IMPROVING THE QUALITY OF SCHOOL INTERACTIONS AND STUDENT WELL-BEING: IMPACTS OF ONE YEAR OF A SCHOOL-BASED PROGRAM IN THE DEMOCRATIC REPUBLIC OF THE CONGO

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Improving the quality of education for millions of children worldwide has become a global priority. This study presents results from the first experimental evaluation to test the impact of a universal school-based program on (1) the quality of school interactions (i.e., students' perceptions of the level of support/care and predictability/ cooperation in their school and classrooms), and (2) students' subjective well-being (i.e., peer victimization and mental health problems). The study took place in the Democratic Republic of the Congo, a low-income country affected by decades of conflict. The evaluation employed a cluster-randomized trial, where the unit of randomization was clusters of two to six schools. Included in the analyses were 3,857 students in second through fourth grades, who attended sixty-three schools nested in thirty-nine clusters. After one year of partial implementation, multilevel analyses showed promising but mixed results. The program had a significant positive impact on students' perceptions of supportive and caring schools and classrooms, but a negative impact on their sense of predictability and cooperation. The program's average effect on students' subjective well-being was not statistically significant, but differential impacts were found for various subgroups of students. The paper concludes with a discussion of the implications of the study and future directions for research in this field.

Education is indispensable to the development of individuals and nations (UNESCO 2014; Hanushek and Woessmann 2007; Gakidou et al. 2010; Collier and Sambanis 2002). Since Education for All and the Millennium Development Goals were adopted in the year 2000, developing countries have made unprecedented progress toward achieving universal access to education (Hanushek and Woessmann 2007; UNESCO 2014; Grantham-McGregor et al. 2007). However, greater access to education can have only limited benefits if the quality of education is poor (Wright and UNICEF 2009; Hanushek and Woessmann 2007; Grantham-McGregor et al. 2007). Improving the quality of learning environments is key to translating access to education into improved learning and life outcomes for all students (Murnane and Ganimian 2014; Wright and UNICEF 2009).

Beyond the structural and physical characteristics of schools and classrooms (e.g., class size, student-teacher ratios, teacher credentials, availability of learning materials), high-quality learning environments are characterized by social and pedagogical interactions that fulfill students' needs for autonomy, competence, and connectedness. A recent review of 115 impact evaluations of educational initiatives in low- and middle-income countries concluded that more and/or better resources (e.g., teaching materials, smaller classes, instructional time) are unlikely to improve student outcomes unless they also improve children's school experiences (UNICEF 2009; Burde et al., under review; de Jong 2010; Betancourt and Williams 2008; Mosselson, Wheaton, and Frisoli 2009; Winthrop and Kirk 2008). Social and pedagogical interactions that meet students' psychological needs help foster their overall sense of well-being, motivation to learn, and academic achievement (Kane and Staiger 2012; Deci et al. 1991; Hamre and Pianta 2005; Niemiec and Ryan 2009; Allen et al. 2013; Ahnert et al. 2012; Sakiz, Pape, and Hoy 2012; Resnick et al. 1997). Abundant research shows that high-quality social and pedagogical interactions between teachers and students, as rated by external observers and by students and teachers, are associated with better student mental health outcomes, enjoyment of school, performance in math and literacy assessments, and a higher level of effort (Hamre and Pianta 2005; Kane and Staiger 2012; Griffith 2002; Allen et al. 2013; Ahnert et al. 2012; Sakiz, Pape, and Hoy 2012; Resnick et al. 1997). Moreover, there is growing evidence to suggest that these interactions are particularly important for children at risk of maladjustment (e.g., children who displayed behavioral problems in the classroom and whose mothers have low levels of education; INEE 2010; Hamre and Pianta 2005; Griffith 2002).

Improving the quality of social and pedagogical interactions at school seems particularly important in low-income and conflict-affected countries. Schools can reach large numbers of children and youth, and can play a protective role for students who face various forms of adversity in their homes and communities (Burde et al., under review; INEE 2010; de Jong 2010; Betancourt and Williams 2008; Mosselson, Wheaton, and Frisoli 2009; Winthrop and Kirk 2008). School experiences can bring normalcy and predictability to children's lives, mitigate the negative effects that life stressors have on their mental health, and reduce the risk of future conflicts by nurturing students' life skills and reducing inequality and social divides (UNICEF 2009; Burde et al., under review; de Jong 2010; Betancourt and Williams 2008; Mosselson, Wheaton, and Frisoli 2009; Winthrop and Kirk 2008). However, schools are not always able to accomplish this.

Despite the importance of positive school experiences, strategies to improve the social and pedagogical interactions between students and teachers remain understudied in countries affected by poverty and conflict. This paper contributes to this small but growing body of literature by reporting one-year results from a cluster-randomized trial of Learning to Read in a Healing Classroom (LRHC), a program in the Democratic Republic of the Congo (DRC). LRHC is a universal school-based program aimed at improving the academic and psychosocial outcomes of children and youth by enhancing teacher motivation and well-being, and transforming the social and pedagogical interactions between students and teachers. We examine the effects of LRHC on two sets of outcomes: children's perception of the quality of school interactions, specifically the levels of support/ care and predictability/cooperation in the school and classroom; and children's subjective well-being, as measured by self-reports of peer victimization and mental health problems.[1]

QUALITY SCHOOL INTERACTIONS

Policy, theory, and research point to the quality of social and pedagogical interactions as key predictors of highly valued academic and lifespan outcomes. From a policy perspective, UNICEF's Child Friendly Schools model strives to create learning environments that are physically healthy and safe, and socially and emotionally supportive (UNESCO 2004; UNICEF 2009). Similarly, the 2005 "Global Monitoring Report on Quality" (Deci and Ryan 2000; UNESCO 2004; Deci et al. 1991) points to interpersonal relationships between students and

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[1]   See Aber et al. (preprint) and Wolf et al. (2015) for reports of the impact of LRHC on student reading and math achievement and teacher motivation and well-being.

teachers as a central aspect of the learning process. Self-determination theory argues that student-teacher and student-student interactions, which fulfill basic psychological needs for autonomy, safety, connectedness, and competency, motivate students to pursue social and academic goals and are fundamental for mental health (Hughes et al. 2008; Deci and Ryan 2000; Deci et al. 1991).

Correlational and longitudinal research from the United States lends support to these theoretical claims and policy goals. Trust, warmth, and a low level of conflict between teachers and students are associated with higher academic engagement and achievement, concurrently and over the long term (Ponitz et al. 2009; Hughes et al. 2008; Cameron et al. 2008; Reyes et al. 2012). Schools and classrooms that have predictable routines and behavioral expectations, and where students enjoy supportive relationships with their teachers and peers and engage in intellectually challenging activities, predict higher levels of motivation for learning and academic attainment (Merritt et al. 2012; Ponitz et al. 2009; NICHD 2003; Cameron et al. 2008; Wilson, Pianta, and Stuhlman 2007; Reyes et al. 2012; Suldo et al. 2009). Moreover, emotionally supportive classrooms characterized by warm and respectful interactions have been linked to a range of positive mental health outcomes, including improved social competence, life satisfaction, and behavioral self-control, as well as reduced depression, anxiety, and aggression (Merrit et al. 2012; NICHD 2003; Wilson, Pianta, and Stuhlman 2007; Suldo et al. 2009).

Additional evidence is available from experimental evaluations of school-based social and emotional learning (SEL) programs in the U.S. and other high-income countries. In addition to teaching concrete social and emotional skills (e.g., self-awareness, managing emotions, responsible decision making), many SEL programs are built on the premise that establishing a safe, orderly, and emotionally supportive learning environment leads to improved student psychosocial and academic outcomes (Hanushek and Woessmann 2007; Hagelskamp et al. 2013; Gakidou et al. 2010; Jones et al. 2010; Collier and Sambanis 2002; Aber et al. 2011). A recent meta-analysis of over 200 SEL programs shows that SEL is a viable and effective approach to improving student outcomes (Durlak et al. 2011).

Despite accumulating evidence from high-income countries, no experimental studies have been conducted in extremely poor and conflict-affected countries to examine whether universal school-based programs can improve the quality of classroom and school interactions, as well as students' well-being and academic performance. A small number of non-experimental studies show promising results. An observational study of the Nueva Escuela Unitaria program in

postconflict Guatemala found positive changes in classroom practices and student behavior (de Baessa, Chesterfield, and Ramos 2002). The program promoted parental involvement and teachers' use of active learning strategies (e.g., small-group activities, peer teaching, use of self-instructional guides), and led workshops where teachers reflected on their experiences as learners and teachers, developed pedagogical materials, and formed teacher circles to support each other in implementing the program. Another study of the USAID-funded Education Reform Program in Egypt found a modest positive shift in classroom instructional practices (Megahed et al. 2008). The program relied on a cascade model (i.e., experts lead workshops so trainers can learn the skills they need to train others), emphasized active learning strategies, and included observation and monitoring of classroom practices. To advance the focus of global educational policy from education access to education quality, more research is critically needed on programs in poor and conflict-affected countries that simultaneously address students' learning opportunities and psychosocial well-being.

