

Manuscript Number: JADP-D-16-00130

Title: Effectiveness of Curriculum-Based Support Group Participation on Children Exposed to ACEs

Article Type: Full Length Article

Keywords: Adverse Childhood Experiences; School-based Program Intervention; At-risk Children

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Abstract: A quasi-experimental, proof-of-concept outcome evaluation was conducted to examine the effectiveness of the Curriculum-Based Support Group program intervention on children (mean age = 6.82 + 1.2) undergoing multiple adverse childhood experiences (N=913). Using an Immediate vs. Wait-List Control group design, the results suggest that CBSG participation significantly improved psychological, social, and cognitive domains that lasted up to 1-year later in follow-up testing ($p < .001$). Literature suggests that enhancing these domains in young children strengthens their inherent resiliency to overcome adversity now and in later life. Here, the data indicate that CBSG program participation has potential to help set a more positive life trajectory in young children that should help increase their chances of living healthier and more productive lives. These findings suggest that the CBSG program may be an effective intervention tool to help mitigate the effects of adverse childhood experiences (ACEs) in young children.

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August 16, 2016

B. Kochenderfer-Ladd, Ph.D.
Editor-in-Chief
The Journal of Applied Developmental Psychology

Dear Dr. Kochenderfer-Ladd,

My co-authors and I wish to submit a new manuscript entitled “Effectiveness of Curriculum-Based Support Group Participation on Children Exposed to ACEs” for consideration by *The Journal of Applied Developmental Psychology*. In this paper, we report an outcome evaluation examining the effectiveness of a school-based intervention program delivered to young children who have encountered four or more adverse childhood experiences (ACEs).

The program evaluation team acquired the data by the intervention service provider who designed, implemented and delivered the program. The sample size is large, a wait-list control group was employed, 1-year post-program follow-up testing was conducted, and an alpha of .01 was used with non-parametric analyses to determine effectiveness. We believe we have taken the necessary precautions with these data to satisfy the scientific rigor your journal requires.

The results from this evaluation are important for a number of reasons. First, while our awareness and knowledge about the poor health consequences of adults with ACEs have intensified, scant attention has been raised concerning therapeutic programs developed to prevent the adverse effects of ACEs in children. Second, there are no peer-reviewed studies examining the short-term and long-term effects of the Curriculum-Based Support Group intervention program on self-confidence, self-esteem, socially-appropriate interactions, listening skills and decision-making.

To bring awareness of an intervention that may help at-risk children exposed to ACEs, we sincerely request that you consider publishing this manuscript in your esteemed journal.

Sincerely yours,

The Authors

- The effects of a CBSG intervention in children exposed to ≥ 4 ACEs were examined
- CBSG enhances self-esteem/confidence, decision-making, social and listening skills
- Pre-, post-program and 1-year follow-up scores were used to confirm effectiveness
- CBSG participation significantly influenced positive behavioral changes
- These data suggest the CBSG intervention may foster resiliency in at-risk children

Author Agreement & Conflict of Interest Statement

We wish to confirm that the first author (Nejtek) received funding, in part, by Rainbow Days and Recovery Resource Council to conduct an outcome evaluation on data collected as part of a state-wide initiative to deliver the CBSG program to at-risk public school students. Nejtek was responsible for supervising program evaluation procedures, data interpretations, and manuscript writing. Talari (co-author) assisted Nejtek and Aryal with database creation, data analyses, table and figure creation. Aryal (co-author) provided biostatistical procedures, performed data analyses, interpretations, and consultation on manuscript content. The authors have no other conflicts of interests or disclosures.

We confirm that we have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, with respect to intellectual property. In so doing we confirm that we have followed the regulations of our institutions concerning intellectual property.

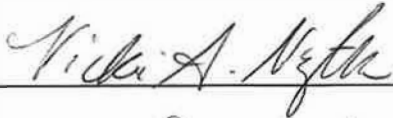
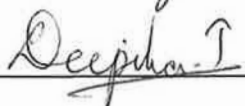

We further confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.

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We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us.

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Effectiveness of Curriculum-Based Support Group Participation on Children Exposed to ACEs

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This work was funded, in part, with grants awarded to the corresponding author by Rainbow Days [RP0145], and Recovery Resource Council [RP0123].

