Effectiveness of the Curriculum-Based Support Group Program to Help Mitigate Adverse Childhood Experiences in Young At-Risk Children
--Manuscript Draft--

Manuscript Number:	
Full Title:	Effectiveness of the Curriculum-Based Support Group Program to Help Mitigate Adverse Childhood Experiences in Young At-Risk Children
Article Type:	Original article
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Funding Information:	Rainbow Days, Inc. (RP0145) — Dr. Vicki A. Nejtek
	Recovery Resource Council (RP0123) — Dr. Vicki A. Nejtek

Abstract: Approximately 34 million children ages birth to 17-years old in the United States have encountered one or more adverse childhood experiences (ACEs) in their lifetime (www.cdc.gov/nchs/slaits/nsch.htm#2011nsch). The detrimental physical and mental health effects of adverse childhood experiences are well-documented in adults. However, the available data showing the effectiveness of evidence-based prevention intervention programs delivered to children currently undergoing ACEs are scarce. Here, we evaluated the short-term and 1-year effectiveness of the Curriculum-Based Support Group program delivered to children with one or more ACEs (N = 1037) attending kindergarten to third grade in a multi-community, proof-of-concept study. We found participants significantly improved their confidence, self-esteem, cooperation with others, classroom participation, willingness to listen, appropriate decision-making, and classmate interactions in both the short-term and the 1-year follow-up conditions. These developmental competencies are key in promoting normative behaviors necessary for children to become resilient to overcome ACEs (Mandleco and Peery 2000). Mood and substance use problems and health deterioration in adulthood can be traced to poor self-esteem triggered by ACEs (Mann et al 2004). Thus, CBSG participation may have strong potential to mitigate the negative lifelong effects triggered by ACEs. Although encouraging, these proof-of-concept data should be viewed with caution.

September 9, 2015

Jacob Kraemer Tebes, Ph.D.

Editor, American Journal of Community Psychology

Yale University School of Medicine

Division of Prevention and Community Research & The Consultation Center

389 Whitney Avenue

New Haven, CT 06511

Dear Dr. Tebes,

My co-author and I are submitting a multi-community study evaluating the effectiveness of a school-based prevention intervention program delivered to kindergarten to third grade children who have encountered one or more adverse childhood experiences during the past 9-months.

We would appreciated your kind consideration of publishing this manuscript in your esteemed journal. Please do not hesitate to contact me should you have any questions about our submission.

Kindest Regards,

Vicki A. Nejtek, Ph.D.

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INTRODUCTION

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/slaits/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 (www.cdc.gov/violenceprevention/acestudy/prevalence.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).

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 et al. 2013], diabetes [Lynch et al. 2013; Danese et al. 2009], chronic obstructive pulmonary disease [Anda, Brown, Dube, 2008], autoimmune / inflammatory disease [Dube etal 2009; Danese et al. 2009], and cardiovascular disease [Dong, Giles, et al 2004; Batten et al 2004]. Smoking [Anda, Croft, Felitti, etal 1999; Earl, Anda, Edwards et al. 2011], alcohol and illicit drug addiction [Dube 2006; Anda 2002; Dube 2003; Dewit 2000; Rothman 2008; Kaufman 2007; Grant 2006], depression [Chapman 2004; Anda 2002; Danese, et al 2009], suicide [Dube 2001], and criminal involvement [Reavis 2013] are also common in adults who suffered with ACEs. 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

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children. The available research shows that at-risk children exposed to adverse situations as described above have an increased risk for asthma, diabetes, and obesity, just to name a few (Felitti et al. 1998; Flaherty et al. 2006; Fuemmeler et al. 2009; Flaherty et al. 2013; Lynch et al. 2013; Wing et al. 2015). Thus, prevention and intervention programs delivered to these at-risk children to avert mental and physical health decline should be of great importance.

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 in relation to ACEs. However, program efficacy requires multiple contacts with numerous social service agencies and extensive service provider follow-ups with a commitment from the abusive or neglectful caregiver to fully participate (Darcy et al. 2011). In contrast, the Curriculum-Based Support Group (CBSG) program is an evidence-based program that is delivered directly to the ACEs child in the neutral environment of the school setting. The CBSG program has been designed to instill normative behaviors, increase the child's self-esteem and social connectedness, and heal their internal well-being while enhancing their cognitive development (www.rdikids.org/docs/CBSGOverview2014.pdf; www.nrepp.samhsa.gov/ViewIntervention.aspx?id=185). Some longitudinal data suggests that the types of psychological, social, and cognitive domains targeted with the CBSG curriculum may be critical to mitigating the negative downstream effects of ACEs (Nilsson et al. 2015; Jones et al. 2015; Mann et al. 2004).

Here, we evaluated the short-term and long-term effectiveness of the CBSG program delivered to at-risk children in a multi-community study. The optimal time to begin delivering this type of curriculum to avert poor mental and physical health and to reduce the

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risk of substance use during the lifetime is in kindergarten (Jones et al. 2015) and in early childhood (Kaufman et al. 2007). Thus, our primary hypothesis was that psychological, social and cognitive domains governing self-esteem, social connectedness, internal well-being, and normative behaviors in young at-risk children attending grades K-3 would significantly improve after CBSG exposure. The secondary hypothesis was that the CBSG curriculum would have a positive long-lasting effect as measured 1-year later.