STUDENT SUBJECTIVE WELL-BEING

Peer Victimization

It is well established that peer relationships play a pivotal role in children's psychosocial and academic trajectories (Buhs, Ladd, and Herald 2006). Peer victimization, or being the target of aggressive behavior from other children, has immediate and long-term effects on psychosocial maladjustment, including increased depression, anxiety, feelings of loneliness, and negative self-concept (Hawker and Boulton 2000; Troop-Gordon et al. 2014; Schwartz et al. 2014; Holt, Finkelhor, and Kantor 2007). Research that examines peer victimization in low-income and conflict-affected countries is limited. However, a study that used data from sixteen low- and middle-income countries (Fleming and Jacobsen 2010) coincides with years of research from high-income countries. In these countries, peer victimization was consistently associated with an increased risk of experiencing depressive symptoms, such as sadness, loneliness, sleeplessness, and suicidal ideation, and with an elevated risk of engaging in poor health behaviors, such as alcohol and tobacco use. Similar results were found in a study with over a thousand children in poor, urban South Africa (Cluver, Bowes, and Gardner 2010), and in a study with Zambian adolescents, which also found a significant relationship between peer victimization and school absenteeism (Siziya, Rudatsikira, and Muula 2012).

Research is less conclusive about the role that positive peer relations play in poor countries affected by conflict. A systematic review of studies on the resilience and mental health outcomes of children affected by armed conflict found that having peer support was associated with lower levels of depression in some studies, but unrelated to depression, post-traumatic stress disorder (PTSD), and overall psychological well-being in others (Tol, Song, and Jordans 2013). Positive peer relationships may not compensate for the negative effects of stressors experienced outside of school, but peer victimization may magnify them. Studies in high- and middle-income countries show that peer victimization can do lasting damage to children's mental health (Schwartz et al. 2014; Troop-Gordon et al. 2014; Cluver, Bowes, and Gardner 2010), and may prevent victims from accessing other protective resources offered by their school because they increase school disengagement and avoidance (Buhs, Ladd, and Herald 2006; Ripski and Gregory 2009).

Given the dearth of research addressing peer victimization in low-income countries affected by conflict, this paper examines the impact of a universal school-based program on Congolese children's self-reports of victimization. The goal is to expand our understanding of school-based strategies that may help reduce the number of stressors in these children's daily lives.

Mental Health Problems

Mental health problems affect 10-20 percent of children and youth worldwide (Kieling et al. 2011). In resource-poor countries affected by conflict, millions of children endure extreme adversity that puts them at a higher risk of developing mental health problems relative to children in other countries (Tol et al. 2011; Tol et al. 2012). In the vast majority of cases, the mental health needs of children living in the most difficult circumstances are not being addressed (Omigbodun 2008). In low- and middle-income countries, for example, it is estimated that over 70 percent of mental health problems go untreated (Betancourt et al. 2012).

From a psychosocial perspective, mental health problems among conflict-affected populations are not only the direct result of exposure to war-related traumatic events, but also the indirect result of increased stressors in their daily life (Tol, Song, and Jordans 2013; Macksoud and Aber 1996). In addition to exposing children to violence, threatened security, and forced displacement, armed conflict disrupts family structure and functioning, deteriorates social networks, and exacerbates existing socioeconomic hardship (Miller 2010; Reed et al. 2012).

Only a handful of randomized control trials conducted in low-income and conflict-affected countries have shown promise in addressing children's psychosocial and mental health needs through school-based programs. The three studies most relevant to this paper were conducted in conflict-affected regions of Nepal, Indonesia, and Sri Lanka, where authors found mixed results from a secondary prevention program involving trauma-processing activities, cooperative play, creative expression, and cognitive behavioral therapy. The Nepali evaluation used a sample of eight schools and did not find significant main effects, but it did find beneficial effects for subgroups of children in terms of psychological difficulties, aggression, prosocial behavior, and sense of hope (Jordans et al. 2010). The Indonesian trial, in which fourteen schools were randomized to treatment versus control conditions, found positive effects on children's PTSD symptoms and sense of hope, but not on stress-related physical symptoms, depression, anxiety, or functional impairment (Tol et al. 2008). Similar results were found in a cluster-randomized trial of a comparable program in Sri Lanka. In that case, however, harmful effects were found for girls' PTSD symptoms (Tol et al. 2012).

In spite of emerging research, the current body of evidence on effective practices to promote mental health in low-income and conflict-affected contexts remains limited and inconclusive. Moreover, no studies have been conducted that test the potentially positive impact of universal programs that have a combined focus on student well-being and academic curricula. School-based programs to improve mental health that are fully integrated with the academic curricula are more likely to be scalable and sustainable, particularly in resource-constrained settings. This paper examines the impacts of one such integrated program on Congolese children's mental health outcomes.

CURRENT PAPER

This paper examines the impacts of one year of partial implementation of Learning to Read in a Healing Classroom on the quality of school interactions, namely, students' perceptions of (a) supportive/caring and (b) cooperative/predictable schools and classrooms, and on students' subjective well-being, namely, (c) mental health problems and (d) victimization. We hypothesized that there would be a positive impact on both sets of outcomes, but expected a stronger impact on the quality of school interactions than on student well-being. The reason for this is that the program was designed to first transform the quality of social and instructional interactions so it could then influence student well-being. We also explored the heterogeneity of treatment impacts as a function of select characteristics of schools (i.e., baseline scores of outcomes) and children (i.e., gender, grade, language minority status).

SETTING

The DRC, the second largest country on the African continent, ranks next to last in the world on the human development index, an indicator of well-being that combines measures of life expectancy, educational attainment, and income.[2] In addition to dramatically low levels of social and economic development, the DRC has experienced ongoing political and social instability for the past four decades and thus ranks in the bottom ten countries on the Global Peace Index (Institute for Economics and Peace 2014).

Due to limited resources, widespread corruption, and ongoing violent conflict, education in the DRC has been severely underfunded and underdeveloped (UNICEF 2013). In the 1980s, when the Congolese education system was considered one of the premier systems in sub-Saharan Africa, the government dedicated 25 percent of its budget to education. By contrast, between 1990 and 2000, the Ministry of Primary, Secondary, and Professional Education (MEPSP) received a mere 1 percent of the national budget. Education expenditures in 2010 (just before this study began) amounted to 2.5 percent of the GDP, whereas they were twice as much in neighboring Rwanda, Burundi, and the Republic of the Congo.[3] Due to insufficient public funding, household resources largely sustain the DRC education system, and teacher salaries are among the lowest in sub-Saharan

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2   See http://hdr.undp.org/en/statistics/.

3   See https://www.cia.gov/library/publications/the-world-factbook/.

Africa. Teachers living in poor and disadvantaged communities are often unable to lift themselves above the poverty line, and thus they are likely to seek additional jobs or relocate to communities with more resources (UNESCO 2014). The loss of good teachers contributes to keeping the most disadvantaged communities at the bottom by reducing access to quality education, which is reflected in students' academic performance. Our baseline results for this study showed that 91 percent of children in the second to fourth grade were unable to answer a single reading comprehension question correctly on a test designed specifically for use in low- and middle-income countries (Torrente et al. 2011).

THE PROGRAM: LEARNING TO READ IN A HEALING CLASSROOM

To improve the quality of education for Congolese children and youth, the United States Agency for International Development (USAID), in partnership with the International Rescue Committee (IRC) and in collaboration with the Democratic Republic of the Congo's MEPSP, mounted a systematic initiative known as Opportunities for Equitable Access to Quality Basic Education (OPEQ). The OPEQ initiative consisted of four elements: informing in-service teacher-training policy and systems on the national level; an in-service teacher professional development program; community mobilization and engagement activities, including providing small grants to support school-improvement plans; and provision of alternative education and vocational training opportunities for out-of-school youth.

Except for the teacher professional development program, these elements were implemented in all participating schools and communities in the program's first year (2011-2012), and were therefore not experimentally evaluated. The teacher professional development program was the only element implemented with an experimental wait-list control design. It aimed to enhance teachers' motivation and performance, and to promote student well-being and academic learning (see the program's Theory of Change, figure 1). It consisted of two main components: (1) integrated teacher resource materials and (2) collaborative school-based Teacher Learning Circles. We describe each of these components below.

