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Longitudinal effects of Youth Empowerment Solutions: Preventing youth aggression and increasing prosocial behavior

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Abstract

Youth violence remains a significant public health problem despite efforts to address it. We describe the evaluation results of Youth Empowerment Solutions (YES), an after-school active learning program implemented by trained local teachers and designed to engage middle school youth in multi-systematic promotive behaviors at the individual-, interpersonal-, and community-level to make lasting positive changes within the context of institutional disadvantages, such as racism. First, we used a modified randomized controlled trial design to examine the direct and indirect influence of YES on prosocial and delinquent behaviors 12 months after the conclusion of the program, through youth empowerment. Next, we evaluated these models by race, to determine if the intervention equitably promotes prosocial outcomes and decreases aggressive behaviors. Among 329 middle school students, YES participation enhanced prosocial behaviors through empowerment, and directly reduced aggressive behaviors a year after the conclusion of the program. This trend was particularly pronounced for African American youth. These effects were found after controlling for age, sex, and behavioral outcomes at baseline, and across different schools and teachers, suggesting that YES can also be sustainable and readily implemented by communities. The implications of the results for youth violence prevention, empowerment theory and intervention development and practice for ethnic minority youth who face structural disenfranchisement are discussed.

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ETHICS STATEMENT

The National Institute of Health reviewed study protocol and issued a Certificate of Confidentiality, CC_HD_11-23 and subsequent renewal to further protect research participants.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

Keywords

adolescent; African American; community development; empowerment; resiliency; violence prevention

BACKGROUND

Adolescence represents an important developmental period that is characterized by increased autonomy particularly in the creation, maintenance, and management of interpersonal relationships (Collins & Steinberg, 2007). While providing opportunities for healthy interactions, interactions that are negative in nature also occur during adolescence. Approximately one in four high school youth reported being in a physical fight, 19% reported being bullied in school, and 16% reported being bullied on social media (Tibbs et al., 2017; Youth Violence Data and Statistics, 2018). Youth also have access to weapons, with 16% of youth reporting weapon carriage, and 5% reported carrying a firearm on one or more days a month (Youth Violence Data and Statistics, 2018). Exposure to violence during adolescence has short and long-term psychological (e.g., depressive symptoms), social (e.g., socioemotional adjustment), developmental (e.g., impulse control), and behavioral (internalizing, externalizing) consequences (Eisman et al., 2015; Hardaway et al., 2012; Monahan et al., 2015), which are particularly pronounced for youth facing systemic disadvantages (Smith & Patton, 2016). Efforts to help youth avoid antecedents to serious violent behaviors such as aggressive behavior may be vital to help address youth violence and improve positive developmental outcomes.

Adverse outcomes related to exposure to youth violence can be compounded by contextual factors. Racial minority youth are disproportionately more likely to be exposed to violence than non-Hispanic White youth (Paxton et al., 2004; Voisin et al., 2017). Homicide, for instance, is the leading cause of death for African Americans males from ages 1 to 19 and the second leading cause of death for African American females from ages 1 to 19, but the fourth and fifth cause for White males and females, respectively (CDC, 2019). African American youth are also more likely to report physical assaults, school fights, and weapon carriage than non-Hispanic White youth (Youth Violence Data and Statistics, 2018). These data, however, fail to capture that African American youth in the United States have and continue to face structural racism, segregation, and disenfranchisement at the individual-, community-, and national levels (McCrea et al., 2019). Therefore, it may be vital to contextualize evaluations and investigate if interventions differentially serve youth who face structural inequities and racism. Evaluation of preventive interventions may be enhanced by considering the differential effects of the program for African American versus white youth instead of simply controlling for race. Additionally, programs that acknowledge structural factors that differentially impact youth based on social constructs such as race may be critical to serving youth who are at greater vulnerability due to the structural inequalities.

In addition, African American youth may not have as many opportunities to experience affirmation of their identity and history that may result from default experiences as a result of white privilege. Yet, researchers found that racial identity mediated the relationship

between natural mentors and educational attainment among African American youth (Hurd et al., 2012). Caldwell et al. (2004) found that racial identity moderated the negative effects of racial discrimination on violent behavior. These studies and others finding positive effects of racial identity for African American youth (R. E. Anderson et al., 2020; Caldwell et al., 2004; Rivas-Drake et al., 2014; Sellers et al., 2003) suggest that efforts to enhance racial identity may have salutary effects for African American youths' positive development. It is also possible that African American youth do not get as many opportunities to develop and practice leadership skills and work with adults on community change as their white counterparts (McCrea et al., 2019). Thus, programs that include both elements of positive racial identity development with leadership development may be more beneficial for African American youth and be important for their wellbeing and behavioral outcomes. Given these findings, we might expect a violence prevention program to have somewhat differential effects for white versus African American youth if it includes efforts to raise awareness about African American history and includes efforts to promote African American youths' ethnic pride (and white youths' appreciation for African American cultural history).

The negative consequences of violence also disproportionately affect youth living in economically challenged communities. Moreover, owing to the long-standing legacy of structural racism in the United States, the frequency and consequences of violence exposure are pronounced among racial minority youth (Garvin et al., 2013; Kann et al., 2014). This is particularly problematic for postindustrial cities, where following an immense period of population and infrastructure growth driven by industrialization, mass exodus due to the decline of industrial production results in a small population which remains in a city which has a large amount of (often empty) infrastructure (Thulin & Zimmerman, 2021). A shrinking population negatively implicates community and social development, decreases the taxation base, and results in less funding for social services including schools, police departments, and public health offices (M. W. Anderson, 2012). For residents of economically challenged cities such as Flint, Michigan, the result is a population facing lower rates of health insurance, higher morbidity and mortality, greater density of abandoned buildings, and a growth in illegal activity and social disorder resulting in Flint being rated as having one of the greatest crime rates per capital in the United States (Browning & Erickson, 2009; FBI Uniform Crime Reports Table 8 Michigan, 2016; Klein & McCarthy, 2010; Sampson & Jeffrey, 2004; Sampson et al., 1997). African American youth, relative to White youth, in these contexts disproportionately contend with more social health determinants—such as worsening schools, increased risk of exposure to violent crime, food deserts, fewer physically safe outdoor spaces, and racism-related stressors. These racial disparities in social health determinants, in turn, can result in greater risk of home foreclosure, parental incarceration, and familial drug and alcohol use, all of which compound to increase risk for violence exposure and use for African American youth. These risks which reflect structural inequality present a truly different context for African American youth to grow up in as compared with their White counterparts and uniquely increase risk for African American youth.