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Abstract

A quasi-experimental, proof-of-concept outcome evaluation was conducted to examine the effectiveness of the Curriculum-Based Support Group program intervention on children (mean age = 6.82 ± 1.2) undergoing multiple adverse childhood experiences (N=913). Using an Immediate vs. Wait-List Control group design, the results suggest that CBSG participation significantly improved psychological, social, and cognitive domains that lasted up to 1-year later in follow-up testing ($p < .001$). Literature suggests that enhancing these domains in young children strengthens their inherent resiliency to overcome adversity now and in later life. Here, the data indicate that CBSG program participation has potential to help set a more positive life trajectory in young children that should help increase their chances of living healthier and more productive lives. These findings suggest that the CBSG program may be an effective intervention tool to help mitigate the effects of adverse childhood experiences (ACEs) in young children.

According to the 2011-2012 National Survey of Children's Health, almost half of the nation's children ages birth to 17 years old (~ 34 million) have experienced one or more Adverse Childhood Experiences (www.cdc.gov/nchs/slait/nsch.htm#2011nsch). Children exposed to Adverse Childhood Experiences (ACEs) include living with caregivers who abuse illicit drugs, alcohol, and or prescription drugs, who are physically and or sexually abusive, who purposefully neglect or abandon them, as well as those who chronically argue, sow discord, and promote dysfunctional familial relationships (http://www.cdc.gov/violenceprevention/cestudy/ace_brfss.html ; Felitti et al., 1998; Anda et al., 2002). Other kinds of ACEs involve caregivers who have serious mental illness or those who may damage the parent-child bond due to incarceration, institutionalization, divorce or separation (Felitti et al., 1998; Dube et al., 2001; Chapman et al., 2004).

While our awareness and knowledge about the poor health consequences of adults with ACEs have intensified, scant attention has been raised concerning therapeutic programs developed to prevent the adverse effects of ACEs in children. Instead, the available research in children exposed to ACEs describes the adverse health consequences in terms of increased risks for acquiring asthma, diabetes, and obesity, just to name a few (Felitti et al., 1998; Flaherty et al., 2006; Fuemmeler, Dedertb, McClernon, & Beckhamb, 2009; Flaherty et al., 2013; Lynch, Waite, & Davey, 2013; Wing, Gjelsvik, Nocera, & McQuaid, 2015). Thus, prevention and intervention programs delivered to children with ACEs to avert mental and physical health decline should be of great importance.

There are few studies examining the effect an intervention program may have on vulnerable children currently undergoing ACEs. Darcy and colleagues (2011) recently described the 2013 Child FIRST intervention (e.g. family home visits, outreach referrals) as a program that attempts to modify the dysfunctional family unit undergoing ACEs. However, positive

behavioral changes depended on the active participation of the abusive or neglectful caregiver to work with numerous social service providers and comply with their recommendations (Darcy et al., 2011).

Rather than involve the abusive caregiver, the Curriculum-Based Support Group (CBSG) program seeks to provide direct nurturing to children exposed to ACEs to instill a sense of self-efficacy and promote their ability to become resilient to negative circumstances. The CBSG program is designed to encourage normative behaviors by increasing a child's confidence, self-esteem, social connectedness, and heal their internal well-being while enhancing their cognitive development. Some longitudinal data suggests that the types of psychological, social, and cognitive domains targeted with the CBSG curricula may be critical to mitigating the negative downstream effects of ACEs (Nilsson, Dahlstrom, Priebe, & Svedin, 2015; Jones, Greenberg, & Crowley, 2015; Mann, Hosman, Schaalma, & Vries, 2004). The optimal time to begin delivering a program intervention to avert poor mental and physical health and to reduce the risk of substance use during the lifetime is in kindergarten (Jones et al., 2015) and in early childhood (Kaufman et al., 2007).

With that in mind, an outcome evaluation to examine the short-term and long-term effects of the CBSG program delivered to children exposed to four or more ACEs was conducted. The primary goal was to examine whether self-esteem, social connectedness, internal well-being, and normative behaviors in young children attending grades K-3 would significantly improve after one semester of CBSG program participation. The secondary goal was to determine if the CBSG curricula would have any positive long-lasting effects using data collected 1-year later in follow-up analyses.

