

**BUILDING RESILIENCE AFTER SCHOOL:  
AN EVALUATION OF A COMMUNITY-BASED PROGRAM IN  
TAMIL NADU, INDIA**

by

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A dissertation submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Psychology

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## **ABSTRACT**

As the world globalizes, mental health researchers increasingly “export” evidence-based mental health treatments to low and middle-income countries, where there is high need for interventions, particularly regarding trauma. However, prior research has shown the importance of cultural considerations and community participation in local interventions. The present longitudinal study measures the impact of an after-school resilience-building program for a group of marginalized Indian schoolchildren in rural farming villages of Tamil Nadu, India. This intervention was locally developed and also includes evidence-based components. The current study is a collaboration between a local community organization, Communities Rising (CR), and an academic research team. A group of children (N= 162) who received the CR intervention for two years were compared with a group of children who did not receive the intervention (N= 241) and all students were followed over the course of four years. Baseline demographic variables, exposure to traumatic events, and school environment variables were included as moderators. Children receiving the Communities Rising intervention reported greater reductions in post-traumatic stress symptoms and greater increases in academic outcomes compared to students who did not receive the intervention. Qualitative data also revealed generally positive attitudes and program acceptability to participants, teachers, and parents. Implications for using locally-developed school-based resilience programs in hard to reach low-resource areas are discussed.

Keywords: children, trauma, international mental health, resilience, school-based interventions, participatory action research

## **Chapter 1**

### **INTRODUCTION**

#### **1.1 Effects of Trauma**

Children who grow up in low and middle-income country (LAMIC) contexts are often exposed to chronic and acute trauma that is linked to the effects of poverty in their community (Dorrington et al., 2014). However, the prevalence rates of chronic trauma exposure remain largely unknown in these contexts. The experience of potentially traumatic events (PTEs) can affect children in many ways. There is a substantial literature in high-income countries demonstrating that children who have experienced PTEs are at increased risk for a broad range of negative outcomes, including difficulties with interpersonal skills and trust (Kerig, Ward, Vanderzee, & Moeddel, 2009), learning and memory (Yasik, Saigh, Oberfield, & Halamandaris, 2007), increased mental health disorders such as depression (Kerig, et al., 2009; Nooner et al, 2012; Shalev et al, 2013), increased aggression (Attar, Guerra, & Tolan, 1994), and lowered academic achievement (Ogata, 2017). Although much of the research has been conducted examining discrete or acute trauma exposure, chronic maltreatment in youth as well as exposure to violence in general have also been linked to overall externalizing problems in children and to violent or aggressive behaviors in youth (Osofsky, Wewers, Hann, & Fick, 1993; Salzinger, 1999). In fact, there has been a recent push in the field to include a new diagnosis of Developmental Trauma Disorder in the DSM-5 in order to capture the complex and long-term effects that seem to be caused by early and chronic exposure to traumatic events (Van der Kolk, 2017).

## **1.2 Prevalence and Correlates of Trauma for Children in LAMICs**

India is a lower-middle income country with high rates of poverty and marginalization of specific communities (Alkire & Seth, 2015). According to the World Bank, in 2012 India had the largest share of the world's impoverished people, with 680 million Indians living below poverty level (The World Bank Group, 2015). Children in India also suffer from high rates of traumatic experiences and exposure to chronic trauma that coincides with childhood in an area of rural poverty without significant government protection or oversight. One study by the government of India found that about 60% of children experienced physical abuse, about 50% experienced sexual abuse, and over 50% of children reported experiencing neglect (Ministry of Women and Child Development, 2007). Exposure to domestic violence in the home is common in rural areas of India as well and is often considered the norm rather than the exception (Ahuja et al., 2000). Although there is a robust literature in the United States and other high-income Western countries linking trauma exposure in childhood to adverse outcomes and evaluating the impact of trauma-focused interventions, there has been relatively little research conducted in LAMICs. Yet it stands to reason that children who live in these contexts are more likely to grow up under conditions of adversity and to suffer the negative consequences of such events (Le, Holton, Romero, & Fisher, 2016).

Major events such as natural disasters or serious and large-scale violence such as civil wars and the trauma associated with these events have been the main focus of existing studies of trauma in LAMIC contexts (Rajkumar, Mohan, & Tharyan, 2011; Ribiero, Andreoli, Ferri, Prince & Mari, 2009). Researchers have primarily investigated the prevalence rates of trauma symptoms meeting criteria for Post Traumatic Stress Disorder (PTSD) or the effects of community-level interventions for trauma symptoms after these types of events. The prevalence rates of PTSD among youth in these studies

vary significantly based on situational and measurement variables but generally align with what would be expected based on rates found in other parts of the world (Rajkumar, Mohan, & Tharyan, 2011; Silove et al, 2014). However, little is known about the effects of more common and ongoing trauma in LAMICs, especially in rural contexts, where access to mental health services is extremely limited. It is important to understand the types of trauma experienced by this population, the psychosocial correlates of trauma, and potential long-term impacts for these youth.

### **1.3 Resilience Interventions for Youth**

In addition to understanding the prevalence and correlates of child trauma experiences in this context, it is essential to understand how intervention programs can work for this population. Child externalizing and internalizing symptoms subsequent to trauma exposure can detrimentally impact children's development, and in the United States researchers have developed interventions to address trauma in childhood and adolescence. One intervention with a strong evidence base in the United States is Trauma-Focused Cognitive Behavioral Therapy (TF-CBT; Cohen, Mannarino, & Deblinger, 2006). This intervention includes components such as relaxation training, psychoeducation, building emotion regulations skills, and writing trauma narratives (Cohen, Mannarino, & Deblinger, 2006). However, TF-CBT is a time and resource-intensive structured individual therapy that is recommended to be delivered by a trained professional or para-professional, and therefore is difficult to implement in low-resource contexts. In some instances, TF-CBT has been adapted to low-resource environments with a small number of participants, for example with 64 orphans in Tanzania who suffered from maladaptive grief (O'Donnell et al, 2014) and 24 sexually

abused adolescent girls in The Democratic Republic of Congo (O'Callaghan, McMullen, Shannon, Rafferty, & Black, 2013). However, these interventions require enormous resources and reach a very limited proportion of youth in need of services.

It is important to adapt treatments to the resources available in the context and to then evaluate these interventions in real-world settings, where services often must be delivered by teachers or other non-mental health providers and in group settings (Cohen, 2013). LAMICs such as India have limited mental health resources and capabilities, especially at the community-level, (Bruckner et al, 2011; Patel, Flisher, Nikapota, & Malhotra, 2008; Semrau et al, 2015), and resources tend to be clustered in small urban affluent areas and hospitals, leaving children in rural communities without access to these resources (Morris et al., 2011). Interventions in these contexts also need to address the ongoing marginalization and potential future trauma that children face. For instance, in India over 75% of school aged children experience being beaten by a cane in school and over 80% reported experiencing verbal degradation or discriminatory verbal abuse by teachers (National Commission for Protection of Children's Rights, 2009). These kinds of experiences have consequences for youths' mental and physical health and often cause children to drop out of school before completion (Plan International, 2010). One 2009 review article (Ribeiro, Andreoli, Ferri, Prince, & Mari) found that across studies in LAMICs, exposure to school-based physical violence, community violence, and domestic violence contributed significantly to negative mental health outcomes for youth, including increases in externalizing symptoms, internalizing symptoms, and general emotional distress. A prior study conducted in India found that the odds ratio for suicidal ideation was 5.3 higher among youth who had experienced physical abuse (Pillai, Andrews, & Patel, 2009). Despite the

evidence that exposure to traumatic events leads to negative outcomes for youth, it is extremely challenging to provide services for children in this context given their ongoing experiences of maltreatment and disadvantage, as well as the very limited availability of specialized mental health professionals (Ertl & Neuner, 2014).

In contexts such as rural India, a comprehensive program is needed that reaches many children, can be delivered in a low-resource context, is sensitive to the complex issues facing these youth, and is culturally-informed so as to be accepted by the community. An area lacking in the literature is the evaluation of “ground-up” or locally developed interventions that incorporate current research but are developed in partnership with the local community and tailored to its context. Evaluations of such programs could inform future treatment research as well as increase understanding of implementation factors that facilitate success in difficult contexts. Classroom-based trauma-informed interventions have been adapted for LAMICs with some success (Betencourt, Meyers-Ohki, Charrow, & Tol, 2013; Tyrer & Fazel, 2014), generally for refugee children and youth affected by war or political violence. These programs typically involve strengthening children’s resilience thorough classroom-based psychoeducation, movement or dance, group cohesion activities, and in some models, a limited exposure component (Ertl & Neuner, 2014). Examples programs include Classroom Based Intervention (CBI; Tol, Komproe, Susanty, Jordans, Macy, & de Jong, 2008), ERASE-Stress (Gelkopf & Berger, 2009), and Overshadowing the Threat of Terrorism (Berger, Pat-Horenczyk, & Gelkopf, 2007). Researchers have strongly emphasized the need for continuing investigation into the effects of classroom-based interventions for children in low-resource settings (Cohen, 2013). One recent systematic review (Barry, Clarke, Jenkins, & Patel, 2013) found that only fourteen studies globally

have used quantitative methods to evaluate any type of school-based interventions for children in LAMIC contexts.

#### **1.4 Community-Based Participatory Action Research**

Despite the need for such program evaluations in LAMICs, the dearth of studies in rural LAMIC communities presents a challenge to understanding the issues. This lack of studies is likely due in part to the difficulty in designing and implementing such research. Recently the field has pushed for community-led research in LAMICs that is based in the local area and produces knowledge that is directly useful to the community from which it comes. In contrast to large, controlled trials, local effectiveness studies conducted in a participatory manner attempt to address issues such as privilege (Stoudt, Fox, & Fine, 2012), social change and empowerment (Radermacher & Sonn, 2007), the community's right to information, and information as intervention (Appadurai, 2006). Additionally, CBPAR research often provides entry and access to more accurate and contextualized information, increases recruitment and retention in hard to reach communities, and increases overall validity of results (Burns, Cooke, & Schweidler, 2011).

Community-based participatory action research is by its nature applied research that attempts to focus on topics that are of critical importance to the community in which the research is conducted (Burns, Cooke, & Schweidler, 2011). Community-based participatory action research principles include working with the community when designing research to identify problems and targets, sharing control of the research process with the community, and research results directly informing the community's interests and needs (Hacker, 2013). Examining the "ground-truth" of researchers' assumptions and directly soliciting information from the community

through qualitative interviews or focus groups is often a feature of this type of research as well (Burns, Cooke, & Schweidler, 2011).

### **1.5 About Communities Rising**

Communities Rising (CR) is an education-focused nongovernmental organization that was founded in 2009 in Villapuram, Tamil Nadu. Communities Rising is a 501c(3) charitable organization in the United States and a registered Indian trust. The organization's mission is to provide educational opportunities and support to marginalized children, many of whom are Dalit ("untouchable"), in rural areas of Villapuram. Communities Rising's original mission was to provide children with basic life and academic skills needed to pursue education after elementary school and to enable children to stay in school. The program offers classes in English, mathematics, Tamil, computer education, music, and art to over 1,600 students in the Villapuram district through after-school programs. Over twenty local staff and teachers work with Communities Rising.

In 2012 Communities Rising developed a resilience program that is aimed at building social and emotional resilience and decreasing discrimination and other stressors for its students, in response to a recognition of the immense need for resilience and support programming in the lives of the children it serves. The leaders of the organization anecdotally became aware of the amount of ongoing trauma and stress that children in this area experience, which includes witnessing suicides, severe domestic abuse, discrimination due to caste status, and gender-based violence. The organization realized that these events were likely impacting the academic and social performance of children in the program (McCoy, 2013). Goals of the resilience program included to provide children with the coping skills that they need in order to perform to their full



potential academically, stay in school, and improve their overall socio-emotional well-being. Although the word trauma is not explicitly mentioned in the program, the skills that are taught are specifically designed to address many of the common symptoms of trauma and to provide support, coping strategies, and resources for children who are affected by chronic stress and trauma in their environment.

The Communities Rising program components include: 1) psychoeducation for teachers and students about emotions and coping strategies (such as the ‘turtle tuck’ for emotion regulation), as well as psychoeducation about the common effects of marginalization and discrimination on children, 2) “circle time” for students to share their experiences, perspectives and emotions with others and learn to listen respectfully to the experiences of others and a “Super Kid” of the day who receives special attention during circle time, 3) rapport-building exercises between classroom peers and between teachers and students, 4) mindfulness practices, including meditation, yoga, and breathing exercises, and 5) creative art and dances, where children are encouraged to express themselves and develop confidence in the value of their own personal identity and expression. Additionally, CR implemented social skills training with a focus on pro-social behavior and empathy throughout its curriculum (Communities Rising, 2014). This resilience training program was incorporated across all of Communities Rising’s program sites.

Some aspects of this community school-based intervention were adapted from empirically supported programs that have been evaluated in the US and other contexts. For example, psychoeducation on trauma and effects on children, “circle time”, and some of the mindfulness and breathing exercises have empirical support in the US (Burke, 2009; Cefai, Ferrario, Cavioni, Carter, & Grech, 2013). The social skills and

pro-social behavior modules were also based on empirically supported social-emotional learning programs such as Second Step that have been evaluated in the US (Low, Cook, Smolkowski, & Buntain-Ricklefs, 2015). However, other components of the program such as creative art and local dances were developed locally for the resources and cultural context.