Applying a developmental lens to violence prevention strategies helps us focus on reducing risk by building youth assets and resources that can both prevent negative behaviors and enhance positive behaviors (Fergus & Zimmerman, 2005). Researchers have become

increasingly interested in identifying and enhancing positive (promotive) factors to reduce violence and negative outcomes related to violence exposure (Harden et al., 2015; Heinze et al., 2016). Assets such as self-esteem, supportive adult relationships, and community engagement can reduce risk of negative outcomes such as violence, and may be particularly important for youth in contexts with limited access to or resources for programs that promote positive youth development (O'Connell et al., 2009; Zimmerman et al., 2018). In addition, a developmental orientation to violence prevention may also consider how interventions can promote positive behaviors such as prosocial involvement and not simply prevent negative behaviors like aggression or violence. Implementing preventive strategies in pre-adolescence (e.g., around age 12) may be particularly helpful given that this is the age when youth begin to engage more autonomously in interpersonal relationships, engage independently within their community, and have the cognitive ability to take on more leadership within these social relationships (Collins & Steinberg, 2007).

Empowerment Theory applied to youth development helps to focus attention on enhancing promotive factors and positive youth development by involving youth in planning and implementing community development projects which will help them gain vital skills, responsibilities, and confidence at the individual- and interpersonal-level which are necessary for positive youth development (Zimmerman, 2000). These skills and responsibilities can help youth make choices to avoid negative influences and problem behaviors and improve engagement in positive behaviors like academic performance and community projects, which help youth learn skills to become leaders (Wilson et al., 2010). Empowerment Theory has been applied to the prevention of youth violence (Eisman et al., 2017; Reischl et al., 2011), and has been of particular interest for programs working with minority youth including African American and Hispanic/Latino youth.

At the individual-level, evaluations of empowerment-based interventions indicate that engaging youth in community improvement activities can reduce violent behaviors and other violence-related psychosocial outcomes (Flay et al., 2004; Nikitopoulos et al., 2009). At the interpersonal- and community-levels, researchers suggest that youth can be engaged in a range of community improvement activities (e.g., public art projects, developing community gardens, creating social service activities, and community beautification projects) with positive outcomes for both the youth and community (Duckett et al., 2010; Miao et al., 2011). Empowering youth to address violence through engaging in community improvement activities at this critical developmental period (i.e., middle school years) may enable them to think critically about their own lives, the context, and systems in which they and their families live, and make choices to avoid problem behaviors as they face risk factors for negative outcomes in their school and community (e.g., negative peer behaviors, witnessing violence). This type of engagement may be particularly important for youth who are disproportionately affected by disparities which are directly influenced by systemic disenfranchisement and racism. It may be that programs which promote individual-behaviors while simultaneously enhancing interpersonal- and community-level engagement skills will help youth not only avoid perpetrating violence, but may promote youth to become leaders of change in their communities.

Although evaluations of Empowerment Theory exist, few researchers have tested the mechanism by which empowerment may effect outcomes over a longer period of time beyond immediate effects in real-world contexts (e.g., Eisman et al., 2015). In addition, few researchers have evaluated efficacy of violence prevention programs derived from Empowerment Theory for African American youth. We expand on existing studies of Youth Empowerment Solutions (YES), a curriculum based on Empowerment Theory which engages youth at the individual-, interpersonal- and community-levels through leadership development and community improvement (Zimmerman et al., 2011). Zimmerman (2000) suggests that Empowerment Theory includes processes and outcomes. Empowering processes at the individual level (i.e., psychological empowerment; PE) include focusing on activities that help youth develop the confidence in themselves to be effective change agents, developing the skills to think critically about resources needed to make positive change in their community, and taking action to be positive change agents in their community (Zimmerman & Eisman, 2017). The YES curriculum includes active learning lessons designed to help youth build a sense of efficacy and leaderships confidence, help youth critically consider the local resources and adult roles necessary to implement their change project, and help them plan and implement change projects they design (Zimmerman et al., 2011).

Though found to be efficacious in the short term (Zimmerman et al., 2018), the present study examines the sustainability of the program effects 1-year post-program exposure and on program efficacy for African American youth compared with White peers. We hypothesized that youth receiving the YES intervention would demonstrate lower levels of aggression and higher levels of prosocial behavior compared to youth in control schools 12 months post-program. We also expected that PE would mediate the effects of the YES program. Finally, we anticipate that the intervention will have similar if not more substantial effects for African American youth compared to white youth, given the program includes attention to Black ethnic identity, leadership behaviors with adults in community change projects, and directly addresses the structural history of slavery and disenfranchisement of Blacks in the United States.

METHODS

Sample

Youth were recruited from the after-school program in participating schools each year at the beginning of the school year (after parent consent as noted below). All youth who signed up for the after-school program in their school were eligible to participate in the study and those with parental consent and who themselves assented to be in the study were then randomly assigned to YES activities or the usual after school activities. Local after-school staff implemented the YES program annually over a 5-year period with a total of 33 program cohorts from 15 schools. Because of district-wide school consolidations, not every school participated every year. The research team recruited 418 students ($M = 12.6$ years, $SD = 0.96$ years; 60.4% female) at middle schools in Flint, MI, and Genesee County school districts. Of the original sample, participants were 45.2% African American, 18.2% biracial, 34.0% white, and 2.6% of youth reported another race.

Participants completed surveys at the start of the program (baseline, Time 1; T1), at the end of the program (Time 2; T2), and approximately 12 months after baseline (Time 3; T3). Of the 418 in the initial sample, 337 youth had data at all three time points. We restricted the sample to African American/biracial ($n = 210$) and White youth ($n = 119$), which resulted in the exclusion of eight youth identifying as another race. Our final analysis sample of 329 youth ($M = 12.6$ years, $SD = 0.96$ years; 59.6% female) included 237 students in the YES condition ($n = 145$ girls, 61.2%) and 92 students in the usual care control condition because enrollment in after-school programming varied across schools and years. We found no differences in demographic variables for the 329 participants retained for analysis as compared with the full sample.

