

Appendix A: Analysis of Cohorts 1 and 2

This page is intentionally blank.

Analysis of Cohorts 1 and 2

For Years 2 and 3 of the social and character development (SACD) multiprogram evaluation, additional funds were provided to enable research teams to add additional schools in order to increase the sample size and the corresponding statistical power of the analyses. Four teams added 2 or 4 schools and randomly assigned half to the treatment and half to the control groups using the same matching process as with the original schools. The additions were as follows: (1) University at Buffalo, The State University of New York (*Academic and Behavioral Competencies Program* [ABC]) added 2 schools, (2) University of North Carolina at Chapel Hill (*Competence Support Program* [CSP]) added 4 schools,¹ (3) Vanderbilt University (*Love In a Big World* [LBW]) added 2 schools, and (4) The Children’s Institute (*Promoting Alternative Thinking Strategies* [PATHS]) added 4 schools. As a result, a second set of 12 schools (and a second cohort of students) was added to the SACD evaluation for Years 2 and 3, raising the total number of schools involved in the study from 84 to 96 (with the second cohort of schools making up 14 percent of the sample).²

Data collection at these schools followed the same process and used the same reports as at the first set of schools. Initial data collection with third-grade students in the second cohort began in fall 2005 (1 year later than the first cohort of third-graders), with the first follow-up at the end of third grade (spring 2006) and the second follow-up at the end of fourth grade (spring 2007). Students were followed for 2 years (through third and fourth grades) but not through fifth grade as was done with Cohort 1.

This appendix examines whether an analysis of the larger sample of both cohorts together (all Cohort 1 students plus all Cohort 2 students) gives similar or different results from those for Cohort 1 alone (presented in chapters 1 through 8). The two cohorts were combined into one sample by grouping all third-graders together and all fourth-graders together. Two analyses were done. The first compared student outcomes for treatment and control students at the end of their fourth-grade year, and the second looked at average yearly growth in student outcomes from the beginning of third grade to the end of fourth grade. As Cohort 2 was not followed through the fifth grade, both analyses are based on the third- and fourth-grade data only.

Sample

There were 7,255 fourth-graders enrolled in one of 95 study schools at the time of data collection in spring of the students’ fourth grade (spring 2006 for Cohort 1 and spring 2007 for Cohort 2). These students included 5,750 original cohort “stayers” who were enrolled in a study school at the time of data collection in fall of their third grade and spring of fourth grade, and 1,505 new entrants who enrolled in a study school after the data collection in the fall of their third grade but before data collection in the spring of fourth grade. The sample universe excluded 1,607 original cohort “leavers” who were enrolled in a study school in fall of third grade but not in spring of fourth grade.

There were 1,064 third-, fourth-, or fifth-grade teachers in spring of fourth grade but 124 either did not give consent to participate or did not provide the requested data. As a result, the teacher samples for the spring of fourth-grade analysis included 940 third- to fifth-grade teachers (fourth-grade teachers completed the Teacher Report on Student and third- to fifth-grade teachers completed the Teacher Report on Classroom and School). Teachers who had been in the study in fall of third grade but were excluded from the fourth-grade

¹ One of CSP’s Cohort 2 schools stopped implementing the intervention after the first year but remained in the study for the second year as a treatment school.

² Of the original 84 schools, one control school dropped out of the study prior to Year 2 when it became a magnet school, leaving 95 schools available for the analysis of both cohorts together.

Appendix A: Analysis of Cohorts 1 and 2

follow-up could either have (1) left the school between fall of third grade and spring of fourth grade or (2) remained at the school but discontinued teaching in the third, fourth, or fifth grade.

The consent and response rates led to the analysis sample sizes and the percentages of the universe of fourth-graders for which there were data (table A.1). The analysis sample for the Child Report was 4,549 (2,395 treatment group students and 2,154 control group students); the samples for the Primary Caregiver Report and Teacher Report on Student were 3,551 (1,856 treatment group students and 1,695 control group students) and 4,737 (2,492 treatment group students and 2,245 control group students), respectively. These Child Report, Primary Caregiver Report, and Teacher Report on Student samples reflected 63 percent, 49 percent, and 65 percent of the 7,255 students in the sample universe of students in the fourth grade in study schools (in spring 2006 for Cohort 1 and spring 2007 for Cohort 2, including both original cohort stayers and new entrants in each cohort). The analysis sample for the Teacher Report on Classroom and School was 940 teachers (482 treatment group and 458 control group), which was 88 percent of the universe of teachers in the study schools. None of the differences between treatment and control groups in the percentage of the universe for which data were collected was statistically significant when the data were pooled across programs.