Communities Rising developed a resilience training program that is suited to the community context, resources available in the community, and fills a need to provide while building academic and coping skills. To the authors' knowledge, no study to date examines the impact of a hybrid resilience program model in the southern Indian context or examines the prevalence rates and impacts of traumatic events on children in this area, outside the context of specific natural disasters. The present study was designed to evaluate the effects of the CR resilience program and to fill the gap in descriptive information about trauma prevalence and correlates in the community. By so doing, this study provides valuable documentation of the experiences of trauma in this community of children and provides feedback to inform future intervention development research and service delivery programs in LAMIC contexts.

### **1.6 Present Study**

The present study is a program evaluation of the Communities Rising resilience program and is designed to examine outcomes of interest among two groups of schoolchildren: a) those who have received Communities Rising's resilience program and b) an equivalent comparison group of same-grade children who have not received any resilience programming. The design of this study was informed significantly by a Participatory Action Research approach, and specifically a community-based

participatory research (CBPR; Hacker, 2013) approach (for a complete definition and review from a NIH perspective, please see Baum, MacDougall, & Smith, 2006).

As such, the participatory approach of this research project began with consultation in the community about what questions to ask and how best these questions could be framed. With Communities Rising as the main community partner and link to key informants and changemakers in the community, we elicited community interest and participation in the development of the projects.

Psychosocial outcomes of interest for the evaluation were chosen based upon the outcomes of particular interest to the community, current research on the common correlates and outcomes of childhood traumatic experiences in LAMICs, and a theory of change that was based on both community input and empirical literature (Shadowen, 2015). Past empirical literature has demonstrated a link between chronic childhood trauma such as abuse and neglect and impaired academic functioning (Petersen, Joseph, & Feit, 2014). Additionally, childhood trauma exposure is associated with a host of emotion regulation difficulties that are thought to be related to fundamental changes in the way that emotional information is processed in the brain and ability of youth to disengage from emotional stimuli (Marusak, Martin, Etkin, & Thomason, 2015). Emotion dysregulation is in turn associated with outcomes such as increased internalizing symptoms (Petersen, Joseph, & Feit, 2014) as well as externalizing behaviors such as increased peer aggression (Rogosch, Cicchetti, & Aber, 1995). Children who have experienced trauma also tend to report more problematic peer relationships and difficulties exhibiting positive social behaviors in school settings (Kim & Cicchetti, 2010). In addition to empirical literature documenting these challenges for trauma-exposed children, reports from local teachers, parents, and community members

confirmed that these domains of functioning align with the specific concerns they have for many youth in the community (McCoy, personal communication, 2013). Therefore, the evaluation focused on outcomes in these particular areas. The study had three particular aims:

**1.6.1 Aim 1. The first aim is to examine the prevalence, correlates, and mental health outcomes (internalizing symptoms, aggression, and trauma symptoms) of trauma in a group of marginalized Indian schoolchildren.**

We hypothesize that children who were exposed to more chronic and acute trauma will exhibit elevated trauma symptom scores. Additionally, children reporting more trauma symptoms will experience elevated levels of internalizing symptoms and aggressive behavior, report lower levels of self-control, and have lower academic scores, consistent with prior literature.

**1.6.2 Aim 2: The second aim is to model the academic, mental health, and behavior impacts of a comprehensive resilience program for a group of marginalized schoolchildren.**

We hypothesize that children who received the treatment will show a steeper growth trajectory in academic achievement, school engagement, and self-control than the comparison group of children. We hypothesize that the treatment group children will show a greater decline in trauma symptoms, depressive symptoms, and aggression than the comparison group children. We hypothesize that trauma will moderate psychosocial outcomes, and that children who have experienced less average trauma will have better outcomes. Moderation by gender and socio-economic status will also be explored, and we hypothesize that children with greater resources will have more positive outcomes at baseline and also experience greater improvement across time.

**1.6.3 Aim 3: The final aim is to explore the facilitators of program influence, satisfaction with the program, and potential barriers to impact for the Communities Rising resilience program.**

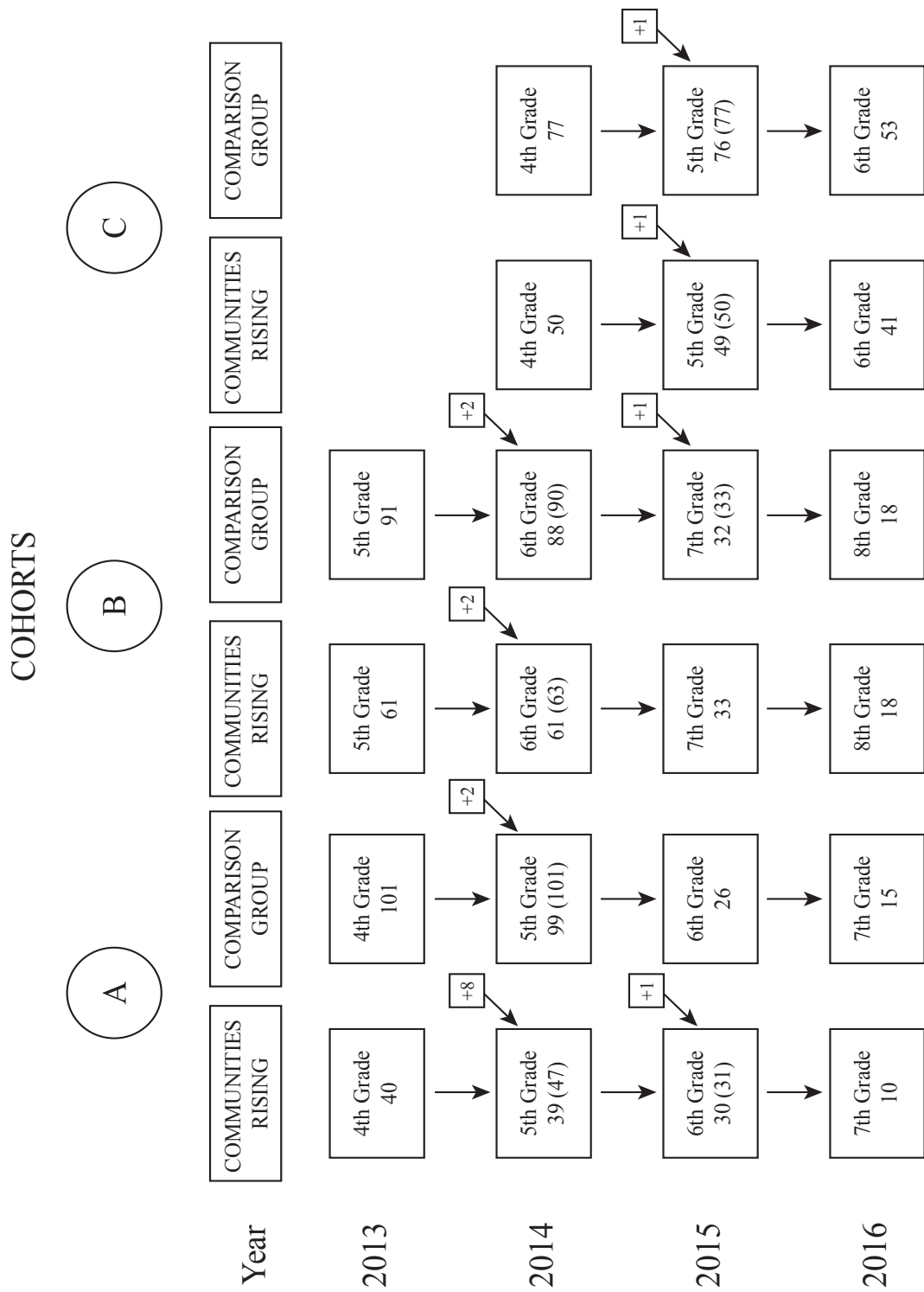
This will be done using semi-structured interviews with the most improved and least improved participants, as well as their parents and teachers. No specific hypothesis is made regarding this qualitative information; these are exploratory questions to gauge the potential facilitators of program success and barriers to implementation.

## **Chapter 2**

### **METHODS**

#### **2.1 Participants**

Participants were 403 students in 4<sup>th</sup>- 8<sup>th</sup> grade in rural elementary schools in Tamil Nadu, India in a longitudinal study over 4 years. Qualitative interviews were conducted with 15 students, 15 parents, and 6 teachers in the community. Thirteen total schools were sampled: 6 Communities Rising schools and 7 Comparison schools. The Comparison schools were chosen based on similarity in location and demographics to the CR schools. Children were surveyed over the course of 4 years between 2012 and 2016. In 2012, 4<sup>th</sup> and 5<sup>th</sup> graders only were sampled (Cohort A and Cohort B), and these children were followed for the next 4 years as they advanced through school. The next year in 2013, another cohort of 4<sup>th</sup> graders was followed (Cohort C). In total, 162 CR students were included and 241 Comparison group students. See Figure 1 for a visual of the flow of participants through the study. The participants were 50% female and 50% male and included both dalit and caste students.



**Figure 1** Participant flow through study

## 2.2 Procedures

Following IRB procedures, school meetings were held at each of the thirteen schools and study purpose and procedures were explained verbally to parents. Parents could opt out of their children participating, and children gave written assent to participate in the project at each time point of the survey. Principals are highly valued and respected in the community, and the principal of each school were involved in the project and gave written consent to researchers. Principals and teachers also served as liaisons to students and parents and were involved in facilitating and explaining the project to students and families.

The survey was conducted by a group of trained local bilingual youth surveyors, who also acted as community liaisons. These youths represented an important segment of their community, as they were raised in the local community but had gone on to receive a college education or higher degree, which is rare in the community. Youth surveyors were four young adult men and three young adult women. Following our CBPR approach, the youth surveyors were active in the design and implementation of the research project and were trained by the lead university researchers according to the University of Delaware IRB procedures.

Surveys were administered orally by the youth surveyors in Tamil to each child at their local school during the school day. All measures were included at each time point, and surveys took on average about 45 minutes per child. Any questions that a child did not understand were explained by the youth surveyors. Youth surveyors were also encouraged to restate a question or to discuss issues individually with students as needed in order to ensure all questions were understood by children and to ultimately increase accuracy of the data collected. This was important, as in Indian culture children are not typically asked their opinion (Seiter & Nelson, 2011), and children were initially



hesitant to offer their personal experiences to surveyors. For more information about the CBPR process, training of youth surveyors, and survey administration see “Youth as Researchers and Participants: Engaging Marginalized Voices in India” (Shadowen, 2015).

## **2.3 Measures**

In selecting survey measures for this study we utilized measures that had been previously validated in the United States and in low and middle-income countries, taking into account evidence for reliability, validity, and cross-cultural validation of the measures. The Indian youth surveyors on the research team also examined each measure at an item-level for validity and acceptability in this context. A bilingual English professor in India translated the items into Tamil and then the items were back-translated to English. The wording of some questions was adapted slightly to increase understanding or relevance in this specific community. All measures were given at all four time points across the study.

### **2.3.1 Demographic Questions**

Demographic questions included information about the participants’ gender, age, and grade. A combined “wealth index” for each child was comprised of questions about the number of meals the child ate per day and the presence of running water in the child’s home. These items were designed to be easily reportable by the children and to measure poverty in this local context. The development of this wealth index was based upon the methodology of the Demographic Health Surveys Program wealth index (Escueta et al, 2014) and questions were developed with the guidance of the local partner organization in India. This index represents relative poverty or wealth within

this context and particular sample of children. Additionally, the variables of caste status (dalit or caste) and religion (Hindu or non-Hindu) were combined to form a “social status” variable, with caste Hindus holding the highest social status in this community, and dalit non-Hindus experiencing greater discrimination and lower social status. (Sankaran, Sekerdej, & von Hecker, 2017). School-level variables of aggregate school social status, aggregate school wealth, and aggregate school exposure to trauma were created from the average level of demographic variables of the children in these schools. These school-level variables were later added to analyses to provide a demographic control for school-level factors.

### **2.3.2 Academic Skills**

Academic abilities measures were adapted from an academic survey tool that was developed by Pratham, the largest education-focused NGO in India. Pratham’s Annual Status of Education Report (ASER Center, 2014) tool has been used throughout all regions of India in collaboration with the Indian government to measure educational attainment in the areas of Tamil language, mathematics, and English language abilities. This tool was used because the research team felt it important to be able to directly compare results to the results of other districts throughout the country and other organizations for information and community advocacy purposes. The tool asks children to complete four questions of increasing difficulty in each in the areas (Tamil, mathematics, and English) until the child is no longer able to complete the prior question. The “academic scores” are then tallied on a level from 0 (could not complete any questions) to 4 (completed the highest level question) in each subject. For example, to score a “1” in mathematics, a child might be able to answer a simple addition question (the easiest question), to score a “2” they next complete a subtraction question,

and a “3” by answering harder multiplication question. Similarly, a child who scored a “1” on the English section may be able to read capital letters in English but not lowercase letters (which would have been a score of “2”).