Procedures

Fifteen schools from Genesee County, Michigan, participated in YES programming between 2012 and 2016, with schools participating in an average of two years (range 1–4, mean = 1.8 years, $SD = 1.08$ years). Youth were recruited within schools. Informed parental consent and participant assent was obtained from all study participants before participation, and parents were mailed copies of both signed consent forms. The University of Michigan Institutional Review Board reviewed and approved all study procedures, and the Data Safety and Monitoring Plan, HUM00037952. All procedures were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The University of Michigan's PEERRS program certified all study team members in ethics and responsible research.

Although our original plan was to randomly assign youth within an after-school program to either YES or usual afterschool activities, due to constraints related to school-based implementation as described below we created a modified random assignment plan. Those assigned to YES would receive the program two afternoons each week for the duration of the program (~15 weeks). Youth would receive usual care during the other two days of after-school programming. Youth assigned to the control condition only received usual care for all four after-school days (no after-school programming was offered on Fridays for either group). When schools had after-school cohorts of eleven or more students, students were randomly assigned to either YES programming ($n = 165$) or regular after-school programming ($n = 117$). For cohorts of fewer than five students, all students participated in the usual after-school programming and cohorts of five to 11 students were all enrolled into YES programming. In addition, four after-school cohorts that included three to five students were all enrolled into YES programming because they had no other after-school programming. Finally, some youth in the control condition did attend the YES program in their school when a teacher invited them to participate because we ended up with too few youth in the usual care condition (see Methods for how we assessed participant exposure to YES).

For this study, we focused on empowerment assessed at T2 and program outcomes assessed at T3 while controlling for demographic and behavioral outcomes at T1. Participants completed the T3 assessment 120 to 301 days after completing the after-school or YES program (median = 195 days; mean = 199.5 days, standard deviation = 34.6 days). The

range of the T2 to T3 period was due to the time to locate students (sometimes overlapping with summer break) and the inconsistent end period of the programming across schools.

YES curriculum description

YES is designed to build youth leadership skills, increase familiarity and ability to work with peers and adults, develop critical thinking skills, and plan and implement community change projects. It is an active learning curriculum informed by empowerment theory and guided by principles of positive youth development (Lerner, 2005). The goals of YES are to provide youth with opportunities for meaningful involvement in preventing youth violence and creating community change to make positive changes in their communities while acknowledging historical and contemporary structural inequity (Thulin & Zimmerman, 2021). YES helps youth develop the critical thinking skills they need to assess their community, and it gives them decision-making power in developing and implementing their community change projects. Program activities include sessions on developing leadership skills, community pride, program planning, resource mobilization, and implementing their community change projects. The curriculum also includes working with adults to implement their projects. The YES curriculum is organized around six themed units: (1) Youth as Leaders; (2) Learning about Our Community; (3) Improving Our Community; (4) Building Intergenerational Partnerships; (5) Planning for Change; and (6) Action and Reflection. The curriculum also includes sessions that focus on African American culture and pride. These sessions included learning about African history and the slave trade, African-Americans' contributions to American life (e.g., the role of Martin Luther King Jr.), and activities such as making and discussing African Masks. The program includes 30 90-min sessions, that are carried out twice a week over 15 weeks.

Measures

Independent variable: YES program participation—As some youth assigned to receive usual after school care received YES (on days when small numbers of students were in the usual after-school care, some teachers included them in YES programming), we determined program participation by asking youth about their exposure to YES program activities (dose received) at the end of the program (T2). The youth reported if they participated in any YES program activities, which we dichotomized as (A) no activities received (coded as 0; $n = 109$) or as (B) participation in any YES activities (coded as 1; $n = 279$). Over a third of the participants (34.7%) reported exposure contrary to their initial group assignment; of these, 78 were assigned to usual program control, but reported YES activities; 67 were assigned to the YES program but reported no YES activities, and 30 students were missing data on dose received. We used dose received because their original randomly assigned condition was not always followed due to contextual challenges. Teachers, for example, allowed students in the usual care condition to participate in the YES group one some days if too few youths were in the usual care after school condition. Thus, some youth in the control condition were present occasionally for YES activities although this was not systematic (i.e., they did not receive all aspects of any single lesson) nor did they engage in the culminating community project. Dose received was a more accurate assessment of exposure as students in both conditions may have been exposed to parts of

the YES program, but program youth received more of the YES curriculum and in a more systematic fashion than youth from the usual care condition who attended only occasionally.

Mediating variable: Youth empowerment (T2)—As previously reported, the YES program activities were designed to enhance the intrapersonal, interactional, and behavioral components of PE. As reported in a prior study (Eisman et al., 2016), confirmatory factor analysis was used to assess the proposed composition of PE, and found it to include three empowerment components—interpersonal empowerment, interactional empowerment, and behavioral empowerment—that all loaded on a single common second-order factor.

Intrapersonal component—We measured the intrapersonal component by assessing youth's leadership, civic efficacy, and level of self-esteem. We evaluated leadership efficacy using three, 5-point Likert items adapted from Zimmerman and Zahniser (1991) ($\alpha = .66$). This included items such as "I am good at leading groups." We assessed perceived civic efficacy using three, 5-point Likert items such as "I can be involved to change my community" ($\alpha = .76$). We assessed self-esteem using six, 5-point Likert items from the Rosenberg Self-Esteem scale (Rosenberg, 1965) ($\alpha = .73$). Items included "I take a positive attitude toward myself." A standardized score for each of the components was calculated, and summed for a cumulative score to represent intrapersonal empowerment at T2.

Interactional component—The interactional component included assessing adult mentorship, access to adult resources, and resource mobilization. We assessed adult mentorship with five items. Youth were asked to identify an adult in their life who was over 25 years of age (who was not a parent) who they could go to for advice. The youth were then asked to use a 5-point Likert ranging from 1 (*once a year or less*), to 5 (*every day*) to indicate how often the adult helped them with a given item, such as "listens to you when you need to talk about things that are important" (Vinokur & Van Ryn, 1993; $\alpha = .84$). We assessed adult resources by asking how many adults ranging from 1 (*none*) to 5 (*four or more*) were available to help solve a problem in their neighborhood, school, and city ($\alpha = .70$). We measured resource mobilization with four 5-point Likert items (e.g., "I can find things in my community to help make my community better"; $\alpha = .70$). A standardized score for each of the components was calculated, and summed for a cumulative score to represent interactional empowerment at T2.

