; Guarino et al., 2006; Simon & Johnson, 2015). Many initial studies into turnover focused on individual teachers' characteristics (e.g., sex, age, race, Guarino et al., 2006), highlighting background factors that brought teachers into the classroom but might make them less likely to stay. Women, for example, make up the majority of the teaching population (76% and growing since 1987) but are also (1.3 times) more likely to leave than men (Borman & Dowling, 2008; Ingersoll et al., 2014). Teachers with the least and most years of experience (and age) tend to leave more (Borman & Dowling, 2008). In low-achieving schools with the highest attrition, newer teachers have even higher exit rates (Hanushek et al., 2016). Among schools serving high-minority, high-poverty student populations, teachers from similar backgrounds as students in these schools are less likely to leave (Achinstein et al., 2010; Whipp & Geronime, 2015). Regarding teacher qualifications, traditionally certified teachers usually persist longer than alternative or emergency certified teachers (Carver-Thomas & Darling-Hammond, 2017, 2019; Marinell & Coca, 2013), however, this does not always hold, especially among urban, high-poverty schools (Papay et al., 2017; Redding & Henry, 2018). Teachers with

more advanced educational attainment (e.g., Master's degree compared to a Bachelor's) also tend to leave at higher rates (Lankford et al., 2002). Turnover research has shifted away from explanations based on teachers' personal characteristics, however, as schools have less control over the population of applicants they draw from (i.e., largely white and female).

Policymakers and researchers next questioned what policies and school-specific characteristics mattered most (e.g., salary, student demographics; Cowan & Goldhaber, 2018; Hanushek et al., 2004b; Lankford et al., 2002). *Labor Market* based theories, in particular, theorize that teachers make choices to leave their position based on the costs and benefits. Teachers theoretically sort away from schools with high levels of "challenging" demographics to seek a position with more benefits and an "easier" student population. In a sample of Georgia teachers, Scafidi et al. (2007) found that teachers left schools with higher proportions of students from racial and ethnic minority backgrounds, which they hypothesize may be due to teachers' perceptions that minority students are less enjoyable and more challenging to teach. Additionally, among high-poverty and low-achieving schools, the extra burden of accountability status and pressures produces further turnover for those schools (Clotfelter et al., 2004; Ryan et al., 2017).

In addition to school-level characteristics, specific job and role characteristic can also influence teachers' turnover decisions. Hard-to-fill subjects such as Math and Science see the highest turnover, which is at least partially caused by out-of-field teachers who are certified in other subject areas but, due to shortages, are placed in math and science positions (Boyd et al., 2012; Ingersoll & May, 2012). Among grade levels, middle school teachers are generally found to leave more than elementary and high

school (Guarino et al., 2011). Marinell & Coca (2013) found that 55% of New York City middle school teachers had left their school after three years, compared to 46% of elementary teachers and 51% of high school teachers.

Ingersoll (2001) marked a shift in the conversation about turnover, by using the nationally representative Schools and Staffing Survey (SASS) to show the link between teacher shortages and teacher turnover. Policy-makers, panicking over potential shortages of teachers, particularly quality teachers, often blame the teacher creation and recruitment pipeline — we have too many strictures on those trying to become teachers, we are not recruiting enough teachers, or we are not recruiting the right type of teachers. However, Ingersoll's findings (2001, and subsequent analyses in 2003, 2012, and 2017) shifted the emphasis to the large numbers of teachers leaving their schools and the field of education as a whole. Ingersoll makes the case that these results indicate a need to re-evaluate the management of and conditions in schools, to better understand teachers' experience of their work in order to address why teachers are moving and leaving.

Recent research, largely from the *organizational theory* approach emphasized by Ingersoll, has supported the importance of working conditions which are particularly salient for teachers and which are under the control of schools to potentially improve (Johnson et al., 2012; Simon & Johnson, 2015). Working conditions include: leadership quality (Grissom, 2011), professional development opportunities, induction and mentorship (Smith & Ingersoll, 2004), collegiality (Kardos & Johnson, 2007), resources and time (Ladd, 2011), and overall school climate (Kraft et al., 2016). School organizational issues, present in teachers' perceptions of their working conditions, undermine teachers' ability to perform to their best ability. Teachers who perceive that

their leadership cannot fix these school issues, will leave to seek a more hospitable teaching environment where they can feel successful with their students (Johnson & Birkeland, 2003).

A minority of teacher turnover studies attempt to take a more holistic approach, here labeled an *ecological perspective.* This theory situates teachers within several contextual and developmentally influencing spheres (per Bronfenbrenner's ecological model, Bronfenbrenner, 1977), including teachers' own background (e.g., social class) and experiences (e.g., attending an underserved school). According to this theory, teachers' working conditions continue to influence their behavior, but their work environment also impacts them subconsciously and differently based on their own personal background (including their values and beliefs). From this perspective, teachers may seek out schools with traditionally underserved students and may persist longer if they identify with the schools' environment based on their own history (Whipp & Geronime, 2015). Ronfeldt, Kwok, and Reininger (2014), for example, examined how certain teachers actively seek out placements working with traditionally underserved communities: a case that contradicts the theories discussed above. Additionally, this framework attempts to take a wider look at teachers' work environments; for instance, a teacher working in a low-achieving, urban school may experience (consciously or subconsciously) the burden of the larger (macrosystem) societal effects of structural racism that has created the current system of inequitable schooling (Djonko-Moore, 2015).

A Restorative Solution to Teacher Turnover?

Researchers from both the organizational and ecological perspectives have looked at the impact of school's social environments on teachers' turnover (e.g., Guin, 2004; Kelly, 2004; Kraft et al., 2016). More positive working conditions including school climate can reduce turnover, but what about new practices grounded in a restorative ethos? Djonko-Moore (2015) theorizes that both teachers' active perceptions of the school organization, and subconscious perceptions, affect teachers' experiences of their job and their subsequent turnover decisions. In this model, school climate subconsciously affects teachers' well-being and appraisals of their experiences at work, which in turn affect their effectiveness, satisfaction, and decision to stay (Jennings & Greenberg, 2009; Rimm-Kaufman & Hamre, 2010). The restorative culture of a school may similarly impact how teachers experience their work, especially considering that most teachers desire a disciplinary approach focused on relationships and community-building (Griffith & Tyner, 2019).[24]

No studies have yet examined the impact of restorative practices (at an individual level) and restorative culture (at the school level) on teacher turnover. A few qualitative studies have noted the potential emotional burden this culture places on teachers to sustain (Lustick, 2017a; Wadhwa, 2015). Additionally, some media reports quote teachers' concerns over the reduced safety ushered in by an apparent lack of consequences that can be introduced by RP, when it is not fully implemented or

[24] I use the term culture instead of climate here to indicate that the use of restorative practices and belief in restorative perspectives are more deeply rooted values and norms, rather than the everyday, fluctuating experiences associated with climate (Van Houtte, 2005).

supported (Dominus, 2016; Perez Jr., 2015; Rey, 2018; Steinberg & Lacoe, 2017). Unfortunately, teachers' pleas for more support in implementing RP are only growing: "Teachers are concerned that there is insufficient training, insufficient principal support and insufficient time in the day to implement it with fidelity" (Rey, 2018). Without proper training needed to support RP to be effective, some teachers question whether RP is or can be successful (Guckenberg et al., 2016).

Restorative cultures, however, are designed and have been shown to promote more positive environments for both students and teachers by enhancing experiences of justice, respect, and empathy, leading to stronger student-teacher relationships (Augustine et al., 2019; Gregory et al., 2016). Additionally, individual teachers who use specific RP practices designed to encourage more positive social-emotional practices such as the expression of feelings, foster more positive student-teacher interactions. Ultimately RP-practicing teachers who thus improve their relationships with students and other teachers may experience more positive feelings at their workplace and derive greater satisfaction from their work. These more positive experiences then translate into teachers' greater affiliation for their school community and entice them to stay.

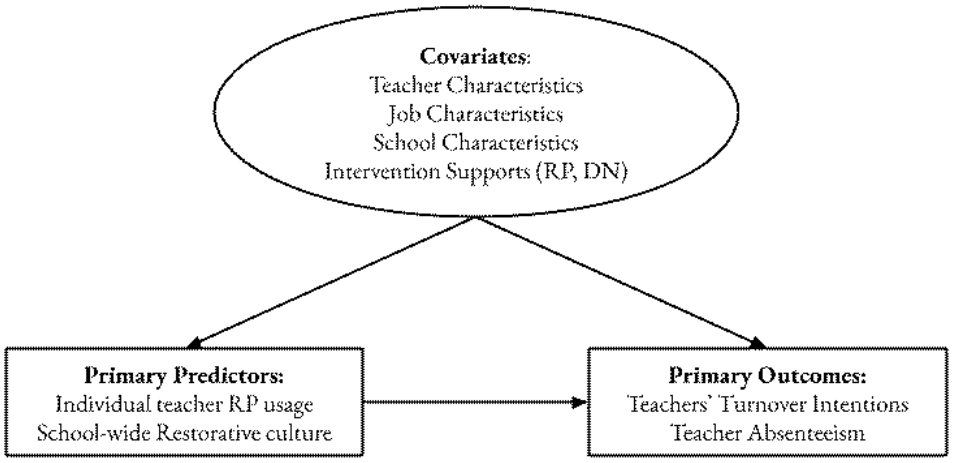
Context. Most studies of teacher turnover analyze a sample from one city or state (with much of the research centered in North Carolina, Texas, New York, and Chicago due the robust data tracking systems) or use national datasets which have a limited number of teachers at urban and high-poverty schools. Papay et al. (2017) was one of the first to look at teacher turnover across multiple urban districts (16 total). Contrary to the picture painted by many studies of teacher turnover, Papay and colleagues found that turnover trends and associations varied substantially between districts, with exit rates

(and hiring needs) varying up to 40% between districts. Within their sample of urban schools they also discovered a much higher turnover rate (annually and cumulatively over several years) than previously suggested by analyses of national datasets. Additionally, contrary to many past findings about the importance of school characteristics and working conditions (such as, in their study, proportion of minority students, salary, and student-teacher ratio), they found no significant relationship between any of these variables and teacher turnover. Papay and colleagues particularly advocated for "additional research to explore patterns and variation across sites in both causal and descriptive analyses" (p.443). This study seeks to fill that gap.

This Study

Teacher turnover from high poverty and urban schools is a well-documented concern. Can the greater use of restorative practices that is growing in urban schools help to stem this tide? This study is among the first to start tackling that question. Additionally, this is one of the few studies that has been able to examine the predictors of turnover-related outcomes in a sample of teachers at schools with the highest risk of turnover: low-performing, urban schools serving large proportions of students from low-income and racial and ethnic minority backgrounds. The current study builds upon previous studies of turnover in high-poverty schools in one state or city (e.g., Ladd, 2011) by examining teachers and schools from several large urban areas across the United States. This study also builds upon previous studies of working conditions by examining how the prevalence of restorative practices, being taken up by many urban schools to enhance school climate and student discipline, relates with teachers' turnover intentions.

Figure 4.1. *Analytic Model Predicting Teachers' Turnover Intentions*



I use a hierarchical logistic modeling approach to estimate the association between teachers' usage of restorative practices and students' reports of the school's restorative culture and teachers' turnover intentions and perceptions of problematic absenteeism. The full theoretical model of relationships is presented in Figure 4.1 My analysis is guided by the following specific research questions:

4.1 How prevalent are restorative practices and restorative cultures in schools, as reported by teachers and students? Which practices are used most frequently?

4.2 What teacher, job, and school characteristics predict more frequent RP usage?

4.3 To what extent do more frequent teacher RP usage and greater student reports of restorative culture predict teachers' intentions to leave their school?

4.4 Do similar patterns of association hold between intentions to move to another school and intentions to leave the teaching profession?

4.5 Do similar patterns of association hold with teachers' perceptions of problematic teacher absenteeism at their school?

4.6 Which RP practices have the strongest association with teachers' turnover intentions and perceptions of problematic absenteeism?

Methods

Data for this study come from 8,616 students and 1,559 teachers at 41 schools (21 high schools and 20 middle schools) participating in a large-scale study of a whole-school reform model focusing on the Diplomas Now (DN, a whole school organization and academic reform; for more details see Corrin et al., 2014) and Restorative Practices (RP, a community building and alternative approach to discipline; for more details about this study and its main findings see MacIver et al., 2018 or Grant et al., in preparation) interventions. Schools were selected for inclusion in the original study from large urban districts. In particular, their districts identified these schools as needing transformation; this sample of schools, therefore, represents some of the most challenged middle and high schools in the US. Of the 41 schools with teachers participating in the Spring 2016 survey, 15 had received supports to implement DN in combination with RP, and 7 others had received supports to implement DN only.

Sample

The sample in this study includes all teachers (n = 1,559) who responded to the Spring 2016 survey. This sample incorporates 437 teachers at 15 RP/DN schools, 336 teachers at 7 DN only schools, and 786 teachers at 19 control schools. Overall, teacher respondents taught at 41 different middle and high schools, across nine large, urban districts in the United States. Additionally, some school level measures are drawn from

the sample of students (n = 8,616 students total) at schools in the study who responded to the Spring 2016 survey. This includes 2,020 students at RP/DN schools, 2,601 students at Diplomas Now only schools, and 4,535 students at control schools. Table 4.2 provides further student and teacher characteristics of the sample. Per school, an average of 35 teachers responded to the survey (with observed number of teacher responses ranging from 5 to 122), and an average of 194 students responded to the survey (ranging from 55 to 813).[25]

Measures

Dependent Variables: Teacher turnover intentions and absenteeism

Teachers' intentions to stay at their school. Two types of turnover intentions were coded as outcomes based on teachers' response to one item, "Which *best describes* your future intentions for your professional career?" For the discrete (binary) outcome, intentions to remain in their school, teachers' responses were coded into two categories: *stay* ("remain in this school") or *leave* ("transfer to a different school in the district", "transfer to a different district", "find a job in a private school or a charter school", or "leave the teaching profession"). This variable was coded: *leave = 0*, *stay = 1* so that this variable can be interpreted as teachers intending to stay at their current school.

Teachers' turnover intentions (stay v. move vs. leave). For the second turnover intentions outcome, teachers' responses were coded into three categories to better distinguish between teachers intending to leave the profession (leavers) and those

[25] There were lower numbers of students surveyed per schools (compared to their overall enrollment) because the Diplomas Now data collection was focused on surveying students in key grades (related to advancement or degree completion). Supplemental Table A4.3 provides the breakdown of the teacher and student samples by grade and cohort.

intending to move to another school but remain in teaching (movers). The same question was coded as *stay = 0* ("remain in this school"), *move = 1* ("transfer to a different school in the district," "transfer to a different district," or "find a job in a private school or a charter school"), or *leave = 2* (or "leave the teaching profession"). Because this variable is coded with stayers as the base category (*= 0*), it can be interpreted as teachers' relative risk of intending to move to another school compared to stay at their school or their relative risk of intending to leave the profession of teaching compared to stay at their school.

Problematic teacher absenteeism. Teachers responded to the question "To what extent was teacher absenteeism a problem in your school during the 2015-2016 school year?" on a 4-point scale. I examined this outcome alongside teachers' turnover intentions because teacher absenteeism could signal greater disengagement and dissatisfaction, a precedent of teachers' decisions to leave their jobs (Mowday et al., 1982). Additionally, teacher absenteeism is a more short term-outcome capturing teachers' daily behaviors, compared to their intended career decisions which are a bigger, long-term decision based on many potential factors.

Independent Variables: Restorative practices and culture

Teachers' self-reported use of restorative practices. This variable captures teachers' own reports of how often they used practices associated RP, including some of the 11 essential elements of RP as specified by IIRP. For example, "How often do you… facilitate dialogue circles to provide opportunities for my students to share feelings, ideas, and experiences?" assessed whether teachers regularly used proactive circles. (Teachers reported on 6 items; Cronbach's alpha = .82.)

Teachers' restorative culture is a school-level measure of how much teachers created a restorative culture in the school, as perceived by students in that school. This measure is based on students' reports of how often teachers employed or modeled RP practices and the spirit with which they implemented them. This concept captures not only how frequently and consistently teachers' employed RP practices, but also *how* teachers delivered RP practices, including their attitude, interest, and spirit. For example, students reported on "How often...do your teachers talk about their feelings?" which measures how often teachers' use affective statements. Students also reported on whether they perceived that teachers displayed a restorative ethos in their behaviors. For example, "When someone misbehaves, teachers…ask questions in a respectful way?" (Students reported on 11 items; Cronbach's alpha = .86.)

Students' restorative culture measures, at the school-level, how much students acquired, adopted, and employed RP practices themselves. Students reported on items that asked how frequently their behavior reflected a restorative ethos. For example, "How many times did the following happen THIS YEAR…I supported students who I saw being hurt, even if there were no adults around." Students' individual responses were then aggregated at the school level to represent the overall student participation in restorative culture. (Students reported on 5 items, Cronbach's alpha = .82.)

Covariates

Individual teacher characteristics are measured by teachers' self-reported answers to questions about their experience, certification, and educational attainment. Teachers responded to two questions about their *teaching experience*: in the teaching profession and at their current school. Teachers responded in categories which were

coded as two binary variables: new teachers (in their first or second year, *= 1*) and highly experienced teachers (15 years or more of experience, *= 1*). Thus, teachers with 2 to 14 years of experience serve as the reference group *(= 0* for both). *Educational attainment* was coded as one binary variable capturing whether teachers had an advanced degree: Bachelor's degree = *0*, Advanced degree (Master's, Specialist, or Doctorate degree) = *1*. *Certification* was captured by two binary variables based on teachers' responses to one question about their teaching certification. *Advanced certification* (*=1*) teachers responded they had an advanced certification (e.g., advanced professional board or National Board certification). *Alternative certification* (*=1*) teachers responded that they had a probationary, emergency, or other non-permanent certification. The certification reference group *(= 0* for both certification variables) contains teachers who responded that they had a professional, regular, or standard state certification.

Job characteristics are also based on teachers' self-report. *Full-time classroom teacher* status was based on teacher's response to an item asking them to select descriptors for their position at their school. This was coded as 1 for teachers who checked that they were a "full-time classroom teacher" (compared to part-time classroom teachers or non-classroom teachers, instructors, or mentors). *Leader* was based on the same question and was coded as 1 for teachers who selected they were an "academic team leader or coordinator (grade level or department chair)" or "interdisciplinary team leader." *Subject taught* was coded into two binary variables (for those subjects at higher risk of turnover according to prior studies): *Math/Science* (*= 1*) and *Special Education* (*= 1*) with all other subjects coded as 0 for both. *Grade level* was coded as one binary variable with high school as the reference category *(= 0)* and middle school = *1*.

School characteristics for the current year (2016) include *school size (*enrollment in number of students), *proportion of students from minority ethnic and racial backgrounds,* and *proportion of students from low-income backgrounds* (eligibility for free and reduced-price lunch). The school demographic variables were acquired from the Common Core of Data (linked using schools' NCES id numbers).

Intervention Supports: Restorative Practices and Diplomas Now captured whether schools received supports for the specific interventions involved in the experimental study from which the data for this study are taken (i.e., were schools assigned to be part of the treatment groups in the experimental study). This was coded with two binary variables. *DN* was coded as 1 for all teachers in schools originally assigned to DN and 0 for all teachers in schools that were not randomly assigned to DN. *RP/DN* was coded as 1 for all teachers in schools that were assigned to RP (and therefore received supports from IIRP through the study to implement RP in combination with DN) and 0 for teachers in schools that were not assigned to RP/DN. Thus, a teacher in a school assigned to RP/DN would be coded as 1 for both of these variables, a teacher in a DN only school would be coded as 1 for DN only, and teachers in control schools would be coded 0 for both.

Analytic Strategy

All analyses were completed using STATA 14.0. Preliminary analyses examined the correlations between the main variables of interest (see Table 4.4) and cross tabulations of main predictors across categories of the outcome to establish a rationale for further multivariate investigation. In the next step, I estimated a generalized multilevel model (using a logit link, command *melogit*) to predict the binary outcome for turnover

intentions (stay in current school vs. leave current school). I estimated a second generalized multilevel model (using a multinomial logit link this time, command *gllamm*) to predict the categorical turnover intentions outcome (stay vs. move vs. leave). Finally, I estimated a multilevel linear regression model (using robust standard errors to account for heteroscedasticity) for the continuous problematic teacher absenteeism outcome (command *mixed*).

Prior to estimating the multinomial logit model, I tested the appropriateness of the categorical outcome (which models turnover intentions as one, three-valued variable) by testing the independence of irrelevant alternatives (IIA) assumption (Hausman & McFadden, 1984). This sensitivity test assessed whether there is enough distinction (and observed variability) between the three groups of intentions: stayers (in their school and job), movers (moving to another teaching job), and leavers (leaving the field of teaching).

I chose to use a multilevel modeling approach because teachers are grouped within schools and are thus not independent of one another. Prior to estimating the multilevel models, I examined how teachers' turnover intentions varied among teachers in the same school compared to teachers across different schools. Specifically, I calculated the proportion of variation in the outcomes between schools (how teachers from different schools vary in their turnover intentions) compared to the total variation (between and within schools, how teachers in the same school vary in their turnover intentions): i.e., the intraclass correlation coefficient (ICC).[26]

[26] I also tested the inclusion of district fixed effects (a set of dummy variables for the nine districts in the study, excluding the first district as the base category). However, these variables created sparseness in the data leading to unstable results. Sensitivity tests also revealed that inclusion of these variables did not affect the conclusions presented.

I estimated a series of models to examine the association between teachers turnover intentions (and problematic absenteeism) and the use of restorative practices, along with other teacher and school factors. The null model (examining only the outcome) was used to calculate the ICC. Then, using a build-up strategy, Models 1-5 gradually add in sets of variables known to be associated with teachers' turnover intentions.

Model 1 includes only the main effect of restorative practice usage (or school-wide restorative culture). Model 2 adds the set of individual teacher characteristics (experience, certification, and educational attainment), with Model 3 further adding job characteristics (teaching role, subject, and grade level taught) to the model. Model 4 adds the set of school-level characteristics (school size, % minority, and % low-income). The final model, Model 5, adds the adjustment for teachers' assigned intervention supports (RP and DN). All continuous covariates are centered around the grand mean to aid interpretation.