Figure 1: Theory of Change for Learning to Read in a Healing Classroom
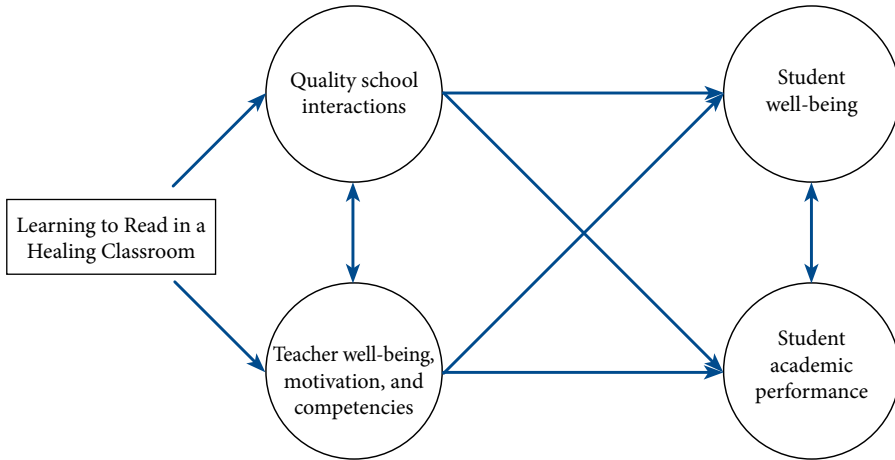
Integrated Resource Materials

The IRC developed materials for Learning to Read in a Healing Classroom and Learning Math in a Healing Classroom. In year one of the program, teachers in the treatment condition were trained on and received only LRHC materials. These materials integrate the IRC's Healing Classrooms strategies to create student-centered, safe, predictable, and emotionally supportive learning environments, with scaffolded pedagogical content and practices to improve French reading instruction. The IRC's strategies are based on thirty years of work in conflict, postconflict, and crisis-affected countries, as well as four years of field testing in Afghanistan, Ethiopia, Sierra Leone, and Guinea (Kirk and Winthrop 2008; Winthrop and Kirk 2008; Kirk and Winthrop 2007). They include addressing students by name, using positive discipline and avoiding corporal punishment, establishing and following a regular classroom schedule, encouraging students to express themselves in French or their home language, using small-group activities to encourage peer interactions, making connections between academic content and students' lives, asking open-ended questions, and employing multiple methods to promote student participation (e.g., turn to a partner, class voting, writing on a personal chalkboard, etc.). These strategies aim to equip teachers with pedagogical content knowledge and pedagogical skills that respond to children's social and emotional needs, thus improving the quality of the learning environment while teaching French reading skills.

The integrated resource materials were developed in collaboration with the MEPSP curriculum experts and included a "Teacher Guide" and a "Model Lesson Plan Bank" for all six primary school grades. The "Teacher Guide" maps the content of foundational reading, writing, and social and emotional well-being. The "Model Lesson Plan Bank" is a guided tool that supports teachers throughout the school year to teach model reading and writing lessons that support students' social and emotional well-being, and to create their own lesson plans. Integrated instructional materials were the main tools for teacher professional development.

Teacher Learning Circles

All teachers participated in an intensive LRHC initial training, and subsequently took part in continuous, long-term in-service training, which used a teacher professional development approach known as Teacher Learning Circles (TLCs). TLCs are rooted in the MEPSP's *Cellule de Base de formation et encadrement* (Basic Unit for training and coaching), a practice that started in 1984 under the National Service for Teacher Training and has evolved over time to include a series of nested TLCs called *Forums d'Echange Pédagogique* (Pedagogical Exchange Forums). The TLCs included weekly grade-level meetings led by teachers, monthly school-level meetings led by school directors, and quarterly school cluster meetings led by cluster coordinators or master teacher trainers.[4]

TLCs were designed to give teachers the opportunity to exchange information, collaborate, solve problems, and support and motivate one another in learning and implementing the new strategies, while also nurturing collegiality and an increased sense of professional self-worth (Frisoli 2014; IRC 2010). Learning circles were expected to facilitate ongoing training and coaching, and provide context-specific feedback from peers, school directors, and master teacher trainers. According to the program's Theory of Change (see figure 1), participation in TLCs was hypothesized to increase teachers' motivation and improve the social and pedagogical processes that occur in the classroom (Emerson et al. 2010; Frazier 2009; Gaible and Burns 2005). These changes were in turn expected to drive improvements in students' well-being and academic performance.

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4   School cluster meetings are a regrouping of primary school teachers from a group of official schools in geographic proximity. Schools are usually grouped in clusters of two to six schools.

Training and Implementation

OPEQ relied on a multilayered model to train school inspectors, school directors, and teachers. The program's original rollout plan consisted of a six-day training for master teacher trainers—who were typically school directors, inspectors, or experienced teachers—on the teacher resource materials for Learning to Read in a Healing Classroom and Learning Math in a Healing Classroom, and in how to assess students' learning outcomes and implement the TLCs. This training was to be completed by July 2011, after which master teacher trainers would train teachers at an initial workshop at the school-cluster level in August-September 2011, and provide ongoing coaching and support to teachers and school directors throughout the 2011-2012 academic year. Teachers were expected to organize weekly TLCs with their peers at the same grade level to practice and support each other in the implementation of the program, and they were expected to engage in their own professional development. School directors were expected to organize monthly TLC meetings with all teachers to provide coaching on the instructional practices.

What actually happened, due to delays in finalizing and producing training materials, is that only the LRHC curriculum was rolled out according to plan. The math resources were not ready until March 2012, so teacher training on Learning Math in a Healing Classroom was postponed until the 2012-2013 academic year. Moreover, reports from the field indicated that the TLCs were not being implemented according to the timeline, with the intended intensity, or in the manner planned. Therefore, in the first half of 2012, teachers, school directors, and master trainers received additional training on how to conduct TLCs. This paper therefore examines the impact of a partial implementation of LRHC during the 2011-2012 academic year.

METHODS

Research Design

The design of the current study is summarized in figure 2 and described in detail below. The data used are from the first and second waves of a multiyear evaluation of LRHC in the eastern DRC. The evaluation employed a cluster-randomized trial with a wait-list control design, whereby clusters of two to six schools—rather than individual schools, students, or teachers—were the unit of randomization. The use of a cluster-randomized design was driven by the intervention delivery

strategy, whereby schools in geographic proximity to each other were served by the same master teacher trainer. These schools' teachers and directors also met quarterly as a cluster for ongoing teacher professional development. In the spring of 2011, public lotteries were conducted in Katanga, a southeastern province of the DRC, to randomize clusters that would start the program in three successive academic years: 2011-2012, 2012-2013, and 2013-2014. Lotteries were carried out independently in four Katanga educational subdivisions: Kalemie, Kongolo, Mutshatsha, and Lubudi. This paper compares clusters that received the program in 2011-2012 to clusters that had not yet received the program (i.e., clusters assigned to begin receiving the program in 2012-2013 or 2013-2014).

Figure 2: Analytic Sample Flow Diagram
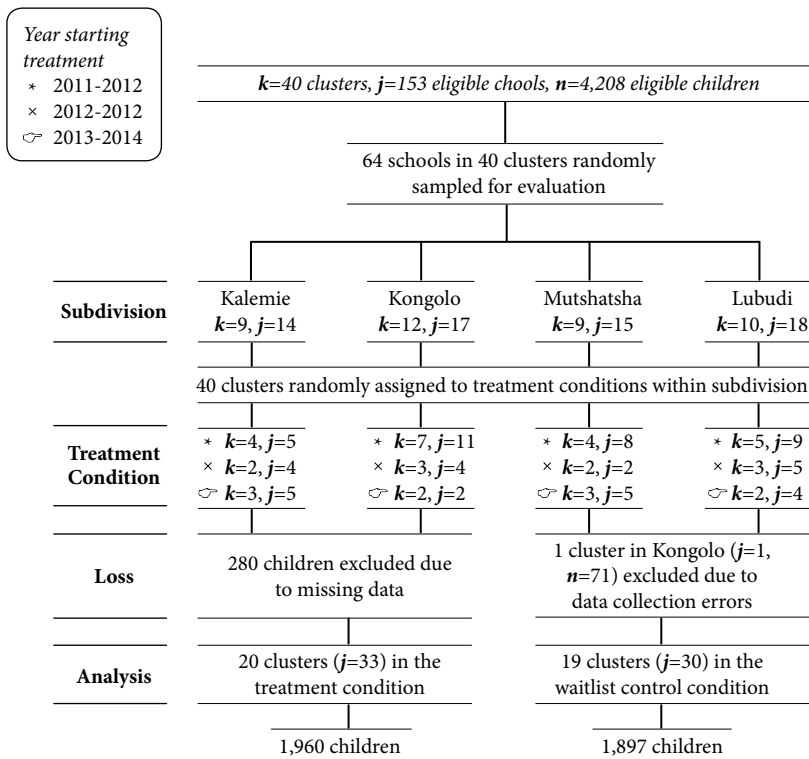
School Sample

A total of 153 schools in four educational subdivisions in Katanga were targeted to receive the program in the first year of the project. The eligible schools had at least four classrooms and 120 students and were officially registered, located in close proximity to other schools (i.e., ~10 KM or one hour walking), in a secure zone (e.g., no movement of armed groups), accessible by motorbike, and presumably not receiving similar support from other private, local, or international agencies. The schools were organized in forty school clusters of two to six schools, based on geographical proximity.