Behavioral component—We measured the behavioral empowerment component by assessing leadership behavior, community engagement, and school engagement. We measured leadership behavior using three 5-point Likert items (Zimmerman & Zahniser, 1991; $\alpha = .77$). Community engagement and school engagement were adapted from the California Healthy Kids Survey (California Healthy Kids Survey, 2004). We measured community engagement with four 5-point Likert items such as "I actively participate in my neighborhoods activities" ($\alpha = .83$) and school engagement with four 5-point Likert items such as "I do volunteer activities to help my school" ($\alpha = .78$). A standardized score for each of the components was calculated, and summed for a cumulative score to represent behavioral empowerment at T2.

Dependent variables

Youth aggressive behavior (T3)—We assessed youth aggression with ten frequency items over the last 30 days with five response categories (0, 1, 2, 3, 4+). The items included verbal and physical aggressive behaviors (e.g., yelling at a teacher, hitting someone, or spreading rumors about another child). A factor analysis indicated that all the aggression items loaded on one factor (based on factor-loadings & scree plot). The T3 Cronbach's α was .84.

Youth prosocial behavior (T3)—We assessed youth prosocial behavior using five 5-point Likert items ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) adapted from Goodman (2001), examining positive interactions youth may have with other people in their lives. The Cronbach α at T3 was .72. Sample items of this measure include “I try to be nice to other people,” “I often offer to help others,” and “I usually share with others.”

Control variables

Youth aggressive behaviors (T1)—Models with aggression as the outcome controlled for aggression at baseline (T1). Aggression was measured the same way at both time points. The T1 Cronbach α was .88.

Youth prosocial behaviors (T1)—Models with prosocial behaviors as the outcome controlled for prosocial behaviors at baseline (T1). Prosocial behavior was measured the same way at both time points. The T1 Cronbach α was .80.

Program period (T1 to T2)—Schools implemented the YES program in accordance with their activity schedules. In some cases, programs were conducted across an entire year, and in other cases across several months. To control for differences in duration of program and data collection follow up, we created a variable to control for the period between baseline (T1) and at the end of the program (T2; mean = 153.05 days, SD = 39.51 days).

Survey period (T1 to T3)—In addition to accounting for program variations, we created a variable to control for the period between the start of the program and the T3 data collection date (mean = 352.18 days, SD = 49.42 days).

Demographic variables—Demographic variables included self-reported sex, race/ethnicity, and age. Sex was evaluated through a dichotomous variable, by asking youth if they identified as “male” (1) or “female” (0). We operationalized race/ethnicity as a dichotomous variable to represent African American/biracial ($n = 150$, 44.5%) and White ($n = 187$, 55.5%) to simplify analyses. Age was calculated using year and month of birth. All demographic variables were collected at T1. Analyses also controlled for clustering by school and cohort.

Implementation fidelity

Several strategies the study used to ensure and monitor program implementation fidelity have been reported on previously (Morrel-Samuels et al., 2018). Research staff provided and recorded attendance for a daylong training to YES teachers (schoolteachers, counselors,

and school support staff) before YES implementation. Research staff also collected dose offered and dose received, participant attendance and participant process evaluation data and conducted fidelity observations to ensure fidelity to the YES curriculum and research design. Observation and teacher reports of program activities were used to monitor implementation. Sessions were randomly selected for research staff observation. These fidelity observers were trained by senior study team members, and their first observation was overseen directly by a senior team member and inter-rater reliability was utilized to ensure efficacious observation. Fidelity results have been previously reported elsewhere with the conclusion that the content of the program and the teacher process for giving control to youth was implemented as intended (Morrel-Samuels et al., 2018).

Analytic approach

We used structural equation modeling (SEM) to test our conceptual model of how YES influences prosocial behavior and aggression (see Figure 1). All study analyses were conducted in Mplus 8.2 (Muthén & Muthén, 2018) and missing data were handled using Full Information Maximum Likelihood (FIML). The fit of our structural models to the data were considered adequate if the RMSEA value was less than or equal to 0.06, CFI value is greater than or equal to 0.90, and SRMR is less than or equal to 0.05 (Kline, 2016).

First, we examined descriptive statistics and intercorrelations between study variables. To account for nesting by school, we evaluated intra-class correlations (ICCs) for our dependent variables and applied an ad-hoc, robust sandwich estimator to compute standard errors and chi-square tests that accounts for non-independent observations (Muthen & Satorra, 1995). Next, we evaluated the measurement model of latent constructs for both models (i.e., empowerment at T2 and prosocial behavior at T3; empowerment at T2 and aggressive behavior at T3). After estimating measurement models, we fit structural models to test the hypothesis that the effects of YES on prosocial behavior and delinquency are mediated by empowerment and report on direct effects of YES on both outcomes. We hypothesized that YES will be indirectly associated with more prosocial behavior and fewer delinquency behaviors at T3. Moreover, we hypothesized that empowerment at T2 will mediate the influence of YES on future delinquency and prosocial behaviors. Finally, given that the YES curriculum focuses on a multicultural framework and African American history we examined the effects of race as a grouping variable on the structural mediation models to examine the effects of exposure to YES (T1) and prosocial behavior (T3) through empowerment (T2) within racial group.

RESULTS

Descriptive statistics

Descriptive statistics for empowerment, prosocial, and aggressive behavior are presented in Table 1. Outcomes were descriptively compared by group, and skewness and variance by condition are similar by intervention and control group, and we found no outliers in either group. We also found no differences in missingness when we compared the intervention and control groups, with 14.7% ($n = 16$) of those in the control group being missing as compared with 12.5% ($n = 35$) of those in the intervention group ($X^2 = 0.313$, $df = 1$, $p = .576$).

Finally, we used scatter plots to visually examine bivariate outliers within and between the intervention and control groups, and within and between racial groups, and identified no outliers that would bias our results.