The equation for the full model (Model 5) predicting the binary outcome of intentions[27] to stay looks like:

$$\log\left(\frac{\pi_{ij}}{1-\pi_{ij}}\right) = \beta_{0j} + \Sigma\beta_{1j} indiv_{ij} + \Sigma\beta_{2j} job_{ij} + \Sigma\beta_{3j} restor\_indiv_{ij}$$

$$\beta_{0j} = \gamma_{00} + \Sigma\gamma_{01} school_j + \Sigma\gamma_{02} restor\_culture_j + \Sigma\gamma_{03} intervention_j$$

$$\beta_{1j} indiv_{ij} = \gamma_{01}$$

[27] The models predicting the multinomial outcome also uses the logarithmic link function, but includes two sets of estimates, modeling the ratio of the proportions in each turnover group; i.e., π_{ij} of leavers over π_{ij} of stayers and π_{ij} of movers over π_{ij} of stayers. The models predicting the continuous outcome of problematic teacher absenteeism did not have a linking function and had an individual error term.

$$\beta_{2j} job_{ij} = \gamma_{02}$$

$$\beta_{3j} restor\_indiv_{ij} = \gamma_{03}$$

where the outcome in log odds of intending to leave, $\log\left(\frac{\pi_{ji}}{1-\pi_{Ji}}\right)$, for teacher *i* in school ,*j* is predicted by a set of vectors of individual level variables: individual teacher characteristics ($indiv_{ij}$), job characteristics (job_{ij}), and individual restorative practices usage ($restor\_indiv_{ij}$)[28]. The intercept at level 1 (β_{0j}) estimates the average log odds of leaving at school *j* and is predicted at level 2 by the vectors of school level variables: school characteristics ($school_j$), restorative culture as perceived by students ($restor\_culture_j$), and intervention supports ($intervention_j$).

Results for the multinomial models will be presented in terms of relative risk ratio (*RRR)*. The relative risk ratio demonstrates the probability of reporting one possible outcome over another, calculated for each predictor variable, simultaneously incorporating the likelihood of all three outcomes: staying, moving, and leaving. A relative risk ratio, lower than one, indicates a higher risk of the second outcome, compared to the first. A relative risk ratio equal to one signifies an equal risk or likelihood that a teacher with those characteristics will have either outcome and a ratio greater than one indicates teachers have a higher risk of the first outcome, when compared to the second.

[28] Models included only one measure of restorative practices or culture at a time, i.e., I modeled the relationships with the different measures of restorative practices separately to prevent bias from multicollinearity.

Results

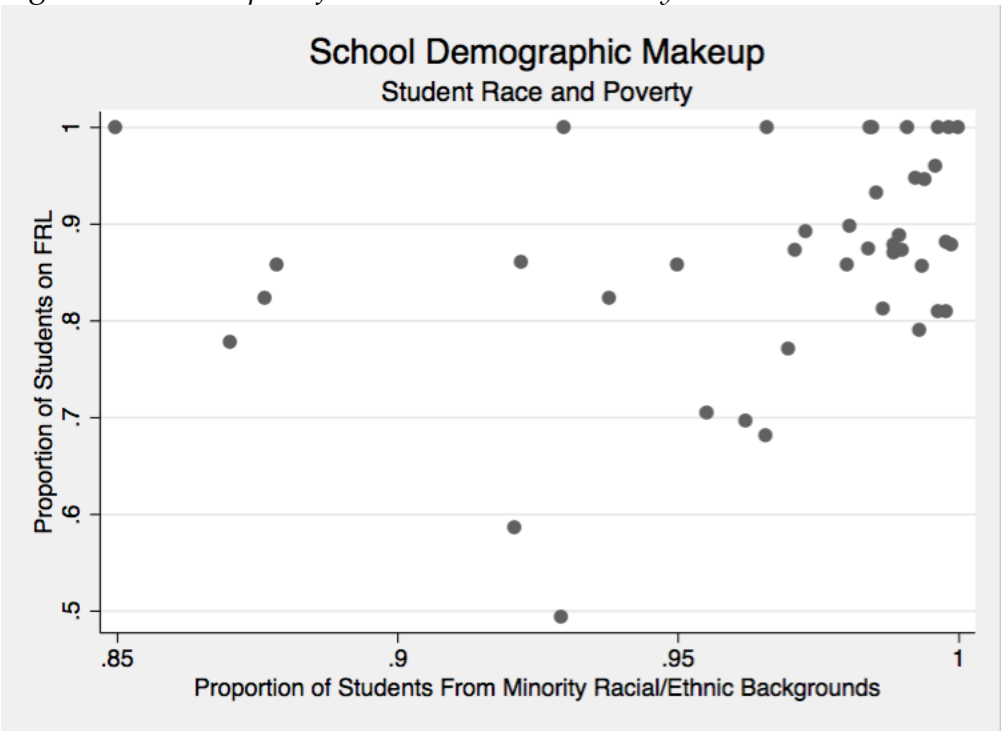
Sample Description

The sample for this study is described in Table 4.1 (with comparisons to similar school samples in Table A4.2). Compared to the average teacher in an urban or Title I school, this sample of teachers is less experienced, with more new (and novice) teachers and fewer experienced teachers (both in teaching overall and at their current school). Almost a quarter (23.8%) of teachers in the sample were new to teaching (with a year or less of experience), and 52% were new (or novice) to their schools. A large proportion (65%) of this sample of teachers had an advanced degree (at least a Master's degree); perhaps due to the city locations, with attendant higher education, of these schools). About 15% of the teachers had an alternative or emergency certification. Two thirds of the teachers taught in high schools (with the other third in middle schools). The average school in the sample was larger than the average Title I school (909 vs. 512 students) and served much higher proportions of student from low-income (86% vs. 70% FRL) and racial and ethnic minority backgrounds than the average Title I school (97% vs. 58% non-white).

Figure 4.2 further illustrates that all schools in this study serve served student populations of at least 85% minoritized racial or ethnic backgrounds, with most serving 95% or more. The lowest rate of students receiving free and reduced price lunch (my proxy for concentration of low-income student background) was 50%, but 75% of the schools in the sample had rates higher than 82% and 25% of the schools had rates above 98%. The high concentration of traditionally underserved populations in this sample of schools is unfortunately not surprising, due to the legacy of unequal educational

opportunities for historically marginalized students, as schools were intentionally drawn into the sample who were in need of turnaround in their academic performance.

Figure 4.2. *Scatterplot of Schools' Percent Minority and Percent FRL*

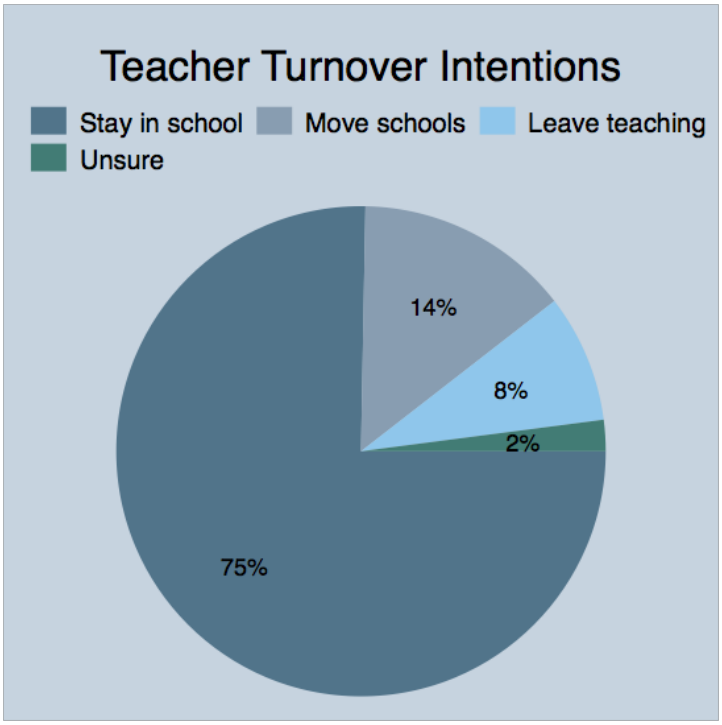


Note. j = 41. Each marker represents one school in the sample.

Regarding teachers with different turnover intentions (to stay or leave their current school), Table 4.1 shows there are some notable descriptive differences between these groups. Teachers intending to remain at their school are likely to be more experienced both in the profession and at their current school. Newcomers to the school are especially likely to intend to leave. Alternatively certified teachers are more likely to be leavers, but also are leaders at the school. Interestingly, teachers who taught special

education courses were more likely to report intentions to stay and greater proportions of teachers working in the middle grades report leaving intentions.

Figure 4.3. *Visualization of Teachers' Turnover Intentions*



Prevalence of RP

Table 4.2 and 4.3 (and Figure 4.3) describe teachers' turnover intentions; 75.3% of teachers intended to remain at their school the following year, which implies an intended turnover rate of about 25% for schools. Of the teachers intending to leave their schools, most intended to transfer to another school (14.5% overall), compared to 8.6% who intended to leave the teaching profession altogether. Interestingly, many leavers still

intended to remain in the Education field (with 92% overall intending to remain in Education, including transitions into leadership or higher education roles).

Figures 4.4 and 4.5 illustrate the prevalence of restorative practices among this sample. The first graph in Figure 4.4 shows that the average teacher uses restorative practices between sometimes and often (3 – 4, with very few teachers reporting they never or rarely (1 – 2) use restorative practices. The next graph to the right compares students' reports of teachers' and students' restorative culture (school-level usage): according to students, there is more of a restorative culture present in teachers' practices than in students' behavior. Additionally, comparing this graph to the other, students' reports, with an average around sometimes to rarely, are markedly lower than teachers' reports. The final graph in Figure 4.4 compares school-level teachers' reports of teachers' restorative culture from 2015 to 2016, illustrating similar distributions across the years.

Figure 4.5 shows how teachers reported using specific practices associated with RP (that compose the measure of individual teacher RP usage in this study). Almost all teachers report they sometimes, often, or always express their feelings to students, encourage students to express feelings, ask restorative questions, and give victims a voice. In contrast, the usage of circles, both proactive and responsive, was more normally distributed in their frequency with the average teacher sometimes using them.

Figure 4.4. *Distributions of Restorative Practices Measures*

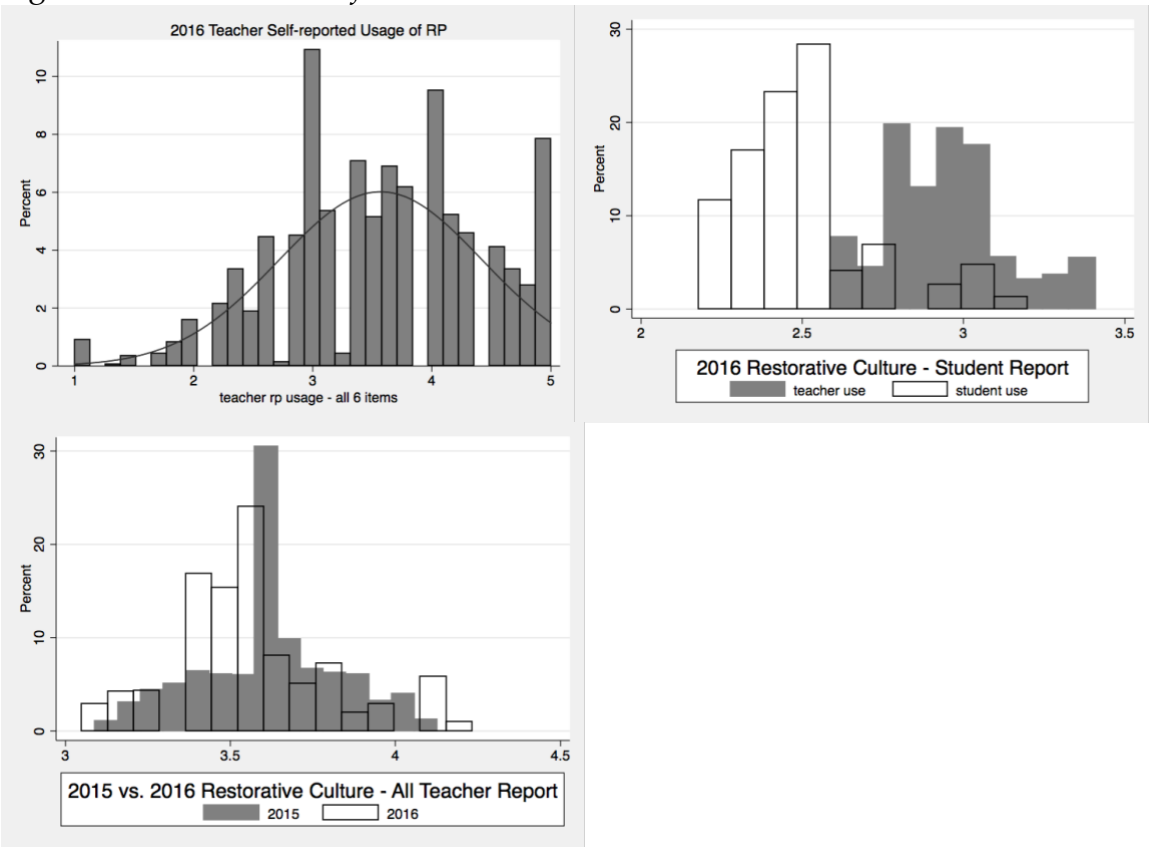
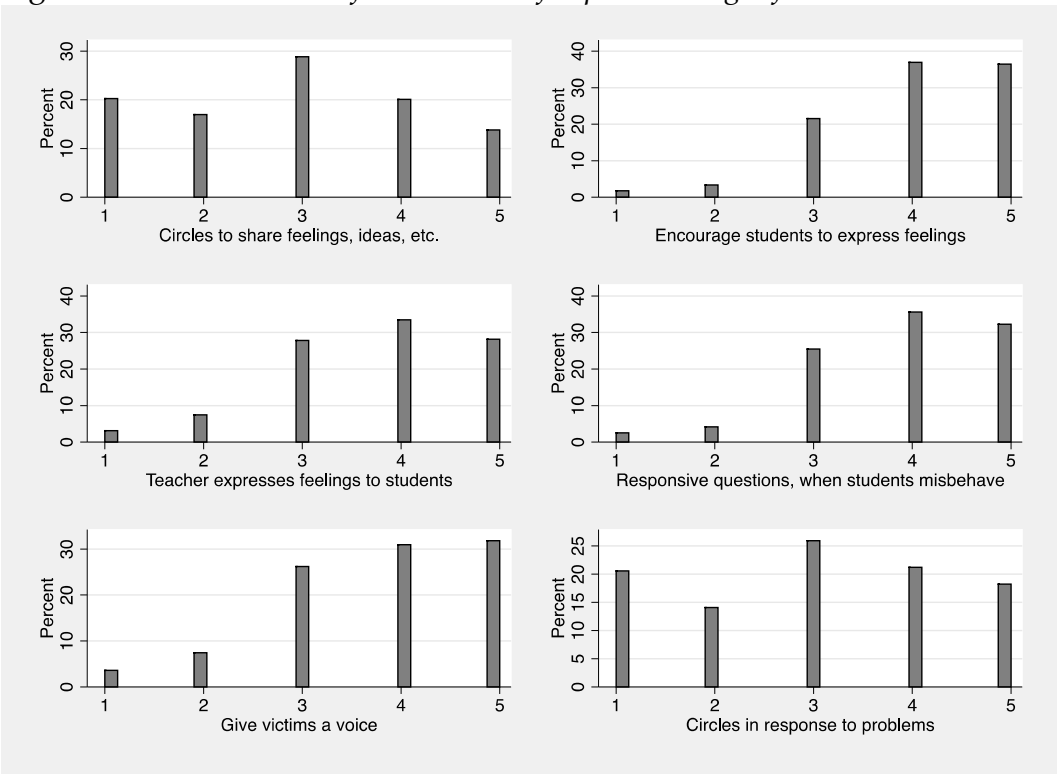


Figure 4.5. *Distributions of Teachers' Self-reported Usage of Restorative Practices*



Analytic Model Setup

Table 4.4 shows the correlations between the main variables of interest, which are modest but statistically significant, justifying further exploration. Prior to running the full analytic models predicting teachers' turnover intentions, I tested the nested structure of the data. I estimated the unconditional (null, or empty of any predictors) two-level generalized linear model with a logit link to predict the share of the variance in intentions to stay which can be accounted for the by the grouping of teachers in schools. For the three category outcome, I separately examined each potential outcome as a binary variable (staying at their school, moving to other schools, leaving the profession). Table 4.4 also shows the ICC values, which were low to moderate (.018, .117, and .341), with the highest value for problematic teacher absenteeism, suggesting a multilevel modeling approach was appropriate.

I also tested whether the categorial outcome was appropriate for investigation: whether the three different categories of turnover intentions represented independent groups in the observed data. To do this, I tested whether the model violated the IIA assumption (i.e., the independence of irrelevant alternatives, or whether if when one outcome category is removed, the relationships change, meaning that the categorization affects the observed results). The suest test confirmed that the multinomial model did not violate the IIA assumption (χ^2= 10.2, 10.6, 5.4, p = .75, .72, .98). I therefore pursued the categorical outcome which distinguishes between teachers intending to leave their schools and those teachers intending to leave the profession as a whole.

Analytic Model Results

Table 4.5 reports the results from the final models that include all listed variables. Teachers reported using RP less frequently if they were more experienced, a full-time classroom teacher, or a Math or Science teacher. In contrast, teachers of special education classes and in middle grades reported using RP more frequently. Although non-significant, being in a school with greater proportions of students on FRL and from minority racial/ethnic backgrounds also predicted more frequent RP usage.

Predicting intentions to stay, new teachers to their schools were more likely to intend to leave and longer tenured teachers more likely to stay. Middle school teachers (compared to high school teachers) and teachers in school with greater share of students receiving FRL were less likely to stay. Contrary to prior findings, though not statistically significant, Math/Science and SPED teachers were more likely to stay, after adjusting for other covariates. Certification or education were not strong predictors of any of the outcomes of interest. The only background factor that statistically significantly predicted greater problematic teacher absenteeism was teachers' leadership roles – they were more likely to report problematic teacher absenteeism. Teachers in these roles may be more aware of teacher absenteeism across the school through their leadership activities and may also be more likely to be required to fill in for absent teachers.

Table 4.6 examines the associations between different measures of restorative practices usage and the binary outcome of intending to stay in their current school and teachers' reports of problematic teacher absenteeism. Specifically, this table illustrates how these associations vary as I built up the multilevel model, adding in the sets of covariates shown in the prior table (4.5). Only individual teachers' reports of using RP consistently and statistically significantly predicted their intentions to stay; a one unit

increase in usage of RP is associated with a 1.35 times greater odds of staying in their school. Or in probabilities, a teacher who moved from sometimes using RP to often using RP has 7% greater probability of intending to stay. Looking at the right half of Table 4.6, teachers' self-reported RP usage and students' reports of teachers' restorative culture were associated with lower teachers' report of problematic teacher absenteeism ($p < .05$).

Next, Table 4.7 discerns whether RP differentially relates with intentions to move to another school versus to leave the teaching profession as a whole. Similar to binary staying intentions, only individual teachers' reports are consistently predictive of the three category outcome of teachers' turnover intentions. Teachers who reported using RP more frequently had 35% lower risk of intending to leave the profession, relative to intending to stay. Teachers' frequency of RP usage was also associated with a reduced risk of intentions to move schools as well, but this relationship was not as strong (20% lower relative risk compared to intending to stay).

Finally, Table 4.8 examines which specific items or practices (as self-reported by teachers) were more associated with teachers' turnover intentions and perceptions of problematic teacher absenteeism. Proactive circle usage had the strongest relationships with the outcomes; teachers who report using proactive circles more frequently are also less likely to report intentions to leave their school or the profession and report less teacher absenteeism. More frequent responsive circle usage was also the only other practice associated with both turnover intentions and teacher absenteeism. Teachers who encouraged students to express their feelings, asked restorative questions, or gave victims' voice, were also more likely to stay at their school, but were not more likely to report less problematic teacher absenteeism. The final item, teachers expressing their

feelings, was not statistically associated with any of the outcomes. Finally, probing differences between moving and leaving intentions, proactive practices (proactive circles and student feelings expression) statistically significantly predicted lower moving intentions, but reactive practices (responsive circles, restorative questions, and giving victims voice) did not. Whereas, all practices besides teachers sharing their feelings predicted lower leaving intentions.

Discussion

The current study examined the prevalence of RP and associations of RP usage with teachers' turnover intentions amongst a unique, policy-relevant sample of some of the most challenged schools in the US. Across 41 middle and high schools in nine large cities, I found that teachers reported generally high usage of RP-related practices (including circles). Among the teachers in this sample, less experienced, non-Math/Science, middle school, and special education teachers were more likely to use RP more frequently. Additionally, teachers who reported using RP practices more often were more likely to report intentions to stay at their school and to report that teacher absenteeism at their school was less problematic.

It is important to note that many of the schools in this study are not implementing whole-school RP. Therefore, it is encouraging that RP-related practices are already prevalent among teachers. In fact, most teachers (> 90%) reported that they at least sometimes encourage students to express their feelings, ask responsive questions when conflict arises, express their feelings to students, and try to give victims a voice when resolving conflicts. Although proactive and responsive circles were some of the lesser

used practices, these trademark RP practices were also the most predictive of lower turnover intentions and less problematic teacher absenteeism.

On the other hand, I also found that students reported much lower levels of restorative culture and practices, compared to teachers. Students specifically reported a more restorative culture among teachers compared to the culture among students. Whose perspective was most predictive? In contrast to Gregory et al. (2016)'s findings that student perceptions of RP usage more strongly predicted the lower use of disciplinary referrals (compared to teachers), I found that students' reports of the restorative culture at the schools (school-wide teacher and student RP usage) were not statistically significantly related with teachers' turnover intentions. Instead, I found that teacher-reported usage of RP more strongly predicted teachers' turnover intentions and absenteeism.

What explains this difference in prevalence and predictive power according to teachers compared to students? Even on the same items (of teachers' usage of RP), teachers and students report distinctly different rates of teacher usage, implying that student and teacher reports are picking up on two different perceptions (or constructs) of RP usage at the school. Teachers may be reporting on their beliefs and their planned or aspirational actions whereas students report on what is actually occurring in the classroom. Potentially, teachers' self-reports reflect their internal attitude towards RP, and this in turn matters more for teachers' turnover intentions than their actual usage or the actual prevalence. This suggests that teachers' beliefs and aspirations about RP could matter more than their actual usage for their turnover intentions. Confirming this, sensitivity tests of the school-wide teacher reports of RP confirmed the group perspective

was not predictive of individual teachers' turnover intentions or problematic teacher absenteeism. These findings reinforce those from other studies of teacher turnover that emphasize the salience of teacher's individual perceptions for their career decisions (Pogodzinski, Youngs, & Frank, 2013), but are in contrast to the findings from Johnson et al. (2012).

In this study, I also found that teachers' self-reported RP usage had a stronger negative relationship with teachers' intentions to leave the teaching profession (i.e., more frequent RP usage predicted lower intentions to leave the profession) compared to teachers' intentions to move to another school. This finding could reference the fact that teachers who are investing in the adoption of these new RP practices are also more invested in their careers as teachers.

Finally, my findings of the positive relationship between RP usage and culture and teachers' perceptions of problematic teacher absenteeism further bolster confidence in the other findings and provide support for RP from across respondents. When teachers or students perceive more teachers using RP, there is also greater teacher morale, as evidenced in lower perceived teacher absenteeism. This suggests that as teacher use RP more, there is a greater morale among teachers and a stronger pull for teachers to show up every day.