METHODS

Study Design

A multi-community, prospective, proof-of-concept study to evaluate CBSG program effectiveness in at-risk early school-aged children was designed. Program implementation sites were public school districts located in two metropolitan cities geographically situated ~ 35-miles apart. There were three independent school districts in Community Site 1 (Dallas, Texas) and 4 independent school districts in Community Site 2 (Fort Worth, Texas). In accordance with the declaration of Helsinki, this study received our university's Institutional Review Board approval, and written informed consent from the parents in each school allowing their children to participate in the CBSG program was obtained.

Participants

Boys and girls of all race/ethnic backgrounds, between the ages of 4- to 9-years old attending public schools in grades K-3 were referred to the CBSG program by their teachers or school counselors who had identified them as an 'at-risk' child. Here, the operational definition of 'at-risk' aligns with a child undergoing one or more ACEs in the past 9-months (for a complete review of ACE criteria see www.cdc.gov/violenceprevention/acestudy/prevalence.html).

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CBSG Curriculum and Program

The CBSG curriculum for children in grades K-3 utilizes a developmental model that is rooted in the combined theories of Piaget and Vygotsky concepts (Blake and Pope, 2008; Malerstein 1979; Fischer, 1980) that targets psychological, social, and cognitive functioning domains. The curriculum 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 and Peery 2000). In addition, in support of the theory of life course/social field first proposed by Kellam et al (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. To that end, we expect that 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.

The CBSG program is uniquely designed to be delivered and evaluated in a variety of settings such as the school classroom setting and is recognized by the (1) Center for Substance Abuse Prevention, (2) U.S. Department of Housing and Urban Develop0ment, (3) Substance Abuse and Mental Health Services Administration (SAMHSA), U. S. Department of Health & Human Services and is registered as an evidence-based prevention intervention program on the National Registry of Evidence-based Programs and Practices (http://www.nrepp.samhsa.gov/ViewIntervention). The CBSG program curriculum

has been implemented throughout Texas and in 31 other states since 1984 resulting in ~1.6 million children served (www.trans4mcenter.org). The overall purpose of this program is *"To provide children and youth who have had, or are at risk for having, adverse experiences with the skills and support they need to rise above adversity and stay in school, and stay free of drugs, violence and crime"* (www.rdikids.org/docs/CBSGOverview2014.pdf; www.trans4mcenter.org).

Program Delivery

Children participated in the CBSG program within the school classroom setting in increments of 1-hour sessions occurring once a week for up to 10-weeks. Sessions were delivered by CBSG facilitators who had received a minimum of 8-hours of training provided by the CBSG program development team. To maximize learning, children in each group session were two or less years apart in age and each group's size was restricted to ten or less students. Both community sites whose facilitators delivered the program in the classroom were required to collect outcomes using a pre- and post-program survey developed by the CBSG development team and approved by the Texas Department of State Health Services (DSHS) for use in public schools.

Program Survey

The CBSG survey contains 6-items measuring the following domains: 1) confidence/ self-esteem, 2) cooperation with others, 3) classroom participation, 4) willingness to listen, 5) appropriate decision-making and 6) classmate interactions. The survey test instrument uses a likert scale and both pre- and post-program surveys are administered and scored by each participant's referring teacher or school counselor. The likert rating scale consists of 0=never, 1=rarely, 2=sometimes, and 3=always measures improvement. Each item is

summed to yield individual item scores and a grand total pre- and post-program score for each participant. It is important to mention 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. Using the current dataset, the survey has a high level of reliability and internal consistency as determined with a Cronbach's alpha of 0.915. 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 0.603-0.811 and an overall Kaiser-Meyer-Olkin Measure of Sampling Adequacy of 0.899.

Data Collection and Analyses

Demographic information such as the geographic school site, age, grade, gender, race/ethnicity, school district, and facilitator name was collected. Dependent variables for all children were individual item scores and grand total scores for each experimental condition (pre-, post-program, and 1-year follow-up). One-year follow-up survey scores were collected on a subset of the children attending grades K-3 whose post-program whereabouts could be identified by the facilitator, referring teacher or counselor within the next academic school year. The children in the 1-year post-program follow-up dataset had not received any additional CBSG program sessions and 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.

Qualitative data were analyzed using a combination of descriptive statistics, frequency distributions, and chi-square analyses, as appropriate. Paired *Student's t*-tests were used to determine whether each participant's scores improved from the pre- to post-program

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conditions. Repeated measures ANOVA was used to examine improvement in scores from pre- to post-program to 1-year post-program follow-up in the subset of children as described earlier. School site, gender, race/ethnicity were analyzed as co-variables. Regression analyses were used to determine if number of sessions attended or reason for referral to CBSG had any predictive influence on outcome scores. Post-hoc Bonferonni analyses were used to control multiple comparisons. As this was a proof-of-concept study, we wanted to use a stricter significance criteria with a 99% confidence interval and an 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).

RESULTS

Combined Multi-Community Sites 1 + 2

Participants

The combined community sites yielded a grand total of 1,057 students attending grades K-3 who participated in the CBSG program. Demographic information is shown in Table 1.