Measurement models

The measurement model of empowerment at time 2 and prosocial behaviors at time 3 was good and consistent with past studies (i.e., $\chi^2(19) = 22.079$, RMSEA = 0.02, CFI = 0.996, SRMR = 0.026). For the empowerment (T2) and aggressive behavior (T3) model, the initial model was slightly outside of the fit statistic range (i.e., $\chi^2(64) = 180.053$, RMSEA = 0.067, CFI = 0.919, SRMR = 0.047). The modifications of correlating residual covariance between two pairs of items were incorporated (i.e., $\chi^2 -40.0$), resulting in an adequate fitting model (i.e., $\chi^2(62) = 140.993$, RMSEA = 0.057, CFI = 0.945, SRMR = 0.043). The two pairs of items were “yelling at other kids” and “completely ignoring someone,” and “hitting/punching someone” and “pushing/shoving someone”.

Effects of YES on prosocial behaviors through empowerment

In the structural mediation model for prosocial outcomes at T3, significant total and indirect effects were observed from the YES intervention to prosocial behaviors through empowerment (Figure 2). The structural model fit the data well (i.e., $\chi^2(69) = 85.33$, RMSEA = 0.027; CFI = 0.979 SRMR = 0.035). The total model was significant ($b = 0.114$, SE = 0.044), with a positive association between exposure to YES and higher prosocial behavior. Though the direct effect of YES on prosocial behavior 12 months later was not significant ($b = 0.061$, SE = 0.041, $p = .141$), the indirect pathway through PE at T2 was significant ($b = 0.053$, SE = 0.018). Among covariates, baseline prosocial behavior was associated with prosocial behavior at T3 ($b = 0.209$, SE = 0.063). Age and sex were not significant, but time between T1 and T3 was predictive of prosocial behavior ($b = 0.001$, SE = 0.000) although the effect size is very small (i.e., due to the granularity of using days as unit of measurement, with a one day increase being associated with a small increase in prosocial behavior). Thus, YES increased feelings of prosocial behavior for White and African American youth, and does not appear to be influenced by sex.

Effects of YES on aggressive behaviors through empowerment

After fitting the measurement model, we assessed the structural models to examine the direct effect of YES on aggressive behaviors and the indirect effect of YES on aggressive behaviors through empowerment. Our structural model demonstrated satisfactory fit to the data (i.e., $\chi^2(152) = 220.557$, RMSEA = 0.037; CFI = 0.946; SRMR = 0.045). The total model was significant ($b = -0.212$, SE = 0.099) and the direction was as expected. The indirect effect was small and insignificant ($b = -0.006$, SE = 0.036, $p = .860$); rather, the majority of the variance is accounted by the direct pathway ($b = -0.206$, SE = 0.119) and is approaching significance for a two-tailed test ($p = .082$), but this is significant for a one-tailed test which was our hypothesis (Figure 2). Among covariates, aggressive behaviors at T1 ($b = 0.265$, SE = 0.073), being female ($b = 0.173$, SE = 0.083), and being African American (0.305, SE = 0.091) were associated with higher aggressive behaviors at T3, while time between baseline (T1) and 12-month follow up (T3) was inversely predictive but had a

very small effect size ($b = -0.002$, $SE = 0.001$). Thus, YES directly reduced aggression at the 1-year follow-up, but was less effective for youth who identified as female.

Evaluating differential effects by race of YES on prosocial behaviors

In the model examining the effects of YES on prosocial behaviors 12 months later by race group, the fit of the model was reasonable (i.e., $\chi^2(138) = 177.011$, $RMSEA = 0.041$; $CFI = 0.953$; $SRMR = 0.056$). The total model ($b = 0.112$, $SE = 0.079$) and direct pathway ($b = 0.071$, $SE = 0.068$) effects were not predictive of prosocial behaviors of White youth, although the indirect pathway approached significance ($b = 0.051$, $SE = 0.027$, $p = .059$). For White youth, the covariate that predicted prosocial behavior at T3 was prosocial behavior at T1 ($b = 0.313$, $SE = 0.094$, $p = .001$). For African American youth, the total model ($b = 0.128$, $SE = 0.049$, $p = .009$) and indirect pathway ($b = 0.057$, $SE = 0.025$, $p = .023$) were both significant, while the direct pathway was not ($b = 0.071$, $SE = 0.048$, $p = .138$). Prosocial behavior at T1 was the only covariate to predict prosocial behavior at T3 for African American youth ($b = 0.365$, $SE = 0.245$, $p = .005$). Yet, direct comparison of the models by race indicated they were not significantly different from one another in the direct pathway predicting prosocial behavior (Wald $\chi^2(1) = 0.079$, $p = .778$) nor in the indirect pathway (Wald $\chi^2(1) = 0.025$, $p = .874$). Thus, YES increased feelings of prosocial behavior by increasing empowerment for White and African American youth. Feelings of empowerment increased by over one-tenth of a point for both sexes. Roughly 50% of the increase of prosocial behavior is due to increase in empowerment. Though the magnitude of the effect size is relatively small, in accordance to Abelson's paradox, small effects may have important practical meaning in an individual's life (Abelson, 1985).

Evaluating differential effects by race of YES on aggressive behaviors

In the model examining the effects of YES on aggressive behaviors 12 months later by race group, the fit of the model was slightly worse than desired (i.e., $\chi^2(304) = 512.296$, $RMSEA = 0.065$; $CFI = 0.829$; $SRMR = 0.079$). Given the fit of the measurement model and structural model, however, we made no further modifications of the model. The total, direct and indirect model was not predictive of aggressive behaviors of White youth. For White youth, the covariate that predicted aggression at T3 was aggression at T1 ($b = 0.110$, $SE = 0.055$, $p = .44$). For African American youth, the total model was significant ($b = -0.386$, $SE = 0.122$, $p = .002$). The model was mostly explained by the direct pathway from intervention exposure to aggressive behaviors ($b = -0.368$, $SE = 0.149$, $p = .013$). Formal comparison of the models indicated that the models were significantly different in the direct pathway (Wald $\chi^2(1) = 7.608$, $p = .006$). The indirect pathway through empowerment was not significant ($b = -0.018$, $SE = 0.053$), and the models comparing Black and White were not significantly different (Wald $\chi^2(1) = 0.414$, $p = .520$). Other covariates that predicted aggressive behaviors at T3 for African American youth were aggressive behaviors at T1 ($b = 0.297$, $SE = 0.074$), being female ($b = 0.240$, $SE = 0.094$); duration between T1 and T3 was inversely predictive of aggression, although the coefficient size is small ($b = -0.003$, $SE = 0.001$, $p = .005$). Thus, YES was efficacious for directly decreasing aggressive behaviors in African American youth and particularly for male African American youth, but not for White youth. Intervention exposure decreased aggression by almost half an aggressive event for African American youth.