Table A.1. Combined Cohorts 1 and 2: Sample size and percentage of sample universe for fourth-graders, by program and by treatment group status

| Program | Analysis sample size (Percent of sample universe) | | | | | | | | | | | |
|--------------|---|-----------------|-----------------|--------------------------|-----------------|-----------------|---------------------------|-----------------|-----------------|--|---------------|---------------|
| | Child Report | | | Primary Caregiver Report | | | Teacher Report on Student | | | Teacher Report on Classroom and School | | |
| | Treatment | Control | Total | Treatment | Control | Total | Treatment | Control | Total | Treatment | Control | Total |
| All programs | 2,395 (63.9) | 2,154 (61.4) | 4,549 (62.7) | 1,856 (49.5) | 1,695 (48.3) | 3,551 (48.9) | 2,492 (66.5) | 2,245 (64.0) | 4,737 (65.3) | 482 (88.6) | 458 (88.1) | 940 (88.3) |
| ABC | 254 (59.8)** | 350 (63.6) | 604 (61.9) | 182 (42.8) | 262 (47.6) | 444 (45.5) | 266 (62.6)*** | 362 (65.8) | 628 (64.4) | 56 (77.8) | 72 (85.7) | 128 (82.1) |
| CSP | 432 (65.9) | 429 (60.2) | 861 (62.9) | 324 (49.4) | 348 (48.8) | 672 (49.1) | 438 (66.8) | 442 (62.0) | 880 (64.3) | 81 (85.3) | 82 (85.4) | 163 (85.3) |
| LBW | 357 (60.9) | 287 (62.1) | 644 (61.5) | 314 (53.6) | 234 (50.6) | 548 (52.3) | 385 (65.7) | 299 (64.7) | 684 (65.3) | 77 (90.6) | 55 (87.3) | 132 (89.2) |
| PA | 284 (66.8) | 225 (66.4) | 509 (66.6) | 215 (50.6) | 184 (54.3) | 399 (52.2) | 302 (71.1) | 251 (74.0) | 553 (72.4) | 43 (86.0) | 39 (86.7) | 82 (86.3) |
| PATHS | 306 (58.5) | 265 (52.2) | 571 (55.4) | 239 (45.7)** | 201 (39.6) | 440 (42.7) | 314 (60.0) | 273 (53.7) | 587 (56.9) | 73 (85.9) | 77 (81.1) | 150 (83.3) |
| 4Rs | 376 (62.8) | 303 (59.4) | 679 (61.2) | 245 (40.9) | 210 (41.2) | 455 (41.0) | 403 (67.3) | 323 (63.3) | 726 (65.5) | 91 (96.8) | 82 (97.6) | 173 (97.2) |
| SS | 386 (72.4) | 295 (69.2) | 681 (71.0) | 337 (63.2) | 256 (60.1) | 593 (61.8) | 384 (72.0) | 295 (69.2) | 679 (70.8) | 61 (96.8) | 51 (96.2) | 112 (96.6) |

** Treatment group significantly different from control group at the .01 level.

*** Treatment group significantly different from control group at the .001 level.

NOTE: Abbreviations are

ABC: *Academic and Behavioral Competencies Program*

CSP: *Competence Support Program*

LBW: *Love In a Big World*

PA: *Positive Action*

PATHS: *Promoting Alternative Thinking Strategies*.

4Rs: *The 4Rs Program (Reading, Writing, Respect, and Resolution)*.

SS: *Second Step*

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix A: Analysis of Cohorts 1 and 2

There were several significant differences at the program level. For the ABC program, there was a statistically significant treatment-control group difference in the percentages with Child Report data (60% for the treatment group and 64% for the control group) and Teacher Report on Student data (63% and 66%, respectively). For the PATHS program, there was a statistically significant difference in the percentages with Primary Caregiver Report data (46% and 40%, respectively).