The evaluation randomly selected a sample of 64 schools out of 153 to participate in data collection. Given unequal cluster sizes, one school was selected from clusters that contained three schools or less, and two schools were selected from clusters containing more than three schools. A consent letter approved by the university's Institutional Review Board and the DRC's MEPSP was sent to all school directors in the evaluation sample. The letter described the evaluation's goals and procedures, emphasized that participation was completely voluntary, and noted that a refusal to participate would not have any negative consequences. After school directors had consented, the IRC team posted flyers at the school to advertise the study and held a meeting with school directors and teachers to go over the study's goals and procedures and to answer questions.

All the schools agreed to participate in the evaluation. However, one was excluded from the analysis due to a research management error that led to unreliable data for that school. Thus, the effective sample for this study includes sixty-three schools nested in thirty-nine clusters. Twenty clusters (j = 33 schools) were assigned to receive the program in 2011, and nineteen clusters (j = 30 schools) were assigned to one- and two-year wait-list control conditions (see figure 2). The excluded school was in the wait-list control condition. In 2011 (baseline year), sample schools had an average of 389.75 students (SD = 234.97; min. 82, max. 1,130) and 8.03 classrooms (SD = 2.98; min. 5, max. 16). The majority of schools were Protestant (34.4 percent) or Catholic (31.3 percent); other religious affiliations included Orthodox (9.4 percent), Kimbanguiste (3.1 percent), and Muslim (1.6 percent). On average, 71.58 percent of the teachers were male, as were nearly all school principals (93.7 percent).

Student Sample

Students in the second, third, and fourth grades were randomly selected by field research staff from school rosters to participate in the evaluation. Before data collection, the field research team informed parent-teacher associations and school management about the study, and posted flyers asking primary caregivers to tell the school if they did not want their children to participate. All selected students gave their verbal assent to participate, and no parents or guardians refused. The target sample size per school was eighty-one students (i.e., twenty-seven per grade), but the actual sample sizes varied substantially. In the second year, a minimum of thirty and a maximum of eighty-one students per school were assessed in the sixty-three sample schools. Data were collected on a total of 4,208 students; however, 6.7 percent (n = 280) of those students were missing gender data, and 1.7 percent (n = 71) had unreliable data. These students (n = 351) were excluded from all analyses. To determine if gender was differentially missing by treatment condition, we fitted a multilevel logistical regression in which gender missingness (i.e., missing data) was predicted by treatment. We found no evidence to suggest differential missingness across treatment conditions. Furthermore, we found no significant gender differences at baseline (2011) for each of the four outcomes examined in this study. These findings suggest that missingness does not pose a threat to the study's internal validity.

The effective sample for this study consists of 3,857 students (48 percent female, mean age 10.3, SD = 2.1), evenly distributed across grades two through four (35.8 percent grade 2, 32.7 percent grade 3, and 31.5 percent grade 4). The majority of students spoke Swahili as their mother tongue (84.8 percent), but there was substantial language diversity (Kisanga, 5.4 percent; Kibemba, 5.1 percent; Kiluba, 2 percent; French, 0.7 percent; other languages, 2 percent). Students were distributed across subdivisions, as follows: 20.7 percent in Kalemie, 24.1 percent in Kongolo, 25.4 percent in Mutshatsha, and 29.8 percent in Lubudi.

Due to a high level of student mobility, the lack of an official education management information system with unique child identifiers, and difficulty in using students' names as reliable identifiers, we were unable to track students over time. Therefore, the outcome scores of students assessed in the first wave were aggregated to the school level to adjust for schools' baseline characteristics.

<center>**Measures**</center>

Measures used in this paper were developed using questions from previously validated surveys, such as the American Institutes for Research Conditions for Learning survey (UNICEF 2009; Godfrey et al. 2012) and the Strengths and Difficulties Questionnaire (Goodman 1997), as well as questions written by the authors to capture key aspects of the program (i.e., classroom predictability and cooperation). Some of the measures had been widely used in low- and middle-income African countries, but others were being used in that context for the first time. The measures were translated and back translated from English to French (the official language of instruction), and subsequently translated into Swahili and Kibemba to improve comprehension. The measures were piloted, refined, and shortened before and after baseline data collection using factor analysis and internal reliability techniques. The four outcome measures used in this study were based on theoretical considerations and results from factor analyses, which suggest four internally coherent and empirically distinct latent factors: supportive and caring schools and teachers, predictable and cooperative learning environments, victimization, and mental health problems (details available upon request). Internal reliabilities for the four outcome measures were consistent across all grade levels.

Local data collectors trained by the IRC administered all measures verbally and chose whether to administer the surveys in French, Swahili, or Kibemba, depending on each child's language ability.

<center>**Quality School Interactions**</center>

Supportive Schools and Teachers

Students' perceptions of support were assessed using seventeen items from two previously validated measures, which asked students about how welcome, included, intellectually engaged, and emotionally supported they felt at school. Fourteen items were drawn from two subscales of the Conditions for Learning Survey (UNICEF 2009): (1) Safe, Inclusive, and Respectful Climate, and (2) Challenging Student-Centered Learning Environment. The first subscale measured students' perceptions of the support and care they received from teachers, and the extent to which students felt welcomed, respected, and safe at school (e.g., "Your teachers treat you with respect," "Teachers at your school are interested in what students like you have to say," "The school is a welcoming place

for children from families like yours"). The second subscale measured whether students felt encouraged to actively engage in the learning process and found lessons intellectually stimulating (e.g., "Every student is encouraged to participate in class discussion," "Teachers at this school expect students like me to succeed in life," "The subjects we are studying at this school are interesting"). The remaining three items came from the Relationship with Teacher questionnaire (Blankemeyer, Flannery, and Vazsonyi 2002). The measure assessed students' perceptions of support from teachers and included the following items: "My teacher gives me help whenever I need it," "My teacher always tries to be fair," and "My teacher notices good things I do." For all items, children indicated how true or untrue the items were, using a four-point Likert scale ranging from 0 (completely false) to 3 (completely true). A single score was obtained by averaging all the items (α = .91).

Predictable and Cooperative Learning Environments

Students' perceptions of predictability and cooperation were measured with ten items developed by the authors. The items assessed children's knowledge of their school routines (i.e., "Do you know what time you have reading lessons/ math lessons?"), the extent to which teachers encouraged cooperation (i.e., Your teacher "recognizes and praises students when they work together," "helps students work together," "shows students how to share books"), and whether peers were supportive and shared activities and materials with each other (i.e., Your classmates and you "help each other learn," "work together to solve problems," "work together to learn how to read/learn math," "share books without fighting"). Students used a four-point Likert scale ranging from 0 (never) to 3 (always). All items were averaged to create a single score (α = .86).

Student Well-Being

Victimization

Five items adapted from the Aggression, Victimization, and Social Skills Scale (Orpinas and Frankowski 2001) were used to measure students' relational and physical victimization (e.g., "A kid from school pushed, shoved, or hit you," "A kid from school called you a bad name," "A student made something up so kids wouldn't like you"). Children answered using a four-point Likert scale ranging from 0 (never) to 3 (numerous times). All items were averaged to form a single score (α = .83).

Mental Health Problems

Students' mental health problems were measured with twelve items from three subscales of the Strengths and Difficulties Questionnaire (Goodman 1997): Conduct Problems (e.g., "You get in many fights with other children," "You get angry and yell at people"), Hyperactivity (e.g., "It is difficult for you to sit quietly for a long time," "It is difficult for you to concentrate"), and Emotional Symptoms (e.g., "You worry a lot," "You feel nervous in situations that are new"). Children rated the frequency of these occurrences on a four-point Likert scale ranging from 0 (never) to 3 (numerous times). All items were averaged to form a single score ($\alpha = .84$).