DISCUSSION

Our findings support that the YES intervention has long-term influence on prosocial and aggressive behaviors, particularly for African American youth, though some sex differences exist. We found that youth who demonstrated that they have become empowered through the program were more likely to engage in increased prosocial behavior at 1-year follow-up than those who did not develop a sense of PE. The results provide evidence that the YES curriculum can have lasting effects for positive development for middle school youth. YES may be particularly useful for positive youth development for African American youth as evidenced by our finding that the program had a direct effect on aggressive behaviors one year later for African American youth (and particularly males) but no direct effect for White youth. Similarly, the indirect effects of YES on prosocial behaviors one year later (mediated by empowerment) were found for African American youth, and were approaching significance for white youth though the difference between models was not significant. Thus, our results support our hypothesis that YES may be somewhat more effective for empowering African American youth compared to their white counterparts.

We found that YES was effective for both increasing prosocial behaviors and decreasing aggressive behaviors one year later. Our hypothesis that empowerment would mediate the relationship between YES and the given 1-year outcome, however, was true only for prosocial behaviors. Though YES was directly influential on aggressive behaviors, our results suggest that empowerment did not mediate the path regardless of race. As YES was designed to develop skills to enable youth to be proactive change agents, it may be more effective in enhance positive behaviors than reduce negative behaviors. The empowerment measures are more closely aligned with positive behaviors and increase the likelihood that they may mediate the effects of the curriculum. The association of the empowerment measures with negative behaviors is more distal and so may not have the same mediating effects as in the positive behavior path. The distal effects may also help explain why empowerment changed subtly for both sexes, and why the indirect pathway between YES and prosocial behaviors is smaller than the direct pathway. While empowerment is an important partial mediator between exposure to YES and prosocial behaviors, our results suggest potential alternative explanations. It may be, for example, that increased ability to engage with adults on community improvement projects in one's neighborhood has long-term implications on other relationships and spaces, such as peer relationships and school or work settings. These long term implications may not be captured through our measures of empowerment outcomes which are focused on types of behaviors that YES directly engages (e.g., community projects in one's neighborhood). Future studies evaluating a wider set of networks that youth engage in could be helpful in understanding the long-term effects of YES. This may be particularly important given that as youth get older they have more autonomy in their interpersonal interactions (Collins & Steinberg, 2007).

Our results suggest that the YES curriculum was particularly beneficial for the African American youth in our sample. Given the location of our study of Flint, Michigan, the different results by race may be a result of deleterious policies that differentially effect African American youth compared to their white counterparts. Like other rust belt cities where policies outside the youths' control such as redlining and deindustrialization resulted

in population decline and substantial infrastructure decay including a shrinking tax-base to support schools (Thulin & Zimmerman, 2021). In addition, African American youth face a myriad of stressors due to historic and structural racism and disenfranchisement (McCrea et al., 2019) and may gain more from programs that focus on community engagement, leadership skill development, and programs that acknowledge and engage with historic and contemporary structural racism than white youth. As suggested by McCrea et al. (2019), we found that an intervention like YES designed to enhance individual-level assets such as youth's leadership and civic engagement and skills, and to work with adults on community improvement projects can help promote positive youth development. Notably, the YES curriculum also engages youth with African American identity development through lessons that affirm their culture and history may be particularly important for African American youth and further explain the race differences we found. In the context of the United States where African American youth may experience structural racism in various ways, providing them with positive messages about their heritage and historical disenfranchisement may help them feel empowered to make positive changes in their community and to engage in more positive and less problem behaviors. The curriculum provides opportunities, where there may be few, for youth to be involved in efforts to improve their community and have successes that they can point to as their own (i.e., their community project). Thus, our results suggest that creating structured opportunities guided by empowerment processes for youth to lead and develop confidence in themselves think critically about their community and work with others, and become involved in community change efforts may be especially important for African American youth who live in economically challenged contexts resulting from policies that have disadvantaged African Americans for generations.

The results of our study may be especially notable because the intervention was designed and implemented in the context of real after-school programming with local trained teachers. Most evidence-based interventions are tested in more tightly structured conditions with research associates implementing the program. Yet, as researchers have noted, tests of programs in these conditions may not translate well as they are rolled out in community settings with local community members as teachers (Onken et al., 2014). Intervention efficacy-trials that are delivered by social scientists in highly controlled situations often fail to translate to community contexts due to real-world contextual challenges and constraints (G. M. Curran et al., 2012; Onken et al., 2014) such as those teachers and school staff face daily; this is particularly important in counties with less financial means for educational services. We found effects 1-year postintervention in after-school programs taught by trained local teachers suggesting that YES can be implemented effectively by local schools and community organizations to have the intended effects on positive youth development. We also note that the program was implemented across different schools with different teachers, suggesting that YES can also be sustainable and readily implemented because of freely available curriculum, adaptation guide, and evaluation materials (yes.sph.umich.edu).

To increase our confidence in the results, we took into consideration several factors. First, our measurement models and variables used in the study were psychometrically sound. This is especially vital because we operationalized complex constructs (i.e., PE outcomes) with several indicators to maintain theoretical consistency (Onken et al., 2014; Zimmerman, 1995). Second, our models included controlling for baseline (T1) youth development

outcomes and demographic factors. Thus, we found that change in the development outcomes could be attributed to YES exposure net the effects of prior outcome measures. Third, beyond controlling for differences by race, we operationalized race as a grouping variable to evaluate efficacy of the YES intervention within racial groups. This approach allows for researchers to not simply control for the differences in privilege between White and African American youth, but to evaluate racial variations in the programmatic functioning of YES.

Another strength of our study is that we have found program effects under the challenging conditions of a natural setting, effectively bypassing testing in highly-controlled research environments. A key factor associated with the limited success of many evidence-based interventions is the failure to test programs under contextual challenges and constraints, and examine program effects beyond the end of intervention programming (P. J. Curran et al., 2010; Onken et al., 2014). Testing effectiveness of programs beyond their end date, when delivered in community settings by local practitioners, is especially vital if we hope to accelerate research-to-practice translation and realize the public health benefits of prevention programs. This is notable because our study demonstrates that with training commensurate with most in-service teacher trainings local teachers can implement the YES program to increase positive youth development outcomes. The fact that we found program effects as hypothesized for 1-year post outcomes in natural conditions suggests that the effects of the program are quite robust.