Implications for Policy and Practice

The results from this study suggest overall positive (or, at the least, non-negative) associations with greater RP usage, adding to the growing evidence base that supports the adoption of RP in schools (Fronius et al., 2019; Gregory & Evans, 2020). Although it is unclear how school-wide usage of RP may relate with turnover intentions, teachers'

individual perceptions of their usage of RP is positively related to their intentions to remain at their school. These findings confirm those of other studies that teachers are generally in favor of more relationship-based practices that are part of RP (e.g., Guckenberg et al., 2016). However, support for teachers adopting these practices remains wanting (Gregory & Evans, 2020). The findings from this study support the idea that teachers would appreciate further school efforts supporting teachers' use of RP and confidence in their ability to use RP practices.

For schools planning RP implementation, my findings also suggest that leaders and trainers should capitalize on practices teachers are already using. Circles are the trademark of RP (and the least widespread among our sample), but when introducing teachers to RP it may be less intimidating to start with what they already know and are doing (building on their prior knowledge). For example, 95% of teachers reported at least sometimes using responsive and restorative questions with students to respond to conflict. PD could use examples from teachers' experiences with these questions and connect it to how a circle could be used for a similar conflict.

Additionally, my findings highlight that there may be subgroups of teachers who need more support during the implementation process (who in this study were less likely to already be using RP). This included more experienced teachers, math/science teachers and high school teachers. These teachers may find it harder to integrate the more soft-skill practices of RP into their instruction or their time with students — for example, high school teachers with exams to prepare students for and more rigid scheduling may not feel like they have the time for RP. Unsurprisingly, my results suggest that experienced

teachers may also need more support or inducement to integrate RP into their more established teaching practices.

Limitations and Future Research

The findings of this study should be interpreted with some caution due to limitations in causal inference, measures, and generalizability. First, causal claims cannot be made about the relationships found in this study because it draws on cross-sectional data and examines non-random variation in the usage of RP as the independent variables of interest. Although teacher survey data were collected at study schools for several years prior to 2016, data across years could only be linked at the school level and my variables of interest are likely to be affected by the large compositional change in these schools which happens each school year (both in management and the actual teachers in the school).

I used both teacher and student reports of RP usage to overcome single source bias (or shared method variance), although most of my findings were from individual teachers' self-report. My findings, like those of Augustine et al. (2019) and Gregory et al. (2016), reaffirm the need in RP research to measure both teachers' and students' perspectives in order to continue probing and investigating the discrepancy in teachers' and students' perspectives of RP usage. Future studies could test my findings using observational measures of teachers' and students' RP usage to further clarify the relationships found in this study.

The non-random sampling of schools in this sample (being drawn from an experiment) potentially limits the generalizability of the findings from this study. Supplemental Table A4.2 compares the teachers and schools in the sample to urban and

Title I schools nationally (across the US). It shows that this sample represents a more traditionally under-resourced population than the typical urban or Title I, school with lower teacher experience and greater proportions of students from low-income and minority racial/ethnic backgrounds. Interestingly, this sample of teachers also contains some interesting resources such as more teachers with advanced degrees which may point to some unique strengths among populations of urban teachers in turnaround schools that may go under-appreciated (and underutilized).

The sample of schools in this study does draw (albeit non-randomly) from a policy-relevant school population: schools identified as being in need of turnaround. This population of schools are the most frequent targets of education reforms, but are much less frequently the participants in the evaluations of these reforms. Typically, the high needs of these schools, such as the greater proportion of students in poverty and the low levels of teacher experience, make it difficult to implement change and sustain growth. Yet, this makes it all the more imperative to identify what are the interventions that can leverage the strengths in these schools and communities to sustain growth.

Finally, I often refer to the primary outcome of this study, teachers' turnover intentions, as a proxy for teacher turnover. Although these outcomes are theoretically related and have been found to be at least partially correlated (DeAngelis, Wall, & Che, 2013; Ladd, 2011), there is also some doubt as to the strength of this relationship. Regardless, the outcome of teachers' turnover intentions is still an important psychological gauge of teachers' attachment and commitment to their schools. Similarly, perceived absenteeism is theoretically linked with actual teacher absenteeism, but that

link has not been confirmed. Future studies should examine the relationship of RP with actual teacher turnover and absenteeism.

Conclusion

The findings from this study contribute to the knowledge base of teachers' experiences of RP and add to the potential benefits that come from using RP practices. Among this sample of urban, turnaround schools across the US, many teachers are using RP-related practices. The findings from this study also suggest that teachers who use more RP practices are more likely to feel attached to their school (i.e., intend to stay) and to perceive greater morale and dedication among their fellow teachers (i.e., with lower problematic absenteeism). The findings from this study can provide information for schools considering adoption of school-wide RP and how to approach that task. Potentially, schools that can get their teachers to buy in to RP may also be more likely to retain their teachers.

Chapter 5 – Conclusion

The series of studies in this dissertation examine how Restorative Practices (RP) affects teachers' intentions to remain at their school. These studies specifically look at this relationship within policy-relevant samples of schools identified for turnaround across nine U.S. cities. This non-random sample of schools took part in a randomized control trial of Diplomas Now, into which RP was integrated from 2014-2016; I utilize the random assignment mechanism in my analyses to bolster the validity of my findings.

The first study in this dissertation (Chapter 2) focused on the more policy-relevant question: how does random assignment of a school to RP affect the school's climate and its teachers' turnover intentions (i.e., their plans to remain at their school and in the profession)? I used an intent-to-treat analysis to analyze how assignment to RP affected these outcomes. Then, in Chapter 3, I completed a process evaluation to dig into the black box of these effect estimates. Specifically, I used a series of path analyses to evaluate the program theory behind RP, looking at how RP was implemented as assigned, and how this explained its effects on the outcomes of interest. Finally, in Chapter 4, I used an observational analysis to examine the prevalence of RP among teachers in these schools more generally and to see how RP usage relates with teachers' turnover intentions.

Converging Evidence and Cross-cutting Themes

Taken together, the findings from these studies provide convergent evidence for the positive impacts of district policies encouraging the schoolwide adoption of RP on school climate in middle schools and high schools and for a relationship between greater RP usage and lower teacher turnover intentions. This rigorous evidence, across multiple

studies, shows that RP can be integrated with other whole school interventions, it works in the highest needs schools, and across multiple cities and regions of the US. Several specific themes that cut across all studies arose through my analyses.

The positive impact of RP on school climate was confirmed with "gold standard" evidence from the randomized control trial of RP/DN. Although this effect varied by subscales, the process analysis confirmed the positive effect of assignment to RP and usage of RP on school climate. These positive effects were observed among both teacher and student reports. This finding adds to the still nascent collection of rigorous research about RP which has shown both positive and null effects on school climate (Acosta et al., 2019; Augustine et al., 2019).

The story between RP and teachers' turnover intentions is more complicated. In Chapters 2 and 3, I did not find a consistently significant direct effect of assignment to RP on teachers' intentions to stay at their school. However, in Chapter 3, I did find evidence of an indirect and positive effect through RP usage and school climate, as hypothesized. My findings in Chapter 4 confirm the link between RP usage and teachers' turnover intentions, reaffirming the key role of securing teacher buy-in when implementing RP. A major contribution of this study is my rigorous examination of the effect of RP on teachers' job intentions — this is one of the first studies looking at how whole-school turnaround interventions affect teachers' turnover intentions, and also one of the first studies to simultaneously look at perceived problematic absenteeism, among teachers, alongside turnover outcomes.

Across all three studies, variation in effects played a significant role in the story. The uptake of the intervention, usage of RP, and effect of RP on the outcomes varied

between districts, between schools, and also within schools. Although the assertion that education practices vary widely is not new, this variability does highlight the contribution of a study like this which includes schools from nine different U.S. cities and is rare in single studies. The findings of consistent effects across district lines provides greater confidence in our findings and their potential replicability and generalizability.

Finally, a surprising finding across the studies in this dissertation was the overall presence of RP among all schools, not just those assigned to implement it as part of the experiment. For example, the treatment contrast, although significant, was not as large as might be expected. Chapter 3 confirmed that half of teacher in schools not assigned to RP had received training on three essential practices covered in RP PD. Chapter 4 also confirmed that over 95% of teachers in the overall sample reported using such restorative-based practices such as asking restorative questions in response to conflict and misbehavior. This diffusion of RP-related practices among urban turnaround schools is encouraging, although it potentially led to under-estimated experimental impacts. Potentially, the experimental impacts can thus be interpreted as the extra boost in outcomes from extra training in and supports for RP.

The Big Picture: Practical Implications from these Findings

The tasks of addressing teacher turnover and implementing RP in schools is only more meaningful and urgent than ever with current events including a pandemic that has shut down schools across the world and a reckoning with our legacy of racism and systems of oppression in the United States in particular. Schools are no exception to the racially unjust systems and institutions set up to propagate white privilege in the United

States. RP provides a tool for schools to reckon with this past, its present inequities, and provide hope for a more equitable future for all children.

Of note for schools seeking to implement RP, the findings from these studies document the difficulty (and promise) of implementing policies in real world settings. Uptake of the intervention (and program) was varied and different from what was intended. Although some program translation and adaptation is expected and encouraged, developing explicit models for how to do and track this could give schools (and researchers) more information about the process of the intervention. Additionally, the findings from this study could provide support for the explicit integration of interventions. Schools never implement programs in isolation; whether it be a new curriculum, a new rewards system, or some other program, schools address the complex needs of their students through a multitude of programs. Explicit integration could help create even better outcomes through synergy. Future studies could use a factorial design to randomly assign schools to integrated programs versus programs in isolation.

Despite the importance of randomized studies for identifying causal effects, top down edicts are generally not enough and not the optimal way to change the culture in a way that improves outcomes. Although I did find that assignment to RP had a significant effect on outcomes, I also found that this effect must translate into actual usage of RP to move outcomes meaningfully. To effect this translation, leaders must seek and earn buy-in from the main change agents: teachers. RP requires teachers to change not just their teaching practices, but their mindset and approach to teaching and relationships with their students — it challenges them to go deep. To do this, teachers need supports from their school community, and a network of supports including their colleagues.

The expansion of RP across schools signals the need for the inclusion of RP in teacher education programs. The restorative approach to teaching is in conflict with much of traditional teacher preparation (focused on behaviorism and punitive systems of consequences). Equipping new teachers with a background in RP helps them avoid landing in a school with RP where they are forced to unlearn their former approach and learn a new restorative approach, all while they are stuck in the tornado that is first year teaching. Additionally, as the positive rigorous evidence supporting RP grows, gearing new teachers up with RP tools can only enhance their practice and help to disseminate best practices to their schools.

Lingering Questions and Future Studies

Not all evidence was confirmatory across all three studies, however, especially regarding the effect of RP on teachers' turnover intentions. These conflicting findings raise important questions to be addressed in future research and follow-up studies. Future analyses within this same dataset could use an instrumental variable approach to estimate the complier average causal effect, potentially isolating exogenous variation to make inferences about the effect of complying with RP. This analysis could leverage the strong internal validity from the random assignment to help explain some of the variation in uptake and/or usage of RP and their impact on the outcomes in a more causally robust way than a path analysis. Additionally, a follow-up study looking at how implementation changed from year 1 to year 2 (or year 0 to 1 to 2 for certain other measures like school climate) could provide more information about the diffusion of RP among treatment schools, compared to control schools, although this could only be completed at the school level.

My findings about the complex, indirect relationships between RP and teachers' turnover intentions also raise questions that could not be answered with this dataset. Although the outcome of teachers' turnover intentions that is examined in these studies is an important outcome, future studies of teacher turnover and RP beyond the current dataset might look at teachers' actual turnover decisions (and turnover over time and at the school level), their commitment, and their psychological well-being to capture a more complete picture of teachers' response to RP. My investigation of teachers' perceptions of problematic teacher absenteeism, which is potentially more noticeable and immediate, reflecting everyday morale, yielded some interesting findings that complemented my findings about teacher turnover. This measure is not frequently seen in the literature but could be informative to explore in future studies to see how it correlates with other school and teacher outcomes, such as working conditions and turnover.

The mixed findings about uptake in this study also call for the development (and validation) of better measures of this (including ways to capture adaptation and uptake in the control group). Usable, quantitative measures could also help inform practice, also be integrated into data systems to support continuous improvement.

Future studies of RP should also track the effects of RP after the two-year implementation period to understand if the program really took root and to test whether the observed effects persist once program supports are taken away. Some school level outcomes are trackable via CRDC data collections, but more detailed survey measures to track over time would enable the modeling of growth patterns and trajectories in RP adoption to examine and test how RP diffuses through the school. Tracking individual teachers over time gives the potential for identifying diffusion roles within the teachers at

these schools (e.g., early leaders, etc.). It is important to understand how RP takes root in schools and spreads, given the difficulty of buy-in due to the large mental and cultural shift required with true RP implementation.

Finally, future studies of RP and teacher turnover can utilize a mixed methods approach, including qualitative data to help understand teachers' decision-making processes and their transition in practice as they adopt RP. Using multiple methods particularly suits an ecological model of teacher development and retention. For instance, it would be important to know if and how teachers' work with their colleagues about RP boosts their own RP adoption as different implementation models (e.g., professional learning groups) are considered. Potentially, cultural norms in the school might also play a key role, in resisting or embracing change, because RP involves a cultural shift around traditional and ingrained behaviorist teaching practices of consequence systems. Additionally, qualitative data gives space for teachers to speak about their experiences with RP in their own words and help explain some of the findings from this and other quantitative studies in a way that is grounded in their experience in the classroom.

Conclusion

In conclusion, the problem of high teacher turnover in our highest needs schools is only likely to worsen in the current political climate. Schools also desperately need an approach to discipline that disrupts the school to prison pipeline and responds to students in a way that supports student development and fosters stronger school communities. For RP, the future seems bright to address these issues, as consistently shown across the findings in these studies. Yet, there remains hard work to do to make this dream a reality. It is not enough to simply paste an RP label onto old practices – schools, teachers,

students, and communities need to commit to new ways and a new culture to make RP work. The impetus is thus placed onto policymakers, administrators, and researchers to give them the tools to do it.

Tables

Table 2.1. *Characteristics of School Composition Prior to Randomization, Overall and by Treatment Status, in the Full RP Sub-study*

Characteristic	All Schools	Treatment	Control
Enrollment	974	1006	938
% FRL	76.9	79.6	73.8
% Minority	96.4	97.3	95.4
j	33	17	16

Note. Based on administrative data from the Common Core of Data (CCD) from 2010-11 or 2011-2012 based on DN cohort (year of randomization). There are no statistically significant differences between treatment and control groups at the $p < .01$ level ($df = 31$).

Table 2.2. *Response to Spring 2016 Survey Among All Sub-study Schools*

Blocks that joined RP sub-study in 2014			Respondents to teacher survey in 2016				
	Schools		Schools			Analytic Sample	
Block	Treatment	Control	Treatment	Control	Total	Schools	Teachers
Southeast MS	2	2	2	2	4	4	159
West MS	1	1	1	1	2	2	66
New England MS	1	1	1	0	1	-	-
New England HS	1	1	1	1	2	2	60
West HS 1	1	1	1	1	2	2	38
West HS 2	1	1	1	1	2	2	66
Mid-Atlantic MS	4	3	4	3	7	7	132
South MS	1	2	1	1	2	2	86
South HS	1	1	1	0	1	-	-
South MidAtlantic HS	1	1	0	0	0	-	-
North MidAtlantic MS	1	1	1	1	2	2	50
Midwest HS	2	1	1	1	2	2	29
Total	17	16	15	12	27	25	686

Note. MS = middle school, HS = high school. One school in the Mid-Atlantic MS block is excluded from this table as they closed prior to the beginning of the RP program. Teachers were only included in the analytic sample (final column) if teachers from at least one school in both the treatment and control conditions responded to the 2016 survey (which was necessary to calculate within block treatment effects).

Table 2.3. *Teacher Characteristics (Spring 2016) – in Analytic Sample*

	Full Analytic Sample		Treatment	Control
Variable	n	%	%	%
Teacher – Individual Characteristics				
Experience – as a teacher	683			
New (1 year or less)		12.5%	11.4%	13.6%
Highly Experienced (15+ years)		38.5%	36.2%	41.0%
Experience – in current school	681			
New (1 year or less)		32.3%	33.8%	34.2%
Highly Experienced (15+ years)		10.6%	9.5%	11.8%
Educational attainment	683			
Bachelor's degree		33.7%	26.2%	41.6%
Master's degree		50.4%	57.0%	43.4%
Specialist certificate/degree		13.3%	14.3%	12.4%
Doctorate		2.6%	2.6%	2.7%
Certification (within state)	669			
Regular		78.2%	75.0%	81.5%
Advanced		9.0%	10.8%	7.1%
Probation/Temporary/Other		12.9%	14.2%	11.4%
Teacher – Job Characteristics				
Full-time (1 = *full-time*)	686	89.2%	85.0%	93.7%
Leader (1 = *leader*)	686	10.5%	10.8%	10.2%
Subject	671			
Math		19.9%	18.8%	21.1%
English		26.9%	25.2%	28.9%
Social Studies		13.0%	13.1%	13.0%
Science		12.0%	11.7%	12.2%
Other		28.2%	31.2%	24.8%
Grade Level	667			
Middle School (6-8th)		72.7%	72.7%	72.7%
High School (9-12th)		27.3%	27.3%	27.3%

Table 2.4. *Baseline Equivalence (Prior to Randomization) in the School Composition Characteristics of Treatment and Control Schools in the Analytic Sample*

School Characteristic	Treatment	Control	Difference (T-C)	P-value
Enrollment (students)	758.6	847.6	- 89.0	.636
% FRL	81.9%	85.1%	- 3.2%	.702
% Minority	96.9%	93.5%	3.3%	.226
% SPED	17.5%	21.5%	- 4.0%	.348
% Male	51.4%	55.0%	- 3.5%	.485
Attendance (%)	89.8%	89.2%	0.6%	.861
Exclusionary Discipline Days (per student)	2.2	2.0	0.2	.824
Sample Size	13	12	25	25

Note. Based on administrative data from the Common Core of Data (CCD) from 2010-11 or 2011-2012 based on DN cohort (year of randomization) and MDRC data collection from administrative records. There were no significant differences ($p < .1$, $df = 23$) between treatment and control groups in the analytic sample.

Table 2.5. *Bivariate Correlations Between Variables of Interest*

Variable	1	2	3	4	5	6
1. Treatment (Restorative Practices)	1					
2. Intentions to stay at school	–.07†	1				
3. Intentions to stay in profession	–.03	.58**	1			
4. School Climate (composite, teacher perception)	–.01	.32**	.09*	1		
5. School Climate (composite, student perception)	.04	.12**	.01	.32**	1	
6. Problematic Teacher Absenteeism	–.07†	–.17**	–.08*	–.47**	–.44**	1
n	683	651	651	672	683	651
Range	0, 1	0, 1	0, 1	-1.8 – 1.4	-.3 – .4	1 – 4
Mean/Proportion	51.4%	73.0%	89.0%	-.085	.056	2.22
SD	-	-	-	.60	.18	1.02
Number of Items	1	1	1	17	33	1
Cronbach's alpha	-	-	-	.87	.94	-
ICC (School)	-	.036	.000	.261	.052	.297
ICC (Block)	-	.023	.000	.142	.082	.097

Note. Analytic sample, N=635-683. School climate variables have been standardized.
† $p < .1$; *$p < .05$; **$p < .01$.

Table 2.6. *Item Loadings for School Climate (Teacher Report)*

Item	Factor 1: Supportive Environment	Factor 2: Professional Learning and Collaboration	Factor 3: Problematic Behaviors
To what extent would you agree or disagree with each of the following statements about your experiences at this school during the 2015-2016 school year?			
There was an atmosphere of trust and mutual respect within the school.	.736		
The environment at the school was conducive to teaching and learning.	.714		
A majority of teachers supported school reform efforts (planned or implemented).	.712		
You met with non-teaching professionals (including school administrators, coaches, specialists, case managers and/or counselors) to identify at-risk students and/or plan interventions for those students		.779	
You participated in a professional learning group on effective response to student misbehavior, alternatives to suspension and exclusion, or ways of making your school safer.		.774	
You collaborated with an interdisciplinary team of teachers who shared the same group of students		.742	
A Language Arts coach provided you with instructional mentoring and support		.665	
A Math coach provided you with instructional mentoring and support		.619	
You participated in a professional learning community with teachers from the same subject areas		.608	
To what extent was each of the following a problem in your school during the 2015-2016 school year?			
Students fighting			.822
Theft			.798
Vandalism/destruction of school property			.772
Verbal abuse of teachers			.745
Physical abuse of teachers			.729
Disruptive behavior of students			.706
Students cutting class			.674

Note. n = 1,288 teachers in the full Diplomas Now study. Items are organized by loading (highest to lowest) within each factor. Loadings above .3 are shown.

Table 2.7. *Item Loadings for School Climate (Student Report)*

Item	Factor 1: Supportive Social Environment	Factor 2: Responsive Instructional Practices	Factor 3: Problematic Behaviors
My teachers really listen to what I have to say.	.734		
Teachers at this school set a positive example for students with their actions.	.723		
Teachers at my school try to be fair.	.723		
The principal and other adults here try to be fair.	.703		
The principal and other adults here are respectful of students.	.702		
My teachers meet with me to talk about schoolwork and give me extra help if I need it.	.585		
The adults here are respectful of each other.	.583		
If I had a problem outside of the classroom, I felt I could talk to a teacher at my school.	.582		
My teachers notice when I am doing a good job and let me know about it.	.574		
Most days I enjoy coming to this school.	.524		
Students at my school get along well with teachers.	.515		
I feel safe at this school.	.504		
Overall, other students at this school accept me for who I am.	.441		
I feel that I 'fit in' at my school.	.439		
There is a friend here I can depend on for help and encouragement	.320		
During the PAST MONTH, how often did the following instructional activities occur in most of your classes?			
Teachers asked me to use critical thinking and reasoning to complete tasks or solve problems.		.686	
Students were engaged in different learning activities at the same time.		.658	
Students worked in small groups or pairs.		.626	
Teachers asked me to provide evidence to support my answered.		.591	
Classroom activities dealt with real-life issues.		.585	
Students worked on individual or group projects that lasted several days.		.573	
How much of a problem are the following...			
students bringing weapons like knives and guns to school.			.807
students using/abusing drugs and alcohol in school.			.801
Students involved in gangs and gangs being on school property.			.773

verbal abuse of teachers or other adults in the school by students.	.748
Physical abuse of teacher or other adults in the school by students.	.746
vandalism/destruction of property.	.744
bullying/cyberbullying (students repeatedly teasing other students in person or online)	.669
teachers not being able to control the classroom.	.661
students fighting	.659
students cutting classes.	.533

Note. n = 5,931 students in the full Diplomas Now study. Items are organized by loading (highest to lowest) within each factor. Loadings above .3 are shown.