COVARIATES

We measured several other variables that were included both as covariates and as potential moderators of program impacts. Child variables included gender (0 = girl, 1 = boy), grade (second to fourth), and language. A language minority indicator was computed based on whether or not a child's primary language differed from the majority language spoken at that child's school (0 = not a language minority, 1 = language minority). In most schools, the majority language was Swahili (90 percent); the other majority languages were Kibemba (8 percent) and Kisanga (2 percent). School-level variables included the 2010-2011 baseline mean scores for the four primary outcomes noted above (e.g., baseline victimization mean for each school). In order to account for variation in conditions and outcomes across regions, and in the size of the unit of randomization (clusters of schools), cluster-level covariates included four dummy indicators for the four Katanga subdivisions and a dummy indicator of cluster size (0 = cluster with one school sampled, 1 = cluster with two schools sampled).

ANALYSES

Multilevel modeling was used to account for the nested structure of the data (i.e., students nested within schools and schools within clusters). Unconditional models with no predictors were fitted first to estimate intra-class correlations, or the proportion of variance in the outcomes attributable to students, schools, and clusters. Next, three-level models were fitted to estimate the main program impacts on each of the four outcomes. Cross-level interactions between treatment status (at level 3) and student or school characteristics (at levels 1 and 2, respectively) were

subsequently added to test for potential moderation effects. Additionally, student, school, and cluster characteristics were included as covariates in all models. All analyses were performed in Stata (version 13.0). Our main model is as follows:

Level 1 (student-level) Model:

$$Y_{ijk} = B_{0jk} + B_{1jk}'X_{ijk} + e_{ijk}$$

Where X_{ijk} is the vector if child covariates (gender, grade, and language).

Level 2 (school-level) Model:

$$B_{0jk} = \gamma_{00k} + \gamma_{01k}W_{jk} + u_{0jk}$$

Where B_{0jk} is the child-level random intercept and W_{jk} is the school baseline mean score.

Level 3 (cluster-level) Model:

$$\gamma_{00k} = \pi_{000} + \pi_{001}T_k + \pi_{002}'Z_k + v_{00k}$$

Where γ_{00k} is the school-level random intercept, Z_k is the vector of cluster-level covariates (subdivision dummies, dummy variable for clusters containing two schools), and T_k is the treatment status assigned to the cluster.

Because thirty-nine clusters (and not schools or students) were the unit of analysis, we had low power to detect statistically significant effects. Therefore, we report findings with significance at $p < .10$. Adequacy of model fit was assessed with deviance statistics using the χ^2 distribution.

RESULTS

Descriptive Results

Descriptive statistics and zero-order correlations among the four outcomes, and for each of the two waves, are shown in table 1, separately for child-level (top panel) and school-level variables (bottom panel). As expected, at the child level and in both waves, students' perceptions of supportive schools and teachers were significantly correlated with lower levels of victimization and mental health problems; higher levels of victimization were correlated with higher

levels of mental health problems. Furthermore, in 2010-2011 (baseline year), more predictable and cooperative contexts were positively correlated with more supportive schools and teachers, and negatively correlated with victimization and mental health problems. However, contrary to our expectations, in 2011-2012 (the follow-up wave), more predictable and cooperative contexts were not significantly correlated with supportive schools and teachers, and were positively correlated with victimization and mental health problems. The school level shows the same overall pattern of results.

Table 1: Bivariate Correlations and Descriptive Statistics for Child- and School-Level Variables

	Child-Level	1	2	3	4	5	6	7	8	N	M	SD
1	Supportive schools and teachers		0.02	-0.30	-0.43	0.12	-0.01	0.02	0.03	3,852	2.41	0.52
2	Predictable and cooperative contexts	0.31		0.08	0.05	-0.07	0.04	0.07	0.00	3,816	1.42	0.70
3	Victimization	-0.18	-0.12		0.52	0.00	-0.02	-0.03	0.00	3,853	0.86	0.77
4	Mental health problems	-0.30	-0.21	0.39		-0.05	0.02	-0.03	0.03	3,852	0.96	0.64
5	Treatment	0.07	0.13	0.00	-0.14		-0.01	-0.02	-0.01	3,857	0.51	0.50
6	Gender (boy = 1)	-0.04	-0.03	0.06	0.04	-0.03		0.04	0.03	3,857	0.52	0.50
7	Grade	0.01	0.08	-0.07	-0.08	-0.01	0.04		0.03	3,857	2.96	0.82
8	Language Minority	-0.03	0.02	-0.01	0.05	-0.01	0.01	0.00		3,857	0.14	0.34
	N	752	752	750	749	753	700	737	753			
	M	3.24	1.81	0.96	2.16	0.51	0.54	3.00	0.29			
	SD	0.47	0.65	0.71	0.62	0.50	0.50	0.81	0.45			

	School-Level Average	9	10	11	12	J	M	SD				
9	Supportive schools and teachers		-0.19	-0.60	-0.70	63	2.39	0.29				
10	Predictable and cooperative contexts	0.35		0.03	0.19	63	1.42	0.23				
11	Victimization	-0.37	-0.27		0.83	63	0.90	0.37				
12	Mental health problems	-0.53	-0.36	0.50		63	0.99	0.38				
	J	63	63	63	63							
	M	3.25	1.82	0.96	2.17							
	SD	0.26	0.40	0.33	0.41							

NOTE: Correlations below the diagonals and descriptive statistics as rows are for baseline (2010-2011) data; correlations above the diagonals and descriptive statistics as columns are for first wave (2011-2012) data. Italicized values indicate correlations at p < .10.

Characteristics at Baseline

To examine whether the treatment and wait-list control groups were equivalent at baseline, we fitted three-level multilevel models in which treatment served as predictor for each of the four outcomes (at baseline). Results showed that treatment condition was not significantly associated with the quality of learning environments, as measured by students' perceptions of supportive schools and teachers ($b = .07$, $p = .127$) and predictable and cooperative contexts ($b = .14$, $p = .194$), nor with students' reports of peer victimization ($b = -.02$, $p = .814$). However, we found a significant association with students' reports of mental health problems. At baseline, students in the wait-list control condition reported significantly lower levels of mental health problems than students in the treatment condition ($b = -.23$, $p < .05$). Our impact analyses include school baseline scores for each of the outcomes to adjust for a lack of baseline equivalence between conditions.

Distribution of Variance

Unconditional models show that the majority of variance in the four outcomes can be attributed to differences between students (see table 2). Nevertheless, a significant amount of variance can be attributed to differences between clusters, with the exception of variance in predictable and cooperative contexts. Specifically, clusters accounted for nearly one-fourth of the variance in students' perceptions of support from school and teachers, over one-third of the variance in mental health problems, and about one-fifth of the variance in reports of victimization.

Table 2: Variance Components and Intra-Class Correlations

	Supportive Schools and Teachers	Predictable and Cooperative Contexts	Victimization	Mental Health Problems
Variance Components				
Between-child	*0.19*	*0.44*	*0.47*	*0.26*
Between-school	0.02	0.01	0.02	0.01
Between-cluster	*0.07*	0.04	*0.11*	*0.14*
Percentage of Variance				
Between-child	*70.07%*	*90.95%*	*78.19%*	*63.53%*
Between-school	6.08%	1.85%	2.57%	1.41%
Between-cluster	*23.85%*	7.20%	*19.24%*	*35.06%*

NOTE: Variance components and intra-class correlations are based on 63 schools and 39 clusters. Italicized values indicate variances significantly different from zero at p < .05.

IMPACTS ON THE QUALITY OF SCHOOL INTERACTIONS

Supportive Schools and Teachers

The program had a significant positive main effect on students' perceived support from schools and teachers (see table 3, column 1). Students in clusters assigned to the treatment condition perceived their schools and teachers to be more supportive than students in the control condition (b = .11, p = .01, d_{WT} = 0.22[5]). Moderation analyses showed that these effects did not vary as a function

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5   Note that dWT represents a standardized mean difference between treatment and control clusters. This was calculated with the following equation from Hedges (2009)

$$d_{WT} = \frac{b}{\sqrt{\hat{\sigma}^2_{BS} + \hat{\sigma}^2_{BC} + \hat{\sigma}^2_{WC}}}$$

where b represents the unstandardized regression coefficient with covariate adjustment (e.g., b = .11), and the three terms of the denominator represent variances at the cluster, school, and child levels, respectively, without covariate adjustment. The rationale behind covariate adjustment for the treatment effect, but not the variances, was to obtain a more precise treatment effect (i.e., adjusted), but standardized based on typical (i.e., unadjusted) variances at each level (Larry V. Hedges, professor of statistics and education and social policy, Northwestern University, personal communication, November 3, 2014). This same approach was utilized to estimate d_{WT} for this and other main effects presently reported.

of students' gender or grade (see table 4, column 1). However, they did vary significantly as a function of students' language minority status and school baseline scores. The program improved children's perceptions of schools and teachers for language majority children (b = .12, p < .01) but not for language minority children (b = .04, p = .50) (see figure 3). Additionally, schools that started with a lower than average level of support (i.e., -1 SD) had improved scores (b = .21, p < .01) after one year in the treatment condition, whereas those with a higher than average level of support (i.e., +1 SD) did not change (b = .01, p = .87) (see figure 4). Overall, these results demonstrate that the program had a positive impact on students' perceptions of support from their schools and teachers. Furthermore, the effects were stronger for language majority students and for students in schools that were initially perceived as being less supportive than average.