Methods

Participants and Program Design

Children of all race/ethnicities attending public schools in grades K-3 who were identified by their teachers or school counselors as undergoing four or more ACEs in the past 9-months were referred to the CBSG program. An independent, proof-of-concept, quasi-experimental outcome evaluation was conducted to examine the effectiveness of the CBSG intervention. The data presented here were obtained from program developers who designed, implemented and delivered the CBSG program to children attending public school.

The program design included Immediate and Wait-List Control groups that were assessed at the pre- and post-program time points. Using a Wait-List Control in a naturalistic design strategy similar to Farrell and Meyer (1997), children were enrolled on a first come, first serve basis in groups no larger than ten per group in each school semester (e.g. *Fall 2011* Immediate Program group vs. *Spring 2012* Wait-List Control group). For example, those who signed up for the program at the beginning of the Fall semester were enrolled in the Immediate group while those who signed up later in the Fall or in the Winter semester were enrolled in the Wait-List Control group occurring in the Spring semester.

As the children undergoing ACEs were considered to be a vulnerable population, the Wait-List Control design was ethically necessary to ensure that each child that had been referred to the CBSG program intervention had the opportunity to participate. This also avoided alienating school officials and parents. In accordance with the declaration of Helsinki, this program evaluation study received university Institutional Review Board approval, and written informed consent from the parents allowing their children to participate in the CBSG program was obtained.

CBSG Curricula

The CBSG curricula for children in grades K-3 utilizes a developmental model that is rooted in the combined theories of Piaget and Vygotsky concepts (Blake & Pope, 2008; Malerstein & Ahern, 1979; Fischer, 1980) that targets psychological, social, and cognitive functioning domains. The curricula is designed to instill age-related normative beliefs, strengthen confidence, improve self-esteem, encourage socially-appropriate interactions, boost listening skills and enhance decision-making. Increased skills in these domains are reported to be essential to counteract the negative influence of ACEs and help a child build resilience to adverse circumstances (Mandleco & Peery, 2000).

In support of the theory of life course/social field first proposed by Kellam, Branch, Agarwal and Ensminger (1975), the social aspect embedded in the prevention intervention program messaging is integrated with psychological and cognitive constructs to yield a richer dimension of each child's overall internal well-being measured in the classroom environment by their teacher. Thus, a child's ability to cope and become resilient to ACEs is entrenched in their internal levels of self-confidence and self-esteem in concert with their ability to adapt to diverse social cues they may receive in a positive school-based environment outside the negative family situation.

CBSG Program

The CBSG is considered both a selective and an indicated program suitable for populations above average risk and those already at-risk for problem behaviors in later life. This program is uniquely designed to be delivered in a variety of settings such as school classrooms and is recognized by the (1) Center for Substance Abuse Prevention, (2) U.S. Department of Housing and Urban Development, (3) Substance Abuse and Mental Health Services

Administration (SAMHSA), U. S. Department of Health & Human Services. It is currently registered as an evidence-based prevention intervention program on the National Registry of Evidence-based Programs and Practices (<http://nrepp.samhsa.gov/AllPrograms.aspx>). The CBSG program curricula has been implemented throughout Texas and in 31 other states since 1984 resulting in over 1.6 million children served (www.trans4mcenter.org). The purpose of this program is “To provide children living in high risk situations with the skills and support they need to overcome adversity, stay in school, and stay free of drugs, violence and crime” (<http://trans4mcenter.org/cbsg>).

Program delivery. The CBSG program was delivered in the school classroom setting in increments of 1-hour sessions occurring once a week for 10-weeks during a school semester. Program facilitators who deliver the intervention receive a minimum of eight hours of training provided by the CBSG development team. To maximize learning, children in each group session are two or less years apart in age and each group’s size is restricted to ten or less students.

Program survey. The CBSG survey created by the program development team has been approved by the Texas Department of State Health Services (DSHS) for use in public schools. This instrument contains 6-items measuring the following competencies: 1) Demonstrating confidence/ self-esteem, 2) Showing a desire to cooperate with others, 3) Demonstrating a willingness to participate in the classroom, 4) Show a willingness to listen to adults, 5) Make appropriate decisions in the classroom and other settings, and 6) Interacting with classmates appropriately. The teacher uses a likert scale from 0-3 to measure pre- and post-program competencies with the following rating 0=never, 1=rarely, 2=sometimes, and 3=always for each of the six items. The higher the rating, the better the improvement in that competency. Each

individual item is summed to yield a total pre- and post-program score for each participant. The range of total scores from least to highest is 0-18.