As in the Cohort 1 study, the sample for the evaluation of the two cohorts raised two cautions for the interpretation of the results. First, because of non-consent and non-response, the impact estimates might not generalize to the full sample universe if the characteristics of students in the study and students not in the study differed in ways that correlated with child outcomes. Second, because the study did not follow leavers from the original cohort, the intent-to-treat (ITT) impacts could not be estimated using all original cohort members. Instead, the evaluation used a repeated cross-sectional analysis approach to estimate impacts; this involved including all students in the study schools who had consent and who provided data at each follow-up point. These unbiased impact estimates for students in the study reflect (1) the extent to which the programs improved the outcomes of the average student in the study, and (2) treatment-induced “mobility effects” resulting from potential differences in the average outcomes of treatment and control students who entered and left the schools after random assignment.

Initial Data

The examination of the initial characteristics³ of students, families, teachers, and schools for the combined cohorts showed few significant differences between the treatment and control groups at the combined-program level and fewer differences among the programs than would be expected by chance. These results are similar to those of the Cohort 1-only sample. The treatment and control groups in the combined sample were similar along all student and parent/caregiver characteristics except for household size (the treatment group students were more likely to come from smaller households: 4.6 people versus 4.7 per household) (table A.2). There were no significant differences between treatment and control groups in the mean values of the outcomes measuring children’s behavior and attitudes (table A.3). There were no significant differences between the treatment and control groups in teachers’ initial characteristics (table A.4), nor were there significant differences in the characteristics of treatment group schools and control group schools (though sample sizes were small for these comparisons) (table A.5). There were no differences between treatment and control groups in teacher-reported measures of the school environment on such dimensions as safety, participatory decision making, and work pressure (these data are not shown in a table).

³ For a list of the characteristics, see Initial Characteristics in chapter 1.

Appendix A: Analysis of Cohorts 1 and 2

Table A.2. Combined Cohorts 1 and 2: Initial characteristics of children, their families, and communities

| Characteristic | Total | Treatment | Control |
|---|-------|-----------|---------|
| Student sample size | 4,202 | 2,202 | 2,000 |
| Student demographics | | | |
| Gender (percent) | | | |
| Male | 47.4 | 47.1 | 47.7 |
| Female | 52.6 | 52.9 | 52.3 |
| Race/ethnicity (percent) | | | |
| White (non-Hispanic) | 40.7 | 39.0 | 42.5 |
| Black (non-Hispanic) | 31.9 | 33.7 | 30.2 |
| Hispanic | 19.9 | 19.8 | 20.0 |
| Other | 7.4 | 7.5 | 7.3 |
| Age (in years) (mean) | 8.1 | 8.1 | 8.1 |
| Primary caregiver and family characteristics | | | |
| Primary caregiver's age (in years) (mean) | 36.0 | 35.9 | 36.1 |
| Primary caregiver's race/ethnicity (percent) | | | |
| White (non-Hispanic) | 44.6 | 42.8 | 46.4 |
| Black (non-Hispanic) | 31.9 | 33.8 | 30.0 |
| Hispanic | 18.2 | 18.0 | 18.3 |
| Other | 5.3 | 5.4 | 5.3 |
| Primary caregiver's education (percent) | | | |
| Did not complete high school | 15.5 | 14.5 | 16.5 |
| Completed high school or equivalent | 24.7 | 24.2 | 25.3 |
| Some college | 39.7 | 40.7 | 38.7 |
| Bachelor's or higher degree | 20.0 | 20.6 | 19.5 |
| Primary caregiver's employment (percent) | | | |
| Full-time | 47.5 | 47.8 | 47.3 |
| Part-time | 14.6 | 14.5 | 14.7 |
| Student and employed | 4.4 | 4.9 | 3.9 |
| Not employed | 32.4 | 31.7 | 33.0 |
| Other | 1.1 | 1.1 | 1.1 |
| Primary caregiver's marital status (percent) | | | |
| Single | 25.0 | 25.6 | 24.4 |
| Married | 55.2 | 54.5 | 56.0 |
| Separated or divorced | 12.7 | 12.7 | 12.7 |
| Widowed | 1.4 | 1.3 | 1.5 |
| Other ¹ | 5.6 | 5.9 | 5.4 |
| Students who live in one household (percent) | 93.6 | 93.5 | 93.7 |
| Number of individuals in household (mean) | 4.7 | 4.6* | 4.7 |

See notes at end of table.