### **2.3.3. School Engagement**

The School Engagement measure consisted of items from both the PISA School Engagement Survey (OCDE, 2000) and the School Anxiety Questionnaire. The PISA School Engagement questionnaire was a five-item questionnaire used to measure students’ engagement in attending school. Items were endorsed on a scale from 0 (never) to 3 (always). Questions included items such as “School is a place where I feel good” and “I make friends easily in school”. The school anxiety questionnaire was a 6-item measure that were scored on a scale from 0 (never) to 3 (always). Questions were developed together with the team of Indian surveyors and included items to measure students’ anxieties about attending school. Example questions include “I am afraid of the teachers at school” and “I feel worried about going to school”. These questionnaires were combined after conducting preliminary analyses that showed high item correlations between the PISA questions and the inverse scores of the School Anxiety questions, to form a 11-item School Engagement measure. Both sets of items measured the underlying construct of happiness in and engagement with school, they were combined to make a School Engagement measure with a Cronbach’s alpha of .83.

### **2.3.4 Trauma Exposure Questions**

*UCLA Posttraumatic Stress Disorder Index.* Trauma exposure questions were measured at all four years in which survey was administered. Trauma exposure questions were adapted from the UCLA Posttraumatic Stress Disorder Index for DSM-

IV (PTSD-RI; Steinberg & Brymer, 2008; Steinberg, Brymer, Decker, & Pynoos, 2004). Children were asked whether or not they had been exposed to nine potentially traumatic events (PTEs) at each survey period. The total number of PTEs endorsed were then tallied in each year. These trauma exposure items were modified from the original 13 UCLA-RI questions with guidance from the local team to reflect circumstances that may be encountered by an Indian child in this region (i.e., “Being in a bad accident, like a bike/car/motorcycle accident”).

### **2.3.5 Trauma Symptoms**

Trauma symptoms were measured using the 22-item severity index of the PTSD-RI (Steinberg & Brymer, 2008; Steinberg et al., 2004). Researchers use the PTSD-RI to assess symptoms of DSM-IV posttraumatic stress disorder among children and adolescents in research and clinical settings (Steinberg, Brymer, Decker, & Pynoos, 2004). The PTSD-RI has been used in research studies internationally in countries throughout Asia (Chen, Lin, Tseng, & Wu, 2002), South and Central America (Garfin et al, 2014; Goenjian et al., 2001), and Africa (Murray et al, 2011).

Participants rate items based on intensity of symptoms over the past month on a 5-point scale from 0 (experienced none of the time) to 4 (experienced most of the time). These symptom categories map onto the DSM-IV PTSD Criterion B, intrusive symptoms (5 items), Criterion C avoidance (7 items), and Criterion D hyper-arousal (5 items), as well as one item to measure fear of trauma recurrence and an item to measure trauma-related guilt symptoms. Sample items include “I have upsetting thoughts, pictures, or sounds of what happened come into my mind when I don’t want them to,” (Criterion B) and “I feel jumpy or startle easily, like when I hear a loud noise or something surprises me” (Criterion D). Participants were only asked to answer the

trauma symptom questions if they had reported any lifetime trauma exposure. Researchers have reported internal consistency of .90 in past studies (Steinberg, Brymer, Decker, & Pynoos, 2004). The Cronbach's alpha on this measure in 2013 was .89.

### **2.3.6 Aggression**

Aggression was measured using the physical and relationship aggression items from the Problem Behavior Frequency Scale (Farrell, White, & Valois, 2000). Previous studies have demonstrated adequate reliability for this 8-item sub-scale ( $\alpha=.84$ ). This scale has also shown strong reliability internationally (Gardner, Williams, Guerra, & Walker, 2011). Participants were asked to indicate how frequently they had engaged in various aggressive behaviors over the past two months on a scale from never (0) to always (3). Some of the items measured nonphysical verbal aggression ("I teased someone to the person's face") while others measured physical aggression ("I shoved or pushed someone"). Time 1 reliability in our study was .88.

### **2.3.7 Internalizing Symptoms**

The Patient Health Questionnaire, modified for children and adolescents (PHQ-9; Spitzer, Kroenke, & Williams, 1999) was used to measure depressive symptoms in the sample. The PHQ-9 is a multipurpose measure for measuring various self-reported depressive symptoms. The PHQ-9 has been well-validated through many studies, including many studies in the United States (Kroenke, Spitzer, & Williams, 2001; Lowe, Unutzer, Callahan, Perkins, & Kroenke, 2004). An example of an item from the measure is: "over the past two weeks, how often have you felt tired, or had little energy?" Reliability at Time 1 in our sample was .66.

### **2.3.8 Self Control**

The Scale of Child Self-Control (Kendall & Wilcox, 1979) was a 12-item self-report measure used to measure students' ability to regulate their emotions and demonstrate self-control. Students were asked to endorse whether or not they agreed with the item never (0), sometimes (1), or always (2). Example items included "I follow instructions of my parents and teachers" and "I annoy others when they are busy", and "when I get angry I am able to calm myself down". Cronbach's alpha at Time 1 of the study was .73.

### **2.3.9 Qualitative Questions**

Preliminary analyses were conducted after the first three years of data collection, and the 10% of program school children whose internalizing symptoms and trauma symptom scores decreased and increased the most over those years were asked to complete qualitative questions at Time 4 in 2016. The parents and teachers of these identified children were also asked to complete the qualitative portion. The academic research team collaborated with the local Indian organization to design qualitative questions that would most effectively elaborate on potential mechanisms of change of the resilience program implementation as well as potential barriers. A sample question for the child participants is: "Has the Communities Rising program helped you to deal with your feelings?" Questions from the teacher interviews included questions such as: "Have you seen a change for better or worse in how [child's name] gets along with his or her classmates?" Parents were asked questions such as: "Has the program helped your child to deal with problems in his or her life? If so, how?"

## **2.4 Data Analytic Plan**

All descriptive analyses were performed in SPSS version 24 (SPSS Inc, Chicago, IL). Changes in outcomes for program versus comparison group participants were explored using growth curve models in a multilevel model framework (HLM; Raudenbush & Bryk, 2002). A hierarchical linear modelling frameworks allows for the non-independence of the observations across time. In a hierarchical linear modeling framework, the coefficient of the model at one level are considered to be random effects that are explained by the variables at a higher level (Tate, 2004). A growth curve modeling approach examines rate of change over time (i.e., the slope), as well as estimating the within and between-subject variation (Churran, Obeidat, & Losardo, 2010). Dependent variables were tested independently, as described in the hypotheses section above.

To model these outcomes, time was analyzed as a within-subjects (Level 1) predictor of the student outcomes, with Year 0 (the first year of data collection, in 2013) coded as 0. To test the hypothesis regarding the impact of the Communities Rising Resilience Program on student outcomes over time, treatment condition was included as a predictor variable. Demographics and predictor variables of gender, socio-economic status, trauma exposure, and a school-level aggregate variable were also included as between-subjects (Level 2) moderators of symptom and outcome trajectory. Level 2 demographic variables were grand mean centered. The random intercepts and random slopes were estimated. The error terms in the models were allowed to vary. We will report final estimation of fixed effects with robust standard errors to account for non-normality and outliers in the data. Qualitative analyses were conducted in Microsoft Word using a simple content analysis approach.

## 2.5 Missing Data

Children were sampled in the classroom, and all children meeting criteria for the survey (in the appropriate grades) were allowed to participate at each time point. However, due to high rates of non-attendance of school, there were children who were not able to be surveyed at each time period due to not being present when the survey was administered. In addition, many children in southern India attend different schools or transfer to boarding schools for 7<sup>th</sup> grade and onward, which made it difficult to find and survey children who were in 7<sup>th</sup> or 8<sup>th</sup> grade. For this contextual reason, many participants are missing after 6<sup>th</sup> grade. See Figure 1 for a flow chart of participation in the two arms of the study. There was a total of 22.3% missing data across all time points. The number of survey time periods completed were not significantly related to gender, relative wealth, caste status, or any baseline psychosocial or academic measures.

The HLM program supports missing data at Level-1 but does not allow for missing data at Level-2. Therefore, the 343 participants with complete Level-2 data were included in the final HLM models, and the results are based upon these participants' data. Missing data analyses were performed for those who were not included in the final growth curve model analyses due to missing Level-2 data. No significant differences were observed between participants who provided complete Level-2 data and those who did not, including treatment condition, demographics, and baseline psychosocial variables. Due to this, the missing data observed in this study was determined to be missing at random, and estimates were calculated in HLM based on restricted maximum likelihood estimation.



## Chapter 3

### RESULTS

#### 3.1 Demographic Analyses

As part of the study, demographic information regarding gender, number of siblings, parents' employment, age, religion, caste status, number of meals eaten a day, and running water availability in the home were collected. Of the 430 students who participated in the study at any time point, 50% were female (n=215) and 50% were male (n=215). At the start of the study in 2013, 47.8% of the students were in 4<sup>th</sup> grade (141 total) and 52.5% were in 5<sup>th</sup> grade (152 total). In 2014, new 4<sup>th</sup> graders were added to the sample (n=127, 30%), along with 148 now 5<sup>th</sup> graders (34.3%), and 153 (35.7%) 6<sup>th</sup> graders. In 2015 and 2016, students who had been previously surveyed were surveyed again. In all, there were three cohorts of students; Cohort A followed from 4<sup>th</sup>-7<sup>th</sup> grade, Cohort B from 5<sup>th</sup>-8<sup>th</sup>, and Cohort C from 4<sup>th</sup>-6<sup>th</sup>. See Figure 1 for a visual representation of this information.

As a proxy for socioeconomic status, the number of meals consumed by children a day and availability of running water were combined to form a Wealth Index. In all, 286 (67%) of the children reported having running water inside their home. About 18% of the children only reported eating one meal a day (typically provided by the school during lunch), while 45% of children reported typically consuming three meals a day. The average number of meals consumed by participating children across conditions per day was 2.27. The Wealth Index included a binary (0 or 1) report of running water in the home, as well as the number of meals reported each day. Wealth Index scores then ranged from 0 to 3, 3 being the highest (wealthiest) category. 32% of children fell into

the wealthiest category, and approximately 25% of children fell into the lowest two wealth categories ( $SD=.98$ ).

It was not possible to randomize child participants to the Communities Rising program or the non-program comparison condition due to various logistical and programmatic issues. Although every effort was made during the evaluation to ensure comparison schools matched with the program schools in terms of baseline demographic characteristics such as SES, and government versus private school type, we also analyzed the data for systematic baseline differences in outcome levels or other important characteristics. Important demographic information such as caste status, religion, poverty (as measured by meals per day, access to indoor toilet, running water, cellphones, etc) were collected and examined using ANOVAs to determine if there were significant baseline demographic characteristic differences between the two groups.

If significant differences were found, sample-matching utilizing Propensity Score Matching was planned (Austin, 2011). There were no significant differences between the intervention and comparison group on important demographic factors such as presence of running water, indoor toilets, use of cellphones, number of daily meals, gender, or religion. However, there were significant differences in caste status ( $F=51.69$ ,  $p<.001$ ), with more caste members being in the comparison group. In the intervention group, 110 students reported being of dalit status, and 28 of caste member status. In the comparison group, 106 reported dalit identity and 128 reported having caste identity. Additionally, preliminary analyses also showed that in 2013 there were more students in the 5<sup>th</sup> grade in the comparison group (compared to the intervention

group). See Table 1 below for demographic information by intervention and comparison group status.

Caste status was included as a control variable in the full models that were performed. Because caste status is an important identifying demographic that impacts all aspects of a person's life in India (Sankaran, Sekerdej, & von Hecker, 2017), we analyzed caste status together with the other demographic data collected in this sample. Results showed that there was a trend towards more females self-reporting into the dalit identity group ( $F= 2.96, p=.086$ ). There was also a significant difference by religious status, such that most caste members identified as Hindu, whereas students with dalit identities identified as both Hindu and Christian ( $F=163.68, p<.001$ ). Due to this overlap of caste status and religious practice, these variables were combined to form a joint variable of caste and religious status that we labeled "Social Status". This was analyzed alongside the Wealth Index in an effort to account for social role and status variables. Descriptive statistics for the sample are included in Table 2.