Note that the child does not realize when or where the teacher or counselor is scoring their performance as both pre- and post-program assessments are conducted during routine classroom activities that are not linked to CBSG session delivery times. The survey demonstrated high reliability and internal consistency as determined with a Cronbach's alpha of .915. Factor analysis shows the 6-item survey also has a high level of construct validity in the pre- and post-test conditions with communalities ranging from .603-.811 and an overall Kaiser-Meyer-Olkin Measure of Sampling Adequacy of .899.

Data Collection and Analyses

Demographic data (age, grade, gender, race/ethnicity) were analyzed using a combination of descriptive statistics, frequency distributions, and chi-square analyses, as appropriate. Independent sample and paired *Student's* t-tests, non-parametric Mann-Whitney test and Wilcoxon Signed Rank test and Analysis of Variance (ANOVA) were used, as needed, to compare total scores and individual item scores in the pre- and post-program conditions. Multivariate and analysis of covariance (MANOVA, ANCOVA) were used, if needed, to determine if there were any factors that could have influenced the results. The primary grouping variable was Immediate Program vs. Wait-List Control. Post-hoc Bonferonni analyses were used to control multiple comparisons, as needed. We used a strict significance criteria with a 99% confidence interval and a two-tailed alpha of 0.01 to determine CBSG program effectiveness. All statistical analyses were performed with the IBM Statistical Package for the Social Sciences (SPSS) version 21 (Armonk, NY) and SAS 9.4 (Cary, NC).

Immediate program versus wait-list controls. Pre-program scores from the Immediate Program group were compared to Wait-List Controls to determine if there was any unexpected cohort bias in those who received the program first versus those being wait-listed. Post-program scores for Immediate Program and Wait-List Control pre-program scores were analyzed to identify group differences in improved behaviors due to CBSG program participation versus no participation. Post-program scores for both groups were analyzed to determine if Wait-List Controls may have improved at a higher level possibly due to program diffusion or transference from the Immediate Program group.

One-year follow-up data. One-year follow-up survey scores were collected on a subset of the 3rd grade children whose post-program whereabouts could be identified by the facilitator, referring teacher or counselor within the next academic school year. Third grade participants were invited to volunteer in the 1-year follow-up to limit age-related developmental maturation bias inherent in K-2nd grade children. Note that the children in the 1-year post-program follow-up dataset had not received any additional CBSG program sessions. In this subset, surveys were scored by a non-referring teacher who was blind to the child's pre- and post-program scores that were obtained in the prior year. A repeated measures ANOVA was used to examine improvement in scores from pre- to post-program to 1-year post-program follow-up.

Results

Immediate Program Group vs. Wait-List Control Group

Participants. Out of 1037 students attending K-3 who were referred to the CBSG program, a total of 913 children enrolled. Using a first-come, first-serve naturalistic grouping strategy, 419 students received the program in the Immediate group condition and the remaining 494 students received the program in the Wait-List Control condition. Out of these 913

enrollees, 897 provided both pre- and post-program data suitable for statistical analyses. Table 1 shows sample characteristics. There were no significant between-group age differences ($F(1,912) = 1.71, p = .19$). Chi-square analyses showed no any gender ($\chi^2(1, N = 913) = 0.03, p = .857$) or race/ethnic ($\chi^2(3, N = 913) = 2.65, p = .448$) differences between the groups. A statistically significant difference in grade distribution between the Immediate and Wait-List Control groups was observed ($\chi^2(3, N = 913) = 23.681, p < .001$), possibly due to the smaller sample of 3rd graders.

PLACE TABLE 1 ABOUT HERE

Survey Scores. Preliminary analysis of the pre and post survey scores using Shapiro-Wilk test indicated that the data was not normally distributed. As a result, we used appropriate non-parametric methods to compare the groups. To determine if there were any differences in survey scores between the students in the Immediate versus Wait-List Control group, Wilcoxon Two-sample tests were performed. A between-group analysis of pre-program total mean survey scores did not significantly differ between the Immediate program versus the Wait-List Control groups ($S = 186741.5, p = .766$). Thus, all students appeared to enter the program with similar grade and age-appropriate abilities.