Figure 3: Supportive Schools and Teachers, Treatment by Child Language Minority Moderation
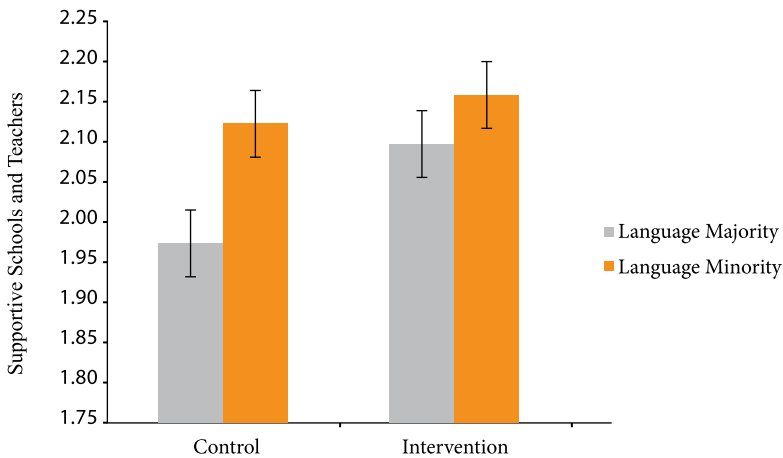
NOTE: Y axis is truncated for clearer presentation.

Figure 4: Supportive Schools and Teachers,
Treatment by School Baseline Moderation
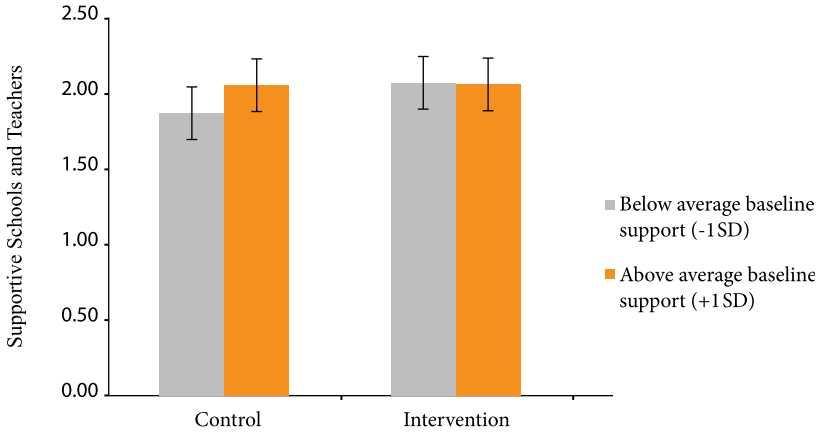
NOTE: Y axis is truncated for clearer presentation. Graphed at one standard deviation below and above the baseline mean.

Predictable and Cooperative Contexts

Contrary to our expectations, treatment showed a significant negative main effect on the predictable and cooperative contexts outcome (see table 3, column 2). Students in treatment clusters perceived lower levels of cooperation and predictability than students in control clusters (b = -.11, p = .09, d_{WT} = -0.15). Moderation analyses showed that child gender, language minority status, and schools' baseline scores did not qualify this negative effect (see table 4, column 2). However, there was a significant interaction with grade (see figure 5). Second-grade students were not affected by treatment (b = -.04, p = .58), but third-grade (b = -.11, p = .08) and fourth-grade (b = -.18, p < .01) students showed the negative treatment effect. Thus, the program resulted in less predictable and cooperative contexts; this effect applied particularly to children in grades three and four.

Table 3: Multilevel Model Parameter Estimates for
Treatment Main Effects and Covariates

Predictors	Supportive Schools and Teachers		Predictable and Cooperative Contexts		Victimization		Mental Health Problems	
Intercept	1.98 (0.07)***		1.31 (0.09)***		1.16 (0.09)***		1.35 (0.1)***	
Treatment	**0.11 (0.05)**		**-0.11 (0.06)***		**-0.01 (0.06)**		**-0.06 (0.08)**	
Child Covariates								
Boy	-0.01 (0.01)		0.02 (0.02)		-0.02 (0.02)		0.01 (0.02)	
Grade	0.02 (0.01)*		0.05 (0.01)***		-0.03 (0.01)**		-0.03 (0.01)***	
Language minority	0.1 (0.02)***		-0.04 (0.03)		-0.03 (0.03)		0.01 (0.03)	
School Covariates								
Baseline score	0.2 (0.11)*		0.02 (0.07)		0.01 (0.09)		0.08 (0.08)	
Cluster Covariates								
Two-school cluster	0.02 (0.05)		-0.11 (0.07)		-0.01 (0.07)		-0.07 (0.08)	
Kongolo	0.18 (0.07)***		0.18 (0.09)**		0.27 (0.09)***		0.16 (0.11)	
Mutshatsha	0.52 (0.08)***		0.09 (0.09)		-0.46 (0.09)***		-0.46 (0.11)***	
Lubudi	0.4 (0.07)***		0.07 (0.09)		-0.38 (0.09)***		-0.43 (0.12)***	
Deviance	4710.35		7811.13		8085.44		5849.52	
Variance Components								
Residual	0.192	88.55%	0.442	92.90%	0.465	93.16%	0.258	82.58%
Between-school	0.022	10.15%	0.009	1.80%	0.016	3.20%	0.007	2.17%
Between-cluster	0.003	1.30%	0.025	5.30%	0.018	3.63%	0.048	15.25%

NOTE: Standard errors shown in parentheses. Subdivision dummies (Kongolo, Mutshatsha, and Lubudi) represent geographical regions larger than the school clusters, in which a fourth subdivision (Kalemie) is used as reference group. *p < .10, **p < .05, ***p < .01

Figure 5: Predictable and Cooperative
Contexts, Treatment by Grade Moderation
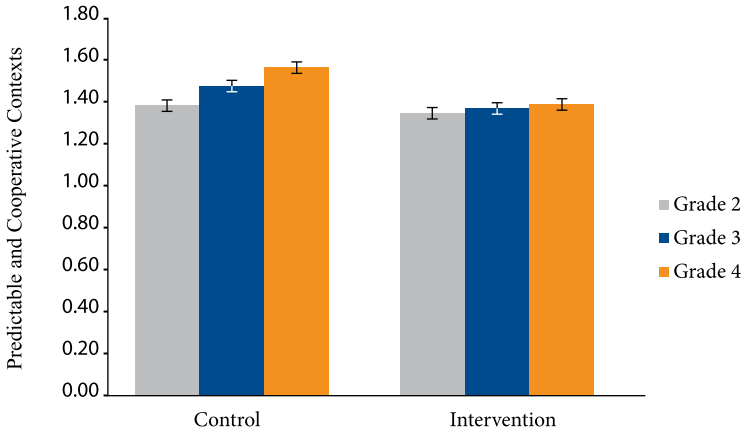
NOTE: Y axis is truncated for clearer presentation.

## IMPACTS ON STUDENT WELL-BEING

Victimization

We did not find a significant main effect of treatment on students' reports of peer victimization (see table 3, column 3), but moderation analyses revealed significant variation in treatment effects as a function of students' characteristics (see table 4, column 4). School baseline victimization and student gender did not moderate the treatment effects, but student grade and language minority status did (see figures 6 and 7). Probing these interactions revealed that none of the subgroup differences was statistically significant across treatment conditions (grade 2, b = .05, p = .46; grade 3, b = -.02, p = .77; grade 4, b = -.08, p = .21; language majority, b = -.03, p = .57; language minority, b = .12, p = .16). Thus, although the significant interaction coefficient and figures 6 and 7 demonstrate nonequivalent treatment slopes based on grade and language minority status, these individual treatment effects were not significantly different from zero. Overall, the results show that the program had differential impacts on students' victimization, with higher-grade and language majority students showing non-statistically significant decreases in victimization relative to lower-grade and language minority students.