Table 1 Demographic Information by Treatment Condition

<b>Demographic</b>	<b>N</b>	<b>Means</b>	<b>Std Dev</b>	<b>F</b>	<b>Significance Level</b>
<b>Toilet</b>				3.19	.075
Comparison	266	.17	.38		
Treatment	160	.11	.31		
<b>Water</b>				1.33	.255
Comparison	266	.69	.35		
Treatment	160	.64	.46		
<b>Cellphone</b>				0.01	.910
Comparison	266	.95	.24		
Treatment	160	.95	.22		
<b>Daily Meals</b>				0.02	.867
Comparison	255	2.27	.76		
Treatment	160	2.28	.76		
<b>Gender</b>				0.00	1.00
Comparison	270	.50	.50		
Treatment	160	.50	.50		
<b>Caste</b>				51.69	.000
Comparison	234	1.46	.51		
Treatment	134	1.82	.38		
<b>Religion</b>				1.63	.200
Comparison	259	1.54	.50		
Treatment	155	1.66	.88		
<b>Grade in 2013</b>				4.14	.041
Comparison	192	.48	.50		
Treatment	101	.60	.49		
<b>Grade in 2014</b>				.24	.620
Comparison	266	1.04	.79		
Treatment	160	1.08	.84		
<b>Grade in 2015</b>				2.63	.106
Comparison	135	1.66	.83		
Treatment	114	1.83	.86		
<b>Grade in 2016</b>				.06	.800
Comparison	87	2.60	.88		
Treatment	68	2.61	.84		

*Note:* Toilet coded 0=no, 1=yes, Water 0=no, 1=yes, Cellphone 0=no, 1=yes, gender 0=male, 1=female, Caste 1=caste, 2=dalit, Religion 1=Hindu, 2=Christian

Table 2 Descriptive Statistics by Caste Status

		<i>N</i>	<i>Mean</i>	<i>Std Dev</i>	<i>F</i>	<i>Sig</i>
<b>Treatment Group</b> (0=comparison)	Caste	152	.158	.366	54.34	.00
	Dalit	216	.509	.501		
<b>Toilet</b> (0=no)	Caste	151	.179	.384	1.19	.267
	Dalit	212	.137	.344		
<b>Cellphone</b> (0=no)	Caste	151	.940	.238	0.246	.620
	Dalit	212	.953	.234		
<b>Water</b> (0=no)	Caste	151	.351	.479	0.789	.375
	Dalit	212	.307	.462		
<b>Meals A Day</b> (#)	Caste	151	2.25	.774	0.014	.905
	Dalit	212	2.25	.749		
<b>Gender</b> (0=male)	Caste	152	.467	.501	2.96	.086
	Dalit	215	.558	.498		
<b>Religion</b> (1= Hindu, 2= Christian)	Caste	150	1.01	.082	163.68	.000
	Dalit	204	1.53	.500		

### 3.2 Descriptive Analyses

All descriptive variables are reported for the 2014 data collection year, as this year included the greatest overall participation in the sample, greatest variability in grade level, and the least missing data ( $n=428$ ). The academic variables of math score, Tamil reading score, and English score were summed into one academic variable with an alpha coefficient of .760. This scale had an average score of 8.19 across all participations ( $SD=2.42$ ). The maximum total score on this variable was 13. In general, participants scored highest on the Tamil reading item ( $M=3.28$ ) and lowest on the English item ( $M=1.83$ ). The mean item-level School Engagement score was 4.00 ( $SD=1.00$ , range .490-4.80). The alpha reliability coefficient for the School Engagement variable was .86.

Finally, the depression symptoms, UCLA-measured trauma symptoms, aggression, and self-control were all included as separate outcome variables. The descriptive statistics for these main psychosocial outcome variables are included in Table 3. The mean item-level response for the Aggression scale was .82 ( $SD=.66$ ), for depressive symptoms was .23 ( $SD=.25$ ), for trauma symptoms was .64 ( $SD=.52$ ), and for the Self-Control scale was 1.37 ( $SD=.33$ ).

The demographic variables that describe the ecological context were of particular interest to the researchers and descriptive statistics and bivariate correlations are illustrated in Table 3. In this sample, 14.6% of the students reported having a toilet in the home ( $SD = .353$ ). Having a toilet in the home was not strongly correlated with many variables, with the exception of having running water in the home and negative correlation with trauma exposure and trauma symptoms. 33% of children reported having running water in the home ( $SD = .470$ ). Having running water in the home was positively correlated with consuming more daily meals and school engagement and

negatively correlated with depression and trauma exposure. 95% of children in the sample reported that their parents had access to a cellphone ( $SD = .232$ ), and the only notable correlation for having access to a cellphone was a slight negative association with the student being female. On average, students reported consuming 2.27 hot meals a day ( $SD = .757$ ). Higher number of hot daily meals was positively correlated with scores in math and English. Daily meals were also positively correlated with School Engagement, Self Control, and negatively correlated with aggression symptoms and trauma symptoms. About 58% of the sample reported being of dalit caste status ( $SD = .493$ ). Dalit caste status was slightly positively correlated with depressive symptoms, but no other significant correlations were detected in bivariate correlations. Finally, female gender was found to be slightly positively correlated with performance in reading and self-control, and negatively correlated with reported aggressive symptoms.

Scores in Tamil language were moderately positively correlated with scores in Math and English. Feeling anxiety about school was negatively correlated with scores in Math, English and Tamil and positively correlated with reports of depressive symptoms and aggression. School engagement was negatively correlated with constructs such as aggression but positively correlated with scores in academic areas (e.g., Math). As expected, Self-Control was positively correlated with presence of running water in the home, higher numbers of daily meal consumption, and performance in academic areas such as Math and English. Aggression was positively correlated with depressive symptoms and trauma symptoms, and negatively correlated with increased number of meals a day and presence of running water in the home as well as performance in school (e.g., English). As would be expected, higher year in

school (Grade) was positively correlated with higher scores in Reading and Math, though the correlation with English was less strong.



Table 3 Bivariate Correlation Matrix 2014 Results

	N	Score Range (Items)	Mean/SD	Tx Grp	Grade	Toilet	Water	Cellphone	Daily Meals	Gender	Caste	Reading	Math	English	School Engage	Self Control	PHQ9	Aggression	Trauma Sx	
<b>Tx Group</b>	430	0-1 (1)	.374 .384	--																
<b>Grade</b>	426	0-3 (1)	1.06 .809	.02	--															
<b>Toilet</b>	426	0-1 (1)	1.46 .353	-.09	.02	--														
<b>Water</b>	426	0-1 (1)	3.29 .470	-.06	.02	.11*	--													
<b>Cellphone</b>	426	0-1 (1)	.948 .232	.01	-.02	.06	.04	--												
<b>Daily Meals</b>	426	0-4 (1)	2.27 .757	.01	.06	.07	.23**	-.04	--											
<b>Gender</b>	430	0-1 (1)	.500 .501	.00	-.04	.08	-.01	-.10*	-.01	--										
<b>Caste</b>	368	0-1 (1)	.587 .493	.35**	-.05	-.04	.05	-.01	-.01	-.07	--									
<b>Reading</b>	285	0-4 (1)	3.28 .953	.01	.16**	.01	.02	.02	.04	.14*	.03	--								
<b>Math</b>	283	0-4 (1)	2.81 .780	.15*	.19**	.04	.07	.05	.22**	-.05	-.06	.48**	--							
<b>English</b>	284	0-4 (1)	1.83 .898	.20**	.12	.06	.02	.06	.18**	.06	-.05	.52**	.57**	--						
<b>School Engage</b>	424	0-3 (14)	1.52 .93	-.09*	.06	.02	.14*	-.02	.47**	.05	-.02	.13*	.27**	.27**	--					
<b>Self Control</b>	425	0-2 (12)	1.38 .333	-.05	.07	.05	.23**	-.01	.33**	.12**	.01	.10	.16**	.26**	.37**	--				
<b>PHQ9</b>	424	0-3 (9)	2.30 .247	.19**	.07	-.09	-.20**	-.03	.39**	.05	.12*	-.25**	-.21**	-.17**	-.32**	-.20**	--			
<b>Aggression</b>	426	0-3 (8)	.823 .656	.12*	.01	.02	-.13**	.03	-.49**	-.14**	-.09	-.09	-.15*	-.18**	-.34**	-.48**	.24**	--		
<b>Trauma</b>	425	0-1 (10)	1.51 1.27	.03	.03	-.15*	-.30**	-.05	-.28**	-.01	-.03	-.06	-.18*	-.16*	-.27*	-.15*	.34**	.20**	--	
<b>Trauma Sx</b>	326	0-4 (22)	.636 .517	.06	.06	-.13*	-.31**	-.04	-.62**	.03	-.02	-.12	-.25**	-.18*	-.43**	-.29**	.58**	.48**	.53**	--

Note: Intervention Group 0=Comparison, 1=CR intervention; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .00$

### **3.3 Aim 1: Trauma and Correlated Psychosocial Variables**

We first report descriptive statistics on trauma and associated outcomes. For these statistics, the 2014 time point sample was used, as this time point had the greatest number of participants ( $n=428$ ) and were evenly distributed across cohorts in 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> grade. A total of 76% of the children surveyed in 2014 reported trauma exposure. The two most commonly reported events were being in a place where people were seriously fighting (44.9% of students) and seeing a family member being hit, punched, or kicked very hard at home (41.4% of students). The mean number of trauma experiences in the whole sample was 1.51 ( $SD = 1.27$ ). Of those children who had experienced at least one PTE, the average number of PTEs was 1.98 ( $SD = 1.08$ ). The distributions of potentially traumatic events reported by males (mean = 1.52,  $SD = 1.23$ ) and females (mean = 1.50,  $SD = 1.30$ ) did not show significant differences.

Exposure to trauma was negatively correlated with access to an indoor toilet, access to running water, and access to a higher number of daily meals (or access to materials and resources that constitute “wealth” in this area). Trauma exposure was also slightly negatively correlated with students’ scores in math and English abilities, as well as negatively correlated with general school engagement. Trauma exposure in this population was positively correlated with depressive symptoms. However, trauma exposure was not strongly correlated with gender or caste, contrary to what might be expected given the particular marginalization of dalits and girls and women in this community. Trauma exposure and trauma symptoms were strongly correlated, as would be expected. Additionally, presence of trauma symptoms was strongly negatively correlated with consumption of daily meals and school engagement, as well as positively correlated with depressive symptoms and aggression.

### **3.4 Aim 2: Growth Models by Intervention Status**

The effects of the intervention were tested using a conditional HLM model. Six conditional models were specified for academic outcomes, school engagement, self-control, aggression, depressive symptoms, and trauma symptoms. The full models included intervention status and the demographic variables of average number of traumas experienced by the child, gender, wealth, social status, and the school-level variables of average school social status, school wealth, and average number of traumas experienced by children in the school. After a full model was specified, a reduced model for each outcome that included only the significant variables from the full model (and predictor variable of intervention condition) was specified. Finally, a dosage model was calculated for each variable. The dosage model included only Communities Rising students, which were coded according to the “dose” of the intervention they received. Cohort C received the full dose of the intervention, as the CR program was fully operational in schools and operating at its full capacity by 2014, when Cohort C was first sampled. Cohort A received less of the intervention, as in 2013 the program was not fully operating with these children. Cohort B students received only a partial dose of the intervention, as students were already in 5<sup>th</sup> grade in 2013 by the time they were first sampled. Therefore, a “dosage” model accounted for these differences in program dose and were included as supplemental models.

#### **3.4.1 Academic Outcomes**

A hierarchical linear model tested the effect of treatment condition on rates of change in students’ trajectories of academic achievement over the course of four school years. An unconditional model using academic outcomes as the outcome examined the within-subjects and between-subjects variability in the yearly survey of academic

abilities. The intraclass correlation coefficient (ICC) for Academic Outcomes was 0.485, indicating that 48.5% of the variance in Academic Outcomes is explained by between-subject differences in academic abilities. This therefore suggests that 51.5% of the variability in Academic Outcomes is due to within-subject fluctuations over time. Results from the within-subjects model also indicated a significant random intercept ( $SD = 1.87, \chi^2(334) = 794.83, p < .001$ ) and a significant random slope related to the time parameter ( $SD = 0.33, \chi^2(334) = 381.84, p < .05$ ). This suggests significant individual differences in both starting levels and rates of change in Academic Outcomes scores and indicates that it is appropriate to include Level-2 variables as potential moderators of these academic trajectories over time.

We then specified a model to examine the effects of demographic variables, trauma exposure, and the treatment condition on rates of change in Academic Outcomes over the course of the four-year survey period. This model revealed a fixed intercept of 6.46 ( $t(338) = 29.73, p < 0.001$ ), indicating the average starting level of student Academic Outcomes at Year 1 (2013). This model also indicated a fixed slope of 1.02 ( $t(338) = 9.84, p < 0.001$ ), showing that, on average, students across treatment condition experienced a significant increase in Academic Outcomes over the course of four academic years, as would be expected. From survey Year 1 to survey Year 4, the estimated average total change in Academic Outcome scores was 1.02 points.

Intervention condition and average number of traumas experienced were included in the model as Level-2 predictors, with individual student wealth, gender, social status (based on religion and caste) also included. Finally, school-level variables derived from averages of all students in that school were included in the model as a control for potential school environment differences. School-level wealth, school-level

social status, and school-level average number of traumas were included in the model. Results for this model are presented in Table 4. On average, children in intervention schools started at a higher level of academic skills ( $B = 1.39, t(338) = 3.36, p < 0.001$ ) and students with a higher level of average trauma at baseline exhibited lower academic scores ( $B = -0.28, t(338) = -1.96, p = 0.05$ ). Over time, students' participation in the intervention condition did not significantly moderate the rate of change in academic skill development ( $B = 0.21, t(338) = 1.34, p = 0.18$ ) in the full model. School social status had a significant effect on the rate of academic change over time, ( $B = -0.42, t(338) = -2.64, p < 0.01$ ). with schools of higher social status having lower rates of increase in academic scores across time. None of the other demographic variables included had a significant impact on the intercept or the slope of change in academic outcomes.