Similarly, a Wilcoxon Two-sample test comparing the post-program total mean score for the Immediate program (14.3 +/- 3.4) group versus the pre-program Wait-List Control (11.4 +/- 3.4) group revealed a statistically significant difference ($S = 220309.5, p < .001$). This suggests that the CBSG intervention influenced positive behavioral changes in those who received the program. Finally, post-program total mean scores for the Immediate and Wait-List Controls did not statistically differ ($S = 177541.5, p = .667$), indicating that there were no observable program

diffusion or transference effects influencing the post-program performance of Wait-List Controls (Table 2).

As there were statistical differences in grade distribution, we analyzed the potential influence of grade on test scores. A Kruskal-Wallis H test showed that there was a significant difference in pre-program test scores among grades, $\chi^2(3) = 14.03, p = .003$, with a mean rank of 407.80 for kindergarten, 493.98 for 1st grade, 456.04 for 2nd grade, and 472.87 for 3rd grade. This difference seems logical due to natural maturation age-effects inherent among the different grades prior to receiving the program. However, there were no significant differences in post-program test scores, $\chi^2(3) = 2.78, p = .427$, with a mean rank of 439.45 for kindergarten, 462.29 for 1st grade, 457.32 for 2nd grade, and 423.59 for 3rd grade. As the CBSG program delivers age-appropriate content, participants were able to show similar improved behaviors regardless of their grade level. To that end, the CBSG program appears to do what it was designed to do for all participants at each grade level – to facilitate positive behavioral change.

Individual survey item scores did not significantly differ between the Immediate and Wait-List Control groups except for the item of confidence /self-esteem ($S = 173508.0, p < .001$); however, this difference disappeared at the post-program time point. Paired analysis using Wilcoxon Signed Rank test for pre- and post-program scores for each group showed that CBSG participation significantly improved -1) Confidence/Self-Esteem, 2) Cooperation, 3) Classroom Participation, 4) Willingness to Listen, 5) Appropriate Decision-Making, and 6) Interactions with Classmates (all items $p < .001$). Taken together, CBSG participation delivered to children undergoing ACEs appears to be an effective intervention program for improving behaviors associated with positive psychological, social, and cognitive functioning.

PLACE TABLE 2 ABOUT HERE

One-year Post-Program Follow-up. To determine if a 10-week exposure of CBSG would produce long-lasting effects without additional CBSG sessions, a 1-year follow-up assessment on a subset of the original sample was conducted. During the last 2-weeks at the end of the following school year (e.g. Spring semester), ninety-six children who had received the CBSG intervention as 3rd graders in the previous year (e.g. Spring semester) were randomly invited to take the survey again. Thus, 61% of the total sample of 3rd graders were participants in the 1-year post-program follow-up. It is important to reiterate that that these 96 children had not received any further exposures to the CBSG program beyond the original 10-sessions they attended as 3rd graders.

A repeated measures ANOVA was used to examine longitudinal improvement over time and a Wilk's Lambda was used to determine the accompanying effect size (partial eta-squared). Figure 1 shows the individual survey item scores in the pre-, post-, and 1-year post-program conditions with multivariate statistics. Teachers who assessed the children in the 1-year condition were 4th grade teachers and were different than the 3rd grade teachers or counselors who assessed them in the original pre- and post-program time points. To determine if there were any scoring bias between teachers or counselors in this 1-year condition, we conducted additional analyses. Using a Kruskal Wallis test, there were no significant scoring differences among the 3rd versus 4th grade teachers or counselors in the 1-year post-program change score ($\chi^2(2) = 3.07, p = .215$).

PLACE FIGURE 1 ABOUT HERE

Discussion

To our knowledge, this is the first study to prospectively examine the effectiveness of an intervention program in young children who have undergone four or more ACEs. In the short-

term, the CBSG program appears to improve confidence, self-esteem, social connectedness, cooperation, listening skills, and decision-making related to internal well-being and normative behaviors in young children exposed to multiple ACEs. These type of developmental competencies are key in promoting normative behaviors necessary for children to become resilient to overcome ACEs (Mandleco & Peery, 2000). Mann et al (2004) reported that the onset of mood and substance use problems, health deterioration, delinquency, and school drop-out in later life can be traced to poor self-esteem triggered by ACEs in childhood. Thus, it is reasonable to expect that the CBSG program may help mitigate the negative lifelong effects triggered by adversity.