Table 2.8. *Estimated Impacts of RP/DN on Outcomes (Organized by Respondent)*

School Climate Outcomes	ATE		ES
Teacher-reported SC Composite	**.170**	**(.103)†**	**.271**
SC: Supportive Environment	.019	(.132)	.021
SC: Professional Learning and Collaboration	.145	(.057)*	.204
SC: (Fewer) Problematic Behaviors	.175	(.150)	.208
Student-reported SC Composite	**.068**	**(.032)***	**.148**
SC: Supportive Social Environment	.087	(.045)†	.152
SC: Responsive Instructional Practices	.045	(.052)	.064
SC: (Fewer) Problematic Behaviors	.089	(.044)*	.116
Turnover-related Outcomes	ATE		
Intentions to stay			
At their school[1]	**-.253**	**(.227)**	**OR = .777**
In the profession[1]	-.315	(.270)	OR = .730
Problematic Teacher absenteeism	-.386	(.180)*	ES = -.356

Note. **Primary outcomes are bolded.** ATE = average treatment effect; ES = effect size; OR = odds ratio; SC = school climate. Robust standard errors are shown in parentheses. Results from these final multilevel models include treatment effect, blocks, and significant covariates (fulltime status for teacher-reported school climate; students' age, grade, and Hispanic race/ethnicity for student-reported school climate; and grade level and experienced teacher status for turnover-related outcomes).

[1]For these binary outcomes, treatment effects are expressed in log odds and odds ratios.

† $p < .1$; * $p < .05$; ** $p < .01$. All significance tests are two-tailed.

Table 3.1. *Characteristics of Schools and Teachers by Treatment Assignment*

Variables	Treatment (RP/DN)	Control
Teacher – Individual Characteristics		
Experience: as a teacher		
New (1 year or less)	21.4%	24.1%
Highly experienced (15+ years)	36.2%	41.0%
Experience: in current school		
New (1 year or less)	55.0%	48.5%
Highly experienced (15+ years)	9.5%	11.7%
Educational attainment: Advanced (Master's or more)	73.8%	58.4%
Certification		
Advanced	10.8%	7.1%
Probation/Alternative/Other	14.2%	11.4%
Teacher – Job Characteristics		
Full-time classroom	85.0%	93.7%
Leader	10.8%	10.2%
Subject		
Math/Science	32.2%	33.7%
SPED	15.9%	21.0%
Grade Level		
Middle School (6-8th)	72.7%	72.7%
High School (9-12th)	27.1%	24.4%
School Characteristics		
Student Enrollment	654 (385)	700 (303)
% Students on FRL	90.7%	87.5%
% Students of Color	96.5%	96.9%
Exclusionary discipline (2014)	80 (79)	103 (103)
Restorative Practices Usage		
Teacher's self-reported use of RP	3.61 (.77)	3.47 (.86)
Teachers' use of RP (student-report)	2.98 (.27)	2.92 (.22)
Teachers' RP spirit (student-report)	3.24 (.22)	3.12 (.15)
Students' (self-reported) use of RP	2.70 (.26)	2.56 (.20)
Teacher's RP PD experiences	2.45 (.93)	1.94 (1.18)
n, J	353, 13	333, 12

Note. Based on analytic sample, $N = 686$ teachers, from Spring 2016 teacher survey respondents. RP/DN = Restorative Practices combined with DN; SPED = special education; FRL = free and reduced price lunch; PD = professional development. Standard deviations provided in parentheses where appropriate.

Table 3.2a. *Bivariate Correlations Between Key Variables – Among Treatment Schools Only*

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Intentions (1=*stay*)	1.00											
2. SC – teacher rating[1]	0.30***	1.00										
3. RP launch (1=*green*)	0.05	–0.12*	1.00									
4. RP PLG (1=*received*)	–0.02	–0.21***	0.45***	1.00								
5. RP consultations	–0.15**	–0.35***	0.33***	0.60***	1.00							
6. RP PD's	–0.02	–0.33***	0.62***	0.77***	0.64***	1.00						
7. Uptake Index	–0.06	–0.38***	0.41***	0.77***	0.75***	0.94***	1.00					
8. Teacher's self-reported use of RP	0.16**	0.19***	0.04	0.07	–0.00	0.08	0.06	1.00				
9. Teachers' use of RP (student-report)	0.04	0.08	–0.25***	0.08	0.06	–0.26***	–0.07	0.08	1.00			
10. Teachers' RP spirit (student-report)	0.02	0.18***	0.09†	0.04	0.07	–0.24***	–0.21***	0.07	0.54***	1.00		
11. Students' (self-reported) use of RP	0.04	0.19***	0.29***	0.48***	0.05	0.25***	0.18***	0.20***	0.09†	0.42***	1.00	
12. Teacher's RP PD experiences	0.10†	0.21***	0.18***	0.18***	0.07	0.18***	0.14**	0.27***	0.10†	0.06	0.14*	1.00
Mean	69.9%	-.01	34.7%	72.5%	1.3	2.1	1.2	3.6	3.0	3.3	2.7	2.5
Standard deviation	-	.58	-	-	1.3	1.7	.9	.8	.3	.2	.3	.9
Range	0, 1	-1.4-1.5	0, 1	0, 1	0-4	0-4	0-3	1-5	1-5	1-5	1-5	0-3

Note. Treatment (DN/RP) sample, *N*=320-353. RP = Restorative Practices; SC = school climate; PLG = professional learning groups; PD = professional development.

[1]School climate variable is the average of standardized items to account for different item ranges.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.2b. *Bivariate Correlations Between Key Variables – Among Analytic Sample*

Variable	1	2	3	4	5	6	7	8
1. Intentions (1=*stay*)	1.00							
2. SC – teacher rating[1]	0.32***	1.00						
3. RP Assignment (=1)	-0.07†	-0.01	1.00					
4. Teacher's Use of RP (teacher self-report)	0.07†	0.12**	0.08*	1.00				
5. Teachers' use of RP (student-report)	-0.04	-0.03	0.35***	0.08*	1.00			
6. Teachers' RP spirit (student-report)	-0.02	-0.00	0.43***	0.04	0.60***	1.00		
7. Students' (self-reported) use of RP	-0.04	0.02	0.35***	0.19***	0.30***	0.39***	1.00	
8. Teacher's RP PD experiences	0.03	0.22***	0.23***	0.29***	0.07†	0.04	0.15***	1.00
n	651	672	686	647	683	683	683	686
Mean	74.6%	-.00	51.5%	3.54	2.92	3.19	2.59	2.20
Standard deviation	-	.60	-	.82	.23	.18	.24	1.09
Range	0, 1	-1.7-1.5	0, 1	1-5	1-5	1-5	1-5	0-3
Number of items	1	18	1	6	5	6	5	3
Reliability	-	.89	-	.84	.80	.84	.82	-

Note. RP = Restorative Practices; SC = school climate; PLG = professional learning groups; PD = professional development.
[1]School climate variable is the average of standardized items to account for different item ranges.
†$p < .10$; *$p<.05$; **$p<.01$, *** $p < 0.001$

Table 3.3. *Path Coefficients from Path Analysis of Uptake, Usage, and Outcomes* (Figure 3.7 – Treatment Only)

Predictor	Mediator(s)	Outcome	*β*	*SE*	*p*
Total Effects					
Uptake	Teachers' RP PD experiences		.20	.05	.001
Uptake		SC	-.21	.06	.001
Uptake		Intentions to stay	-.01	.02	.849
Direct Effects					
Uptake		SC	-.39	.07	.000
Uptake		Intentions to stay	.16	.04	.011
Indirect Effects					
Uptake	Teachers' RP PD experiences	Teacher self-reported use	.05	.017	.004
Uptake	Teachers' RP PD experiences	SC	.02	.008	.009
Uptake	PD – SC	Intentions to stay	.01	.002	.010

Note. *N* = 353; teachers in treatment schools only. RP = Restorative Practices. PD=Professional Development. SE = Bootstrap (5,000) standard errors. Point estimates for paths are presented in standardized coefficients. Only significant ($p < .05$) indirect paths related to the research questions (predicted by uptake) are included in the table.

Table 3.4. *Comparison of Model Fit (Path Analyses of Assignment, Usage, and Outcomes)*

Model	LL (df)	RMSEA	BIC	LR p-value
1. Full Hypothesized Model (Figure 3.8)	-9692.64 (156)	.054	20387.55	
2. Without all b paths	-9739.62 (146)	.100	20417.26	.000
3. Without c' path	-9695.03 (154)	.052	20379.50	.091
4. Without insignificant b paths	-9698.66 (152)	.056	20373.90	.017

Note. n = 617 (fully observed cases, with listwise deletion). LL = log-likelihood; df = degrees of freedom; LR p-value = Log-likelihood ratio test p-value (compared to model 1). All models had the same R^2.

Table 3.5. *Path Analysis of Assignment, Usage, and Outcomes* (Figure 3.8 – Treatment and Control)

Paths				*β*	*SE*	*p*
Total Effects						
RP Assignment	Teacher self-reported RP usage			.07	.07	.300
RP Assignment	Teacher RP usage (student-report)			.20	.06	.001
RP Assignment	Teacher RP spirit (student-report)			.22	.05	.000
RP Assignment	Student self-reported use			.12	.05	.011
RP Assignment	Teacher RP PD experience			.55	.13	.000
RP Assignment		SC		.27	.10	.009
			Intentions to stay	-.03	.05	.614
	Student self-reported use	SC		-1.08	.45	.016
	Teacher RP PD experience	SC		.12	.10	.000
	Teacher self-reported RP usage		Intentions to Stay	.05	.02	.042
	Teacher RP usage (student-report)		Intentions to Stay	.53	.14	.000
	Teacher RP spirit (student-report)		Intentions to Stay	-.43	.15	.003
Direct Effects						
RP Assignment		SC		.22	.03	.000
RP Assignment			Intentions to stay	-.10	.03	.000
Indirect Effects						
RP Assignment	RP PD experience	Teacher Use		.12	.03	.000
RP Assignment	Teacher RP Spirit	SC		.18	.07	.015
RP Assignment	RP PD experience	SC		.05	.01	.000
RP Assignment	Teacher RP Spirit		Intentions to stay	-.13	.06	.029
RP Assignment	Teacher RP Spirit	SC	Intentions to stay	.05	.02	.016
RP Assignment	Student use	SC	Intentions to stay	-.08	.02	.002
RP Assignment	RP PD experience	SC	Intentions to stay	.01	.004	.001

Note. *N* = 686. RP = Restorative Practices. PD=Professional Development. SC = School climate. SE = Bootstrap (5,000) standard errors. Point estimates for paths are presented in standardized coefficients. Only significant ($p < .05$) indirect effects and direct and total effect paths related to the research questions are included in the table.

Table 4.1. *School and Teacher Characteristics (by Turnover Intentions)*

Variables	n	Mean/%	Turnover Intentions Stayers	Turnover Intentions Leavers
Teacher – Individual Characteristics			1,097[1]	360[1]
Experience – as a teacher	1,556			
New (1 year or less)		23.8%	22.2%	30.1%
Highly experienced (15+ years)		38.4%	40.5%	32.0%
Experience – in current school	1,554			
New (1 year or less)*		52.0%	49.3%	61.0%
Highly experienced (15+ years)*		13.7%	15.6%	7.8%
Educational attainment	1,554			
Bachelor's degree		34.6%		
Master's degree		48.3%		
Specialist certificate/degree		14.1%		
Doctorate		3.1%		
Advanced Education*		65.4%	64.7%	63.0%
Certification (within state)	1,520			
Regular		78.5%		
Advanced*		6.8%	6.5%	7.4%
Alternative*		14.6%	13.6%	18.4%
Teacher – Job Characteristics				
Full-time classroom teacher*	1,559	90.0%	91.6%	91.4%
Leader*	1,559	10.8%	9.6%	12.8%
Subject	1,539			
English		26.1%		
Social Studies		13.9%		
Other (CTE, Languages, etc.)		29.1%		
Math/Science*		30.9%	31.8%	30.7%
Special Education*		16.9%	18.0%	13.9%
Grade Level	1,525			
Middle School (6-8th)*		38.2%	36.7%	45.7%
High School (9-12th)		61.8%		
Intervention Supports: RP	1,559	28.0%	26.3%	35%
DN	1,559	49.6%	49.0%	54.2%
School Characteristics	41			
Enrollment		909	1220	1134
% FRL		86.5%	84.1%	86.7%
% Minority Race/Ethnicity		96.6%	96.6%	96.6%
Number of Full-time teachers		54	72	66
Student-to-teacher ratio		17.0:1	17.0:1	17.5:1

Note. CTE = career and technical education; RP = Restorative Practices; DN = Diplomas Now; FRL = free or reduced price lunch status. Alternative certification includes Probationary and Temporary certifications. Turnover intentions columns report the demographics for the subgroups of teachers defined at the top (n = 1,097 and 360).
* designates dummy variables included in the analytic models representing categorical demographic features.
[1]Number of stayers and leavers does not add up to the total number of observations due to 30 teachers who responded they were "unsure" and 102 teachers who did not respond to the turnover intentions item (or responded in a way that was non-codeable).

Table 4.2. *Distribution and Coding of Turnover Intentions Variables*

Turnover Category	%	Stay	Move	Leave
Stayers				
Stay at School	75.3%	1	0	0
Movers				
Move schools within district	8.3%	0	1	0
Change districts (including relocation)	5.1%	0	1	0
Change to private school	0.8%	0	1	0
Leavers				
Leave profession (including retirement)	6.0%	0	0	1
Leave teaching, stay in Education (role switch)	2.4%	0	0	1
Undecided	2.1%	0	0	0

Note. n = 1,457.

Table 4.3. *Proportions of Teachers Reporting Different Types of Staying Intentions*

Staying Measure	%
Stay in Education	91.9%
Stay in Teaching	89.5%
Stay at School	75.3%

Note. n = 1,457.

Table 4.4. *Bivariate Correlations Between Main Variables of Interest*

Variable	1	2	3	4	5	6
1. Intentions to move	1.00					
2. Intentions to leave	–0.13***	1.00				
3. Problematic teacher absenteeism	0.14***	0.08*	1.00			
4. Teachers' use of Restorative Practices (teacher self-report)	–0.03	–0.10***	–0.06*	1.00		
5. Teachers' restorative culture – (student report, school level)	0.06*	–0.02	–0.12***	0.05*	1.00	
6. Students' restorative culture – (student report, school level)	0.06*	–0.01	0.07**	0.17***	0.52***	1.00
Mean (or Proportion)	14.5%	8.6%	2.17	3.57	2.95	2.50
SD	-	-	1.02	.82	.19	.22
Range	0, 1	0, 1	1 – 4	1 – 5	1 – 5	1 – 5
Number of items	1	1	1	6	11	5
Reliability	-	-	-	.85	.86	.82
ICC	.117	.018	.341	.051	-	-

Note. n=1406-1564. SD = standard deviation. ICC = intra-class correlation.
*p<.05; **p<.01, *** p<0.001

Table 4.5. *Regression Analyses Including All Covariate Estimates*

Variables	Teachers' RP Usage (teacher self-report)	Intentions to Stay (OR)	Problematic Teacher Absenteeism
Teacher Characteristics			
Experience at school - New (0-1 years)	0.06 (0.05)	0.74 (0.11)*	–0.04 (0.06)
Experienced (15+ years)	–0.17 (0.07)*	1.78 (0.43)*	0.01 (0.08)
Advanced Degree	0.04 (0.05)	0.96 (0.14)	0.02 (0.05)
Certification - Alternative	–0.08 (0.07)	0.76 (0.14)	–0.00 (0.07)
- Advanced	–0.07 (0.09)	0.80 (0.21)	0.00 (0.10)
Job Characteristics			
Full-time Classroom Teacher	–0.20 (0.09)*	0.92 (0.24)	–0.06 (0.10)
Leader role	–0.04 (0.08)	0.74 (0.16)	0.21 (0.08)**
Subject - Math/Science	–0.15 (0.05)**	1.18 (0.16)	0.02 (0.05)
- SPED	0.15 (0.06)*	1.29 (0.23)	–0.03 (0.06)
Grade level – middle school	0.18 (0.09)*	0.72 (0.13)†	0.27 (0.15)†
School Characteristics			
Enrollment[1]	0.00 (0.00)	1.00 (0.00)	–0.00 (0.00)
% Students FRL[1]	0.37 (0.36)	0.06 (0.04)**	1.52 (0.86)+
% Students Minority race/ethnicity[1]	0.83 (0.98)	3.01 (5.13)	–0.96 (2.35)
Teachers' Use of Restorative Practices		1.32 (0.10)**	–0.06 (0.03)*
Intervention Support – RP	–0.13 (0.12)	0.99 (0.20)	–0.49 (0.28)†
– DN	0.13 (0.10)	0.91 (0.16)	0.06 (0.25)
Constant	3.64 (0.12)**	1.70 (0.72)	2.48 (0.21)**

Note. n = 1363 (absenteeism), n = 1371 (intentions), j =41. RP = Restorative Practices. OR = Odds ratio. SPED = Special education classes. Standard errors in parentheses. Units are in beta coefficients of original scale unless noted otherwise. Results are presented from final model, Model 5 in Table 4.6 below, with all covariates included.

[1]Centered variables

** p<0.01, * p<0.05, † p<0.1

Table 4.6. *Regression Analyses Predicting Intentions to Stay and Problematic Teacher Absenteeism*

	Outcome: Intentions to Stay (OR)			Outcome: Problematic Teacher Absenteeism (B)		
Model (variables added)	Teachers' RP usage	Teachers' restorative culture	Students' restorative culture	Teachers' RP usage	Teachers' restorative culture	Students' restorative culture
1: Bivariate	1.280 (.198)**	.530 (.238)	.596 (.229)	–.062 (.029)*	–.481 (.372)	.1232 (.327)
2: + Teacher	1.309 (.102)**	.539 (.239)	.636 (.241)	–.062 (.028)*	–.489 (.375)	.229 (.331)
3: + Job	1.321 (.104)**	.770 (.358)	1.037 (.446)	–.063 (.029)*	–.735 (.341)*	–.047 (.332)
4: + School	1.315 (.102)**	1.301 (.528)	1.030 (.359)	–.063 (.029)*	–1.163 (.439)**	–.191 (.371)
5: + Intervention Supports	1.317 (.101)**	1.498 (.658)	1.080 (.384)	–.064 (.029)*	–.894 (.414)*	.122 (.333)

Note. n = 1363 (absenteeism), n = 1371 (intentions), j =41. Turnover Intentions binary outcome results presented in odds ratio (OR). Problematic Teacher absenteeism results presented in original 4-point scale units (how problematic: not a problem – a serious problem), with robust standard errors. All models account for the clustering of teachers in schools using a hierarchical modeling approach. Covariate sets for each model are as follows (and shown in Table 4.5): Model 1 includes only the restorative practices measures (shown in the column header), Model 2 adds the individual teacher characteristics of new or experienced at the school, alternative or advanced certification, and advanced educational attainment; Model 3 adds the individual teacher job characteristics of subject (math/science or SPED), full-time classroom status, leadership role, and grade level taught (middle vs. high school); Model 4 adds the school characteristics of enrollment, % students from racial/ethnic minority background, and % students on FRL; and Model 5 adds intervention supports dummy variables (Diplomas Now and Restorative Practices).

** p<0.01, * p<0.05, † p<0.1

Table 4.7. *Multinomial Logistic Regression Analysis Predicting 3-Category Turnover Intentions* (Results in RRR)

Outcome Category (compared to staying intentions)	Teachers' RP usage	Teachers' restorative culture	Students' restorative culture
Moving	.806 (.078)*	.863 (.461)	1.027 (.441)
Leaving	.650 (.078)**	.430 (.311)	.687 (.402)

Note. n = 1343, j =41. RP = Restorative Practices. Results are presented in relative risk ration (RRR) units comparing likelihood of outcomes to the likelihood of intending to stay. Based on final model (5) with all covariates.
** p<0.01, * p<0.05, † p<0.1

Table 4.8. *Regression Analyses Predicting Outcomes by Individual Teacher RP Usage Items*

Teacher self-reported practice	Construct	Intentions to Stay (binary)	Intentions to move	Intentions to leave	Teacher Absenteeism
I facilitate dialogue circles to provide opportunities for my students to share feelings, ideas, and experiences.	proactive circles	1.196 (.062)**	.861 (.055)*	.772 (.062)**	–.067 (.019)**
I actively encourage students to express their feelings.	student feelings expression	1.286 (.088)**	.770 (.066)**	.733 (.075)**	–.040 (.026)
I facilitate a dialogue circle with my students as a response to an incident or problem.	responsive circles	1.107 (.053)*	.943 (.056)	.811 (.060)**	–.046 (.017)**
When students misbehave, I respond by asking them questions about what happened, who has been harmed, and how the harm can be repaired.	restorative questions	1.198 (.078)**	.858 (.070)+	.781 (.076)*	–.025 (.027)
When students' negative behaviors harm others, I provide opportunities for those who were harmed to be heard and to have a say in what needs to happen to make things right	victim voice	1.157 (.069)*	.898 (.067)	.773 (.069)**	–.028 (.021)
I express my feeling to my students throughout the day.	teacher feelings expression	1.098 (.070)	.984 (.079)	.838 (.080)+	.015 (.018)

Note. n = 1325-63, j = 41. Based on final model (5) with all covariates. Teachers responded to these individual items based on their frequency of using these practices on a 5-point scale : never, rarely, sometimes, often, or always.
** p<0.01, * p<0.05, † p<0.1

References

Achinstein, B., Ogawa, R. T., Sexton, D., & Freitas, C. (2010). Retaining teachers of color: A pressing problem and a potential strategy for "hard-to-staff" schools. *Review of Educational Research, 80*(1), 71-107. doi:10.3102/0034654309355994

Acosta, J., Chinman, M., Ebener, P., Malone, P. S., Phillips, A., & Wilks, A. (2019). Evaluation of a whole-school change intervention: Findings from a two-year cluster-randomized trial of the restorative practices intervention. *Journal of Youth and Adolescence, 48*(5), 876-890. doi:10.1007/s10964-019-01013-2

Adnot, M., Dee, T., Katz, V., & Wyckoff, J. (2016). Teacher turnover, teacher quality, and student achievement in DCPS. *Educational Evaluation and Policy Analysis, 39*(1), 54-76. doi:10.3102/0162373716663646

Agresti, A. (2002). *Categorical data analysis* (2nd ed.). Hoboken, NJ: Wiley & Sons, Inc.

Alexander, K., Entwisle, D., & Olson, L. (2014). *The long shadow:Ffamily background, disadvantaged urban youth and the transition to adulthood*. New York: Russell Sage Foundation.

Allensworth, E., Ponisciak, S., & Mazzeo, C. (2009). *The schools teachers leave: Teacher mobility in chicago public schools*. Chicago, IL. Consortium on Chicago School Research.

Alliance for Excellent Education. (2014). *On the path to equity: Improving the effectiveness of beginning teachers*. Washington, DC: Alliance for Excellent Education.

Angrist, J. D., Imbens, G. W., & Rubin, D. B. (1996). Identification of causal effects using instrumental variables. *Journal of the American Statistical Association, 91*(434), 444-455.