PLACE TABLE 1 ABOUT HERE

Survey Results

Out of the 1057 enrolled, 1037 provided evaluable data for both the pre- and post-program comparison analyses. According to age-related grade level, participants included those in kindergarten=266, 1st grade = 289, 2nd grade = 298, and 3rd grade = 204. As each child enters the program at different levels of development, we were not surprised to find significant differences in pre-program scores as a function of grade level ($F_{(3,1036)}$ = 5.86, *p*

= 0.001). Bonferroni comparisons showed the predominating factor that influenced grade level differences was between kindergarten and 1st graders (p = 0.000). We propose that this may represent the natural milestone in psychological, social, and cognitive developmental change that is evident between kindergarten and 1st grade children. Interestingly, there were no significant differences between grade levels in the post-program scores ($F_{(3,1036)}$ = 1.141, p = 0.331). Thus, having received CBSG program exposure all children seemed to improve at the appropriate development level within their grade cohort.

Survey grand total mean scores analyzed with paired *t-tests* show that in comparison to pre-program survey scores, children significantly improved after CBSG participation(11.26 $\pm$ 3.54 vs. 14.30 $\pm$ 3.04; $t_{(1036)}$ = -35.77, p< 0.0001). Figure 1 shows the extent of improvement in each of the individual survey items corresponding to specific psychological, social and cognitive domains. The results indicate that CBSG participation significantly improves confidence/self-esteem, cooperation, classroom participation, willingness to listen, appropriate decision-making, and classmate interactions.

PLACE FIGURE 1 ABOUT HERE

These results were not influenced by gender ($F_{(1036)}$ = 2.42, p = 0.104) or race/ethnicity ($F_{(1036)}$ = 0.662, p = 0.398). However, as the data were obtained by multiple school districts in two different cities, 'site' was used as a grouping variable and 'school district' within each site as a random factor to determine if there were any significant differences in pre- or post-program scores as a function of location. Based on the estimated marginal means and Bonferroni corrections, an ANOVA showed there were no significant differences

in pre-program scores ($F_{(1056)}$ = 0.001, p = 0.978). However, a significant difference was noted in post-program scores ($F_{(1036)}$ = 25.40, p = 0.0001). Analyzing each of the 7 independent school district (ISD) sites located in urban and suburban areas indicated that the mean differences in post-program scores between the two largest urban independent school districts (Fort Worth *vs.* Dallas) contributed to the post-program differences (p = 0.0001). Thus, the combined dataset was separated into Community Site 1 (Dallas) and Community Site 2 (Fort Worth) and the data reanalyzed to determine CBSG program effectiveness for each community.

Community Site 1: Rainbow Days – Dallas, Texas

Participants

Demographics from a total of 342 participants in site 1 are shown in Table 2. Out of 342 children who enrolled in the program, 336 provided evaluable data for statistical paired comparisons from both the pre- and post-program conditions. This represents a ~1.75% attrition rate.

PLACE TABLE 2 ABOUT HERE

Pre- and Post-Program Survey Results

The total mean scores in the pre- *vs.* post-program conditions (means = 11.96 *vs.* 15.80) significantly differed suggesting that CBSG participation improved psychological, social and cognitive domains ($t_{(335)}$ = -22.01, p = 0.0001). Figure 2 illustrates the improvement in each individual survey item scored in the pre- and post-program conditions.

PLACE FIGURE 2 ABOUT HERE

Reason for Need and Number of Sessions Attended

The 'reason for need' to refer a child to the CBSG program included child abuse (n= 4), domestic violence + homelessness (n=23), homeless (n= 94), and human trafficking (n=17). Although the ACE questionnaire was not formally used, a consensus determination by facilitators, teachers, school counselors, program evaluator, and the CBSG development team was used to classify these 138 children as having at least 4 ACEs due to the nature of their experiences. The other 198 children's 'reason for need' was recorded as receiving a 'counselor or teacher referral' with no additional information available. Mean change scores for the other groups include the abused children who showed the greatest improvement than any other group (mean = 5.75 +/- 3.3), the domestic violence + homeless group (mean = 3.00 +/- 3.0), and human trafficking (mean = 2.88 +/- 3.72). Bonferroni post hoc comparisons showed that there was a significant difference in the pre- to post-program change score between 'homeless' (mean = 2.85 +/- 3.9) and 'counselor or teacher referral' (mean = 4.4 +/- 2.6), $F_{(4,335)}$ = 5.32, p = 0.001. These data suggest that while the homeless children improved, their overall improvement was less than those referred by their teacher/school counselor.

When the number of sessions attended were analyzed in relation to reason for need, we found that the 138 children who were most in need attended 4-5 sessions in comparison to the 198 children who were counselor/teacher referred to the CBSG program who attended 8-10 sessions. Among those children who were most in need, regression analyses showed that the change score was not significantly influenced as a function of sessions attended ($F_{(1,137)}$ = 0.013, R^2 = 0.010, β = -0.09, t = -0.11, p = 0.132). Among those who were teacher/school counselor referred, regression analyses again showed that the change

score was not significantly influenced as a function of number of sessions attended, (F $_{(1,197)}$ = 2.28, R^2 = 0.012, β = 0.43, t = 1.51, p = 0.132).