Table 4: Three Level Multi-Level Model Parameter Estimates
and Standard Errors for Treatment Interaction Effects

| Predictors	Supportive Schools and Teachers	Predictable and Cooperative Contexts	Victimization	Mental Health Problems
Treatment X Gender				
Intercept	1.97 (0.07)***	1.31 (0.09)***	1.15 (0.09)***	1.36 (0.1)***
Treatment	0.12 (0.05)**	-0.11 (0.07)	0 (0.06)	-0.08 (0.08)
Boy	0 (0.02)	0.02 (0.03)	-0.01 (0.03)	-0.01 (0.02)
Treatment X Gender	**-0.02 (0.03)**	**0 (0.04)**	**-0.03 (0.04)**	**0.04 (0.03)**
Deviance	4709.89	7811.13	8085.03	5848.40
Treatment X Grade				
Intercept	1.95 (0.08)***	1.21 (0.1)***	1.06 (0.1)***	1.28 (0.11)***
Treatment	0.18 (0.07)***	0.1 (0.1)	0.18 (0.1)*	0.08 (0.1)
Grade	0.03 (0.01)**	0.09 (0.02)***	0 (0.02)	-0.01 (0.01)
Treatment X Grade	**-0.02 (0.02)**	**-0.07 (0.03)***	**-0.07 (0.03)**	**-0.05 (0.02)**
Deviance	4708.63	7804.19	8079.54	5844.37
Treatment X Language Minority				
Intercept	1.97 (0.07)***	1.31 (0.09)***	1.17 (0.09)***	1.36 (0.1)***
Treatment	0.12 (0.05)***	-0.1 (0.06)	-0.03 (0.06)	-0.07 (0.08)
Language Minority	0.15 (0.03)***	-0.02 (0.05)	-0.11 (0.05)**	-0.04 (0.04)
Treatment X Language Minority	**-0.08 (0.04)***	**-0.04 (0.07)**	**0.15 (0.07)**	**0.15 (0.07)**
Deviance	4706.82	7810.73	8080.48	5846.29
Treatment X School Baseline				
Intercept	1.95 (0.07)***	1.31 (0.09)***	1.17 (0.09)***	1.37 (0.1)***
Treatment	0.11 (0.04)***	-0.1 (0.06)*	-0.01 (0.06)	-0.06 (0.08)
School Baseline Outcome Mean	0.39 (0.13)***	-0.08 (0.12)	0.1 (0.12)	0.12 (0.09)
Treatment X Baseline	**-0.39 (0.17)**	**0.14 (0.15)**	**-0.19 (0.16)**	**-0.14 (0.16)**
Deviance	4705.76	7810.27	8084.14	5848.74

NOTE: Four separate interaction models were run for each of the four outcomes (e.g., a treatment by gender model, a treatment by grade model, etc.). The same covariates were used as described in table 3 in all above models, but parameter estimates are not presented to conserve space. *$p < .10$, **$p < .05$, ***$p < .01$

Figure 6: Victimization, Treatment by Grade Moderation
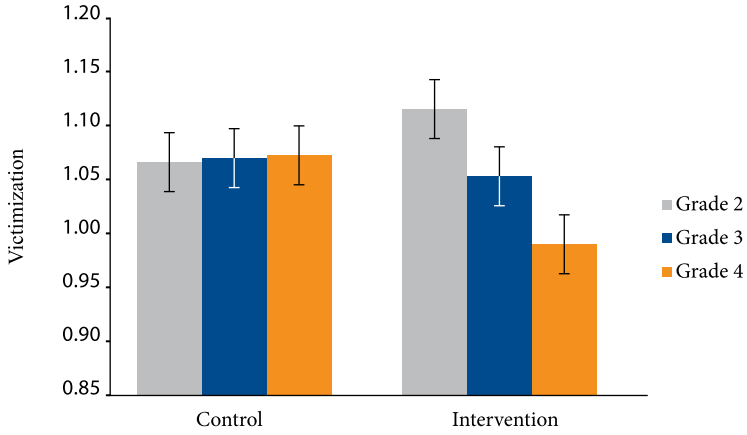
NOTE: Y axis is truncated for clearer presentation.

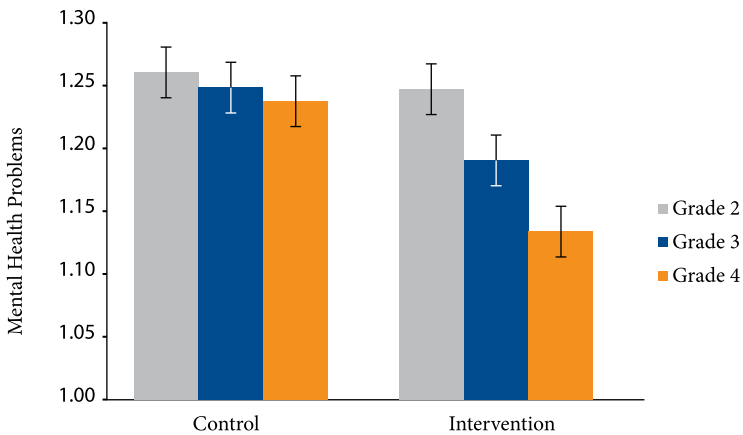*Figure 7:* Victimization, Treatment by Child Language Minority Moderation
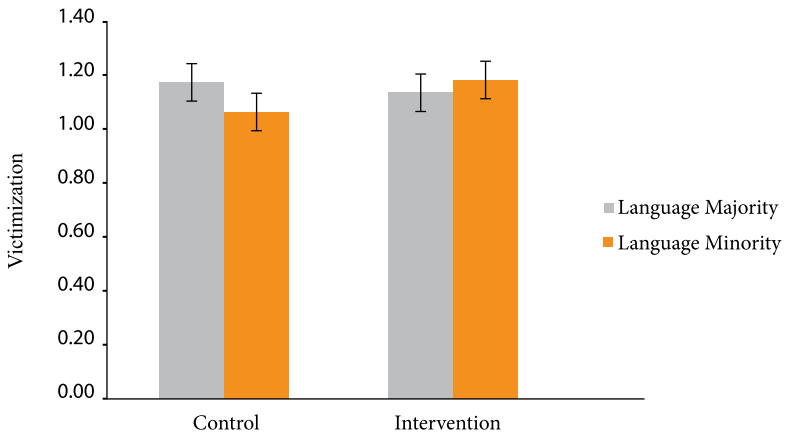
NOTE: Y axis is truncated for clearer presentation.

Mental Health Problems

Similar to the findings for victimization, we did not find a statistically detectable main effect of the program on students' mental health problems (see table 3, column 4), and there were no differential treatment impacts as a function of school baseline levels of mental health problems or students' gender (see table 4, column 3). Moderation analyses showed that treatment impacts did vary significantly as a function of student grade and language minority status (see figures 8 and 9). However, follow-up comparisons of treatment effects within grade (grade 2, b = -.01, p = .86; grade 3, b = -.06, p = .44; grade 4, b = -.11, p = .19), and for language minority and majority students (language majority, b = -.07, p = .38; language minority, b = .02, p = .79), revealed no statistically significant differences across treatment conditions. Akin to the victimization findings, treatment impacts were not the same across grades and language minority status, but none of these treatment effects was significantly different from zero. Overall, the program had differential impacts on students' mental health problems, with higher-grade and language majority students showing decreases (though not necessarily significant) relative to lower-grade and language minority students.

Figure 8: Mental Health Problems,
Treatment by Grade Moderation

NOTE: Y axis is truncated for clearer presentation.

Figure 9: Mental Health Problems, Treatment by
Child Language Minority Moderation
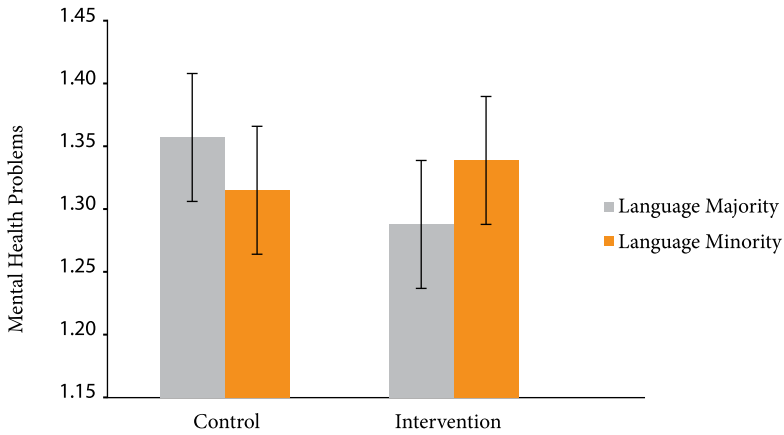
NOTE: Y axis is truncated for clearer presentation.

DISCUSSION

This paper presents results from the first experimental evaluation of a universal school program aimed at improving teacher practices, school interactions, and student well-being and academic outcomes in the DRC, a low-income country that has endured decades of violent conflict. In this paper, we asked whether the program Learning to Read in a Healing Classroom improved two sets of outcomes: the quality of school social and pedagogical interactions, and students' subjective well-being. Analyses after one year of partial implementation show promising but mixed results. In terms of quality school interactions, there were positive impacts on students' perceptions of supportive schools and teachers, but negative impacts on students' perceptions of predictability and cooperation in the school and classroom. For students' subjective well-being, the program had no main effects, but there were significant differential effects for subgroups of students. Each of these findings is discussed in detail below.