Anyon, Y. (2016). *Taking restorative practices school-wide: Insights from three schools in Denver*. Denver, CO. Denver School-Based Restorative Practices Partnership

Anyon, Y., Gregory, A., Stone, S., Farrar, J., Jenson, J. M., McQueen, J., . . . Simmons, J. (2016). Restorative interventions and school discipline sanctions in a large urban school district. *American Educational Research Journal, 53*(6), 1663-1697. doi:10.3102/0002831216675719

Armour, M. (2013). *Ed White Middle School restorative discipline evaluation: Implementation and impact*. Austin, TX. The Institute for Restorative Justice and Restorative Dialogue (IRJRD)

Armour, M. (2015). Restorative Practices: Righting the wrongs of exclusionary school discipline. *University of Richmond Law Review, 50*, 999-1038.

Armour, M. (2016). *Ed White Middle School restorative discipline evaluation: Implementation and impact, 2014/2015*. Austin, TX. The Institute for Restorative Justice and Restorative Dialogue (IRJRD).

Astor, R. A., Benbenishty, R., & Estrada, J. N. (2009). School violence and theoretically atypical schools: The principal's centrality in orchestrating safe schools. *American Educational Research Journal, 46*(2), 423-461. doi:10.3102/0002831208329598

Augustine, C. H., Engberg, J., Grimm, G. E., Lee, E., Wang, E. L., Christianson, K., & Joseph, A. A. (2019). *Can restorative practices improve school climate and curb*

suspensions? An evaluation of the impact of restorative practices in a mid-sized urban school district. Santa Monica, CA. RAND Corporation.

Ballou, D., & Podgursky, M. (2002). Returns to seniority among public school teachers. *Journal of Human Resources*, 892-912. doi:10.2307/3069620

Barnes, G., Crowe, E., & Schaefer, B. (2007). *The cost of teacher turnover in five school districts: A pilot study*. New York, NY. National Commission on Teaching and America's Future.

Beets, M. W., Flay, B. R., Vuchinich, S., Acock, A. C., Li, K. K., & Allred, C. (2008). School climate and teachers' beliefs and attitudes associated with implementation of the positive action program: a diffusion of innovations model. *Prevention Science, 9*(4), 264-275. doi:10.1007/s11121-008-0100-2

Berkowitz, R., Moore, H., Astor, R. A., & Benbenishty, R. (2016). A research synthesis of the associations between socioeconomic background, inequality, school climate, and academic achievement. *Review of Educational Research, 87*(2), 425-469. doi:10.3102/0034654316669821

Billingsley, B. S. (2004). Special education teacher retention and attrition: A critical analysis of the research literature. *The Journal of Special Education, 38*(1), 39-55. doi:10.1177/00224669040380010401

Blood, P., & Thorsborne, M. (2005). *The challenge of culture change: Embedding restorative practice in schools.* Paper presented at the 6th International Conference on Conferencing, Circles and other Restorative Practices,'Building a Global Alliance for Restorative Practices and Family Empowerment', Sydney, Australia.

Blood, P., & Thorsborne, M. (2006). *Overcoming resistance to whole-school uptake of restorative practices*. Paper presented at the International Institute of Restorative Practice's 'The Next Step: Developing Restorative Communities, Part 2', Bethlehem, PA.

Bonell, C., Allen, E., Warren, E., McGowan, J., Bevilacqua, L., Jamal, F., . . . Viner, R. M. (2018). Effects of the Learning Together intervention on bullying and aggression in English secondary schools (INCLUSIVE): A cluster randomised controlled trial. *The Lancet, 392*(10163), 2452-2464. doi:10.1016/s0140-6736(18)31782-3

Borman, G. D., & Dowling, N. M. (2008). Teacher attrition and retention: A meta-analytic and narrative review of the research. *Review of Educational Research, 78*(3), 367-409. doi:10.3102/0034654308321455

Borman, G. D., & Kimball, S. M. (2005). Teacher quality and educational equality: Do teachers with higher standards-based evaluation ratings close student achievement gaps? *The Elementary School Journal, 106*(1), 3-20. doi:10.1086/496904

Botvin, G. J. (2004). Advancing prevention science and practice: Challenges, critical issues, and future directions. *Prevention Science, 5*(1), 69-72.

Boyd, D., Grossman, P., Hammerness, K., Lankford, H., Loeb, S., Ronfeldt, M., & Wyckoff, J. (2012). Recruiting effective math teachers: Evidence from New York City. *American Educational Research Journal, 49*(6), 1008-1047. doi:10.3102/0002831211434579

Boyd, D., Lankford, H., Loeb, S., & Wyckoff, J. (2005). Explaining the short careers of high-achieving teachers in schools with low-performing students. *The American Economic Review, 95*(2), 166-171. doi:10.1257/000282805774669628

Bradshaw, C. P. (2013). Preventing bullying through Positive Behavioral Interventions and Supports (PBIS): A multitiered approach to prevention and integration. *Theory Into Practice, 52*(4), 288-295. doi:10.1080/00405841.2013.829732

Bradshaw, C. P., Koth, C. W., Bevans, K. B., Ialongo, N., & Leaf, P. J. (2008). The impact of school-wide positive behavioral interventions and supports (PBIS) on the organizational health of elementary schools. *School Psychology Quarterly, 23*(4), 462-473. doi:10.1037/a0012883

Bradshaw, C. P., Koth, C. W., Thornton, L. A., & Leaf, P. J. (2009). Altering school climate through school-wide Positive Behavioral Interventions and Supports: Findings from a group-randomized effectiveness trial. *Prevention Science, 10*(2), 100-115. doi:10.1007/s11121-008-0114-9

Bradshaw, C. P., Waasdorp, T. E., & Leaf, P. J. (2015). Examining variation in the impact of school-wide positive behavioral interventions and supports: Findings from a randomized controlled effectiveness trial. *Journal of Educational Psychology, 107*(2), 546-557. doi:10.1037/a0037630

Braithwaite, J. (1999). Restorative justice: Assessing optimistic and pessimistic accounts. *Crime and Justice, 25*, 1-127. doi:10.1086/449287

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist, 32*(7), 513-531. doi:10.1037/0003-066X.32.7.513

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development *Handbook of Child Psychology* (Vol. I. Theoretical Models of Human Development). Hoboken, NJ: John Wiley & Sons, Inc.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. *Sage Focus Editions, 154*, 136-136.

Bruno, J. E. (2002). Teacher absenteeism in urban schools. *Education Policy Analysis Archives, 10*(32).

Bryan, C. J., Bryan, A. O., Anestis, M. D., Anestis, J. C., Green, B. A., Etienne, N., . . . Ray-Sannerud, B. (2016). Measuring moral injury: Psychometric properties of the moral injury events scale in two military samples. *Assessment, 23*(5), 557-570. doi:10.1177/1073191115590855

Bryk, A., & Schneider, B. (2002). *Trust in schools: A core resource for improvement*. New York, NY: Russell Sage Foundation.

Bryk, A., Sebring, P. B., Allensworth, E., Easton, J. Q., & Luppescu, S. (2010). *Organizing schools for improvement: Lessons from Chicago*. Chicago, IL: University of Chicago Press.

Carver-Thomas, D., & Darling-Hammond, L. (2017). *Teacher turnover: Why it matters and what we can do about it.* Palo Alto, CA: Learning Policy Institute.

Carver-Thomas, D., & Darling-Hammond, L. (2019). The trouble with teacher turnover: How teacher attrition affects students and schools. *Education Policy Analysis Archives, 27*. doi:10.14507/epaa.27.3699

Castro, F. G., Barrera, M., & Martinez, C. R. (2004). The cultural adaptation of prevention interventions: Resolving tensions between fidelity and fit. *Prevention Science, 5*(1), 41-45.

Clotfelter, C. T., Glennie, E., Ladd, H., & Vigdor, J. (2008a). Teacher bonuses and teacher retention in low-performing schools: Evidence from the North Carolina $1,800 teacher bonus program. *Public Finance Review, 36*(1), 63-87.

Clotfelter, C. T., Glennie, E., Ladd, H., & Vigdor, J. (2008b). Would higher salaries keep teachers in high-poverty schools? Evidence from a policy intervention in North Carolina. *Journal of Public Economics, 92*(5-6), 1352-1370. doi:10.1016/j.jpubeco.2007.07.003

Clotfelter, C. T., Ladd, H. F., Vigdor, J., & Wheeler, J. (2006). High-poverty schools and the distribution of teachers and principals. *North Carolina Law Review, 85*, 1345.

Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2011). Teacher mobility, school segregation, and pay-based policies to level the playing field. *Education Finance and Policy, 6*(3), 399-438. doi:10.1162/EDFP_a_00040

Clotfelter, C. T., Ladd, H. F., Vigdor, J. L., & Diaz, R. A. (2004). Do school accountability systems make it more difficult for low-performing schools to attract and retain high-quality teachers? *Journal of Policy Analysis and Management, 23*(2), 251-271. doi:10.1002/pam.20003

Cochran-Smith, M., Cannady, M., McEachern, K. P., Piazza, P., Power, C., & Ryan, A. (2011). Teachers' education, teaching practice, and retention: A cross-genre review of recent research. *Journal of Education, 191*(2), 19-31. doi:10.1177/002205741119100205

Cohen, J., McCabe, L., Michelli, N. M., & Pickeral, T. (2009). School climate: Research, policy, practice, and teacher education. *Teachers College Record, 111*(1), 180-213.

Cook, T. D., Habib, F.-N., Phillips, M., Settersten, R. A., Shagle, S. C., & Degirmencioglu, S. M. (1999). Comer's school development program in Prince George's County, Maryland: A theory-based evaluation. *American Educational Research Journal, 36*(3), 543-597. doi:10.3102/00028312036003543

Cornell, D. G., & Huang, F. (2018). Collecting and analyzing local school safety and climate data. In M. Mayer & S. Jimerson (Eds.), *School safety and violence prevention: Science, practice, and policy driving change.* Washington, DC: American Psychological Association.

Corrin, W., Sepanik, S., Gray, A., Fernandez, F., Briggs, A., & Wang, K. K. (2014). *Laying tracks to graduation: The first year of implementing Diplomas Now*. MDRC. New York, NY.

Corrin, W., Sepanik, S., Rosen, R., & Shane, A. (2016). *Addressing early warning indicators: Interim impact findings from the Investing in Innovation (i3) evaluation of Diplomas Now*. New York, NY. MDRC.

Costello, B., Wachtel, J., & Wachtel, T. (2009). *The restorative practices handbook: For teachers, disciplinarians and administrators*. Bethlehem, PA: International Institute for Restorative Practices.

Cowan, J., & Goldhaber, D. (2018). Do bonuses affect teacher staffing and student achievement in high poverty schools? Evidence from an incentive for national

board certified teachers in Washington State. *Economics of Education Review, 65*, 138-152. doi:10.1016/j.econedurev.2018.06.010

Dane, A. V., & Schneider, B. H. (1998). Program integrity in primary and early secondary prevention: Are implementation effects out of control? *Clinical Psychology Review, 18*(1), 23-45. doi:10.1016/S0272-7358(97)00043-3

Darling-Hammond, L. (2015). *The Flat World and Education: How America's Commitment to Equity Will Determine our Future*. New York, NY: Teachers College Press.

Darling-Hammond, S., Fronius, T. A., Sutherland, H., Guckenburg, S., Petrosino, A., & Hurley, N. (2020). Effectiveness of restorative justice in US K-12 schools: A review of quantitative research. *Contemporary School Psychology*. doi:10.1007/s40688-020-00290-0

Davis, B., Sumara, D. J., & Sumara, D. (2006). *Complexity and education: Inquiries into learning, teaching, and research*: Psychology Press.

Deal, T. E., & Peterson, K. D. (2016). *Shaping school culture: The heart of leadership* (3rd ed.). San Francisco, CA: Jossey-Bass.

DeAngelis, K. J., & Presley, J. B. (2007). *Leaving schools or leaving the profession: Setting Illinois' record straight on new teacher attrition*. Edwardsville, IL. Illinois Education Research Council.

DeAngelis, K. J., Wall, A. F., & Che, J. (2013). The impact of preservice preparation and early career support on novice teachers' career intentions and decisions. *Journal of Teacher Education, 64*(4), 338-355. doi:10.1177/0022487113488945

DeCesare, D., McClelland, A., & Randel, B. (2017). *Impacts of the Retired Mentors for New Teachers Program.* . Regional Educational Laboratory Central. Washington, CD. US Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Education Laboratory Central. Retrieved from http://ies.ed.gov/ncee/edlabs

Desimone, L. (2002). How can comprehensive school reform models be successfully implemented? *Review of Educational Research, 72*(3), 433-479. doi:10.3102/00346543072003433

Djonko-Moore, C. M. (2015). An exploration of teacher attrition and mobility in high poverty racially segregated schools. *Race Ethnicity and Education, 19*(5), 1063-1087. doi:10.1080/13613324.2015.1013458

Dobson, D., & Cook, T. J. (1980). Avoiding type III error in program evaluation: Results from a field experiment. *Evaluation and Program Planning, 3*(4), 269-276. doi:10.1016/0149-7189(80)90042-7

Dominus, S. (2016, September 7). An effective but exhausting alternative to high-school suspensions. *The New York Times*. https://www.nytimes.com/2016/09/11/magazine/an-effective-ut-exhausting-alternative-to-high-school-suspensions.html

Domitrovich, C. E., Bradshaw, C. P., Greenberg, M. T., Embry, D., Poduska, J. M., & Ialongo, N. S. (2010). Integrated models of school-based prevention: Logic and theory. *Psychology in the Schools, 47*(1), 71-88. doi:10.1002/pits.20452

Domitrovich, C. E., & Greenberg, M. T. (2000). The study of implementation: Current findings from effective programs that prevent mental disorders in school-aged

children. *Journal of Educational and Psychological Consultation, 11*(2), 193-221. doi:10.1207/s1532768xjepc1102_04

Donaldson, M. L., & Johnson, S. M. (2010). The price of misassignment: The role of teaching assignments in Teach For America teachers' exit from low-income schools and the teaching profession. *Educational Evaluation and Policy Analysis, 32*(2), 299-323. doi:10.3102/0162373710367680

Duncan, A. (2009). Preparing the teachers and school leaders of tomorrow: Secretary Arne Duncan's remarks at the American Association of Colleges for Teacher Education Conference [Press release]. Retrieved from https://www2.ed.gov/news/speeches/2010/02/02192010.html

Durlak, J. A., & DuPre, E. P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology, 41*(3-4), 327-350. doi:10.1007/s10464-008-9165-0

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development, 82*(1), 405-432. doi:10.1111/j.1467-8624.2010.01564.x

Dusenbury, L., Brannigan, R., Falco, M., & Hansen, W. B. (2018). A review of research on fidelity of implementation: implications for drug abuse prevention in school settings. *Health Education Research, 18*(2), 237-256. doi:10.1093/her/18.2.237

National School Climate Council (NSCC) (2007). *The School Climate Challenge: Narrowing the gap between school climate research and school climate policy,*

practice guidelines and teacher education policy. National School Climate Center, Center for Social and Emotional Education, and National Center for Learning and Citizenship at Education Commission of the States. *https://www.schoolclimate.org/themes/schoolclimate/assets/pdf/policy/school-climate-challenge-web.pdf*

Elliott, D. S., & Mihalic, S. (2004). Issues in disseminating and replicating effective prevention programs. *Prevention Science, 5*(1), 47-53.

Etzioni, A. (1969). *The semi-professions and their organization: Teachers, nurses, social workers*. New York, NY: Free Press.

Evans, K. R., Lester, J. N., & Anfara Jr, V. A. (2013). Restorative justice in education: What we know so far. *Middle School Journal, 44*(5), 57-63.

Evans, K. R., & Vaandering, D. (2016). *The little book of restorative justice in education: Fostering responsibility, healing, and hope in schools.* New York, NY: Good Books, Skyhorse Publishing, Inc.

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*(3), 272. doi:10.1037/1082-989X.4.3.272

Flannery, K. B., Fenning, P., Kato, M. M., & McIntosh, K. (2014). Effects of school-wide positive behavioral interventions and supports and fidelity of implementation on problem behavior in high schools. *Sch Psychol Q, 29*(2), 111-124. doi:10.1037/spq0000039

Ford, J. K., MacCallum, R. C., & Tait, M. (1986). The application of exploratory factor analysis in applied psychology: A critical review and analysis. *Personnel Psychology, 39*(2), 291-314. doi:10.1111/j.1744-6570.1986.tb00583.x

Fronius, T., Darling-Hammond, S., Persson, H., Guckenberg, S., Hurley, N., & Petrosino, A. (2019). *Restorative Justice in U.S. Schools: An Updated Research Review*. San Francisco, CA. WestEd Justice & prevention Research Center.

Fronius, T., Persson, H., Guckenburg, S., Hurley, N., & Petrosino, A. (2016). *Restorative justice in US schools: A research review*. San Francisco, CA. WestEd Justice and Prevention Training Center.

Glass, G. V., Smith, M. L., & McGaw, B. (1981). *Meta-analysis in social research* (Vol. 124). New York, NY: Sage Publications.

Glazerman, S., Isenberg, E., Dolfin, S., Bleeker, M., Johnson, A., Grider, M., & Jacobus, M. (2010). *Impacts of comprehensive teacher induction: Final results from a randomized controlled study.* (NCEE 2010-4027). Washington, DC: National Center for Education Evaluation and Regional Assistance.

Glazerman, S., Protik, A., Teh, B.-r., Bruch, J., & Max, J. (2013). *Transfer incentives for high-performing teachers: Final results from a multisite randomized experiment.* (NCEE 2014-4004). Washington, DC: National Center for Education Evaluation and Regional Assistance.

Goldhaber, D., Quince, V., & Theobald, R. (2017). Has it always been this way? Tracing the evolution of teacher quality gaps in U.S. public schools. *American Educational Research Journal, 55*(1), 171-201. doi:10.3102/0002831217733445

Gonzalez, T. (2012). Keeping kids in schools: Restorative justice, punitive discipline, and the school to prison pipeline. *Journal of Law and Education, 41*, 281.

Gonzalez, T. (2015). Socializing schools: Addressing racial disparities in discipline through restorative justice. In D. J. Losen (Ed.), *Closing the school discipline gap: Equitable remedies for excessive exclusion*. New York, NY: Teachers College Press.

González, T., Sattler, H., & Buth, A. J. (2019). New directions in whole-school restorative justice implementation. *Conflict Resolution Quarterly, 36*(3), 207-220. doi:10.1002/crq.21236

Gottfredson, D. C., & Gottfredson, G. D. (2002). Quality of school-based prevention programs: Results from a national survey. *Journal of Research in Crime and Delinquency, 39*(1), 3-35. doi:10.1177/002242780203900101

Grant, A. A., Byrnes, V., Clark, E., MacIver, D., Balfanz, R., & Lofton, R. (in preparation). combining restorative practices with diplomas now: Results from a randomized control trial evaluating impacts on teacher's practices, students' disciplinary problems, suspensions/expulsions and conflict in big city schools.

Gregory, A., Clawson, K., Davis, A., & Gerewitz, J. (2016). The promise of restorative practices to transform teacher-student relationships and achieve equity in school discipline. *Journal of Educational and Psychological Consultation, 26*(4), 325-353. doi:10.1080/10474412.2014.929950

Gregory, A., & Evans, K. (2020). *The Starts and Stumbles of Restorative Justice in Education: Where Do We Go from Here?* Boulder, CO. National Education

Policy Center. Retrieved from http://nepc.colorado.edu/publication/restorative-justice

Gregory, A., Gerewitz, J., Clawson, K., Davis, A., & Korth, J. (2013). *RP-Observe Manual*. Rutgers University. Retrieved from http://www.iirp.edu/pdf/pa13-handout-gregory-davis.pdf

Gregory, A., Skiba, R. J., & Noguera, P. A. (2010). The achievement gap and the discipline gap: Two sides of the same coin? *Educational Researcher, 39*(1), 59-68. doi:10.3102/0013189x09357621

Gregory, A., Ward-Seidel, A., & Carter, K. (2019). 12 indicators of Restorative Practices implementation: Checklists for administrators. doi:10.13140/RG.2.2.34663.80808

Griffith, D., & Tyner, A. (2019). *Discipline reform through the eyes of teachers*. Thomas B. Fordham Institute. http://fordhaminstitute.org/national/research/discipline-reform-through-the-eyes-of-teachers

Grissom, J. A. (2011). Can good principals keep teachers in disadvantaged schools? Linking principal effectiveness to teacher satisfaction and turnover in hard-to-staff environments. *Teachers College Record, 113*(11), 2552-2585.

Grissom, J. A., Kalogrides, D., & Loeb, S. (2017). Strategic staffing? How performance pressures affect the distribution of teachers within schools and resulting student achievement. *American Educational Research Journal, 54*(6), 1079-1116. doi:10.3102/0002831217716301

Gritz, R. M., & Theobald, N. D. (1996). The effects of school district spending priorities on length of stay in teaching. *Journal of Human Resources, 31*(3), 477-512. doi:10.2307/146262

Guarino, C. M., Brown, A. B., & Wyse, A. E. (2011). Can districts keep good teachers in the schools that need them most? *Economics of Education Review, 30*(5), 962-979. doi:10.1016/j.econedurev.2011.04.001

Guarino, C. M., Santibanez, L., & Daley, G. A. (2006). Teacher recruitment and retention: A review of the recent empirical literature. *Review of Educational Research, 76*(2), 173-208. doi:10.3102/00346543076002173

Guckenberg, S., Hurley, N., Persson, H., Fronius, T., & Petrosino, A. (2016). *Restorative Justice in U.S. schools: Practitioners' perspectives.* San Francisco, CA. WestEd Justice & Prevention Research Center.

Guin, K. (2004). Chronic teacher turnover in urban elementary schools. *Education Policy Analysis Archives, 12*(42). doi:10.14507/epaa.v12n42.2004

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (1998). *Multivariate data analysis* (Vol. 5). Upper Saddle River, NJ: Prentice Hall.

Hakanen, J. J., Bakker, A. B., & Schaufeli, W. B. (2006). Burnout and work engagement among teachers. *Journal of School Psychology, 43*(6), 495-513. doi:10.1016/j.jsp.2005.11.001

Hamre, B. K., & Pianta, R. C. (2001). Early teacher–child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development, 72*(2), 625-638. doi:10.1111/1467-8624.00301

Hanselman, P., Grigg, J., K. Bruch, S., & Gamoran, A. (2016). The consequences of principal and teacher turnover for school social resources. In *Family Environments, School Resources, and Educational Outcomes* (Research in the

Sociology of Education, Vol. 19, pp. 49-89). doi: 10.1108/S1479-353920150000019004

Hanushek, E. A., Kain, J. F., & Rivkin, S. G. (2004a). The revolving door: A path-breaking study of teachers in Texas reveals that working conditions matter more than salary. *Education Next, 4*(1), 76-83.