Overall, within the groups of children most in need (n = 138) and those in the teacher or school counselor referred group (n=198), all children showed improved change scores. However when the number of sessions the total population received were compared to each other (regardless of the reason for need), the only significant difference in change scores was noted between those children who attended 5 sessions vs. 10 sessions ($F_{(4,331)}$ = 5.04, p = 0.001). Again, the children who attended 5 sessions were those who were homeless. Although the homeless children significantly improved overall with the 5 sessions they received as shown earlier, these data suggest that children who are homeless may benefit more than any other at-risk group if they received more than 5 sessions of CBSG program messaging.

Community Site 2: Recovery Resource Council – Fort Worth, Texas

Study Participants

Table 3 shows the site 2 demographics of 715 participants who enrolled in the CBSG program.

PLACE TABLE 3 ABOUT HERE

Pre- and Post-Program Survey Results

Out of the 715, there were 701 children who provided evaluable data for statistical paired comparison analyses from the pre- and post-program conditions. This represents a ~1.95% attrition rate. Those participating in the CBSG program showed significant improvements from the pre- and post-program total test scores (mean = 10.93 *vs.* 13.59; *t*

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$_{(700)}$ = -29.36, p< 0.001). Figure 3 shows the psychological, social, and cognitive domains that significantly improved after CBSG program participation.

PLACE FIGURE 3 ABOUT HERE

Reason for Need and Number of Sessions Attended

The 'reason for need' to refer a child to the CBSG program included skills deficit (n= 375), risky behaviors (n=57), mental or physical health problems (n= 77), and socioeconomic issues (n=187). As stated with Community Site 1, a consensus determination by facilitators, teachers, school counselors, program evaluator, and the CBSG development team was used to classify these children as having at least two ACEs due to the nature of their experiences. The mean number of sessions attended was 9.24 +/- 1.51. Of the 701 children with evaluable data, post hoc Bonferroni comparisons showed that there were no statistically significant differences in change scores as a function of 'reason for need' (F $_{(4,696)}$ = 1.194, p = 0.312) or as a function of number of sessions attended (F $_{(9,705)}$ = 1.128, p = 0.340). Thus, no further analyses were performed with these variables.

To determine if CBSG participation would produce long-lasting effects without additional CBSG sessions, we conducted a 1-year follow-up survey assessment. We found 96 third grade children whose matched survey scores for the three experimental conditions, pre- and post-program, and 1-year follow-up were obtained. It is important to reiterate that these 96 children did not receive any further exposures to CBSG sessions beyond the original sessions they attended during the time period prior to the 1-year follow-up testing.

A repeated measures ANOVA used to examine longitudinal improvement over time and a Wilk's Lambda was used to determine the accompanying effect size as shown with partial

eta-squared. Figure 4 shows the individual survey item scores in the pre-, post-, and 1-year post-program conditions with the accompanying multivariate statistics. Teachers who assessed the children in the 1-year condition were fourth grade teachers and were different than the third grade teachers who assessed them in the pre- and post-program conditions. To determine if there were any scoring bias between teachers or school counselors, we conducted additional analyses. There were no significant scoring differences in any of the experimental conditions among teachers or counselors who may have differed between third and fourth grades ($F = 0.020$, $p = 0.88$). The data show that CBSG participation provides long-lasting psychological, social, and cognitive improvements that appear to continue up to 1-year later.

<div align="center">PLACE FIGURE 4 ABOUT HERE</div>

DISCUSSION

To our knowledge, this is the first multi-community site study to prospectively examine the effectiveness of a prevention/intervention program targeting young at-risk children who have suffered at least one ACE during the past 9-months. The results support our primary hypothesis that CBSG program participation significantly improves psychological, social, and cognitive domains in these young and vulnerable children. Moreover as predicted in our secondary hypothesis, the data indicate that the CBSG curriculum messaging is effective in promoting long-lasting improvements in these domains observed 1-year later.

The evidence suggests that CBSG program participation enhances developmental competencies in increased self-confidence and self-esteem, classroom cooperation and participation, and appropriate social interactions. Importantly, CBSG participants appear to be more willing to listen and more skilled in processing information that is critical in

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appropriate decision-making. These developmental competencies are key in promoting

normative behaviors necessary for children to become resilient to overcome ACEs

(Mandleco and Peery 2000). Moreover, 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 delivering the CBSG program to children currently undergoing

ACEs has strong potential to mitigate the negative lifelong effects triggered by ACEs.

Our longitudinal data that suggests that CBSG participation promotes sustained

psychosocial competence are particularly encouraging as Jones et al (2015) conducted a

20-year longitudinal study and found a child's social competence in kindergarten is a

stronger predictor of future criminality in adulthood than childhood aggression. Jones et al

(2015) examined teacher's ratings of pro-social behavior in kindergarten children and

followed them until they were 25-years old. Pro-social behavior was defined as

cooperating with their peers, helpful, adept at understanding other's feelings, and knows

how to be a problem-solver. Importantly, these are the same types of behaviors the CBSG

program enhances.