LIMITATIONS

Though this study provides compelling evidence for the effectiveness of the YES program, especially for African American youth, several limitations require attention. Due to context-driven programmatic changes, program exposure had to be evaluated as dose received (as compared with intent to treat). Thus, although designed as a randomized control trial, modifications to the design had to occur in response to real-life constraints that arose in the schools (i.e., combining groups of youth for programming at times with small numbers of students in a given group so as to make afterschool programming easier on a given day). Our design may be more quasi-experimental in nature, though we did include a control condition and included several control variables to make the groups as similar as possible. We also found enough contamination across groups that we needed to consider actual dosage of the intervention as our primary independent variable. Notably, however, the contamination of the intended assignment would only operate to reduce finding differences across groups. Yet, we found program effects even one year post exposure. This suggests that our findings may be especially strong because program effects were manifested despite some youth in the usual care group attending some YES sessions.

Another limitation, again due to similar constraints of school-implemented programming, is that the intervention was implemented over different time periods across schools and cohorts (i.e., the same school may have had different timing across different implementation years). We addressed this limitation by controlling for the amount of time between baseline (T1) and end of intervention (T2), and between baseline (T1) and the follow-up (T3). We also found in our fidelity assessment of this program that despite differences

in timing, intervention implementation included many of the key lessons and activities (e.g., community change project) of the YES curriculum. Thus, timing may not be as important as the content of the program which adds to our confidence in our measure of dose-received (see Eisman et al., 2016 for more details). Future research designed to examine implementation by systematically documenting adaptations using implementation science frameworks (Wiltsey Stirman et al., 2015) and testing the feasibility and potential utility of implementation strategies to enhance fidelity would be a useful next step in intervention development.

Finally, our measure of sex was based on the binary assessment of male or female. We acknowledge that this binary assessment does not adequately reflect the complexity of gender experienced by youth. Future research that measures gender in a more representative way is necessary if we are to understand how gendered experiences influence adolescent development and how different youth respond to our interventions. We also only controlled for sex in our analyses because we were unable to evaluate program effects by sex due to sample size limitations. This may have turned out to be a good thing as examining the intervention using a binary definition of sex may not have accurately assessed program effects by gender identity. Future research that assesses gender identity in nonbinary ways and examines differences by gender identity (vs. simply controlling for it) would be particularly informative as we found for racial identity (Tables 2 and 3).

CONCLUSIONS

Implementing a curriculum that acknowledges historical and contemporary structural racism while engaging youth at the individual-, interpersonal- and community-levels through leadership development and community improvement may be particularly effective for African American youth who experience social and structural disenfranchisement. In urban settings that have high levels of economic challenge helping youth to develop the confidence in themselves to be effective change agents, developing the skills to think critically about resources needed to make positive change in their community, and taking action to be positive change agents in their community reduces aggressive behaviors and increases prosocial behaviors. Given the limited uptake of evidence-based public health interventions in communities and diminishment or absence of program effects when evidence-based program are implemented in community settings, our study demonstrates that YES can be successfully delivered in community settings, that it can have lasting effects on positive youth development, and that programs designed to enhance PE may be especially helpful for African American youth.