Impacts on the Quality of School Interactions

The program had significant but mixed effects on the quality of school and classroom social and instructional interactions. After one year of partial implementation, students in the treatment condition perceived their schools and teachers to be more supportive and caring, but also less predictable and cooperative. Specifically, students in treatment schools felt more welcome, respected, and safe, and more supported by their teachers; they also experienced their classrooms as being more intellectually engaging and stimulating than students in the wait-list control condition. This finding is well aligned with IRC's intended objectives for the program, with the research team's hypotheses, and with prior research. Learning to Read in a Healing Classroom equips teachers with student-centered pedagogical techniques, such as greeting all students by name, reducing the use of corporal punishment, and encouraging classroom participation, which predict positive changes in students' subjective experience of the classroom and school contexts. We expect that, with time, such contextual and subjective changes will enhance students' well-being and ability to learn. Research from high-income countries has shown that school-based programs that integrate social and emotional learning principles—those focused on improving the interactions between students and teachers and among students— into core academic curricula improve teacher practices and the quality of learning environments (Seidman 2012; Durlak et al. 2011). Our study extends those results to low-income countries affected by conflict.

Contrary to our expectations, students in treatment schools also perceived their learning environments to be less predictable and cooperative than students in the control condition. Children in the treatment condition reported knowing less about their school activities and perceived that teachers encouraged them less to cooperate and share with their peers. Given that this was the first year of a whole-school program aimed at transforming school and classroom practices, students may have felt disoriented about their school routines and activities. This negative effect was not significant for students in second grade, which lends support to the notion that students who have spent more time in school and are presumably more accustomed to the school's routines would find the changes brought about by the program disorienting. Evidence from a qualitative case study in five treatment schools indicated that some teachers did not initially feel comfortable implementing the new instructional strategies. Teacher discomfort may have led to more hesitation and less clarity in the flow of classroom activities, which could have increased students' sense of uncertainty about their classroom routines (Frisoli 2014). The negative findings could also be due to a "sensitization

effect." The program encouraged teachers to establish a schedule and to draw students' attention to it. As a result, teachers and students in treatment schools may have become more aware of the schedule and developed expectations that it would be followed. Thus deviations from the schedule may have left students in treatment schools feeling more disoriented than students in control schools. On the other hand, prior research suggests that program effectiveness is likely to increase in the second year of implementation (Domitrovich et al. 2008). One of the reasons to expect this improvement is participants' growing familiarity with the program. Therefore, we expect this negative effect to fade away as students and teachers become more familiar with LRHC. Nonetheless, if this finding is replicated in future studies, program designers should develop strategies to prevent negative impacts on students' knowledge of their school routines, given that school-based universal programs intentionally introduce changes in school activities. This is particularly critical in contexts where schools and classrooms have the potential to provide structure and stability in the midst of otherwise unpredictable circumstances.

It remains unclear, however, why students in treatment schools would feel less encouraged to cooperate and share with their classroom peers. It may be that in classrooms with over 50 students—which are common in the DRC—whole-classroom techniques that do not require student cooperation and sharing are easier to manage and monitor than small-group collaborative techniques, and are therefore favored by teachers. Teachers equipped with better classroom management techniques as a result of the program may rely more on structured whole-classroom activities than teachers in the control condition. Overreliance on whole-classroom activities could reduce opportunities for peer cooperation. Even though we cannot test this hypothesis directly, we know that some teachers in the qualitative case study reported having difficulty with the use of small-group cooperative activities in classrooms with a large number of students, as they felt that the classroom became loud and chaotic (Frisoli 2014). Future studies should include observations of teacher practices and classroom processes to shed light on this unexpected finding.

Overall, these results provide partial support for universal school-based programs' effectiveness in transforming the quality of students' school experiences in low-income countries affected by conflict. However, the unintended consequences for students' perceptions of predictability and cooperation are a reason for concern and merit further exploration. In particular, systematic observational and qualitative methodologies are needed to unveil the processes whereby school programs, such as LRHC, may disrupt students' perceptions of predictability and cooperation in the school and classroom. Further research also can help determine whether increased familiarity with the program leads to more positive and fewer negative results.

IMPACTS ON STUDENTS' SUBJECTIVE WELL-BEING

Learning to Read in a Healing Classroom attempts to transform the quality of social and instructional interactions between students and teachers in order to improve student well-being. Therefore, after one year of partial implementation, we expected the program to have a weaker impact on students' well-being than on the quality of school interactions. Perhaps not surprisingly, then, our analyses revealed no statistically detectable differences for students' victimization and mental health problems between the treatment and control conditions. Two potential explanations for these null findings are the heterogeneity of treatment impacts for subgroups of students, and the mixed impacts found for the quality of social and instructional interactions. First, our results revealed significant heterogeneity of treatment effects as a function of student characteristics, which indicates that the program did not have the same impact on all students. Subgroup differences did not reach statistical significance, but they still may have prevented our finding a statistically significant main treatment effect. Prior evaluations of secondary mental health programs in similar contexts have found heterogeneous and significantly negative impacts for subgroups of students (Jordans et al. 2010; Tol et al. 2012). Our results, and those of prior studies, indicate that programs designed to address the needs of children in these challenging circumstances need to be further refined to become more effective, or to at least avoid harming some subgroups of children. Second, we found that the program had mixed but statistically significant impacts on the quality of school interactions (i.e., positive effects on students' perceptions of supportive schools and teachers, and negative effects on predictability and cooperation). These mixed impacts may explain the mixed effects on students' well-being. For instance, it is possible that the program had negative effects among students for whom school plays an important compensatory role in terms of safety and predictability. Analyses conducted

after two years of implementation will help determine whether the differential treatment effects are sustained or attenuated once participants become more familiar with the program.

Altogether, the results indicate that, after one year of partial implementation, LRHC did not have an overall positive or negative effect on students' well-being. The findings also suggest that the program had differential impacts for different subgroups of students. These findings, however, are inconclusive and await replication.

LIMITATIONS

Although the present study has a number of strengths, it also has several important limitations that should be kept in mind. First, we relied on students' self-reports to measure the four outcomes of interest. Self-reports are subject to the bias of social desirability, depend on individuals' introspection, and do not always overlap with information gathered from other sources. However, they are a relatively inexpensive method of gathering information from large samples and, except for predictable and cooperative school environments, we were careful to adapt questions that had been previously validated with elementary school students and, when possible, with students in African countries. Moreover, students' perceptions of the school environment, their teachers, and their own sense of safety and connectedness have been linked to other important academic outcomes (Kane and Staiger 2012), and therefore it is important to examine them when evaluating a program that aims to improve children's well-being and learning opportunities.

Second, we were unable to track individual students over time. Modeling individual baseline scores would have increased our power to detect treatment impacts by reducing the amount of unexplained variance at the individual level. In addition, we could have tested whether program impacts varied as a function of individual baseline characteristics (e.g., household poverty, academic performance, etc.). Instead, we adjusted for baseline characteristics at the school level and tested treatment interactions with time-invariant student characteristics (e.g., gender and language). Third, there are potential moderators of treatment impacts that we were not able to measure during the first year of the study. For example, we did not measure fidelity of implementation or directly assess students' exposure to violence or daily stressors related to conflict. These factors have been found to moderate the impact of similar school-based programs (Tol

et al. 2012). Collecting detailed records of actual program implementation is key to understanding heterogeneous and negative treatment impacts, and could have shed light on our unexpected findings. Unfortunately, we did not collect such data.

A fourth limitation is the lack of qualitative data, which could have provided alternative explanations for our findings and deepened our understanding of educators' and students' perceptions of the program. Fifth, the generalizability of our findings is limited to schools in Katanga province and similar contexts. Sixth, and last, about 8 percent of the sample (n = 351) was excluded due to missing data (6.7 percent) or data-collection errors (1.7 percent). It is important to note, however, that the rate of missing data did not differ significantly by treatment condition and should not introduce bias to our estimates of treatment impacts.

Despite these limitations, this study is the first to report results from an experimental evaluation of a universal school-based program that aims to improve the quality of school interactions and students' well-being in a low-income African country that has been affected by decades of conflict. Albeit inconclusive, our results show that universal school-based programs like Learning to Read in a Healing Classroom offer a promising approach to transforming the education opportunities of children in countries like the DRC. However, more research is needed to replicate these findings and to determine whether the positive impacts will be sustained and outweigh the potential negative impacts on students.

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