Jones et al (2015) showed that 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. In addition, binge drinking and the number of days marijuana use also

predicted by poor social behavior in kindergarten children such as the likelihood that they

would live in or be on a wait list for public housing and receive public assistance as an

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adult. These results may have relevance to the homeless children in our study who lead

transient lives and are at-risk for a lifetime of poor health, legal involvement, and poverty.

Although the homeless participants only received five CBSG sessions, the post-program

scores suggest that they significantly benefited with this brief CBSG exposure. Whether or

not this benefit is long-lasting in this group cannot be determined with this dataset.

However, the fact that young homeless children have rarely been studied, underscores the

importance of our data that suggests that homeless children exposed to the CBSG program

may have a better chance of living healthier and more rewarding lives if given the

opportunity to receive this prevention intervention program.

The psychological, social, and cognitive domains targeted with the CBSG program underlie

the developmental competency of self-control. Moffitt et al (2011) followed a cohort of

1,000 children from birth to 32-years old and tested their levels of self-control every 2- to 3-

years starting at 3-years old. Moffitt and colleagues (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. Moffitt et al (2011) also reported that

the 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.

Although our study was not designed for extensive follow-up, the Moffett et al (2011) results

lends support to our findings that CBSG participation has promise in averting these kinds

of negative life outcomes.

It is important to note that participants in both the Moffitt et al (2011) or Jones et al (2015) studies did not receive or participate in any prevention intervention programs. To our knowledge there are no other prevention intervention school-based programs with the kind of curriculum that CBSG has designed in targeting a well-defined group of developmental competencies that are now known to predict adult outcomes. Taken together with our data, these lines of evidence suggest that implementing the CBSG prevention intervention program in the school setting to at-risk children has convincing potential to mitigate the adverse effects of ACEs later in life.

For better or for worse, the psychological, social, and cognitive development of ACE children perpetuates 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 illness 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 should be a priority with child development researchers, educators, and public health policy makers.

Limitations and Strengths

Although we lacked a control group, this proof-of-concept multi-community site research was not designed to compare outcomes between those with and without CBSG exposure. If a control group had been implemented, then recruitment might have suffered and it would have been difficult to engage two large community sites to participate. Instead, we sought to collect preliminary data to determine the impact the CBSG program would have in

young, at-risk children. Moreover, the detrimental physical and mental health outcomes of

ACEs are well-documented; and yet, there are few if any prevention/intervention programs

delivered to young children to enhance their psychological, social, and cognitive

development most affected by ACEs. To that end, a strength of this research is that we

have a rather large sample size from which to determine CBSG effectiveness and our

stringent statistical significance adds credence to our data interpretations. Another strength

is that we captured data showing long-term effectiveness of the CBSG program in a 1-year

follow-up design.

While no differences were found in the pre-program scores for the two community sites,

another possible limitation was the difference in post-program scores. After finding the

differences were driven by the two largest urban ISD community sites (Dallas *vs*. Fort

Worth), it was encouraging to also find that the CBSG program was significantly effective at

improving post-program behaviors in both community sites regardless of whether the

schools were situated in urban or suburban locations. Thus, the CBSG program seems to

show substantial effectiveness across geographic locations. While the outcomes from this

multi-community study are certainly encouraging, these preliminary proof-of-concept data

should be viewed with caution.

CONCLUSION

The CBSG program appears to enhance psychological, social, and cognitive domains

underlying self-esteem, social connectedness, internal well-being, and normative behaviors

in young at-risk children. The literature suggests that these domains and associated

behaviors may be considered protective factors that are necessary in early childhood in

order to build resiliency to overcome ACEs now and later in life. Here, the data indicates

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that CBSG program participation has strong potential to help set a more positive life trajectory in young, at-risk children that should help increase their chances of living healthier and more productive lives.