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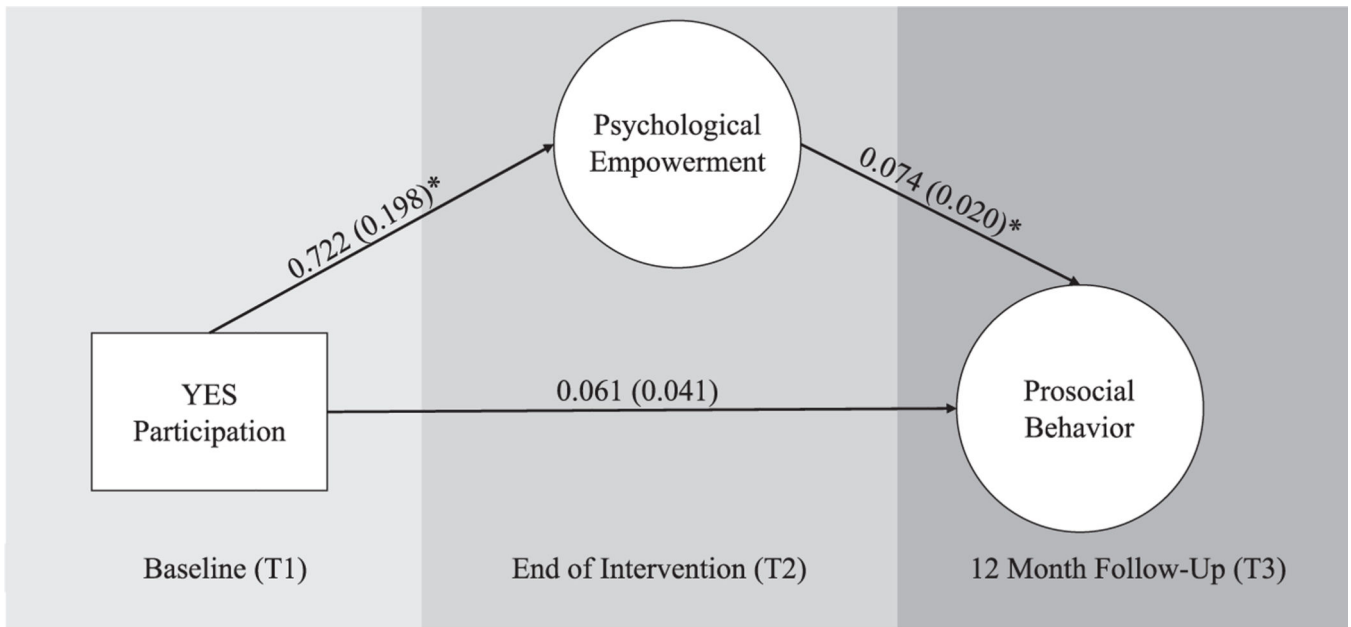
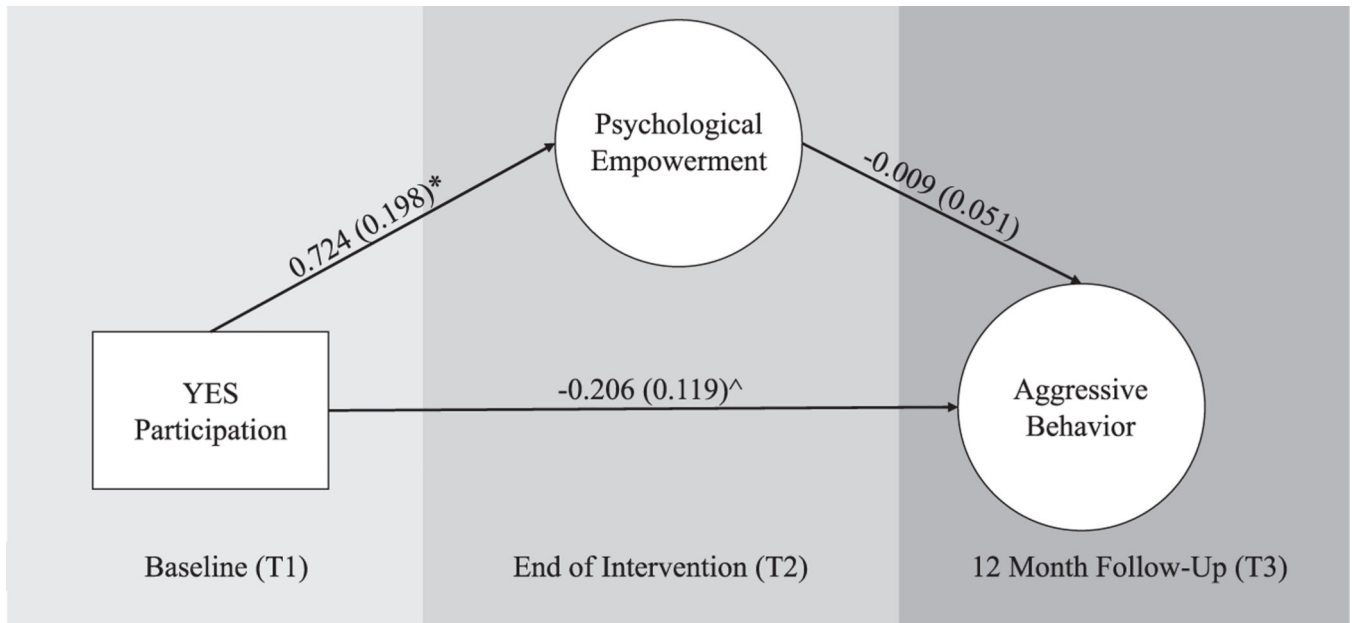


FIGURE 1.

Model of YES participation (T1), Psychological Empowerment (T2), and Prosocial Behavior (T3) Effect Size (standard error) * $p < .05$. Model Total Effect: 0.114 (0.044)* indirect effect of YES on Prosocial Behavior through PE: 0.053 (0.018)* direct effect of YES on Prosocial Behavior: 0.061 (0.041). Model controlled for prosocial behavior at T1, sex (male reference group), race/ethnicity (Black reference group), participant age (at T1), period between the start of YES (T1) and date of data collection at end of intervention (T2), and period between start of YES (T1) and 12-month follow up (T3)

**FIGURE 2.**

Model of YES Participation (T1), Psychological Empowerment (T2), and Aggressive Behavior (T3) Effect Size (standard error) * $p < .05$, ^ $p < .10$. Model Total Effect: $-0.212 (0.099)^*$ Indirect effect of YES on Aggressive Behavior through PE: $-0.006 (0.036)$ Direct Effect of YES on Aggressive Behavior: $-0.206 (0.119)^{\wedge}$. Model controlled for aggressive behavior at T1, sex (male reference group), race/ethnicity (Black reference group), participant age (at T1), period between the start of YES (T1) and date of data collection at end of intervention (T2), and period between start of YES (T1) and 12-month follow up (T3)

TABLE 1

Descriptive statistics

Empowerment sub-scales, Time 2	M (SD)	Skewness
Intrapersonal component		
Leadership efficacy	3.95 (0.65)	-0.60
Civic efficacy	4.30 (0.56)	-0.70
Self-esteem	4.10 (0.68)	-0.88
Interactional component		
Adult mentorship	4.35 (0.82)	-1.75
Adult resources	3.83 (1.11)	-0.82
Resource mobilization	4.22 (0.50)	-0.41
Behavioral component		
Leadership behavior	3.40 (0.88)	-0.36
Community engagement	3.55 (0.89)	-0.81
School engagement	4.07 (0.60)	-0.63
Outcomes	Time 1 M (SD)	Time 3 M (SD)
Aggressive behavior	1.88 (0.95)	1.18
Prosocial behavior	4.30 (0.62)	-0.98
		1.50 (0.64)
		4.34 (0.51)
		1.92
		-0.65

TABLE 2

YES on aggressive behaviors 12 months later, by race

	African American youth			White youth		
	beta	S.E.	p value	beta	S.E.	p value
Total Model	-0.386	0.122	0.002	0.072	0.074	0.33
Direct Pathway	-0.368	0.149	0.013	0.057	0.085	0.504
Indirect Pathway	-0.018	0.053	0.734	0.015	0.022	0.486

Note: Model controlled for aggressive behavior at T1, sex (male reference group), participant age (at T1), period between the start of YES (T1) and date of data collection at end of intervention (T2), and period between start of YES (T1) and 12-month follow up (T3).

TABLE 3

YES on prosocial behaviors 12 months later, by race

	African American youth			White youth		
	beta	S.E.	p value	beta	S.E.	p value
Total Model	0.128	0.049	0.009	0.112	0.079	0.124
Direct Pathway	0.071	0.048	0.138	0.071	0.068	0.298
Indirect Pathway	0.057	0.025	0.023	0.051	0.027	0.059

Note: Model controlled for prosocial behavior at T1, sex (male reference group), participant age (at T1), period between the start of YES (T1) and date of data collection at end of intervention (T2), and period between start of YES (T1) and 12-month follow up (T3).