A reduced model was tested that included intervention condition, average numbers of traumas experienced, and school social status as the only Level-2 predictors (See Table 4). Results indicate that in this reduced model, intervention condition and average number of traumas remained a significant predictor of the starting levels of academic skills. Additionally, in the reduced model the intervention condition of Communities Rising did significantly predict rates of change in academic skill outcomes ( $B = 0.30, t(342) = 2.32, p = 0.021$ ). School social status also continued to significantly predict rates of change in academic outcomes in the reduced model ( $B = -0.02, t(342) = -2.58, p = 0.010$ ).

Finally, a supplemental dosage model analysis was conducted to examine the effects of subsequent “amounts” of the program on child outcomes. Because the Communities Rising resilience program began in 2013 and was substantially improved

in 2014, the CR students who were in cohort A and B (see Figure 1) received less “dose” of the treatment than did the students in cohort C. Using just the CR students for the supplemental analysis, the model was specified in the same manner to examine the effects of treatment dosage, demographic variables, and trauma exposure on Academic Outcomes over time. This reduced model had a fixed intercept of 7.36 ( $t(117) = 19.15$ ,  $p < 0.001$ ), indicating the average starting level of student Academic Outcomes at Year 1 (2013). This model also indicated a fixed slope of 1.71 ( $t(117) = 13.54$ ,  $p < 0.001$ ), indicating that, on average, students across dosage conditions in the Communities Rising treatment experienced a significant increase in Academic Outcomes over the course of four academic years. From survey Year 1 to survey Year 4, the estimated total change in Academic Outcome scores was 1.70 points. Additionally, the amount of the Communities Rising treatment that students received did not significantly impact the starting point of students academically ( $B = 0.75$ ,  $t(117) = 0.68$ ,  $p = 0.496$ ) but it did significantly positively predict the rates of change in academic outcomes for the children ( $B = 2.47$ ,  $t(117) = 6.91$ ,  $p < 0.001$ ).

Table 4 Final estimation of fixed effects (with robust standard errors) for Academic Outcomes

Fixed Effects	Full Model				Reduced Model			
	Coefficient	S.E.	<i>t</i> -ratio	<i>p</i> -value	Coefficient	S.E.	<i>t</i> -ratio	<i>p</i> -value
<b>Time 1 average</b>								
Intercept	6.46***	0.22	29.73	<0.001	6.69***	0.15	41.97	<0.001
Intervention Condition (CR)	1.39***	0.38	3.63	<0.001	0.95***	0.29	3.24	0.001
Average Trauma	-0.28*	0.14	-1.96	0.05	-0.37**	0.13	-2.79	0.006
Female Gender	0.13	0.26	0.50	0.62				
Wealth	0.16	0.15	1.11	0.27				
Social Status	0.10	0.19	0.55	0.59				
School Social Status	0.46	0.36	1.29	0.20				
School Wealth	1.65	0.98	1.70	0.09				
School Trauma	-0.99	0.66	-1.51	0.13				
<b>Rate of change per year</b>								
Intercept	1.02***	0.10	9.84	<0.001	0.99***	0.08	12.83	<0.001
Intervention Condition (CR)	0.21	0.16	1.34	0.18	0.30*	0.13	2.32	0.021
Average Trauma	0.01	0.08	0.05	0.96				
Female Gender	0.01	0.12	0.02	0.99				
Wealth	-0.048	0.07	-0.71	0.48				
Social Status	0.02	0.08	0.22	0.82				
School Social Status	-0.42**	0.16	-2.64	0.009	-0.02**	0.09	-2.58	0.010
School Wealth	-0.61	0.45	-1.35	0.178				
School Trauma	0.06	0.29	0.19	0.84				

Note: N = 343, df = 338 for full model and df = 342 for reduced model; treatment condition coded 1 = CR, 0 = comparison; Wealth coded 0-3; Social Status coded -1 to 1; gender coded 1 = female, 0 = male; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . Unstandardized coefficients are reported.

### 3.4.2 School Engagement Outcomes

A hierarchical linear model tested whether treatment condition moderated change in school engagement trajectories over the course of four years of the study. An unconditional model using school engagement outcomes as the outcome examined the within-subjects and between-subjects variability in the yearly survey of academic abilities. The intraclass correlation coefficient (ICC) for School Engagement was 0.038, indicating that 3.8% of the variance in School Engagement is explained by between-subject variability in school engagement scores. This therefore suggests that 96.2% of the variability in School Engagement scores is due to within-subject fluctuations over time.

In the full model there was a fixed intercept of 2.29 ( $t(338) = 64.97, p < 0.001$ ), indicating the average starting level of student engagement in school at Year 1. This model also indicated a fixed slope of  $-0.08(t(338) = -3.81, p < 0.001)$ , demonstrating that students across treatment conditions on average experienced a significant decrease in School Engagement over the course of four academic years. From survey Year 1 to survey Year 4, the estimated total change in School Engagement scores was  $-0.08$  points.

Intervention condition and average number of traumas experienced were included in the model as Level-2 predictors. Results for this model are presented in Table 5. On average, children in intervention schools and non-intervention schools started at the same levels of school engagement and students with a higher level of average trauma at baseline exhibited lower engagement scores ( $B = -0.06, t(338) = -2.32, p = 0.02$ ). Over time, students' participation in the intervention condition did not significantly moderate the rate of change in engagement scores ( $B = 0.02, t(338) = 0.78, p = 0.44$ ) in the full model. Wealth status had a significantly positive effect on



engagement scores ( $B = 0.06$ ,  $t(338) = 2.31$ ,  $p = 0.021$ ) at baseline but not over time. Average number of traumas had a significantly negative effect on engagement scores at baseline ( $B = -0.06$ ,  $t(338) = -2.32$ ,  $p = 0.021$ ) but not over time. None of the other demographic variables included had a significant impact on the intercept or the slope of change in engagement scores.

A reduced model was tested that included intervention condition, average numbers of traumas experienced, and wealth status as the only Level-2 predictors (See Table 5). Results indicate that in this reduced model, wealth status and average number of traumas remained the only predictors of baseline levels of school engagement and there were no significant predictors of change in engagement scores over time.

Finally, a supplemental dosage model analysis was conducted. The model was specified in the same manner to examine the effects of treatment dosage, demographic variables, and trauma exposure on School Engagement over time within the Communities Rising condition. The dosage model revealed a fixed intercept of 2.37 ( $t(117) = 47.87$ ,  $p < 0.001$ ), indicating the average starting level of student school engagement at Year 1 (2013). This model also indicated a fixed slope of -0.10 ( $t(117) = -4.04$ ,  $p < 0.001$ ), indicating that, on average, students across treatment condition experienced a significant decrease in School Engagement over the course of four academic years. From survey Year 1 to survey Year 4, the estimated total change in School Engagement scores across all Communities Rising participants was -0.10 points. However, in this dosage model the effects of increased exposure to the intervention condition became clear, as students in cohorts who received more months in the Communities Rising program experienced a marginally significant ( $B = 0.16$ ,  $t(117) = 1.91$ ,  $p = 0.059$ ) increase in school engagement scores over time.

Table 5 Final estimation of fixed effects (with robust standard errors) for School Engagement

Fixed Effects	Full Model				Reduced Model			
	Coefficient	S.E.	<i>t</i> -ratio	<i>p</i> -value	Coefficient	S.E.	<i>t</i> -ratio	<i>p</i> -value
<b>Time 1 average</b>								
Intercept	2.29***	0.04	64.97	<0.001	2.32***	0.03	85.50	<0.001
Intervention Condition (CR)	0.04	0.06	0.64	0.636	0.029	0.05	0.63	0.527
Average Trauma	-0.06*	0.03	-2.32	0.021	-0.057*	0.03	-2.42	0.028
Female Gender	0.05	0.04	1.13	0.260				
Wealth	0.06*	0.03	2.31	0.021	0.06*	0.03	2.42	0.016
Social Status	0.03	0.03	0.88	0.380				
School Social Status	0.01	0.05	0.11	0.106				
School Wealth	0.11	0.16	0.70	0.485				
School Trauma	0.07	0.15	0.47	0.642				
<b>Rate of change per year</b>								
Intercept	-0.08***	0.02	-3.81	<0.001	-0.09***	0.02	-5.28	<0.001
Intervention Condition (CR)	0.02	0.03	0.78	0.435	0.03	0.02	1.12	0.236
Average Trauma	0.01	0.02	0.23	0.822				
Female Gender	-0.01	0.02	-0.57	0.567				
Wealth	-0.01	0.01	-0.74	0.459				
Social Status	-0.02	0.02	-1.49	0.138				
School Social Status	0.02	0.03	0.59	0.56				
School Wealth	-0.09	0.08	-1.07	0.287				
School Trauma	0.01	0.11	0.01	0.991				

Note: N = 343, df = 338 for full model and df = 342 for reduced model; treatment condition coded 1 = CR, 0 = comparison; Wealth coded 0-3; Social Status coded -1 to 1; gender coded 1 = female, 0 = male; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . Unstandardized coefficients are reported.

### 3.4.3 Self-Control Outcomes

A hierarchical linear model tested whether treatment condition moderated change in children's abilities to exhibit self-control over the course of four years of the study. An unconditional model using self-control outcomes examined the within-subjects and between-subjects variability in the yearly survey of self-control abilities. The intraclass correlation coefficient (ICC) for the Self Control variable was 0.032, indicating that 3.2% of the variance in self-control abilities is explained by between-subject variability. Therefore, this suggests that 96.8% of the variability in scores is due to within-subject differences across time.

A conditional model was specified to examine the effects of demographic variables, trauma exposure, and the treatment condition on self-control scores over the course of four years. This conditional model revealed a fixed intercept of 1.43 ( $t(338) = 54.62, p < 0.001$ ), indicating the average starting level of self-control in school at Year 1. This model also indicated a fixed slope of -0.03 ( $t(338) = -1.74, p = 0.081$ ), demonstrating that students across treatment conditions on average experienced a marginally significant decrease in self-control over the course of four academic years.

Intervention condition and average number of traumas experienced were included in the model as Level-2 predictors, similarly to the models described above. Results for this model are presented in Table 6. On average, children in intervention schools and non-intervention schools started at the same levels of self-control. Students with a higher level of relative wealth exhibited higher self-control scores ( $B = 0.04, t(338) = 2.40, p = 0.017$ ), as did female students ( $B = 0.11, t(338) = 3.71, p < 0.001$ ). Over time, students' participation in the intervention condition had a marginally significant effect on the rate of change in self-control scores ( $B = 0.04, t(338) = 1.73, p$

= 0.08) in the full model. None of the other demographic variables included had a significant impact on the intercept or the slope of change in self-control scores.

A reduced model was tested that included intervention condition, average numbers of traumas experienced, gender, and wealth status as the only Level-2 predictors (See Table 6). Results indicate that in this reduced model, wealth status and female gender remained the only predictor of baseline levels of self-control. In the reduced models, the effects of the intervention on change in self-control were reduced ( $B = 0.03$ ,  $t(338) = 1.53$ ,  $p = 0.127$ ).

Finally, a supplemental dosage model analysis was conducted. The model was specified in the same manner to examine the effects of treatment dosage, demographic variables, and trauma exposure on Self-Control scores over time within the Communities Rising condition. This dosage model revealed a fixed intercept of 1.46 ( $t(117) = 38.06$ ,  $p < 0.001$ ), indicating the average starting level of CR student self-control in 2013. This model also indicated a fixed slope of -0.03 ( $t(117) = -1.07$ ,  $p = 0.289$ ). In this dosage model, students in cohorts who received more months in the Communities Rising program experienced a significant increase in self-control scores over the four years of the study ( $B = 0.16$ ,  $t(117) = 2.14$ ,  $p = 0.034$ ).

Table 6 Final estimation of fixed effects (with robust standard errors) for Self-Control

Fixed Effects	Full Model				Reduced Model			
	Coefficient	S.E.	<i>t</i> -ratio	<i>p</i> -value	Coefficient	S.E.	<i>t</i> -ratio	<i>p</i> -value
<b>Time 1 average</b>								
Intercept	1.44***	0.03	54.62	<0.001	1.44***	0.03	55.31	<0.001
Intervention Condition (CR)	-0.03	0.04	-0.76	0.446	-0.03	0.03	-0.82	0.412
Average Trauma	0.01	0.02	0.16	0.874				
Female Gender	0.12***	0.03	3.72	<0.001	0.08***	0.02	3.95	<0.001
Wealth	0.04*	0.02	2.40	0.017	0.04*	0.01	4.45	<0.001
Social Status	-0.01	0.02	-0.46	0.649				
School Social Status	0.04	0.04	1.09	0.279				
School Wealth	0.04	0.11	0.36	0.719				
School Trauma	0.09	0.11	0.79	0.432				
<b>Rate of change per year</b>								
Intercept	-0.03	0.02	-1.75	0.081	-0.04***	0.01	-3.78	<0.001
Intervention Condition (CR)	0.04‡	0.02	1.73	0.084	0.03	0.02	1.53	0.127
Average Trauma	-0.01	0.02	-0.93	0.352				
Female Gender	-0.03	0.02	-1.68	0.095				
Wealth	0.01	0.01	0.12	0.902				
Social Status	0.01	0.01	0.13	0.896				
School Social Status	-0.01	0.02	-0.43	0.670				
School Wealth	-0.01	0.06	-0.13	0.910				
School Trauma	-0.04	0.08	-0.47	0.637				

Note: N = 343, df = 338 for full model and df = 342 for reduced model; treatment condition coded 1 = CR, 0 = comparison; Wealth coded 0-3; Social Status coded -1 to 1; gender coded 1 = female, 0 = male; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; ‡  $p < .10$ . Unstandardized coefficients are reported.