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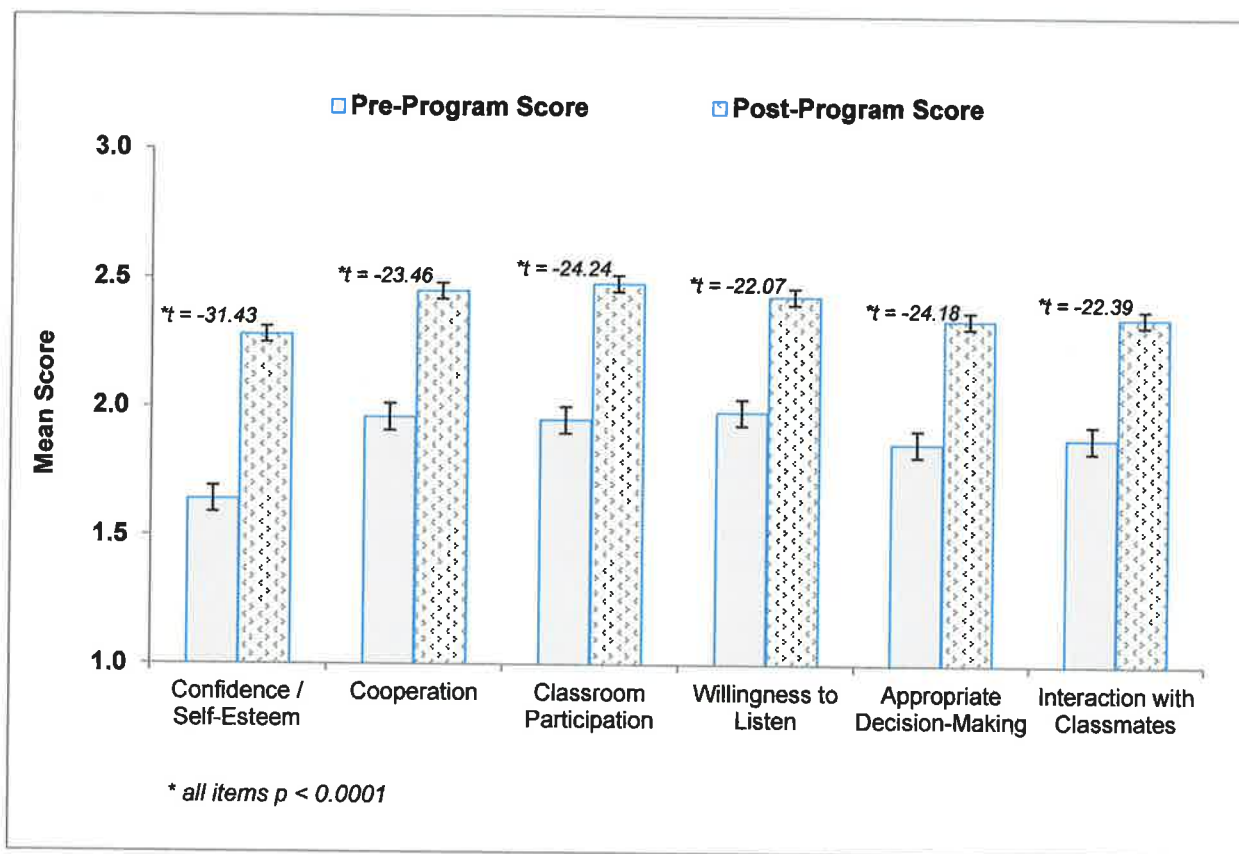
Figure 1. Combined Sites 1 and 2 Pre- and Post-Program Survey Scores*