Hanushek, E. A., Kain, J. F., & Rivkin, S. G. (2004b). Why public schools lose teachers. *Journal of Human Resources, 39*(2), 326-354. doi:10.2307/3559017

Hanushek, E. A., & Rivkin, S. G. (2010). *Constrained job matching: Does teacher job search harm disadvantaged urban schools?* (NBER Working Paper No. 15816). Washington, DC: National Bureau of Economic Research.

Hanushek, E. A., Rivkin, S. G., & Schiman, J. C. (2016). *Dynamic effects of teacher turnover on th quality of instruction*. (NBER Working Paper 22472). Cambridge, MA: National Bureau of Economic Research.

Harris, D. N., & Adams, S. J. (2007). Understanding the level and causes of teacher turnover: A comparison with other professions. *Economics of Education Review, 26*(3), 325-337. doi:10.1016/j.econedurev.2005.09.007

Hausman, J., & McFadden, D. (1984). Specification tests for the multinomial logit model. *Econometrica: Journal of the Econometric Society*, 1219-1240. doi:10.2307/1910997

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76*(4), 408-420. doi:10.1080/03637750903310360

Heckman, J. J., & Snyder Jr, J. M. (1996). *Linear probability models of the demand for attributes with an empirical application to estimating the preferences of legislators (NBER Working Paper No. 5785)*. National Bureau of Economic Research.

Hellevik, O. (2007). Linear versus logistic regression when the dependent variable is a dichotomy. *Quality & Quantity, 43*(1), 59-74. doi:10.1007/s11135-007-9077-3

Henke, R. R., Chen, X., Geis, S., & Mpr Associates, B. C. A. (2000). *Progress through the teacher pipeline: 1992-93 college graduates and elementary/secondary school teaching as of 1997.* Washington, D.C.: U.S. Department of Education. National Center for Education Statistics.

Hill, H. C., & Erickson, A. (2019). Using implementation fidelity to Aad in interpreting program impacts: A brief review. *Educational Researcher, 48*(9), 590-598. doi:10.3102/0013189x19891436

Holme, J. J., Jabbar, H., Germain, E., & Dinning, J. (2017). Rethinking teacher turnover: Longitudinal measures of instability in schools. *Educational Researcher, 47*(1), 62-75. doi:10.3102/0013189x17735813

Holme, J. J., & Rangel, V. S. (2012). Putting school reform in its place: Social geography, organizational social capital, and school performance. *American Educational Research Journal, 49*(2), 257-283. doi:10.3102/0002831211423316

Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods, 6*, 3-60.

Hopkins, M., & Spillane, J. P. (2014). Schoolhouse teacher educators: Structuring beginning teachers' opportunities to learn about instruction. *Journal of Teacher Education, 65*(4), 327-339. doi:10.1177/0022487114534483

Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika, 30*(2), 179-185.

Horner, R. H., Sugai, G., Smolkowski, K., Eber, L., Nakasato, J., Todd, A. W., & Esperanza, J. (2009). A randomized, wait-list controlled effectiveness trial assessing school-wide positive behavior support in elementary schools. *Journal of Positive Behavior Interventions, 11*(3), 133-144. doi:10.1177/1098300709332067

Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1-55.

Hulleman, C. S., Rimm-Kaufman, S. E., & Abry, T. (2013). Innovative methodologies to explore implementation: Whole-part-whole—Construct validity, measurement, and analytical issues for intervention fidelity assessment in education research. In T. G. Halle, A. Metz, & I. Martinez-Beck (Eds.), *Applying implementation science in early childhood programs and systems* (pp.65-93). Paul H. Brooks Publishing Co.

Hurley, N., Guckenburg, S., Persson, H., Fronius, T., & Petrosino, A. (2015). *What further research is needed on Restorative Justice in schools?* San Francisco, CA. WestEd.

Ingersoll, R. M. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal, 38*(3), 499-534. doi:10.3102/00028312038003499

Ingersoll, R. M. (2002). *Out-of-field teaching, educational inequality, and the organization of schools: An exploratory analysis*. CPRE Research Reports. Retrieved from http://repository.upenn.edu/cpre_researchreports/22

Ingersoll, R. M. (2003). *Is there really a teacher shortage?* CPRE Research Reports. Retrieved from http://repository.upenn.edu/cpre_researchreports/37

Ingersoll, R. M. (2004). *Why do high-poverty schools have difficulty staffing their classrooms with qualified teachers?* Report Prepared for: Renewing Our Schools, Securing Our Future A National Task Force on Public Education. Washington, DC. Center for American Progress; Institute for America's Future.

Ingersoll, R. M., & May, H. (2011). *Recruitment, retention and the minority teacher shortage.* (CPRE Research Report # RR-69). University of Pennsylvania; University of California, Santa Cruz: Consortium for Policy Research in Education; Center for Educational Research in the Interest of Underserved Students.

Ingersoll, R. M., & May, H. (2012). The magnitude, destinations, and determinants of mathematics and science teacher turnover. *Educational Evaluation and Policy Analysis, 34*(4), 435-464. doi:10.3102/0162373712454326

Ingersoll, R. M., & Merrill, L. (2017). *A quarter century of changes in the elementary and secondary teaching force: From 1987 to 2012.* (NCES 2017-092). Washington, DC.

Ingersoll, R. M., Merrill, L., & Stuckey, D. (2014). *Seven trends: The transformation of the teaching force. CPRE Working Paper (#WP-01).* CPRE Report. Philadelphia, PA. Consortium for Policy Research in Education, University of Pennsylvania.

Ingersoll, R. M., & Perda, D. (2008). The status of teaching as a profession. In J. H. Ballantine & J. Z. Spade (Eds.), *Schools and society: A sociological approach to education* (3rd ed., pp. 107-118). Los Angeles, CA: Pine Forge Press.

Ingersoll, R. M., & Perda, D. (2010). Is the supply of Mathematics and Science teachers sufficient? *American Educational Research Journal, 47*(3), 563-594. doi:10.3102/0002831210370711

Ingersoll, R. M., & Smith, T. M. (2003). The wrong solution to the teacher shortage. *Educational Leadership, 60*(8), 30-33.

Ingersoll, R. M., & Strong, M. (2011). The impact of induction and mentoring programs for beginning teachers: A critical review of the research. *Review of Educational Research, 81*(2), 201-233. doi:10.3102/0034654311403323

International Institute for Restorative Practices (2009). *Improving school climate: Findings from schools implementing restorative practices*. Bethlehem, PA.

Jackson, C. K. (2009). Student demographics, teacher sorting, and teacher quality: Evidence from the end of school desegregation. *Journal of Labor Economics, 27*(2), 213-256.

Jain, S., Bassey, H., Brown, M. A., & Kalra, P. (2014). *Restorative justice in Oakland schools: Implementation and impacts.* Data in Action, LLC.

Jennings, P. A., Brown, J. L., Frank, J. L., Doyle, S., Oh, Y., Davis, R., . . . Greenberg, M. T. (2017). Impacts of the CARE for teachers program on teachers' social and

emotional competence and classroom interactions. *Journal of Educational Psychology, 109*(7). doi:10.1037/edu0000187

Jennings, P. A., Frank, J. L., Snowberg, K. E., Coccia, M. A., & Greenberg, M. T. (2013). Improving classroom learning environments by Cultivating Awareness and Resilience in Education (CARE): Results of a randomized controlled trial. *School Psychology Quarterly, 28*(4), 374-390. doi:10.1037/spq0000035

Jennings, P. A., & Greenberg, M. T. (2009). The prosocial classroom: Teacher social and emotional competence in relation to student and classroom outcomes. *Review of Educational Research, 79*(1), 491-525. doi:10.3102/0034654308325693

Jo, B., Asparouhov, T., Muthen, B., Ialongo, N., & Brown, C. H. (2008). Supplemental material for cluster randomized trials with treatment noncompliance. *Psychological Methods*. doi:10.1037/1082-989X.13.1.1.supp

Johnson, S. M. (2006). *The workplace matters: Teacher quality, retention, and effectiveness. (Best Practices Working Paper)*. Washington, DC. National Education Association.

Johnson, S. M., & Birkeland, S. E. (2003). Pursuing a "Sense of Success": New teachers explain their career decisions. *American Educational Research Journal, 40*(3), 581-617. doi:10.3102/00028312040003581

Johnson, S. M., Kraft, M. A., & Papay, J. P. (2012). How context matters in high-need schools: The effects of teachers' working conditions on their professional satisfaction and their students' achievement. *Teachers College Record, 114*(10).

Johnson, S. M., Reinhorn, S. K., Charner-Laird, M., Kraft, M. A., Ng, M., & Papay, J. P. (2014). Ready to lead, but how? Teachers' experiences in high-poverty urban schools. *Teachers College Record, 116*(10).

Jolivette, K., Patterson, D. P., Swoszowski, N. C., McDaniel, S. C., Kennedy, C., & Ennis, R. P. (2014). School-wide positive behavioral interventions and supports in a residential school for students with emotional and behavioral disorders: First years of implementation and maintenance follow-up focus groups. *Residential Treatment for Children & Youth, 31*(1), 63-79. doi:10.1080/0886571x.2014.878584

Kaiser, H. F., & Rice, J. (1974). Little jiffy, mark IV. *Educational And Psychological Measurement, 34*(1), 111-117.

Kalogrides, D., Loeb, S., & Béteille, T. (2012). Systematic sorting: Teacher characteristics and class assignments. *Sociology of Education, 86*(2), 103-123. doi:10.1177/0038040712456555

Kam, C.-M., Greenberg, M. T., & Walls, C. T. (2003). Examining the role of implementation quality in school-based prevention using the PATHS curriculum. *Prevention Science, 4*(1), 55-63. doi:1389-4986/03/0300-0055/1

Kardos, S. M., & Johnson, S. M. (2007). On their own and presumed expert: New teachers' experience with their colleagues. *Teachers College Record, 109*(9), 2083-2106.

Kelly, S. (2004). An event history analysis of teacher attrition: Salary, teacher tracking, and socially disadvantaged schools. *Journal of Experimental Education, 72*(3), 195-220. doi:10.3200/JEXE.72.3.195-220

Kirby, S. N., & Grissmer, D. W. (1993). *Teacher attrition: Theory, evidence, and suggested policy options*. Santa Monica, CA. RAND Corporation.

Kline, R. B. (2016). *Principles and practice of structural equation modeling.* (4th ed.). New York, NY: Guilford Press.

Kohl, D., Recchia, S., & Steffgen, G. (2013). Measuring school climate: An overview of measurement scales. *Educational Research, 55*(4), 411-426. doi:10.1080/00131881.2013.844944

Kozol, J. (2012). *Savage inequalities: Children in America's schools*. New York, NY: Broadway Books.

Kraft, M. A., Blazar, D., & Hogan, D. (2018). The effect of teacher coaching on instruction and achievement: A meta-analysis of the causal evidence. *Review of Educational Research, 88*(4), 547-588. doi:10.3102/0034654318759268

Kraft, M. A., Marinell, W. H., & Shen-Wei Yee, D. (2016). School organizational contexts, teacher turnover, and student achievement: Evidence from panel data. *American Educational Research Journal, 53*(5), 1411-1449. doi:10.3102/0002831216667478

Kraft, M. A., Papay, J. P., Charner-Laird, M., Johnson, S. M., Ng, M., & Reinhorn, S. K. (2012). *Committed to their students but in need of support: How school context influences teacher turnover in high-poverty, urban schools*. Unpublished manuscript, Project on the Next Generation of Teachers, Harvard Graduate School of Education.

Kushman, J. W. (1992). The organizational dynamics of teacher workplace commitment: A study of urban elementary and middle schools. *Educational Administration Quarterly, 28*(1), 5-42. doi:10.1177/0013161X92028001002

Ladd, H. F. (2011). Teachers' perceptions of their working conditions: How predictive of planned and actual teacher movement? *Educational Evaluation and Policy Analysis, 33*(2), 235-261. doi:10.3102/0162373711398128

Ladson-Billings, G. (2006). It's not the culture of poverty, it's the poverty of culture: The problem with teacher education. *Anthropology & Education Quarterly, 37*(2), 104-109. doi:10.1525/aeq.2006.37.2.104

Lankford, H., Loeb, S., & Wyckoff, J. (2002). Teacher sorting and the plight of urban schools: A descriptive analysis. *Educational Evaluation and Policy Analysis, 24*(1), 37-62. doi:10.3102/01623737024001037

Levinson, M. (2015). Moral injury and the ethics of educational injustice. *Harvard Educational Review, 85*(2), 203-228.

Leviton, L. C., & Lipsey, M. W. (2007). A big chapter about small theories: Theory as method: Small theories of treatments. *New Directions for Evaluation, 2007*(114), 27-62. doi:10.1002/ev.224

Lewis, S. (2009). *Improving school climate: Findings from schools implementing restorataive practices*. International Institute for Restorative Practices Graduate School.

Loomer, T. L. (2017). *How teachers who use restorative approaches come to adopt a restorative justice mindset: A phenomenological study of process* (Unpublished doctoral dissertation). Georgia Fox University, Newberg, Oregon.

Lustick, H. (2017a). "Restorative Justice" or restoring order? Restorative school discipline practices in urban public schools. *Urban Education*, 1-28. doi:.o0r.g1/107.171/0770/402004280589519717744117 25

Lustick, H. (2017b). "What are we restoring?" Black teachers on restorative discipline In Okliwa, N. S., Khalifa, M., & Briscoe, F. M. (Eds.), *The school to prison pipeline: The role of culture and discipline in school* (Advances in Race and Ethnicity in Education, Vol. 4, pp. 113-134). Emerald Publishing Limited.

MacIver, D., Grant, A. A., Balfanz, R., Byrnes, V. Clark, E., & Lofton, R. (2018). Combining Restorative Practices with Diplomas Now: Results from a randomized control trial evaluating impacts on teacher's practices, students' disciplinary problems, suspensions/expulsions and conflict in big city schools. Report prepared for the Atlantic Philanthropies.

MacKinnon, D. P. (2012). *Introduction to statistical mediation analysis*. New York: Routledge.

MacKinnon, D. P., & Dwyer, J. H. (1993). Estimating mediated effects in prevention studies. *Evaluation Review, 17*(2), 144-158. doi:10.1177/0193841X9301700202

MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods, 7*(1), 83. doi:10.1037/1082-989X.7.1.83

Mansfield, K. C., Fowler, B., & Rainbolt, S. (2018). The potential of Restorative Practices to ameliorate discipline gaps: The story of one high school's leadership team. *Educational Administration Quarterly, 54*(2), 303-323. doi:10.1177_0013161X17751178

Marinell, W. H., & Coca, V. M. (2013). *"Who stays and who leaves?" Findings from a three-part study of teacher turnover in NYC middle schools*. New York, NY. Research Alliance for New York City Schools.

Mayworm, A. M., Sharkey, J. D., Hunnicutt, K. L., & Schiedel, K. C. (2016). Teacher consultation to enhance implementation of school-based restorative justice. *Journal of Educational and Psychological Consultation, 26*(4), 385-412. doi:10.1080/10474412.2016.1196364

McCluskey, G., Lloyd, G., Kane, J., Riddell, S., Stead, J., & Weedon, E. (2008). Can restorative practices in schools make a difference? *Educational Review, 60*(4), 405-417. doi:10.1080/00131910802393456

McFarland, J., Hussar, B., Wang, X., Zhang, J., Wang, K., Rathbun, A., . . . Bullock Mann, F. (2018). *The condition of education 2018*. (NCES 2018-144). Washington, D.C.: U.S. Department of Education.

McKinley, W., Mone, M. A., & Moon, G. (1999). Determinants and development of schools in organization theory. *Academy of Management Review, 24*(4), 634-648. doi:10.2307/259346

McMorris, B. J., Beckman, K. J., Shea, G., Baumgartner, J. J., & Eggert, R. C. (2013). *Applying restorative justice practices to Minneapolis public schools students recommended for possible expulsion: A pilot program evaluation of the Family and Youth Restorative Conference Program*. Minneapolis, MN. School of Nursing and the Healthy Youth Development. Prevention Research Center, Department of Pediatrics, University of Minnesota.

Mehta, T. G., Atkins, M. S., & Frazier, S. L. (2013). The organizational health of urban elementary schools: School health and teacher functioning. *School Mental Health, 5*(3), 144-154. doi:10.1007/s12310-012-9099-4

Mirsky, L. (2007). SaferSanerSchools: Transforming school cultures with restorative practices. *Reclaiming Children and Youth, 16*(2), 5.

Mirsky, L. (2011). Restorative practices: Giving everyone a voice to create safer saner school communities. *The Prevention Researcher, 18*(5), 3-6.

Mirsky, L., & Wachtel, T. (2007). The worst school I've ever been to: Empirical evaluations of a restorative school and treatment milieu. *Reclaiming Children and Youth, 16*(2), 13.

Morrison, B. E. (2006). School bullying and restorative justice: Toward a theoretical understanding of the role of respect, pride, and shame. *Journal of Social Issues, 62*(2), 371-392. doi:10.1111/j.1540-4560.2006.00455.x

Morrison, B. E., Blood, P., & Thorsborne, M. (2005). Practicing restorative justice in school communities: Addressing the challenge of culture change. *Public Organization Review, 5*(4), 335-357. doi:10.1007/s11115-005-5095-6

Morrison, B. E., & Vaandering, D. (2012). Restorative justice: Pedagogy, praxis, and discipline. *Journal of School Violence, 11*(2), 138-155. doi:10.1080/15388220.2011.653322

Mowday, R. T., Porter, L. W., & Steers, R. M. (1982). *Employee—organization linkages: The psychology of commitment, absenteeism, and turnover*. Academic Press.

Musca, S. C., Kamiejski, R., Nugier, A., Méot, A., Er-Rafiy, A., & Brauer, M. (2011). Data with hierarchical structure: impact of intraclass correlation and sample size on type-I error. *Frontiers in Psychology, 2*, 74.

Nieto, S. (2003). *What keeps teachers going?* New York, NY: Teachers College Press.

O'Donnell, C. L. (2008). Defining, conceptualizing, and measuring fidelity of implementation and its relationship to outcomes in K–12 curriculum intervention research. *Review of Educational Research, 78*(1), 33-84. doi:10.3102/0034654307313793

Okonofua, J. A., Paunesku, D., & Walton, G. M. (2016). Brief intervention to encourage empathic discipline cuts suspension rates in half among adolescents. *Proc Natl Acad Sci U S A, 113*(19), 5221-5226. doi:10.1073/pnas.1523698113

Opfer, V. D., & Pedder, D. (2011). Conceptualizing teacher professional learning. *Review of Educational Research, 81*(3), 376-407.

Orr, L. (1999). *Social experiments: Evaluating public programs with experimental methods*. Thousand Oaks, CA: SAGE.

Ortega, L., Lyubansky, M., Nettles, S., & Espelage, D. L. (2016). Outcomes of a restorative circles program in a high school setting. *Psychology of Violence, 6*(3), 459-468. doi:10.1037/vio0000048

Ost, B. (2014). How do teachers improve? The relative importance of specific and general human capital. *American Economic Journal: Applied Economics*, 127-151. doi:10.1257/app.6.2.127

Papay, J. P., Bacher-Hicks, A., Page, L. C., & Marinell, W. H. (2017). The challenge of teacher retention in urban schools: Evidence of variation from a cross-site

analysis. *Educational Researcher, 46*(8), 434-448. doi:10.3102/0013189X17735812

Pas, E. T., Waasdorp, T. E., & Bradshaw, C. P. (2015). Examining contextual influences on classroom-based implementation of positive behavior support strategies: Findings from a randomized controlled effectiveness trial. *Prevention Science, 16*(8), 1096-1106. doi:10.1007/s11121-014-0492-0

Payne, A. A., & Welch, K. (2013). Restorative Justice in schools: The influence of race on restorative discipline. *Youth & Society, 47*(4), 539-564. doi:10.1177/0044118x12473125

Perez Jr., J. (2015, 25 February). Teachers complain about revised CPS discipline policy. *Chicago Tribune*. Retrieved from https://www.chicagotribune.com/news/ct-cps-discipline-concerns-met-20150225-story.html

Pham, L. D., Nguyen, T. D., & Springer, M. G. (2020). Teacher merit pay: A meta-analysis. *American Educational Research Journal*. doi:10.3102/0002831220905580

Piaget, J. (2000). Piaget's theory of cognitive development. *Childhood cognitive development: The essential readings* (pp. 33-47). Hoboken, NJ: Wiley-Blackwell.

Pogodzinski, B., Youngs, P., & Frank, K. A. (2013). Collegial climate and novice teachers' intent to remain teaching. *American Journal of Education, 120*(1), 27-54.

Project, T. N. T. (2012). *The irreplaceables: Understanding the real retention crisis in America's urban schools*. Brooklyn, NY. Author.

Rainbolt, S., Fowler, E. S., & Mansfield, K. C. (2019). High school teachers' perceptions of restorative discipline practices. *NASSP Bulletin, 103*(2), 158-182.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (Vol. 1). Thousand Oaks, CA: Sage.

Redding, C., & Henry, G. T. (2018). Leaving school early: An examination of novice teachers' within- and end-of-year turnover. *American Educational Research Journal, 56*(1), 204-236. doi:10.3102/0002831218790542

Rey, J. (2018). Buffalo teacher survey points to disruptive students, lack of discipline. *The Buffalo News*. Retrieved from https://buffalonews.com/2018/01/29/buffalo-teacher-survey-cites-disruptive-kids-lack-of-discipline/

Riestenberg, N. (2003a). *Restorative schools grants final report, January 2002-June 2003: A summary of the grantees' evaluation*. St. Paul, MN.

Riestenberg, N. (2003b). *Restorative schools grants final report.* St. Paul, MN: Minnesota Department of Education.

Rimm-Kaufman, S. E., & Hamre, B. K. (2010). The role of psychological and developmental science in efforts to improve teacher quality. *Teachers College Record, 112*(12), 2988-3023.

Rivkin, S. G., Hanushek, E. A., & Kain, J. F. (2005). Teachers, schools, and academic achievement. *Econometrica, 73*(2), 417-458. doi:10.1111/j.1468-0262.2005.00584.x

Rogers, E. M. (2003). *The diffusion of innovation* (5th ed.). New York, NY: Free Press.

Ronfeldt, M., Kwok, A., & Reininger, M. (2014). Teachers preferences to teach underserved students. *Urban Education, 51*(9), 995-1030. doi:10.1177/0042085914553676

Ronfeldt, M., Loeb, S., & Wyckoff, J. (2013). How teacher turnover harms student achievement. *American Educational Research Journal, 50*(1), 4-36. doi:10.3102/0002831212463813

Rosenthal, R., & Rubin, D. B. (1986). Meta-analytic procedures for combining studies with multiple effect sizes. *Psychological Bulletin, 99*(3), 400. doi:10.1037/0033-2909.99.3.400

Ross, S. W., Romer, N., & Horner, R. H. (2011). Teacher well-being and the implementation of school-wide positive behavior interventions and supports. *Journal of Positive Behavior Interventions, 14*(2), 118-128. doi:10.1177/1098300711413820

Russell, D. W. I. S. U., Ctr for Family Research in Rural Mental Health, Ames, IA, US, Kahn, J. H., Spoth, R., & Altmaier, E. M. (1998). Analyzing data from experimental studies: A latent variable structural equation modeling approach. *Journal of Counseling Psychology*. doi:10.1037/0022-0167.45.1.18

Ryan, S. V., von der Embse, N. P., Pendergast, L. L., Saeki, E., Segool, N., & Schwing, S. (2017). Leaving the teaching profession: The role of teacher stress and educational accountability policies on turnover intent. *Teaching and Teacher Education, 66*, 1-11. doi:10.1016/j.tate.2017.03.016

Sable, J., Plotts, C., & Mitchell, L. (2010). *Characteristics of the 100 largest public elementary and secondary school districts in the United States: 2007–08*. (NCES

2011-301). Washington, DC: U.S. Department of Education, National Center for Education Statistics.