### 3.4.4 Aggression Outcomes

Aggression outcomes were also tested in a hierarchical linear model. An unconditional model using aggression outcomes as the outcome examined the within-subjects and between-subjects variability in the yearly survey of aggressive behaviors. The intraclass correlation coefficient (ICC) for the Aggression variable was 0.015, indicating that 1.5% of the variance in Aggression is explained by between-subject variability in aggressive behaviors. This therefore suggests that 98.5% of the variability in aggressive behaviors are due to within-subject fluctuations over time.

A conditional model was specified to examine the effects of level 2 variables. The conditional model revealed a fixed intercept of 0.69 ( $t(338) = 14.47, p < 0.001$ ), indicating the average starting level of aggressive behaviors in school at Year 1. This model also indicated a fixed slope of 0.03 ( $t(338) = 0.92, p = 0.36$ ), demonstrating that students across treatment conditions on average experienced a non-significant change in aggressive behaviors over the course of four academic years. From survey Year 1 to survey Year 4, the estimated total change in Aggression scores was 0.03 points.

Level-2 predictors were included and results for this model are presented in Table 7. On average, children in intervention schools and non-intervention schools started at the same levels of aggression and students with a higher level of average trauma at baseline exhibited higher levels of aggressive behaviors ( $B = 0.10, t(338) = 2.83, p = 0.005$ ). Over time, students' participation in the intervention condition did not significantly moderate the rate of change in aggression scores ( $B = -0.01, t(338) = -0.10, p = 0.917$ ) in the full model. Wealth status had a significantly negative effect on aggression scores ( $B = -0.11, t(338) = -3.22, p = 0.001$ ) at baseline but not over time. Similarly, female gender was significantly predictive of lower aggression scores at baseline ( $B = -0.16, t(338) = -2.92, p = 0.004$ ) but not over time ( $B = -0.02, t(338) = -$

0.67,  $p = 0.500$ ). None of the other demographic variables included had a significant impact on the intercept or the slope of change in aggression.

A reduced model was tested that included intervention condition, average numbers of traumas experienced, gender, and wealth status as the only Level-2 predictors (See Table 7). Results indicate that in this reduced model, average number of traumas, wealth status, and gender remained significant predictors of baseline levels of aggression and that there were no significant predictors of change in aggression scores over time.

Finally, a supplemental dosage model analysis was conducted for aggression scores. The model was specified in the same manner to examine the effects of treatment dosage, demographic variables, and trauma exposure on aggression scores over time within the Communities Rising condition. From survey Year 1 to survey Year 4, the estimated total change in aggression scores across all Communities Rising participants was -0.09 points. However, in this dosage model the effects of increased exposure to the intervention condition were non-significant, as students in cohorts who received more months in the Communities Rising program experienced a non-significant decrease in aggressive behaviors ( $B = -0.13$ ,  $t(117) = -0.86$ ,  $p = 0.39$ ). However, in the dosage model the effects of increased numbers of traumas became evident, as students who experienced a higher average number of traumas experienced a reported increase in aggressive behaviors over time ( $B = 0.71$ ,  $t(117) = 2.17$ ,  $p = 0.032$ )

Table 7 Final estimation of fixed effects (with robust standard errors) for Aggression Outcomes

Fixed Effects	Full Model				Reduced Model			
	Coefficient	S.E.	<i>t</i> -ratio	<i>p</i> -value	Coefficient	S.E.	<i>t</i> -ratio	<i>p</i> -value
<b>Time 1 average</b>								
Intercept	0.69***	0.05	13.47	<0.001	0.74***	0.05	15.58	<0.001
Intervention Condition (CR)	0.04	0.09	0.54	0.590	-0.03	0.06	-0.57	0.569
Average Trauma	0.10**	0.03	2.84	0.005	0.08**	0.03	2.62	0.009
Female Gender	-0.16**	0.05	-2.92	0.004	-0.17**	0.06	-3.08	0.002
Wealth	-0.11**	0.03	-3.22	0.001	-0.11***	0.03	-3.51	<0.001
Social Status	0.04	0.05	0.77	0.445				
School Social Status	-0.04	0.08	-0.62	0.534				
School Wealth	0.03	0.20	0.14	0.886				
School Trauma	-0.30	0.20	-1.51	0.133				
<b>Rate of change per year</b>								
Intercept	0.03	0.03	0.92	0.359	-0.02	0.02	-0.65	0.514
Intervention Condition (CR)	-0.01	0.04	-0.10	0.917	-0.02	0.03	-0.47	0.637
Average Trauma	-0.03	0.02	-1.13	0.257				
Female Gender	-0.02	0.03	-0.68	0.500				
Wealth	0.01	0.02	-0.27	0.790				
Social Status	-0.01	0.03	-0.27	0.734				
School Social Status	0.05	0.04	1.05	0.296				
School Wealth	0.01	0.12	0.11	0.914				
School Trauma	-0.25	0.16	-1.57	0.118				

Note: N = 343, df = 338 for full model and df = 342 for reduced model; treatment condition coded 1 = CR, 0 = comparison; Wealth coded 0-3; Social Status coded -1 to 1; gender coded 1 = female, 0 = male; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; ‡  $p < .10$ . Unstandardized coefficients are reported



### 3.4.5 Depressive Symptoms Outcomes

Depressive symptoms were also tested in a hierarchical linear model. An unconditional model using depressive symptoms outcomes as the outcome examined the within-subjects and between-subjects variability in the yearly survey of depressive symptoms. The intraclass correlation coefficient (ICC) for Depressive Symptoms was 0.50, indicating that 5.0% of the variance in Depressive Symptoms is explained by between-subject variability in scores. Therefore, 95.0% of the variability in Depressive Symptoms scores is due to within-subject fluctuations over time.

A conditional model was specified to examine the effects of demographic variables, trauma exposure, and the treatment condition on children's depression symptoms over the course of four years. The conditional model revealed a fixed intercept of 0.25 ( $t(338) = 11.70, p < 0.001$ ), indicating the average starting level of student depressive symptoms in school at Year 1. This model also indicated a fixed slope of -0.01 ( $t(338) = -0.69, p = 0.491$ ), demonstrating that students across treatment conditions on average experienced a non-significant change in depressive symptoms over the course of four academic years. From survey Year 1 to survey Year 4, the estimated total change in depressive symptoms scores was -0.01 points.

Intervention condition and average number of traumas experienced were included in the model as Level-2 predictors, with individual student wealth, gender, social status also included as controls, along with the school level variables, similarly to the models described above. Results for this model are presented in Table 8. On average, children in intervention schools and non-intervention schools started at the same levels of depressive symptoms, and students with a higher level of average trauma at baseline exhibited higher depression scores ( $B = 0.07, t(338) = 4.61, p < 0.001$ ) and those with higher levels of wealth exhibited lower levels of depressive symptoms at

baseline ( $B = -0.03$ ,  $t(338) = -2.18$ ,  $p = 0.030$ ). Over time, students' participation in the intervention condition did not significantly moderate the rate of change in depressive symptom scores ( $B = 0.01$ ,  $t(338) = 0.50$ ,  $p = 0.614$ ) in the full model. None of the other demographic variables included had a significant impact on the intercept or the slope of change in depressive symptom scores.

A reduced model was tested that included intervention condition, average numbers of traumas experienced, and wealth status as the only Level-2 predictors (See Table 8). Results indicate that in this reduced model, wealth status and average number of traumas remained the only predictor of baseline levels of depressive symptoms and there were no significant predictors of change in depressive symptoms over time.

Finally, a supplemental dosage model analysis was conducted. The model was specified in the same manner to examine the effects of treatment dosage, demographic variables, and trauma exposure on depressive symptoms over time within the Communities Rising condition. This dosage model revealed a fixed intercept of 0.26 ( $t(117) = 7.83$ ,  $p < 0.001$ ), indicating the average starting level of student depressive symptoms at Year 1 (2013). This model also indicated a fixed slope of -0.02 ( $t(117) = -1.03$ ,  $p = 0.305$ ), indicating that, on average, students across dosage levels experienced a non-significant decrease in depressive symptoms over the course of four academic years. Students who received a higher dose of the Communities Rising program showed no significant changes in depressive symptoms over time ( $B = -0.09$ ,  $t(117) = -1.29$ ,  $p = 0.199$ )

Table 8 Final estimation of fixed effects (with robust standard errors) for Depressive Symptoms

Fixed Effects	Full Model				Reduced Model			
	Coefficient	S.E.	<i>t</i> -ratio	<i>p</i> -value	Coefficient	S.E.	<i>t</i> -ratio	<i>p</i> -value
<b>Time 1 average</b>								
Intercept	0.26***	0.02	11.70	<0.001	0.27***	0.02	17.38	<0.001
Intervention Condition (CR)	-0.03	0.03	-1.03	0.302	-0.02	0.03	-0.79	0.428
Average Trauma	0.07***	0.01	4.61	<0.001	0.06***	0.01	6.97	<0.001
Female Gender	0.01	0.03	0.43	0.671				
Wealth	-0.03*	0.01	-2.18	0.030	-0.03***	0.01	-3.37	<0.001
Social Status	0.03	0.02	1.26	0.208				
School Social Status	-0.06‡	0.03	-1.69	0.092				
School Wealth	-0.14	0.09	-1.59	0.112				
School Trauma	0.03	0.11	0.33	0.744				
<b>Rate of change per year</b>								
Intercept	-0.01	0.01	-0.69	0.491	-0.01	0.01	-1.01	0.316
Intervention Condition (CR)	0.01	0.02	0.50	0.614	-0.01	0.02	0.27	0.789
Average Trauma	-0.01	0.02	-0.21	0.383				
Female Gender	0.01	0.02	0.71	0.474				
Wealth	0.01	0.01	0.19	0.847				
Social Status	-0.01	0.01	-0.82	0.413				
School Social Status	0.04	0.03	1.56	0.119				
School Wealth	0.08	0.06	1.31	0.190				
School Trauma	-0.14‡	0.08	-1.82	0.069				

Note: N = 343, df = 338 for full model and df = 342 for reduced model; treatment condition coded 1 = CR, 0 = comparison; Wealth coded 0-3; Social Status coded -1 to 1; gender coded 1 = female, 0 = male; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; ‡  $p < .10$ . Unstandardized coefficients are reported

### 3.4.6 Trauma Symptoms Outcomes

A hierarchical linear model tested whether treatment condition moderated change in trauma symptom trajectories over the course of four years of the study. An unconditional model using trauma symptoms as the outcome examined the within-subjects and between-subjects variability in scores. The intraclass correlation coefficient (ICC) for Trauma Symptoms was 0.040, indicating that 4.0% of the variance in trauma symptoms is explained by between-subject variability in trauma symptom scores. This therefore suggests that 96.0% of the variability in trauma symptom scores is due to within-subject fluctuations over time.

We then specified a model to examine the effects of demographic variables, trauma exposure, and the treatment condition on rates of change in trauma outcomes over the course of the four years of the survey period. The conditional model revealed a fixed intercept of 0.48 ( $t(336) = 12.12, p < 0.001$ ), indicating the average starting level of student trauma symptoms at Year 1. This model also indicated a fixed slope of -0.02 ( $t(336) = -0.97, p = 0.334$ ), indicating that, on average, students across treatment condition experienced a nonsignificant amount of change in trauma symptoms over the course of four academic years.

Intervention condition and average number of traumas experienced were included in the model as Level-2 predictors, with individual student wealth, gender, social status, and school level variables also included. Results for this model are presented in Table 9. On average, children in intervention schools started at a higher level of trauma symptoms ( $B = 0.17, t(336) = 2.32, p = 0.021$ ) and students with a higher level of average trauma at baseline exhibited higher trauma symptoms ( $B = 0.14, t(336) = 5.52, p < 0.001$ ), as would be expected. Additionally, students from relatively wealthier families reported fewer trauma symptoms ( $B = -0.12, t(336) = -5.11, p$

<0.001) at baseline. Over time, students' participation in the intervention condition significantly moderated the rate of change in lowering trauma symptoms ( $B = -0.08$ ,  $t(336) = -2.42$ ,  $p = 0.02$ ) in the full model. No demographic or control variable impacted the rate of change in trauma symptoms over time.

A reduced model was tested that included intervention condition, average numbers of traumas experienced, and wealth as the only Level-2 predictors (See Table 9). Results indicate that in this reduced model, intervention condition, average number of traumas, and wealth remained a significant predictor of the starting levels of trauma symptoms. Additionally, in the reduced model the intervention condition of Communities Rising continued to be the only variable that significantly predicted rates of change in trauma symptoms reduction ( $B = -0.07$ ,  $t(341) = -2.57$ ,  $p = 0.008$ ).