Figure 2. Site 1 Pre- and Post-Program Survey Scores*

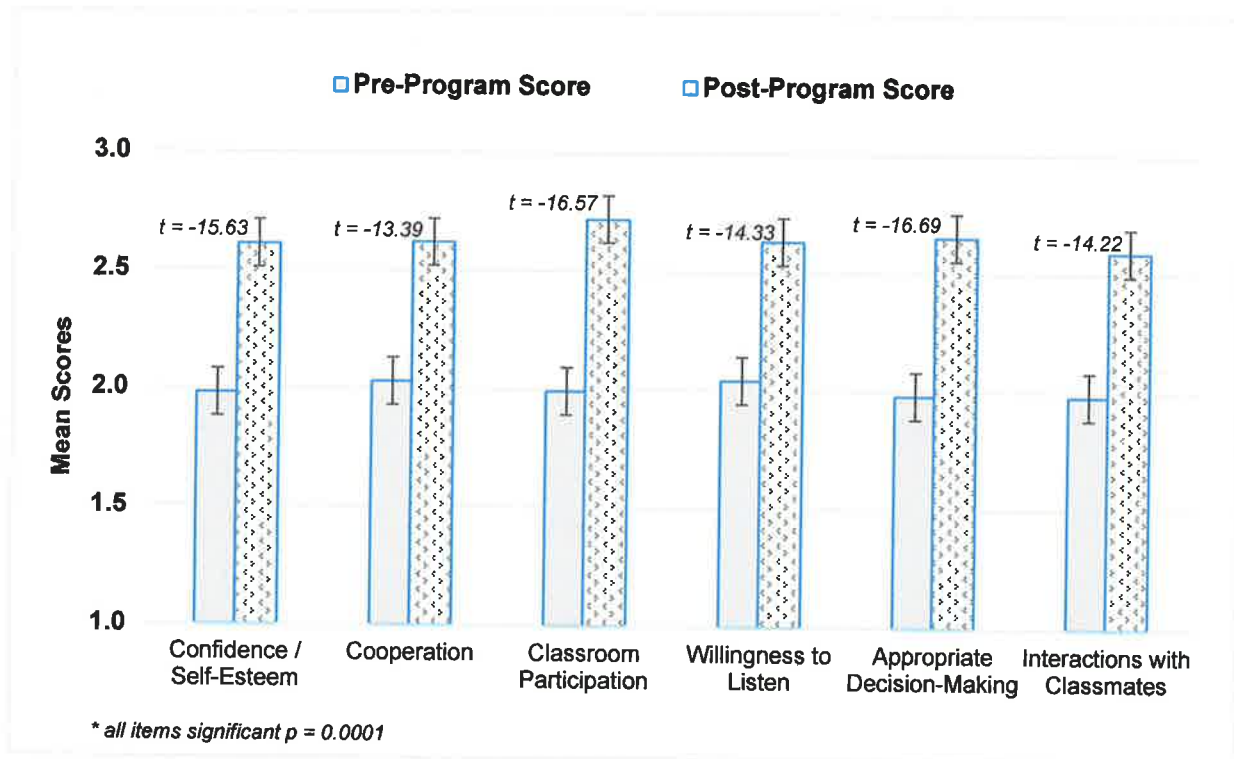* all items significant p = 0.0001

Figure 3. Site 2 Pre- and Post-Program Survey Scores*

* all items significant p = 0.0001
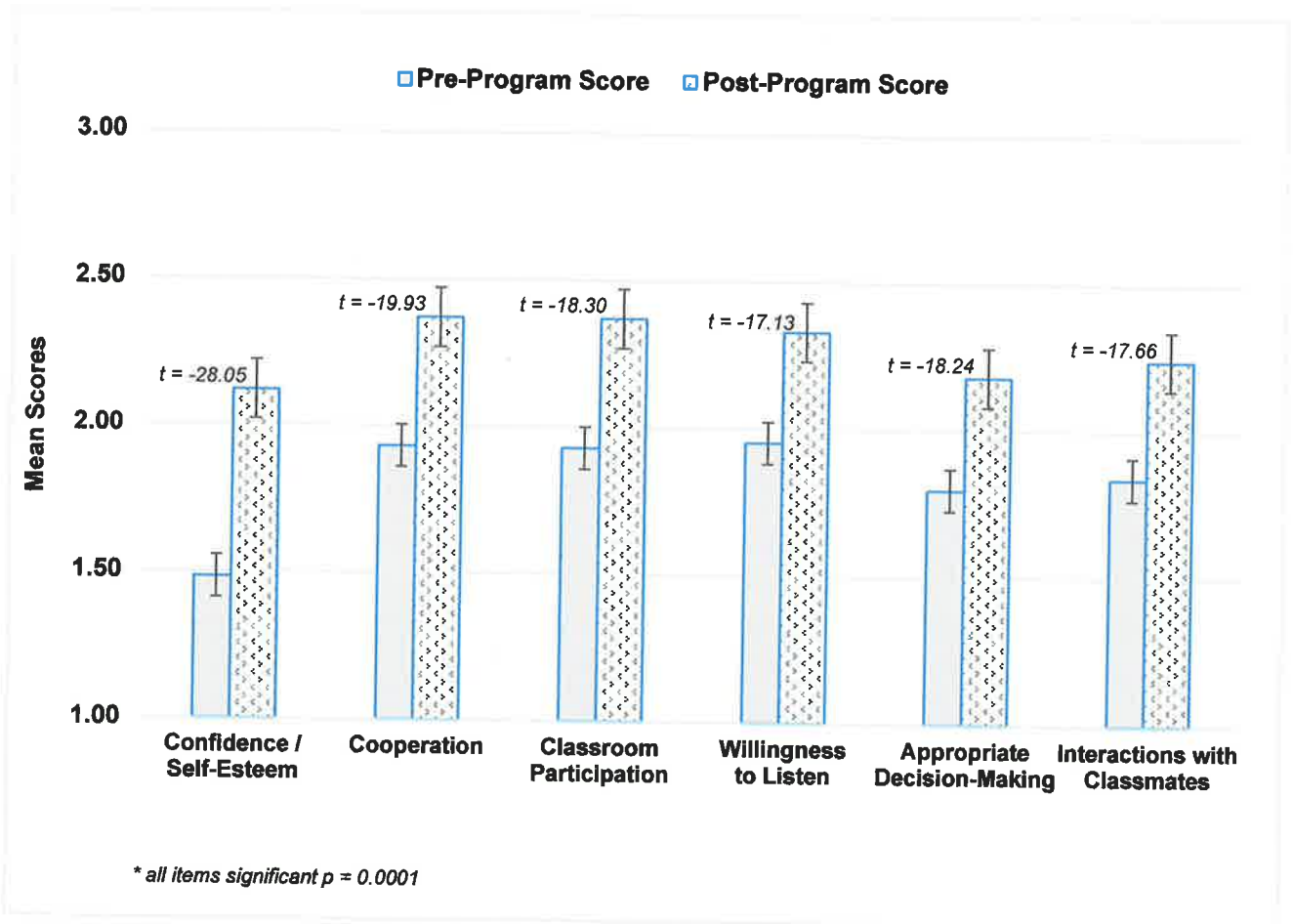
Figure 4. Site 2 Pre- and Post-Program and One-Year Follow-up Survey Scores

	F-value	Significance	Power
Confidence/Self Esteem	F=70.644	p=0.000	η^2=0.600
Desire to Cooperate	F=42.337	p=0.000	η^2=0.474
Willingness to Participate	F=26.792	p=0.000	η^2=0.363
Willingness to Listen to Adults	F=32.290	p=0.000	η^2=0.407
Appropriate Decision Making	F=39.490	p=0.000	η^2=0.457
Interaction with Classmates	F=32.563	p=0.000	η^2=0.409