International Institute for Restorative Practices (IIRP) (2020). *SaferSanerSchools: Whole school change through Restorative Practices*. Bethlehem, PA.

Scafidi, B., Sjoquist, D. L., & Stinebrickner, T. R. (2007). Race, poverty, and teacher mobility. *Economics of Education Review, 26*(2), 145-159. doi:10.1016/j.econedurev.2005.08.006

Scanlon, J. W., Horst, P., Nay, J. N., Schmidt, R. E., & Waller, A. (1977). Evaluability assessment: Avoiding type III and IV errors. In G. R. Gilbert & P. J. Conklin (Eds.), *Evaluation management: A source book of readings* (pp. 71-90). Washington, DC: Federal Executive Institute, U.S. Civil Service Commission.

Schochet, P. Z., & Chiang, H. S. (2011). Estimation and identification of the complier average causal effect parameter in education RCTs. *Journal of Educational and Behavioral Statistics, 36*(3), 307-345. doi:10.3102/1076998610375837

Schulte, A. C., Easton, J. E., & Parker, J. (2009). Advances in treatment integrity research: Multidisciplinary perspectives on the conceptualization, measurement, and enhancement of treatment integrity. *School Psychology Review, 38*(4), 460.

Sepanik, S., Corrin, W., Roy, D., Gray, A., Fernandez, F., Briggs, A., & Wang, K. K. (2015). *Moving down the Track: Changing school practices during the second year of Diplomas Now*. New York, NY. MDRC.

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

Shelby, J. A. (2016). *High school teacher well-being and schoolwide positive behavior interventions and supports.* (Unpublished doctoral dissertation). St. Mary's College of California, Moraga, CA.

Simon, N. S., & Johnson, S. M. (2015). Teacher turnover in high-poverty schools: What we know and can do. *Teachers College Record, 117*(3), 1-36.

Smith, T. M., & Ingersoll, R. M. (2004). What are the effects of induction and mentoring on beginning teacher turnover? *American Educational Research Journal, 41*(3), 681-714. doi:10.3102/00028312041003681

Song, S. Y., & Swearer, S. M. (2016). The cart before the horse: The challenge and promise of restorative justice consultation in schools. *Journal of Educational and Psychological Consultation, 26*(4), 313-324. doi:10.1080/10474412.2016.1246972

Springer, M. G., Ballou, D., Hamilton, L., Le, V.-N., Lockwood, J. R., McCaffrey, D. F., . . . Society for Research on Educational, E. (2011). *Teacher pay for performance: experimental evidence from the project on incentives in teaching (POINT)*, Washington, DC.

Steinberg, M. P., & Lacoe, J. (2017). The academic and behavioral consequences of discipline policy reform: Evidence from Philadelphia. *The Fordham Institute, 2*(2018), 15.

Stinebrickner, T. R. (2002). An analysis of occupational change and departure from the labor force: Evidence of the reasons that teachers leave. *Journal of Human Resources, 37*(1), 192-216. doi:10.2307/3069608

Sugrue, E. P. (2019). Moral injury among professionals in K–12 education. *American Educational Research Journal, 57*(1), 43-68. doi:10.3102/0002831219848690

Sutcher, L., Darling-Hammond, L., & Carver-Thomas, D. (2016). *A coming crisis in teaching? Teacher supply, demand, and shortages in the US*. Palo Alto, CA. Learning Policy Institute.

Swain-Bradway, J., Maggin, D. M., & Buren, M. K. (2015). *PBIS forum in brief: Integration of RJP within SWPBIS*. PBIS Leadership Forum- Roundtable Dialogue.

Tett, R. P., & Meyer, J. P. (1993). Job satisfaction, organizational commitment, turnover intention, and turnover: Path analyses based on meta-analytic findings. *Personnel Psychology, 46*(2), 259-293. doi:10.1111/j.1744-6570.1993.tb00874.x

Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2013). A review of school climate research. *Review of Educational Research, 83*(3), 357-385. doi:10.3102/0034654313483907

Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2013). A review of school climate research. *Review of Educational Research, 83*(3), 357-385.

Thapa, A., Cohen, J., Higgins-D'Alessandro, A., & Guffey, S. (2012). School climate research summary: August 2012. *School Climate Brief, 3*, 1-21.

Thissen, D., Steinberg, L., & Kuang, D. (2002). Quick and easy implementation of the Benjamini-Hochberg procedure for controlling the false positive rate in multiple comparisons. *Journal of Educational and Behavioral Statistics, 27*(1), 77-83.

Useem, E., Offenberg, R., & Farley, E. (2007). *Closing the teacher quality gap in Philadelphia: New hope and old hurdles*. Philadelphia, PA. Research for Action.

Vaandering, D. (2010a). The significance of critical theory for restorative justice in education. *Review of Education, Pedagogy, and Cultural Studies, 32*(2), 145-176. doi:10.1080/10714411003799165

Vaandering, D. (2010b). *Towards effective implementation and sustainability of restorative justice in Ontario public schools: A critical case study* (Unpublished doctoral dissertation). University of Western Ontario, London, Ontario.

Vaandering, D. (2013). Implementing restorative justice practice in schools: What pedagogy reveals. *Journal of Peace Education, 11*(1), 64-80. doi:10.1080/17400201.2013.794335

Van Houtte, M. (2005). Climate or culture? A plea for conceptual clarity in school effectiveness research. *School Effectiveness and School Improvement, 16*(1), 71-89. doi:10.1080/09243450500113977

Voight, A., Hanson, T., O'Malley, M., & Adekanye, L. (2015). The racial school climate gap: Within-school disparities in students' experiences of safety, support, and connectedness. *American Journal of Community Psychology, 56*(3-4), 252-267. doi:10.1007/s10464-015-9751-x

Waasdorp, T. E., Bradshaw, C. P., & Leaf, P. J. (2012). The impact of schoolwide positive behavioral interventions and supports on bullying and peer rejection: A randomized controlled effectiveness trial. *Archives of Pediatrics & Adolescent Medicine, 166*(2), 149-156. doi:10.1001/archpediatrics.2011.755

Wadhwa, A. (2015). *Restorative justice in urban schools: Disrupting the school-to-prison pipeline*. New York: Routledge.

Walker, H. M., Horner, R. H., Sugai, G., Bullis, M., Sprague, J. R., Bricker, D., & Kaufman, M. J. (1996). Integrated approaches to preventing antisocial behavior patterns among school-age children and youth. *Journal of Emotional and Behavioral Disorders, 4*(4), 194-209.

Watlington, E., Shockley, R., Guglielmino, P., & Felsher, R. (2010). The high cost of leaving: An analysis of the cost of teacher turnover. *Journal of Education Finance, 36*(1), 22-37. doi:10.1353/jef.0.0028

What Works Clearinghouse (2014). *Procedures and standards handbook. Version 4.1.* Institute of Education Sciences.

Whipp, J. L., & Geronime, L. (2015). Experiences that predict early career teacher commitment to and retention in high-poverty urban schools. *Urban Education, 52*, 1-30. doi:10.1177/0042085915574531

Williams, B., Onsman, A., & Brown, T. (2010). Exploratory factor analysis: A five-step guide for novices. *Australasian Journal of Paramedicine, 8*(3), 1-13. doi:10.33151/ajp.8.3.93

Wilson, A. N. (2015). A critique of sociocultural values in PBIS. *Behavior Analysis in Practice, 8*(1), 92-94. doi:10.1007/s40617-015-0052-5

Zehr, H. (2015). *The little book of restorative justice*. New York, NY: Skyhorse Publishing, Inc.

Appendix

Table A1
IIRP 11 Essential Elements

Essential Element	**Description**
Affective Statements	Personal expressions of feeling in response to specific behaviors.
Restorative Questions	Questions that address inappropriate behavior in a way that places the responsibility for making things right and restoring relationships on those involved in the situation.
Small Impromptu Conferences	Questioning exercises that quickly resolve lower-level incidents involving two or more people.
Proactive Circles	Community-building or instructional meetings, with participants seated in a circle, often responding sequentially to a prompt from the facilitator.
Responsive Circles	Meetings that respond to a concern or misbehavior, with participants seated in a circle, often responding sequentially to a prompt from the facilitator.
Restorative Conferences	Structured meetings typically used in response to serious incidents or a cumulative pattern of less serious incidents which focus on repairing the relational harm caused by misbehavior.
Fair Process	A set of transparent decision-making practices designed to create open lines of communication, assure people that their feelings and ideas have been taken into account, and foster a healthy community.
Reintegrative Management of Shame	A recognition that shame is a critical regulator of human social behavior.
Restorative Staff Community	A staff that models and consistently uses restorative practices with each other to build and maintain healthy adult relationships.
Restorative Approach with Families	An approach that values the contributions, knowledge, and expertise of family members.
Fundamental Hypothesis Understandings	An understanding that human beings are happiest, healthiest, and most likely to make positive changes in their behavior when those in authority do things with them rather than to them or for them.

Table A2.1

Comparison of School Composition Characteristics (Prior to Randomization) in the Full RP Sub-study and in the Analytic Sample

School Characteristic	Full RP Sub-study	Analytic Sample	Excluded from Analytic Sample	Difference	P-value
Enrollment	973.7	799.1	1293.9	494.9*	.032
% FRL	76.9%	83.3%	65.1%	18.2%*	.016
% Minority	96.4%	95.3%	41.6%	3.1%	.113
% SPED	19.7%	19.2%	21.6%	2.3%	.595
% Male	53.2%	53.0%	54.3%	1.3%	.805
Attendance (%)	88.0%	89.6%	81.7%	7.8%	.053
Exclusionary Discipline Days (per student)	2.2	2.1	2.5	.4	.708
Sample Size	31	25	6	31	

Note. Based on administrative data from the Common Core of Data (CCD) in 2010-11 or 2011-12 based on year of entry into the trial.

* mark the results from (2-tailed) tests of significant differences between schools in the analytic sample and schools in the full sub-study (that are excluded from the analytic sample).

† $p < .1$; $^{*}p < .05$; $^{**}p < .01$.

Table A2.2
Specification Test: Without "joiner" teachers (1 year)
Teacher Characteristics Post-treatment (Spring 2016) – in Analytic Sample

	Joiner Sample		Treatment	Control
Variables	n	%	%	%
Teacher – Individual Characteristics				
Experience – as a teacher	220			
New (1 year or less)		37.7%	32.2%	44.1%
Master (5-9 Years)		20%	24.6%	14.7%
Educational attainment	220			
Bachelor's degree		43.6%	37.3%	51%
Master's degree		44.6%	53.4%	34.3%
Specialist certificate/degree		9.1%	8.5%	9.8%
Doctorate		2.7%	.9%	4.9%
Certification (within state)	220			
Regular		64.6%	64.4%	64.7%
Advanced		5.9%	5.9%	5.9%
Probation/Temporary/Other		29.4%	29.5%	29.4%
Teacher – Job Characteristics				
Full-time (1 = *full-time*)			91.5%	97.1%
Leader (1 = *leader*)			5.1%	8.8%
Subject	218			
Math		17.4%	16.4%	18.6%
English		30.7%	31.0%	30.4%
Social Studies		11.9%	9.5%	14.7%
Science		15.14%	14.7%	15.7%
Other				
Grade Level				
Middle School (6-8th)			75.6%	83.2%
High School (9-12th)			24.3%	16.8%

Table A2.3
School Climate: Teacher and Student Report Comparison

Variable	Respondent		Correlation
	Teacher	Student	
Students fighting	2.64	2.99	.66
Students cutting class	2.84	2.90	.53
Teachers not being able to control the classroom	3.23	2.70	.61
Physical abuse of teachers or adults by students	1.70	2.04	.63
Verbal abuse of teachers or adults by students	2.74	2.30	.63
Vandalism/ destruction of property	2.33	2.51	.67
Factor: Problems at School			.65
Composites	2.83	2.87	.58
n	1,559	8,609	41

Note. This table compares respondents' standardized scores on these items, aggregated to the school level ($n = 41$ schools in the full Diplomas Now study). All correlations factors are statistically significant ($p < .05$).

Table A2.4
Response Rates for Spring 2016 Teacher Survey - By Block

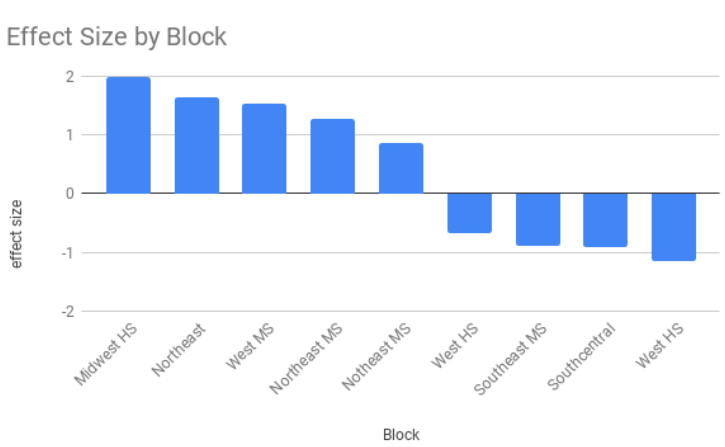
Block	Treatment	Control	Block Average
Southeast MS	58%	87%	72%
West MS	94%	92%	93%
New England MS	44%	-	-
New England HS	98%	37%	68%
West HS 1	20%	34%	27%
West HS 2	37%	81%	59%
Mid-Atlantic MS[1]	95%	75%	85%
South MS[1]	96%	89%	93%
South HS	80%	-	-
South MidAtlantic HS	-	-	-
North MidAtlantic MS	81%	45%	63%
Midwest HS[1]	94%	92%	93%
Average			

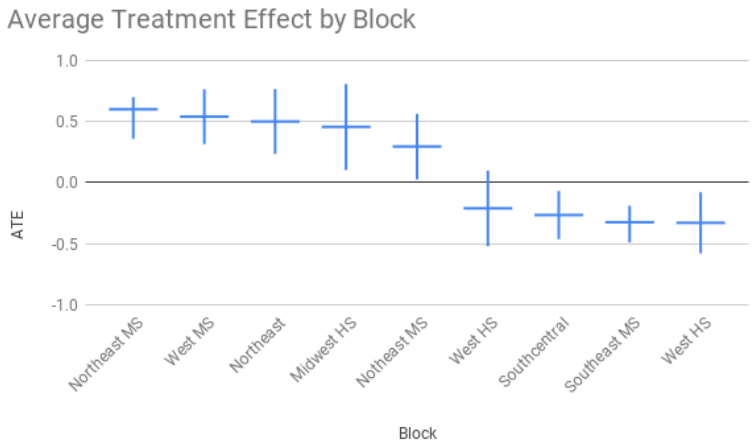
Note. Block averages are calculated based on all schools in the block which had any respondents to the Spring 2016 teacher survey. – indicates where schools did not respond to the survey as a whole; [1] marks blocks where there were non-responding schools and which are not factored (as 0's) into the averages reported in this table.

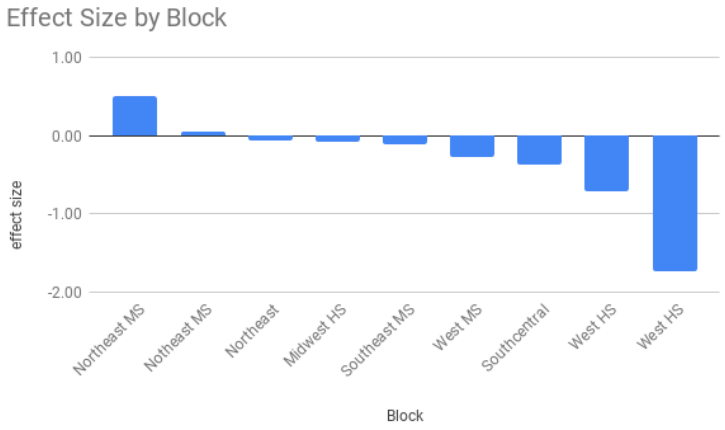
Table A3.1
Implementation Measures for Usage

RP Exposure and Usage (treatment and control schools; teacher-report at individual level; student-report at school level)		**Questions**
Teachers' self-reported use of RP	How often do you use the following approaches?	-I facilitate dialogue circles to provide opportunities for my students to share feelings, ideas, and experiences -I actively encourage students to express their feelings -I express my feeling to my students throughout the day -When students misbehave, I respond by asking them questions about what happened, who has been harmed, and how the harm can be repaired -When students' negative behaviors harm others, I provide opportunities for those who were harmed to be heard and to have a say in what needs to happen to make things right -I facilitate a dialogue circle with my students as a response to an incident or problem
Students' reports of Teachers' use of RP	How often...	- Do your teachers talk about their feelings? - Do your teachers encourage students to express their feelings? - Do your teachers ask students for their thoughts and ideas when decisions need to made that affect the class? - Do your teachers explain the reasoning behind decisions that affect students? - Do your teachers clearly state new expectations and consequences if expectations are not met?
Students' reports of Teachers' RP spirit	When someone misbehaves, do your teachers...	-Respond to negative behaviors by asking students questions about what happened, who has been harmed, and how the harm can be repaired? -Ask questions in a respectful way? -Provide opportunities for those who were harmed to be heard and to have a say in what need to happen to make things right? -Listen to what students have to say when they have misbehaved? -Avoid scolding and lecturing? -Focus on behavior and not whether students are "good" or "bad"?
Students' self-reported use of RP	How many times did the following things happen THIS YEAR?	- I participated in a circle discussion or meeting that helped solve a problem in my classroom. - I helped restore relationships that had been damaged or broken. -I supported students who I saw being hurt, even if there were no adults around. - I worked with my classmates and a teacher to solve a problem, after sharing my feelings and listening to the feelings of others. - I tried to "make things right" after thoughtless words or action.
Teachers' reports of RP PD	Have you participated in professional development on the following topics?	-Using Restorative Practices to improve student behavior and build community - Using dialogue circles with students to build relationships, discuss issues, ask questions, and deal with problems of behavior - Facilitating conferences that respond to wrongdoing

Figure A3.1
Variation in Estimated Impact on School Climate and Teachers' Intentions to Stay (from ITT Analysis)







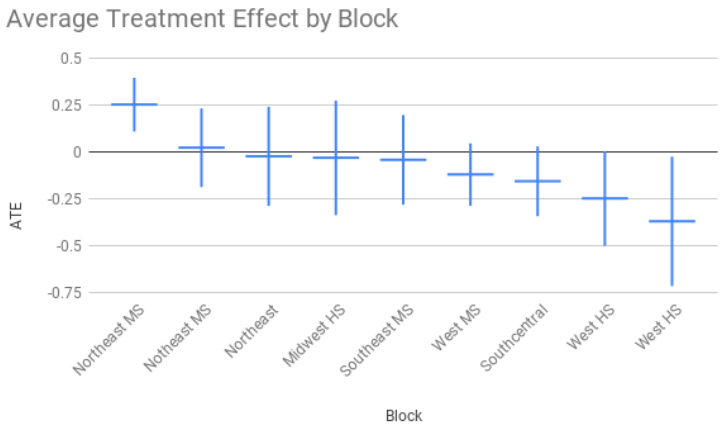


Table A3.2
Direct Effects of Covariates

Covariate	Outcome	Figure 3.6		Figure 3.7		Figure 3.8	
		β	*SE*	*β*	*SE*	*β*	*SE*
% Students on FRL	Teacher's self-reported use of RP	-.08	.02***				
	Students' (self-reported) use of RP					.79	.22***
	SC			.29	.11**		
	Intention to Stay					-.005	.002*
% Students from minority race/ethnic backgrounds	Teacher's self-reported use of RP	.25	.07***				
	Teacher's RP PD experiences			.12	.05*		
	Intentions to Stay					-.18	.03***
Exclusionary discipline (2014)	Teacher's self-reported use of RP	.12	.04**				
	Teachers' use of RP (student-report)					1.14	.18***
	Teachers' RP spirit (student-report)			-.64	.28*	1.59	.26***
	Students' (self-reported) use of RP			-.38	.16*		
	SC			.32	.16*	-.07	.03*
Enrollment	Students' (self-reported) use of RP					-.53	.14***
	Teacher's RP PD experiences	-.15	.03***	-.18	.03***		
	SC			-.15	.05**		
	Intention to Stay			-.11	.04*	-.16	.04***
School level (middle)	Intention to Stay					.09	.04*
Full-time classroom role	Teacher's self-reported use of RP					-.08	.04*
	Teachers' use of RP (student-report)					.04	.02*
	Teacher's RP PD experiences					-.06	.03*
	SC					-.07	.03*
Non-traditional certification	Students' (self-reported) use of RP					-.02	.01*
	Teacher's RP PD experiences					-.10	.05*
New to school	Teachers' use of RP (student-report)					-.09	.04*

*$p < .05$; **$p < .01$; ***$p < .001$

Table A4.1
RP Survey Items

Teachers' RP usage **(Teacher self-report)**	Teachers' restorative culture **(Student-report)**	Students' restorative culture (Student self-report)
I facilitate dialogue circles to provide opportunities for my students to share feelings, ideas, and experiences	*How often…*Do your teachers talk about their feelings?	*How many times did the following things happen THIS YEAR?* I participated in a circle discussion or meeting that helped solve a problem in my classroom.
I actively encourage students to express their feelings	Do your teachers encourage students to express their feelings?	I helped restore relationships that had been damaged or broken.
I express my feeling to my students throughout the day	Do your teachers ask students for their thoughts and ideas when decisions need to made that affect the class?	I supported students who I saw being hurt, even if there were no adults around.
When students misbehave, I respond by asking them questions about what happened, who has been harmed, and how the harm can be repaired	Do your teachers explain the reasoning behind decisions that affect students?	I worked with my classmates and a teacher to solve a problem, after sharing my feelings and listening to the feelings of others.
When students' negative behaviors harm others, I provide opportunities for those who were harmed to be heard and to have a say in what needs to happen to make things right	Do your teachers clearly state new expectations and consequences if expectations are not met?	I tried to "make things right" after thoughtless words or action.
I facilitate a dialogue circle with my students as a response to an incident or problem.	*When someone misbehaves, do your teachers...* Respond to negative behaviors by asking students questions about what happened, who has been harmed, and how the harm can be repaired?	
	Ask questions in a respectful way?	
	Provide opportunities for those who were harmed to be heard and to have a say in what need to happen to make things right?	
	Listen to what students have to say when they have misbehaved?	
	Avoid scolding and lecturing?	
	Focus on behavior and not whether students are "good" or "bad"?	