Finally, a supplemental dosage model analysis was conducted to examine the effects of subsequent "amounts" of the program on child outcomes. This dosage model had a fixed intercept of 0.74 ( $t(117) = 11.54$ ,  $p < 0.001$ ), indicating the average starting level of student trauma symptoms in the CR condition at Year 1. This model also indicated a fixed slope of -0.16 ( $t(117) = -5.04$ ,  $p < 0.001$ ), indicating that, on average, students across dosage conditions in the Communities Rising treatment experienced a significant decrease in trauma symptoms over the course of four academic years. However, in this dosage model the amount of the Communities Rising program administered to the children did not seem to significantly impact the rate of decrease in trauma symptoms over time ( $B = 0.12$ ,  $t(117) = 1.08$ ,  $p = 0.282$ ).

In summary, we specified models for outcomes of academic performance, school engagement, self-control, aggressive behaviors, depressive symptoms, and trauma symptoms. The intervention had a positive impact on rates of change in the

areas of academic performance in the reduced model and the dosage model and had a positive impact on the decrease of trauma symptoms in the full and reduced models.

The CR program also seemed to impact rates of improvement in self-control at marginal levels of significance in a full model, and at a significant level in the model examining the dosage effects for the CR program. There were no significant findings in the areas of depressive symptoms, aggressive behaviors, and school engagement.

Table 9 Final estimation of fixed effects (with robust standard errors) for UCLA Trauma Symptoms

Fixed Effects	Full Model				Reduced Model			
	Coefficient	S.E.	<i>t</i> -ratio	<i>p</i> -value	Coefficient	S.E.	<i>t</i> -ratio	<i>p</i> -value
<b>Time 1 average</b>								
Intercept	0.48***	0.04	12.12	<0.001	0.82***	0.05	17.07	<0.001
Intervention Condition (CR)	0.17*	0.07	2.32	0.021	0.12*	0.05	2.42	0.016
Average Trauma	0.14***	0.03	5.52	<0.001	0.16***	0.02	9.41	<0.001
Female Gender	0.06	0.05	1.27	0.204				
Wealth	-0.12***	0.03	-5.11	<0.001	-0.10***	0.01	-7.28	<0.001
Social Status	0.01	0.04	0.320	0.749				
School Social Status	0.10	0.08	1.34	0.180				
School Wealth	0.14	0.18	0.73	0.466				
School Trauma	0.07	0.12	0.57	0.570				
<b>Rate of change per year</b>								
Intercept	-0.02	0.02	-0.97	0.334	-0.02	0.02	-1.41	0.161
Intervention Condition (CR)	-0.08*	0.03	-2.42	0.016	-0.07**	0.03	-2.27	0.008
Average Trauma	0.01	0.02	0.31	0.754				
Female Gender	0.01	0.02	0.22	0.829				
Wealth	0.02	0.01	1.21	0.228				
Social Status	-0.01	0.02	-0.63	0.528				
School Social Status	-0.01	0.03	-0.39	0.695				
School Wealth	0.05	0.09	0.52	0.603				
School Trauma	-0.03	0.07	-0.42	0.679				

Note: N = 343, df = 338 for full model and df = 342 for reduced model; treatment condition coded 1 = CR, 0 = comparison; Wealth coded 0-3; Social Status coded -1 to 1; gender coded 1 = female, 0 = male; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; ‡  $p < .10$ . Unstandardized coefficients are reported

### **3.5 Aim 3: Qualitative Focus Groups**

#### **3.5.1 Student Perspectives**

Almost all of the surveyed students stated that the Communities Rising program had helped them and that they enjoyed coming to the program. The students who had worsened or unimproved outcomes across the four years tended to report more family conflict in the home and difficulties with peers and family members.

One student reported that because she is a girl, her parents prefer her male sibling, and this has caused her to perform worse in school and have lower general well-being. However, she stated that the meditation components particularly of the program were helpful for her, and that she has learned to calm herself down and control her anger. The program has helped her to adjust to her father's drinking problem as well. A male student noted that he has felt worse over time as well because of his family and their drinking problems. He stated, "I don't have enough to eat. And I don't think [my family] love me as I want." This student said that the program has helped him to focus in his classes, even when he has problems in other areas of his life. He reported that he is able to control his anger and sadness and "I am proud of who I am right now."

Many students noted that the program helped them to "feel better about [themselves]". One student stated that he stopped being aggressive with other children and using bad words. A female student noted, "It has changed my anger, sadness, and self-worth. It helped me to adjust and understand better. It has helped me focus in school and respect my elders more. It has helped me communicate more with family."

One student said that she is feeling better because, "I was afraid there was no one taking care of me. After CR has come to our village, I am now feeling safe and



happy that someone is taking care of me.” The program helped her especially with reading and math, and in learning how to reach out to friends when she is sad. Students in general also reported increased focus and better behavioral control due to the CR program. For one student, CR helped her to focus more on school and improve her grades, as well as learn to control her sadness and anger and to improve relationships with other students. Overall, students mentioned that the CR program helped them to feel supported, like they were cared for, and helped them to navigate difficult home and family situations. Meditation was specifically mentioned several times as a means to cope with daily life stresses.

### **3.5.2 Parent Perspectives**

It was more difficult to engage parents in answering questions about the program, as not all parents knew the details of the CR curriculum. However, parents did seem to notice differences in their children’s behavior at home and to attribute these improvements to the CR program. Parents reported that they notice children helping out more at home and respecting elders. One mother said that her daughter learned to read and can now help her mother fill out job applications. Another parents reported that her daughter is doing well in the program and is helping out with younger siblings more at home. Respect for others, self-confidence, and improvements in academic success were positive outcomes that parents seemed to note.

One parent noted that her child seemed to feel happier since starting the program. This parent stated that “[my child] is thinking that she can achieve something with her life”.

### **3.5.3 Teacher Perspectives**

Many teachers believed that the program helped students to improve their self-confidence and to develop coping skills to help with adversity. One teacher stated that the program helps to improve student self-confidence and helped them not feel afraid of hard things in their lives. Improvements in self-confidence, social skills, and coping skills were mentioned as positive outcomes of the program. Teachers also overwhelmingly reported improvements in behavior and focus for the students.

Teachers agreed that the most beneficial aspects of the program included meditation time, circle time, academic support, “Super Kid” activities, and Speaker Circle. CR helps teachers and students build relationships that are based on mutual respect and understanding, and teachers recognized this and believed it to be important. When asked if any aspect of the program should be excluded, teachers universally responded “no”.

### **3.5.4 Challenges and Strengths of the Program**

Students and parents identified many of their favorite aspects of the program. For students, meditation and the extra academic supports were their favorite program activities. Parents identified academic support, building relationships with teachers, and friend supports activities as the most beneficial activities for their children. Other aspects of the program that were mentioned by students and parents include Circle Time and learning how to speak in front of others.

Teachers identified meditation activities and Circle Time as the most beneficial aspects of the program. Additionally, teachers often mentioned the “Super Kid” activity (where one child is the super kid each day and is given praise and support for his or her

special qualities). Teachers also identified academic supports and building better relationships with students as important aspects of the program.

Parents and students were asked to identify challenges or areas of the program which could be improved, but no parent or child identified any aspects for improvement. For the most part, teachers were also satisfied with all areas of the program. One teacher stated that resources in math and games within the program were limited and noted that it continues to be challenging to manage student behavior during the after-school program. One teacher also noted that learning technology and computers is important for the children and should be incorporated to a greater degree.

## **Chapter 4**

### **DISCUSSION**

#### **4.1 Discussion**

The findings of this study provide a baseline understanding of the challenges that are faced by children growing up in this area of Tamil Nadu, India. In this sample, less than 15% of students had access to toilets, and only around 30% had access to running water. Most students were consuming at least two hot meals a day. There is evidence of the pervasiveness of trauma experiences in childhood in a rural setting in Tamil Nadu. Of the students surveyed, the average number of traumas experienced was 1.71 and over 75% of students had experienced at least one traumatic event. These results suggest that chronic trauma is prevalent in childhood in this area and is in line with current estimates of global trauma exposure (Kazlauskas, 2017). Documentation of this data is important due to the fact that most mental health data on youth come from industrialized countries and yet 80% of the world's youth are located in LAMICs (Atilola, 2015). This data also contributes to a growing body of literature in LAMICs documenting the prevalence and comorbidities of mental health disorders and trauma (see, for example: Ribeiro, Andreoli, Ferri, Prince, & de Jesus, 2009). It is essential to gather basic descriptive data in order to best understand how prevention and intervention programs are most likely to be effective in this context, and to understand how an existing program may best address community issues. An after-school program located in the community is an effective context to gather data related to these issues and to evaluate whether such an after-school program can effectively and appropriately

address these symptoms and promote resilience skills that may help youth to better cope with the stressors in their environment.

These results also provide partial support for the success of a community-based after school resilience program in the community on child outcomes. The effectiveness of the program was demonstrated over time on children's mental health and academic outcomes in the areas of academic success, increased self-control (marginally), and decreased trauma symptoms. However, the program did not significantly impact children's school engagement, aggressive behaviors, or depressive symptoms and therefore hypotheses were only partially supported.

Overall, the children who participated in the CR program started at a higher level on academic performance (perhaps due to effects of the partial program before the full program began in 2013), and CR students also showed a significant positive difference in the rate of improvement in academic scores over time compared to the non-CR students in the reduced model. These positive intervention effects in the area of academic outcomes support the hypothesis that the CR program would have impacts on children's academic functioning over time. This finding is consistent with the literature that out-of-school time programs are effective at increasing academic outcomes for marginalized children (Knopf et al, 2015).

One potential mechanism by which these academic outcomes may be improved by the program is through (marginally) increased self-regulation and self-control among CR students due to the intervention. There is developing evidence that school-based interventions which target increased executive functioning among students can increase students' academic achievement (Jacob & Parkinson, 2015). Self-control, strongly related to self-regulation (i.e., "when I am angry, I am able to calm myself down") is a

social-emotional skill important skill to resiliency (Moore, 2013), and is linked with a host of positive learning and other later positive outcomes (De la Riva & Ryan, 2000).

Additionally, the CR program demonstrated success in decreasing children's post-traumatic stress symptoms over the course of the intervention. As expected, children with higher trauma exposures reported higher trauma symptoms at baseline. However, symptom trajectories did not differ according to trauma exposure, but were linked only to participation in the CR program. This is consistent with the theory of change for the CR program, that activities would target stress and chronic trauma and reduce trauma symptoms. Many students and teachers identified circle time (which targets social connection) and mindfulness-based activities such as meditation as most important for their successful outcomes. This is consistent with literature that suggests that school-based interventions can be successful at decreasing post-traumatic stress symptoms in children exposed to trauma and that mindfulness is one of the effective strategies for such change (Ortiz & Sibinga, 2017).

Interestingly, contrary to some research on school engagement and links to academic outcomes, this study did not support a significant increase in school engagement through the CR program. In fact, although experiences of trauma were negatively associated with starting levels of school engagement, and relative wealth was associated with positive school engagement at baseline, over time all students had a slight but significant decrease in school engagement scores. The various socio-economic, family, and social pressures on students to disengage from school in favor of money-generating activities is difficult to address in an intervention program (Ungar, Russell, & Connelly, 2014). This alarming result is an area for future exploration and also would indicate that the mechanism of change underlying the increase in academic

scores for the CR program is unlikely to be an increase in engagement in the schooling process.

Overall, children's level of depressive symptoms such as trouble falling or staying asleep and feeling sad were not improved with the intervention. Although higher levels of depressive symptoms were reported from children who experienced higher average levels of trauma, this did not significantly change across time for either group of children and was not associated with any other measured factor. Research has found that across school-based programs in the U.S. and internationally, programs are typically less effective at addressing complex psychological issues such as depressive symptoms, which can have multiple causes and links (Bonhauser et al, 2005; Mueller et al, 2011; Ungar, Russell, & Connelly, 2014). In this case, lack of positive results in this area may also be due to the particular measure used (the PHQ9 measure). While this measure has validity in the US, it is possible that the questions involving somatic symptoms (i.e, "poor appetite" and "feeling tired") overlap more with general health issues in this rural low-resource context. For instance, the above may be more linked to health issues such as intestinal parasites in this population, where the incidence of such parasites is almost 50% of the population (Kumar, Jain, & Jain, 2014).

Aggressive behaviors in the CR group also did not decrease over the course of the intervention. Although aggressive behaviors were associated at baseline with increased exposure to trauma, male gender, and relative lack of wealth, there were no significant trajectories for aggressive behaviors over the course of the four years of the study. This is a surprising finding, especially in light of increases in student-reported self-control in the CR group and decreases in post-traumatic stress symptoms that may lead to aggressive behaviors. However, the lack of findings in this area may be due to

the fact that aggressive behaviors were measured through self-report by the children. Further work, perhaps with teacher or parent-report, will be needed in this area. Aggressive behaviors may also be more stable and resistant to change without specific, targeted interventions to these behaviors. One teacher did note that a challenge of the after-school CR program was in managing student behaviors (with fewer teachers than during the school day). Perhaps specific programming targeting aggressive behaviors is needed.

These results show that overall the CR program had a positive impact in three key areas: academic success, post-traumatic stress symptoms, and self-control (marginally). Given the difficulty of effecting change on a large scale with the limited resources of the program, difficulties of the environment, and challenges of working with marginalized children, the impact of this program as well as the acceptance by the local community is an important step in understanding how programs can be developed from the bottom-up and implemented effectively. In the future, further analysis of mechanisms of change, the specific impact of academic versus psychosocial factors, and qualitative data on any additional needs held by this community would be important.