Wilk's Lambda F test - This test is based on linearly dependent pairwise comparisons among the estimated marginal means
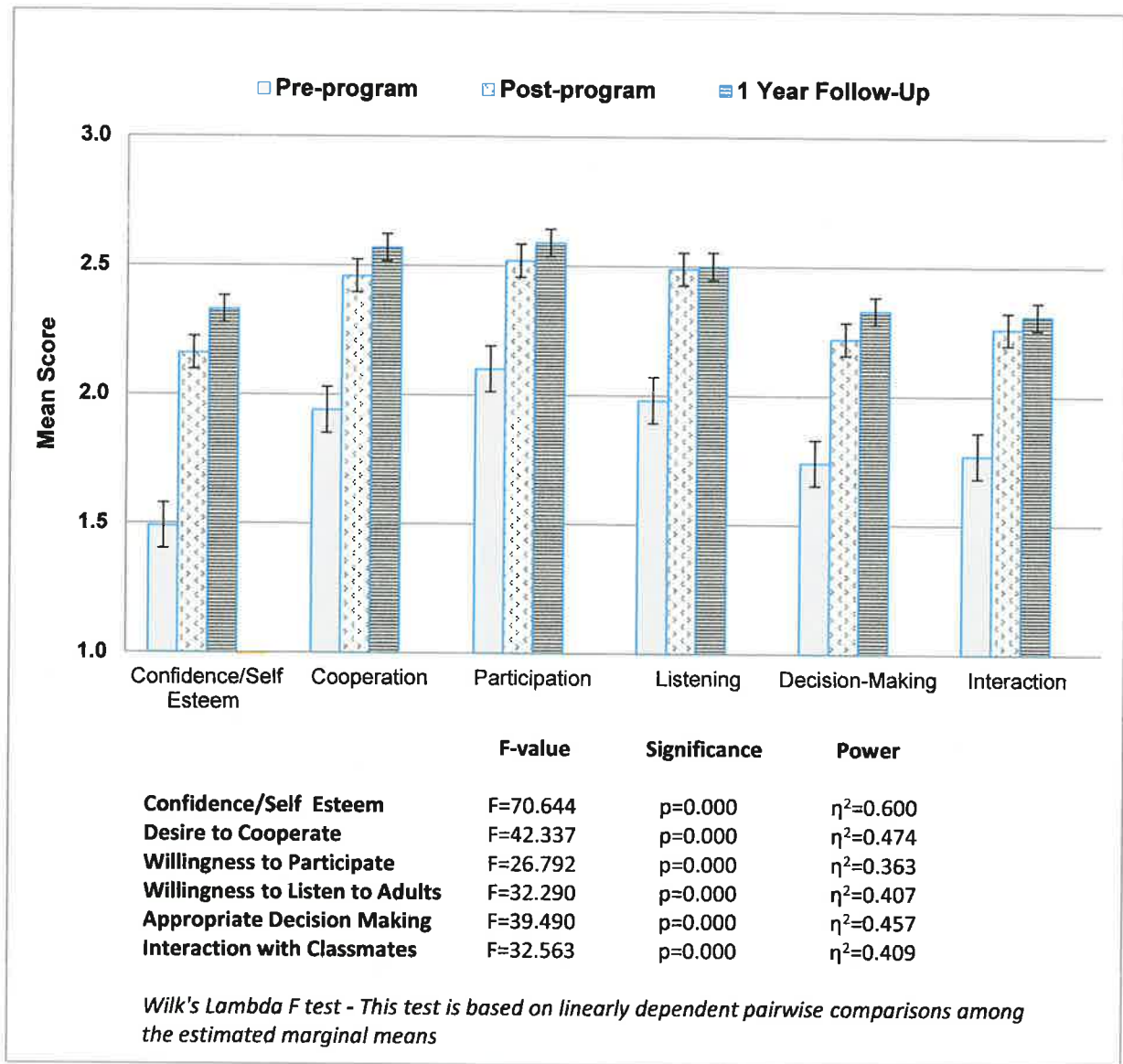
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Table 1. **Combined Multi-Community Sites 1 + 2 Demographic Characteristics**

Grades K-3 *(mean age = 6.83 ± 1.21) Community Sites 1 + 2*						
Gender	Black	White (non-Hispanic)	Hispanic	Other	Missing	Total
Girls	133	118	170	10	3	434
Boys	193	145	246	14	2	600
Missing	1	1	2	1	18	23
Total	327	264	418	25	23	1057

Table 2. Site 1 Demographic Characteristics

Grades K-3 *(mean age = 6.62 ± 1.12)*						
Gender	Black	White (non-Hispanic)	Hispanic	Other	Missing	Total
Girls	72	20	65	1	0	158
Boys	91	16	73	3	0	183
Missing	1	0	0	0	1	1
Total	**164**	**36**	**138**	**4**	**1**	**342**

Table 3. Site 2 Demographic Characteristics

Grades K-3 *(mean age = 6.93 ± 1.24)*						
Gender	Black	White (non-Hispanic)	Hispanic	Other	Missing	Total
Girls	61	98	105	9	3	276
Boys	102	129	173	11	2	417
Missing	0	1	2	1	18	22
Total	**163**	**228**	**280**	**21**	**23**	**715**
Participants who completed 1-year follow-up						
Girls	1	15	26	5	0	47
Boys	3	26	17	2	0	48
Missing	0	0	0	1	0	1
Total	**4**	**41**	**43**	**8**	**0**	**96**