Table A4.2
School and Teacher Characteristics – Compared to other teacher populations

Variables	Mean/%	Title I	75% FRL	Urban
Teacher – Individual Characteristics				
Experience – as a teacher		14 years	13	13.2
Novice (4 years or less)	23.8%	13.7%	17.2%	16.0%
Experienced (15+ years)	38.4%	43.3%	39.1%	39.9%
Experience – in current school		8.4 years	7.3	7.1
Novice (4 years or less)*	52.0%	39.1%	44.6%	44.1%
Experienced (15+ years)*	13.7%	21.6%	17.4%	16.6%
Educational attainment				
Bachelor's degree	34.6%	42.2%	42.6%	38.7%
Master's degree	48.3%	46.5%	46.2%	49.4%
Specialist certificate	14.1%	8.5%	8.9%	9.6%
Doctorate	3.1%			
*Advanced Education	65.4%	55.0%	55.1%	59.0%
Certification (within state)				
Regular	78.5%			
Advanced*	6.8%			
Alternative*	14.6%			
Teacher – Job Characteristics				
Full-time classroom teacher*	90.0%			
Leader*	10.8%			
Subject				
English	26.1%			
Social Studies	13.9%			
Other (CTE, Languages, etc.)	29.1%			
Math/Science*	30.9%			
Special Education*	16.9%			
Grade Level				
Middle School (6-8th)*	38.2%			
High School (9-12th)	61.8%			
Intervention Supports: RP/DN	28.0%			
DN	49.6%			
School Characteristics				
Enrollment	909	512		
% FRL	86.5%	69.4%		
% Minority Race/Ethnicity	96.6%	58.4%		
Number of Full-time teachers	54	32		
Student-to-teacher ratio	17.0:1	16.2:1		

Table A4.3
Grade Makeup

	Teachers		Students	
Variables	Cohort 1	Cohort 2	Cohort 1	Cohort 2
Grade Level				
6th grade	24.1%	16.8%	37.9%	22.2%
7th grade	27.4%	20.0%	11.7%	1.2%
8th grade	28.6%	19.2%	0.4%	0.1%
9th grade	35.0%	42.2%	47.9%	41.2%
10th grade	37.3%	43.7%	1.1%	0.3%
11th grade	37.3%	44.7%	0.4%	0.3%
12th grade	34.8%	42.0%	0.6%	34.8%

Note. Cohort 2 has a greater share of 12th grade students because they were a focal student group for the DN data collection (being in their fourth year of the DN study which was interested in tracking their high school completion).

Biography and Curriculum Vitae

Ashley Anne Grant was born in 1988 in the state of New Jersey.

Ashley completed her undergraduate work at Georgetown University, where she received a Bachelor of Arts in Linguistics (with minors in Medieval Studies and Studio Art). As an undergraduate, she studied abroad at University College London, in England. She was a teaching fellow in the Alliance for Catholic Education at Saint Joseph's (ACESJU) program, earning her Master of Science in Education from Saint Joseph's University in 2014. During this program and afterwards, she taught 5th grade for three years in urban Catholic schools in Philadelphia, PA. After teaching, she began her doctoral studies at Johns Hopkins University in 2015. During her time at Hopkins, she has been a doctoral fellow and research team member at the Johns Hopkins' Institute for Education Policy and worked on the Restorative Practices/Diplomas Now evaluation team in the Center for the Social Organization of Schools. During her time in Baltimore, she also engaged in community based teaching, research, and leadership including serving as a board member for a local Catholic school serving low-income students.

Ashley A. Grant

Johns Hopkins University

School of Education ashley.a.grant@jhu.edu
2800 N. Charles St., Baltimore, MD 21218 (609) 707-0965

EDUCATION

2020 *expected* **Ph.D., Education | Johns Hopkins University**
Area of study: Quantitative methods, Research Design, Education Policy and Leadership
Committee: Dr. Doug MacIver (advisor), Dr. Martha MacIver, Dr. Richard Lofton, Dr. Ashley Berner, Dr. Nicholas Ialongo

2014 **M.S., Education (Middle Years) | Saint Joseph's University**
Alliance for Catholic Education Teaching Fellow

2011 **B.A., Linguistics | Georgetown University,** cum laude

SCHOLARSHIP

REFEREED JOURNAL ARTICLES

Grant, A. A., Hann, T., Godwin, R., Shackelford, D., & Ames, R. T. *(2020).* A framework for graduated teacher autonomy: Linking teacher proficiency with autonomy. *The Educational Forum.* DOI: 10.1080/00131725.2020.1700324

Grant. A. A., Jeon, L., & Buettner, C. K. (2019). Chaos and professional commitment in the early childhood education classroom: Direct and indirect associations through teaching efficacy. *Teaching and Teacher Education: An International Journal of Research and Studies, 81*, 50-60. DOI: 10.1016/j.tate.2019.02.010

Grant. A. A., Jeon, L., & Buettner, C. K. (2019). Relating teachers' working conditions and well-being to their career intentions and commitment to their job. *Educational Psychology, 39*(3), 294-312. DOI: 10.1080/01443410.2018.1543856

Jeon, L., Buettner, C. K., **Grant, A. A.,** & Lang, S. N. (2019). Early childhood teachers' stress and children's social, emotional, and behavioral functioning. *Journal of Applied Developmental Psychology, 61*, 21-32. DOI: 10.1016/j.appdev.2018.02.002

Jeon, L., Buettner, C. K., & **Grant, A. A.** (2018). Early childhood teachers' psychological well-being: Exploring potential predictors of depression, stress, and emotional exhaustion. *Early Education and Development*, *29*(1), 53-69. DOI: 10.1080/10409289.2017.1341806

TECHNICAL REPORTS

Grant, A. A. (2018) *School Climate and Restorative Practices: An Overview*. Prepared for the Open Society Foundation.

MacIver, D., **Grant, A. A.,** Balfanz, R., Byrnes, V. Clark, E., & Lofton, R. (2018). Combining Restorative Practices with Diplomas Now: Results from a Randomized Control Trial Evaluating Impacts on Teacher's Practices, Students' Disciplinary Problems, Suspensions/Expulsions and Conflict in Big City Schools. Prepared for the Atlantic Philanthropies.

Grigg., J. & **Grant, A. A**. (2017) – Educational and Life Outcomes of BCP Graduates. Prepared for the Baltimore Curriculum Project and Baltimore Education Research Consortium.

MANUSCRIPTS UNDER REVIEW

Brantlinger, A. **Grant, A. A**.., Miller, J., Griffin, M. (*under review at Education Policy*). Maintaining The Gaps: A Program Theory Evaluation of Mathematics Teacher Training in the New York City Teaching Fellows Program.

Brantlinger, A., Cooley, L., Miller, J., & **Grant, A. A.** (*under review at …)* Intersectionality and Teacher Turnover: How Teacher Selection, Training, and School Assignments Interactively Shape Selective? Alternative Route Mathematics Teacher Retention

Grant, A. A.. & Brantlinger, A. (*under review at American Educational Research Journal*). Who's Left? Patterns of Teacher Turnover in NYCTF Math Teachers and the Impact of School Climate Perceptions.

MANUSCRIPTS IN PREPARATION (AVAILABLE UPON REQUEST)

Grant, A. A., Byrnes, V., Clark, E., MacIver, D., Balfanz, R., & Lofton, R. (*in preparation for AERA Open)* Combining Restorative Practices with Diplomas Now: Results from a Randomized Control Trial Evaluating Impacts on Teacher's Practices, Students' Disciplinary Problems, Suspensions/Expulsions and Conflict in Big City Schools

Grant, A. A., Mac Iver, D. & Mac Iver, M. A. (*in preparation for Journal of Research on Educational Effectiveness*). The Impact of Restorative Practices and Diplomas Now on School Climate and Teachers' Turnover Intentions: Evidence from a Cluster Multi-site Randomized Control Trial.

Bostic, B. & **Grant, A. A**. (*in preparation for Teaching and Teacher Education*) Can Teacher Collaboration Buffer Against a Reliance on Exclusionary Discipline? An Exploratory Study of Collegial Social Networks in New York City High Schools

Grant, A. A., & Berner, A. B. *(report in preparation)* Development and Validation of a Cross-Sector School Culture Survey.

Grant, A. A.. (*in preparation*). Examining Causal Heterogeneity in the Effect of School Safety on Teacher Turnover.

POLICY BRIEFS & OP-EDS

Grant, A. A. (26 May 2020) *Virtual Charter Schools' Consistent and Persistent Negative Impacts* in The Best Evidence in Brief (BEiB) Newsletter.

PRESENTATIONS

NATIONAL AND INTERNATIONAL CONFERENCE PRESENTATIONS

2020

Grant, A. A., Siegel-Stechler, K., & Plasman, J**.** *Development and Validation of a Cross-Sector School Culture Survey.* Poster presentation (online) at the 2020 annual meeting of the Association for Education Finance and Policy (March), Ft. Worth, TX

Grant, A. A. *Testing The Promise Of Restorative Practices For Reducing Teacher Turnover In Hard-To-Staff Schools.* Poster accepted for presentation at the 2020 annual meeting of the Society for Research on Educational Effectiveness (March), Washington, DC.

Grant, A. A. *School Safety and Teacher Turnover in NYC: A Case of Causal Heterogeneity.* Poster accepted for presentation at the 2020 annual meeting of the Society for Research on Educational Effectiveness (March), Washington, DC.

Miller, J., **Grant, A. A.,** Griffin, M. J., Viviani, W. & Brantlinger, A. M. (2020, Apr 17 - 21) *Program Theory Evaluation of Mathematics Teacher Training in the NYC Teaching Fellows Program* [Paper Session]. AERA Annual Meeting San Francisco, CA http://tinyurl.com/vcoubtd (Conference Canceled)

Grant, A. A. (2020, Apr 17 - 21) *Teachers Getting Restorative? Restorative Practices Implementation, School Climate, and Teachers' Turnover Intentions* [Roundtable Session]. AERA Annual Meeting San Francisco, CA http://tinyurl.com/rvt6bom (Conference Canceled)

Bostic, B. & **Grant, A. A.** (2020, Apr 17 - 21) *The Relationship Between Teacher Collaboration and Student Discipline Outcomes in New York City High Schools* [Paper Session]. AERA Annual Meeting San Francisco, CA http://tinyurl.com/s9nfjm2 (Conference Canceled)

2019

Grant, A. A., MacIver, D., Balfanz, R., Byrnes, V. Clark, E., & Lofton, R. *Combining Restorative Practices with Diplomas Now: Results from a Randomized Control Trial Evaluating Impacts on Teacher's Practices, Students' Disciplinary Problems, Suspensions/Expulsions and Conflict in Big City Schools*. Paper presentation at the 2019 annual meeting of the Society for Research on Educational Effectiveness (March), Washington, DC.

Grant, A. A. *The Good, the Bad, and the Ugly of Environmental Chaos: Teachers' Perspectives of School Order*. Paper presentation at the 2019 annual meeting of the American Educational Research Association (April), Toronto, Canada.

Grant, A. A. *Who's Left? Patterns of Turnover in NYCTF Mathematics Teachers and the Impact of School Climate.* Paper presentation at the 2019 annual meeting of the American Educational Research Association (April), Toronto, Canada.

2018 **Grant, A. A.** *The impact of Restorative Practices on teachers' turnover intentions.* Division H Graduate Student In-Progress Research presentation at the 2018 annual meeting of the American Educational Research Association (April), New York, NY.

Jeon, L., Buettner, C. K., & **Grant, A. A**. *Early childhood teachers' psychological well-being: Exploring potential predictors of depression, stress, and emotional exhaustion.* Paper in Roberts, A. (chair) symposium, Teachers' mental health and psychological well-being across contexts, at the 2018 annual meeting of the American Educational Research Association (April), New York, NY.

2017 Organized Paper Symposium: *Early Childhood Educators' Social-Emotional Capacity and Classroom Quality.*

Jeon, L., Buettner, C. K., Pierce, J. L., & **Grant, A. A.** *The moderating role of preschool teachers' depression on the associations between children's disabilities status and social- behavioral competence.* Paper presentation at the 2017 biennial meeting of the Society for Research in Child Development (April), Austin, TX.

Grant. A. A., Jeon, L., & Buettner, C. K. *Relating teachers' working conditions and well- being to their career intentions and commitment to their job.* Paper presentation at the 2017 biennial meeting of the Society for Research in Child Development (April), Austin, TX.

Alfes, C., Robinson, G., **Grant, A. A.,** Jeon, L., & Buettner, C. K. *Teachers' mindfulness and preschool student outcomes: Potential social, emotional, and cognitive benefits*. Poster presentation at the 2017 biennial meeting of the Society for Research in Child Development (April), Austin, TX.

Grant, A. A. & Jeon, L. *Teacher turnover in hard-to-staff schools: A review of theory in the literature*. Paper presentation at the 2017 annual meeting of the American Educational Research Association (April), San Antonio, TX.

Fonseca, E., **Grant, A. A.,** & Stein, M. *Measurement Variation in Teacher Turnover and Workplace Conditions Research.* Paper presentation at the 2017 annual meeting of the American Educational Research Association (April), San Antonio, TX.

Jeon, L., Buettner, C. K., & **Grant, A. A.** *The role of early childhood teachers' sense of community and work engagement in child development.* Poster presentation at the Society for Prevention Research 25th annual meeting (May 2017), Washington, DC.

Jeon, L., Buettner, C. K., **Grant, A.A.,** & Lang, S. N. *Exploring the role of teachers' stress in young children's social-emotional development.* Paper presentation at the 2017 annual meeting of European Early Childhood Education Research Association (August), Bologna, Italy.

2016 **Grant, A.,** Jeon, L., & Buettner, C. *Self-Efficacy as a Mediator of the Association Between Classroom Chaos and Early Childhood Educators' Occupational Commitment*. Poster presentation at the Society for Prevention Research (May), San Francisco, CA.

LOCAL AND REGIONAL CONFERENCE PRESENTATIONS

2017 Parkhideh, A., **Grant, A. A.,** & Jeon, L. *Chaos in the School Environment: Teacher Perceptions and Measures.* Poster presentation at the Hopkins CARES symposium (August), Baltimore, MD.

2016 Shia, K., & **Grant, A. A.**. *Links between parent-teacher relationships and parent-teacher reported child behavioral outcome discrepancies*. Poster presentation at the Hopkins CARES symposium (July), Baltimore, MD.

Grant, A., Godwin, R., Hann, T., & Shackelford, D. *Graduated Teacher Autonomy: A Theoretical Framework for Teacher Evaluation*. Poster presentation at the Eastern Evaluation Research Society (May), Galloway, NJ.

AWARDS, GRANTS, FELLOWSHIPS

2020 CaRing Award (leadership and community service), Johns Hopkins University

2019 Doctoral Fellow, Institute for Education Policy, Johns Hopkins University

2018 Travel award ($), AERA Division H
Alumni Association Student Grant, Johns Hopkins University Alumni Council, awarded to support Education Doctoral Speaker Series

2017 Travel Award ($), AERA Division L

2016 Top Poster Award ($), Eastern Evaluation Research Society

RESEARCH EXPERIENCE

2018– **Survey Developer | Institute for Education Policy, Johns Hopkins University**
Program on Educational Pluralism: School Culture Survey, Koch Foundation grant, PI: Ashley Berner, PhD — Development, piloting, validation, and distribution of a new survey measuring school culture

2017– **Doctoral Researcher | Center for Social Organization of Schools, Johns Hopkins University**
Restorative Practices and Diplomas Now, i3 & Atlantic Philanthropies grant, PI: Doug MacIver, Ph.D. and Robert Balfanz, PhD — Experimental evaluation of Restorative Practices in 9 US urban districts, on implementation; school climate; student behavior, attendance, and suspensions; and teachers' turnover intentions

2017 - **Research Consultant | University of Maryland, College Park**
New York City Teaching Fellows (NYCTF), NSF grant, PI: Andrew Brantlinger, PhD — Evaluation (observational) of NYCTF secondary mathematics teaching program on teacher distribution, preparedness, effectiveness, and retention

2018– **Doctoral Fellow| Institute for Education Policy, Johns Hopkins University**
Research team member contributing to research tool development, data collection, and project reports including: Wit & Wisdom implementation evaluation, Knowledge Map development and assessment

2017-18 **Doctoral Researcher | Center for Research and Reform in Education, Johns Hopkins School of Education**
Vision for Baltimore, PI: Robert Slavin, PhD

2017 **Research Consultant | Baltimore Children's Scholarship Fund**
Develop plan (including survey) for collecting data on current students and alumni

2017 **Evaluator and Research Consultant | Johns Hopkins Science of Learning Institute**
Develop and implement observational tool to evaluate teachers in the adult classroom

2015-17 **Doctoral Researcher | Johns Hopkins School of Education**
Social-Emotional Capacity of Teachers (SECAP) & Executive Functioning (EF), PI: Lieny Jeon, PhD and Cynthia Buettner, PhD; Teachers and their School Environments (TSE) — Research team and lab coordinator (of 5 undergraduate research assistants) to oversee recruitment, data collection (survey, observational, child assessment), and management; Analysis of teachers' well-being and job attitudes in relation to their work environments

and students' development; Create mixed methods research design (focus groups, interviews, surveys), recruitment of 3 schools, and data collection to understand teachers' perspectives of environmental chaos

2016 **Research Manager | Baltimore Curriculum Project**
Charter school graduate tracking and evaluation, Abell Foundation grant

2015-16 **Doctoral Researcher | Johns Hopkins School of Education**
Equipping Teachers Project, IES grant, PI: Martha MacIver, PhD — PD development and implementation

2015-16 **Doctoral Researcher | Johns Hopkins School of Education**
STEM Achievement in Baltimore Elementary Schools (SABES), NSF grant, PI: Carolyn Parker, PhD

TEACHING EXPERIENCE

Instructor – Breaking in Baltimore: Urban Education Winter 2020
Undergraduate level, College of Arts and Sciences, Johns Hopkins University
Community Based Learning course

Teaching Assistant – Basic and Inferential Statistics Fall 2019
Doctoral level, Education PhD program, Johns Hopkins University

Teaching Assistant – Research Methods II Spring 2019
Doctoral level, online Education EdD program, Johns Hopkins University

Instructor – The Achievement Gap: Looking at and Re-evaluating how we study educational inequity Fall 2019
Fall 2018
Undergraduate level, College of Arts and Sciences, Johns Hopkins University
Designed course as part of Special Opportunities for Undergraduate Learning

Teaching Assistant – Hierarchical Linear Models Fall 2017
Doctoral level, Education PhD program, Johns Hopkins University

GUEST LECTURER

The Evidence Base behind Restorative Practice – in Seminar in Elementary Schools Spring 2019
Johns Hopkins University

Survey Methods – in Research Methods in Psychology Fall 2018
Goucher College

MENTORING POSITIONS

Monitoring and Advising Undergraduate Research Assistants 2016-2017
SECAP project, Johns Hopkins University

Advising Summer Research Intern: Katie Shia, Arianna Parkhideh Summer 2016
Center for Talented Youth, Johns Hopkins University Summer 2017

P-12 POSITIONS

5th Grade Teacher/Graduate Program Fellow 2012–2015
ACESJU, St. Martin of Tours (Independence Mission School), Philadelphia, PA
Inclusive 5th grade classroom teacher for 28 students at Title I school

CERTIFICATIONS, TRAINING, WORKSHOPS

2020 William L. Boyd National Educational Politics Workshop | UCEA & AERA

Civic Engagement Certificate | Center for Social Concern, Johns Hopkins University

Educational Pluralism + Research to Policy (Graduate Student Colloquium) | Charles Koch Foundation

2019 Leadership Certificate | Contemplative Leaders in Action

Heterogenous Treatment Effects | SREE Pre-conference, Luke Miratrix and Avi Feller

William L. Boyd National Educational Politics Workshop | UCEA & AERA

Wit & Wisdom Curriculum Implementation Observation | Institute for Education Policy, Johns Hopkins University

Schools, Prisons & Concentrated Poverty: Addressing Challenges, Generating Solutions Symposium | Everyone Graduates Center, Johns Hopkins University

2018 Teaching Academy Certification | Center for Educational Resources, Johns Hopkins University

Instructional Practice Guide (IPG) Observer | Achieve the Core

Restorative Practices | International Institute for Restorative Practices

William L. Boyd National Educational Politics Workshop | UCEA & AERA

2017	Creative Strategies for Mixing Qualitative and Quantitative Approaches in Mixed Methods Research | AERA Methods Session, Elizabeth Creamer
	William L. Boyd National Educational Politics Workshop | UCEA & AERA
2016	Pre-K Classroom Assessment Scoring System (CLASS) Observer | Teachstone
	The Coleman Report at Fifty: Its Relevance for Policy and Practice Today | Johns Hopkins University
2014	Teacher, 4th-8th Grade (Middle Years) | Pennsylvania
	Leadership Development (Robert A. Fox Leadership Program) | University of Pennsylvania

STATISTICAL & METHODS TRAINING

Johns Hopkins Courses: Introduction to Statistics, Linear Models, Categorical Data Analysis, Hierarchical Linear Modeling (HLM), Structural Equation Modeling (SEM) & Factor Analysis, Longitudinal and Panel Data Analysis (including Event History Analysis), Causal Inference (Part I & II), Survey Design

Other training (Research Projects): Program Evaluation, Implementation evaluation, Randomized control trials (block and cluster designs), Survey design, Measurement testing and development

Software: Stata, HLM, R, Dedoose, NVivo, Excel (familiarity with SPSS)

LEADERSHIP & SERVICE

UNIVERSITY

Co-Chair, Education Doctoral Student Association, JHU	(2016 - 18)
Student Representative, School of Education Doctoral Committee, JHU	(2016 - 18)
Student Peer Mentor, JHU	(2016 - 17)

PROFESSIONAL PEER REVIEW

Ad hoc reviewer:	*Teachers College Record* *Education Management, Administration, and Leadership* *Teaching and Teacher Education*

PROFESSIONAL MEMBERSHIP

American Educational Research Association (AERA) (Since 2015)
Divisions A, H, L
SIGs: School Community, Climate, and Culture; Catholic Education; Social and Emotional Learning; Urban Education
Division L Graduate Student Committee (2019-20)
Society for Prevention Research (SPR) (Since 2015)
Society for Research on Child Development (SRCD) (Since 2016)
Society for Research on Educational Effectiveness (SREE) (Since 2019)
Association for Educational Finance and Policy (AEFP) (Since 2019)

COMMUNITY

Engaged Graduate Student Network (Johns Hopkins, Baltimore, MD) (Since 2018)
School Board Member, Holy Angels Catholic School (Baltimore, MD) (Since 2017)
Tutor, Reading Partners (Robert W. Coleman Elementary, Baltimore, MD) (2018)