In addition to the specific outcomes of interest targeted in this study, there were several other important lessons learned from the qualitative research component of this mixed-method study that are important to incorporate into the broad picture of the success of the CR program in this context. Information gleaned from the qualitative data demonstrates that there was sufficient acceptability and tolerance of this intervention in the community, and that teachers and parents were generally pleased with how the program was implemented. The qualitative responses were also essential to add local



voices to the quantitative evidence that was gathered. Participant feedback supports the idea that a “home-grown” intervention that targets trauma symptoms, behavior symptoms, and academic outcomes can be successful with minimal resources in a LAMIC community context. This is particularly important as there is a lack of psychosocial and resilience support programs in LAMICs currently (Prince et al, 2007; Leventhal et al, 2016), and this data contributes to a growing literature that demonstrates that community- resourced and developed prevention and resilience programs can be effective.

As mental health research and implementation become more globalized, the evidence-based practices and interventions will necessarily intersect with resource availability, cultural mental health values, and practices in each local community. This problem is not unique to a LAMIC context. As we know from the literature, even within America’s multi-cultural society, there are variations in local community acceptability and uptake of interventions that are often based on local attitudes, beliefs, or practices (Jiminez et al 2012). Past research has shown that the local challenges to implementation of evidence-based practices can be a barrier to service provision and that these factors need to be acknowledged and taken into consideration when designing mental health services (Brenman, Luitel, Mall, & Jordans, 2014; Tiberi, 2016). However, the design and implementation of this program and success in promoting positive student outcomes provides support for a method of developing such programs in a way that they are efficacious, sustainable, and also acceptable to local cultural preferences.

The field of mental health particularly grapples with the complex issues of how to determine the efficacy and feasibility of lab-tested interventions once they are

disseminated and implemented in a community setting. Evaluating needs and developing programs in low-resource areas is particularly challenging. The CBPR process of this study was essential to researchers' ability to collect data with this marginalized population, and certainly was essential to the collection of accurate data. The participatory design of the project allowed researchers to design research that interested in the local community and had buy-in from key cultural informants in the community such as CR staff, principals, and important community leaders. Their endorsement of the research team and input to the design and implementation of the data collection process allowed researchers access to the community in ways that would not have been possible as cultural outsiders. The research results were also fed directly back to the community in order to support development and changes in program to benefit the community.

Additionally, the youth surveyors' participation as bilingual and bi-cultural liaisons served an important role in data collection. These youth surveyors were able to understand and support the high-level goals of the project and also to understand and facilitate the cultural logistics that were necessary to collecting accurate data. Surveys were initially intended to be given individually to student participants to complete by hand in the manner of a traditional survey, since all children were old enough to read and write in Tamil. However, community input from teachers and from youth surveyors allowed the research team to understand that despite their literacy, due to cultural norms and expectations, children would not feel comfortable understanding or completing individual surveys in this manner and the surveys would seem like "tests" (the only other analogous experience that children in this area experience for written feedback). The survey process was changed according to this cultural insight, and almost certainly

the data was more accurate for having been administered orally and supported by youth surveyors. Additionally, youth surveyors provided daily feedback on the needs and challenges of the survey implementation. Collaboration with the local community and cultural insiders in particular facilitated this project on every level and demonstrates the importance of acknowledgement and incorporation of cultural norms, values, and needs when implementing research in a cultural context different from that of the research team.

The design of the project was also participatory, and the local community was especially interested in learning about academic outcomes for children, the association between the program and academic outcomes, and the association between trauma symptoms and academic outcomes. Community interests and feedback was constantly taken into account. The outcome data was reported back to the community on an annual basis by the research team (broken down by school), with particular areas of strengths and weaknesses for that particular school highlighted. Based on this data, schools were able to adjust their curriculum or focus as desired to improve student success. This direct feedback loop to the community increased community goodwill toward the research project and data collection became an easier process each year as the community began to understand and value the work of the research team in new ways. The CBPR approach was extremely successful in this context, and there are long-lasting impacts on the local community. For instance, youth surveyors are now trained in human subjects' data collection, have had exposure to a major research project and team work on this project, and were able to practice English abilities throughout the course of four years. Additional capacity building in the form of psychoeducation, data collection, and research training was done with principals and some teachers in the community.

## 4.2 Strengths and Limitations

This study had several important strengths and limitations. Due to the nature of the data collection process, the study could only feasibly include self-report data from student participants, and researchers were not able to survey parents or teachers to include their perspectives about student symptoms and progress. Additionally, due to cultural norms and values around privacy, it is possible that children may have underreported potentially traumatic events and trauma symptomatology. However, this is a common issue with research in areas with traditional cultural values and trauma. The quasi-experimental nature of the study due to lack of randomization into the intervention and comparison group is another limitation of this study, partially addressed in post-data collection analyses. Due to the number of schools in the sample, it was also not possible to include schools as a level 3 variable, thereby accounting for differences by school. This was also partially addressed in the inclusion of school characteristics and environment in data analysis.

A major strength of this study was the Participatory Action Research (PAR) approach taken in the development, implementation, and analyses phases. The local community was involved in this research project from its inception, and the inclusion of local knowledge and expertise in every aspect of the project likely contributed to the validity of the results. The survey was conducted in Tamil and with well-educated young community members who were able to spend up to 45 minutes with each child and invest in engaging with each child to encourage the most accurate responses possible. Because the survey followed the same children over a series of four years, a trajectory of change was able to be calculated rather than an analysis of only pre-intervention and post intervention differences. In addition, the qualitative component of this study allowed researchers to better understand what aspects of the program were

successful and which were not as effective. Acceptability of the program and preferences of the local community were also taken into consideration via the qualitative data that was obtained here.

### **4.3 Conclusion and Future Directions**

Further research is needed to explore the impact of trauma specifically on children and communities in LAMICs and the interaction between this impact and the political and societal system. Additionally, understanding the factors that may contribute to a resilient outcome for children is important, and research that parses the particular traits or processes that contribute to individual-level resilience as well as the mechanisms of change in social-emotional and resilience programs are needed. These processes have begun to be investigated in certain populations such as war-zones (Karadzhov, 2015), but studies of more typical LAMIC contexts are important as well, as we know that most youth in LAMICs experience traumatic events and stressors throughout their childhood (Lund et al, 2010). Bringing evidence-based programs in low resource communities to scale in a feasible manner should also be a target of future research.

Bridging the gap between research and practice, especially in low resource contexts, has remained difficult and focus has necessarily turned to how best to facilitate adoption of best practices through partnerships and attention to contextual issues (Kilbourne, Williams, Bauer, & Arean, 2012). This study provides evidence that a cross-continent community collaboration and CBPR research approach can be both practical and efficacious in a low-resource environment. Future studies should continue to focus on and value knowledge that can be provided by the local community and the

integration of best practices from scientific literature with flexibility in implementation and evaluation.

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**Appendix**  
**IRB LETTERS**





RESEARCH OFFICE

210 HULLIHEN HALL  
UNIVERSITY OF DELAWARE  
NEWARK, DELAWARE 19716-1551  
Ph: 302/831-2136  
Fax: 302/831-2828

DATE: April 26, 2013

TO: Noel Shadowen  
FROM: University of Delaware IRB

STUDY TITLE: [438615-2] Communities Rising: Program Evaluation & Research in Tamil Nadu, India

SUBMISSION TYPE: Revision

ACTION: APPROVED  
APPROVAL DATE: April 26, 2013  
EXPIRATION DATE: April 16, 2014  
REVIEW TYPE: Full Committee Review

Thank you for your submission of Revision materials for this research study. The University of Delaware IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Full Committee Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All sponsor reporting requirements should also be followed.

Please report all NON-COMPLIANCE issues or COMPLAINTS regarding this study to this office.

Please note that all research records must be retained for a minimum of three years.

Based on the risks, this project requires Continuing Review by this office on an annual basis. Please use the appropriate renewal forms for this procedure.

If you have any questions, please contact Jody-Lynn Berg at (302) 831-1119 or [jlberg@udel.edu](mailto:jlberg@udel.edu). Please include your study title and reference number in all correspondence with this office.



RESEARCH OFFICE

210 HULLIHEN HALL  
UNIVERSITY OF DELAWARE  
NEWARK, DELAWARE 19716-1551  
Ph: 302/831-2136  
Fax: 302/831-2828

DATE: April 17, 2014

TO: Noel Shadowen  
FROM: University of Delaware IRB

STUDY TITLE: [438615-5] Communities Rising: Program Evaluation & Research in Tamil Nadu, India

SUBMISSION TYPE: Continuing Review/Progress Report

ACTION: APPROVED  
APPROVAL DATE: April 16, 2014  
EXPIRATION DATE: April 16, 2015  
REVIEW TYPE: Full Committee Review

Thank you for your submission of Continuing Review/Progress Report materials for this research study. The University of Delaware IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Full Committee Review based on the applicable federal regulation.

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Please report all NON-COMPLIANCE issues or COMPLAINTS regarding this study to this office.

Please note that all research records must be retained for a minimum of three years.

Based on the risks, this project requires Continuing Review by this office on an annual basis. Please use the appropriate renewal forms for this procedure.

If you have any questions, please contact Nicole Farnese-McFarlane at (302) 831-1119 or nicolefm@udel.edu. Please include your study title and reference number in all correspondence with this office.



RESEARCH OFFICE

210 Hullihen Hall  
University of Delaware  
Newark, Delaware 19716-1551  
Ph: 302/831-2136  
Fax: 302/831-2828

DATE: June 16, 2015

TO: Noel Shadowen  
FROM: University of Delaware IRB

STUDY TITLE: [438615-8] Communities Rising: Program Evaluation & Research in Tamil Nadu, India

SUBMISSION TYPE: Continuing Review/Progress Report

ACTION: APPROVED  
APPROVAL DATE: June 16, 2015  
EXPIRATION DATE: April 16, 2016  
REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # (9)

Thank you for your submission of Continuing Review/Progress Report materials for this research study. The University of Delaware IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

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Please note that all research records must be retained for a minimum of three years.

Based on the risks, this project requires Continuing Review by this office on an annual basis. Please use the appropriate renewal forms for this procedure.

If you have any questions, please contact Nicole Farnese-McFarlane at (302) 831-1119 or nicolefm@udel.edu. Please include your study title and reference number in all correspondence with this office.



RESEARCH OFFICE

210 HULLIHEN HALL  
UNIVERSITY OF DELAWARE  
NEWARK, DELAWARE 19716-1551  
Ph: 302/831-2136  
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DATE: April 25, 2016

TO: Noel Shadowen  
FROM: University of Delaware IRB

STUDY TITLE: [438615-10] Communities Rising: Program Evaluation & Research in Tamil Nadu, India

SUBMISSION TYPE: Continuing Review/Progress Report

ACTION: APPROVED  
APPROVAL DATE: April 25, 2016  
EXPIRATION DATE: April 16, 2017  
REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # (9)

Thank you for your submission of Continuing Review/Progress Report materials for this research study. The University of Delaware IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

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Please report all NON-COMPLIANCE issues or COMPLAINTS regarding this study to this office.

Please note that all research records must be retained for a minimum of three years.

Based on the risks, this project requires Continuing Review by this office on an annual basis. Please use the appropriate renewal forms for this procedure.

If you have any questions, please contact Nicole Farnese-McFarlane at (302) 831-1119 or nicolefm@udel.edu. Please include your study title and reference number in all correspondence with this office.





RESEARCH OFFICE

210 Hullihen Hall  
University of Delaware  
Newark, Delaware 19716-1551  
Ph: 302/831-2136  
Fax: 302/831-2828

DATE: April 20, 2017

TO: Noel Shadowen  
FROM: University of Delaware IRB

STUDY TITLE: [438615-12] Communities Rising: Program Evaluation & Research in Tamil Nadu, India

SUBMISSION TYPE: Continuing Review/Progress Report

ACTION: APPROVED  
APPROVAL DATE: April 20, 2017  
EXPIRATION DATE: April 16, 2017  
REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # (9)

Thank you for your submission of Continuing Review/Progress Report materials for this research study. The University of Delaware IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

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Based on the risks, this project requires Continuing Review by this office on an annual basis. Please use the appropriate renewal forms for this procedure.

If you have any questions, please contact Nicole Farnese-McFarlane at (302) 831-1119 or nicolefm@udel.edu. Please include your study title and reference number in all correspondence with this office.



RESEARCH OFFICE

210 Hullihen Hall  
University of Delaware  
Newark, Delaware 19716-1551  
Ph: 302/831-2136  
Fax: 302/831-2828

DATE: April 12, 2018

TO: Noel Shadowen  
FROM: University of Delaware IRB

STUDY TITLE: [438615-13] Communities Rising: Program Evaluation & Research in Tamil Nadu, India

SUBMISSION TYPE: Continuing Review/Progress Report

ACTION: APPROVED  
APPROVAL DATE: April 12, 2018  
EXPIRATION DATE: April 16, 2019  
REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # (9)

Thank you for your submission of Continuing Review/Progress Report materials for this research study. The University of Delaware IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

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