The CBSG intervention also seems effective in promoting long-lasting improvements in confidence, self-esteem, social connectedness, cooperation, listening skills, and decision-making up to 1-year later. The findings suggesting sustained psychosocial competence in CBSG participants are particularly encouraging in relation to the recent findings from Jones, Greenberg, and Crowley (2015) who conducted a 20-year longitudinal study. Jones et al (2015) defined social competence as cooperating with their peers, helpful, adept at understanding other's feelings, and knows how to be a problem-solver. In fact, kindergarten children with poor pro-social behavior scores were significantly more likely to drop out of high school, be arrested as a juvenile delinquent, and have a higher number of arrests in adulthood than those with higher pro-social ratings (Jones et al, 2015). In addition, binge drinking and the number of days marijuana use was also predicted by poor social behavior in kindergarten that increased the likelihood that they would live in public housing and receive public assistance as an adult (Jones et al, 2015).

Similarly, Moffitt et al. (2011) found that children who had a 'willingness to listen', were able to 'cooperate well with others', and exhibited 'appropriate interactions with others' showed

a level of self-control and self-regulation that predicted positive adult behaviors by the age of 32-years old. Both Jones et al (2015), and Moffitt et al (2011) found that children who had the poorest self-control during their most critical window of cognitive developmental (e.g. 3-11-years old) had significantly poorer health outcomes, more financial problems, higher incidents of single-parenthood, and more criminal convictions even after controlling for gender, low IQ and low family socioeconomic status in adulthood.

The results from Jones et al. (2015) and Moffitt et al (2011) highlight the importance of the CBSG program delivery to kindergarten through third grade children to enhance their psychological, social, and cognitive competencies. Here, we found that the CBSG program was as equally effective in kindergarten children as it was with their first, second and third grade peers. Importantly, the psychological, social, and cognitive domains targeted with the CBSG program underlie the developmental competency of self-control.

For over a decade converging evidence shows that in comparison to those without ACEs, adults who encountered ACEs as children have higher than usual rates of cancer (Brown, Thacker, & Cohen, 2013), diabetes (Lynch et al., 2013; Danese et al., 2009), chronic obstructive pulmonary disease (Anda et al., 2008), autoimmune / inflammatory disease (Dube et al., 2009; Danese et al., 2009), and cardiovascular disease (Dong, Giles, Felitti, Dube, & Williams, 2004; Batten, Aslan, Maciejewski, & Mazure, 2004). In addition, smoking (Anda et al., 1999; Edwards, Anda, Gu, Dube, & Felitti, 2007), alcohol and illicit drug addiction (Dube et al., 2006; Anda et al., 2002; Dube et al., 2003; Dewit, Adlaf, Offord, & Ogborne, 2000; Rothman, Edwards, Heeren, & Hingson, 2008; Kaufman et al., 2007; Grant et al., 2006), depression (Chapman et al., 2004; Anda et al., 2002; Danese et al., 2009), suicide (Dube et al., 2001), and criminal

involvement (Reavis, Looman, Franco, & Rojas, 2013) are also common in adults who suffered with ACEs.

With an abundant amount of research on adults who has suffered ACEs in childhood, mounting evidence is well-documented showing the detrimental psychological, social, and cognitive outcomes of ACEs. To that end, this quasi-experimental, proof-of-concept outcome evaluation was implemented to rigorously analyze data previously collected by program developers to determine program effectiveness in children currently undergoing ACEs. Here, we found it interesting that the post-program and 1-year total scores for both the Immediate and Wait-List groups never reached above 15 out of a possible maximum score of 18. The 1-year subgroup total score was 14.65. However, a perfect score of 18 responding ‘Always’ to questions of demonstrating confidence/self-esteem, cooperation, willingness to participate, appropriate decision-making, and interacting with classmates appropriately would be highly suspect in any population, let alone an at-risk sample. Nevertheless, the 1-year follow-up data (n=96) showed medium to large effect sizes with a rate of improvement between pre-program and 1-year follow-up total scores of 31.5%.

For better or for worse, the psychological, social, and cognitive development of ACE children will perpetuate a cycle of public health outcomes that will repeat itself generation after generation. Thus, redirecting the future health and well-being of our youngest and most vulnerable children to avert them from becoming indigent, homeless, criminals, substance abusers with chronic mental and/or medical illnesses is a worthwhile endeavor to undertake. Further examining the CBSG program to prevent and intervene in the lives of at-risk children who undergo ACEs is clinically relevant and should be a priority with child development researchers, educators, and public health policy makers.

Limitations and Strengths

A limitation is that as a proof-of-concept outcome evaluation the results are not suitable to predict lifelong mental or physical health outcomes. However, our data provide some modest evidence that enhancing pro-social behaviors in young ACE children may prepare them with the necessary skills to cope with adversity. To be candid, we do not expect one 10-week semester of CBSG delivered to kindergarten children will influence life-long behaviors in these same children as teens or adults. Nevertheless, the positive behavioral changes that did occur are encouraging. These findings may suggest that continuing CBSG delivery using age-appropriate curricula from K-12th grades may serve as an effective prevention and intervention program.

Another limitation is the lack of a randomized, double-blind control design due to ethical concerns of withholding an intervention program to vulnerable at-risk children. Use of a healthy control group (without ACEs) in the same school was not utilized as that design may have created a 'we versus them' atmosphere in the student body. However, this program evaluation has several strengths. For example, an Immediate and Wait-List Control group strategy was implemented, the evaluation had a sufficiently large sample size to determine short-term and long-term program effectiveness, and rigorous statistical methods were employed.

While the outcomes from this evaluation are certainly encouraging, these proof-of-concept data should be viewed with caution as we hesitate to generalize these results to other geographic locations, settings, or older populations. In addition, while participants showed behavioral improvements in the post-program and 1-year follow-up conditions, it is difficult to assign clinical relevance as many other factors that we were unable to control may have contributed to this outcome. Future multi-site studies with longitudinal follow-up with the addition of a healthy non-ACE control group are warranted.

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Table 1. Sample Characteristics

Demographics	Immediate Program (n=419)	Wait-List Control (n=494)	Grand Total (n=913)
Age (Mean \pm SD)	6.88 (1.2)	6.77 (1.2)	6.82 (1.2)
<i>Gender</i>			
Girls	179	207	386
Boys	239	265	504
Missing	1	22	23
<i>Race / Ethnicity</i>			
African-American	122	132	254
Anglo-American	104	128	232
Hispanic-American	185	194	379
Other	7	14	21
Missing	0	23	23
<i>Grade</i>			
Kindergarten	100	148	248
1	103	144	247
2	117	143	260
3	99	59	158

Table 2. Between-Group and Within-Group Comparisons

Survey Items	Immediate Program (n=419)		Wait-List Control (n=494)	
	Post Mean (SD)	Post Mean (SD)	Pre Mean (SD)	Post Mean (SD)
<i>0=Never, 1=Rarely 2=Sometimes, 3=Always</i>				
Confidence/Self-Esteem*	1.56 (.76) ^a	2.27 (.62) ^b	1.70 (.76) ^c	2.27 (.61) ^d
Cooperation	2.01 (.81)	2.43 (.66)	1.97 (.73)	2.47 (.57)
Classroom Participation	1.99 (.83)	2.49 (.67)	1.96 (.73)	2.50 (.60)
Willingness to Listen	2.02 (.83)	2.41 (.70)	1.99 (.74)	2.47 (.61)
Appropriate Decision-Making	1.93 (.80)	2.35 (.72)	1.85 (.71)	2.35 (.60)
Interactions with Classmates	1.90 (.80)	2.35 (.71)	1.90 (.68)	2.38 (.61)
Total Scores**	11.39 (3.8) ^a	14.34 (3.4) ^b	11.37 (3.4) ^c	14.39 (2.8) ^d

*ac: $p < .001$

**ac: $p = .766$; bc: $p < .001$; bd: $p = .667$

All other between-group comparisons were not significant

All within-group paired pre- to post-program score comparisons were significant: $p \leq .001$

Figure 1. Longitudinal Survey Scores