Appendix A: Analysis of Cohorts 1 and 2

Table A.2. Combined Cohorts 1 and 2: Initial characteristics of children, their families, and communities—Continued

| Characteristic | Total | Treatment | Control |
|---|-------|-----------|---------|
| Primary caregiver's relationship to child (percent) | | | |
| Mother (stepmother) | 85.9 | 86.0 | 85.8 |
| Father (stepfather) | 8.9 | 8.5 | 9.4 |
| Grandparent | 3.1 | 3.2 | 3.0 |
| Other relative | 1.3 | 1.4 | 1.3 |
| Nonrelative | 0.8 | 1.0 | 0.6 |
| Student lives with (percent) | | | |
| Mother (stepmother) and father (stepfather) | 58.4 | 57.0 | 59.7 |
| Mother (stepmother) only; father (stepfather) not present | 35.1 | 36.3 | 33.9 |
| Father (stepfather) only; mother (stepmother) not present | 2.6 | 2.4 | 2.8 |
| Other relative/nonrelative; parents not present | 4.0 | 4.3 | 3.6 |
| Highest education of anyone in household (percent) | | | |
| Did not complete high school | 10.7 | 9.6 | 11.9 |
| Completed high school or equivalent | 22.4 | 21.7 | 23.1 |
| Some college | 40.5 | 42.1 | 39.0 |
| Bachelor's or higher degree | 26.3 | 26.6 | 26.0 |
| Total household income (percent) | | | |
| Less than \$20,000 | 34.6 | 33.7 | 35.4 |
| \$20,000 to \$39,999 | 24.6 | 25.2 | 24.1 |
| \$40,000 to \$59,999 | 15.0 | 15.4 | 14.5 |
| \$60,000 or more | 25.9 | 25.7 | 26.0 |
| Household income-to-poverty ratio (percent) | | | |
| Below 135 percent | 40.8 | 39.3 | 42.3 |
| 135 to 185 percent | 18.7 | 19.3 | 18.1 |
| Above 185 percent | 40.5 | 41.4 | 39.6 |
| Alabama Parenting Questionnaire—Poor Monitoring and Supervision Subscale (mean) | 1.2 | 1.2 | 1.2 |
| Alabama Parenting Questionnaire—Positive Parenting Subscale (mean) | 3.5 | 3.5 | 3.5 |
| Confusion, Hubbub, and Order Scale (mean) | 2.2 | 2.2 | 2.2 |
| Community characteristics (mean) | | | |
| Community Risks Scale | 1.5 | 1.5 | 1.5 |
| Community Resources Scale | 2.7 | 2.7 | 2.7 |
| Child-Centered Social Control Scale | 3.1 | 3.0 | 3.1 |

* Treatment group significantly different from control group at the .05 level.

¹ Categories combined to protect confidentiality.

NOTE: Weights, which assign equal weight to each school within each of the programs and to each program across programs, were used in producing the treatment, control, and overall means. Statistical tests were conducted using regressions that included program indicators to account for the sample design and adjusted for clustering at the school level.

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix A: Analysis of Cohorts 1 and 2

Table A.3. Combined Cohorts 1 and 2: Mean scores and standard deviations for initial outcome measures

| Outcome measure–Report | Range | Total | | Treatment | | Control | |
|---|-------|-------|-----|-----------|-----|---------|-----|
| | | Mean | SD | Mean | SD | Mean | SD |
| Social and Emotional Competence Domain | | | | | | | |
| Self-Efficacy for Peer Interaction–CR | 1-4 | 2.9 | 0.6 | 2.9 | 0.6 | 2.9 | 0.6 |
| Normative Beliefs About Aggression–CR | 1-4 | 1.2 | 0.5 | 1.2 | 0.5 | 1.2 | 0.5 |
| Empathy–CR | 1-3 | 2.4 | 0.4 | 2.4 | 0.4 | 2.4 | 0.4 |
| Behavior Domain | | | | | | | |
| Altruistic Behavior–CR | 0-3 | 1.5 | 0.8 | 1.4 | 0.8 | 1.5 | 0.8 |
| Altruistic Behavior–TRS | 1-4 | 1.4 | 0.5 | 1.4 | 0.5 | 1.4 | 0.4 |
| Altruistic Behavior–PCR | 1-4 | 2.3 | 0.7 | 2.3 | 0.7 | 2.3 | 0.8 |
| Positive Social Behavior–TRS | 1-4 | 3.0 | 0.7 | 3.0 | 0.7 | 3.0 | 0.7 |
| Positive Social Behavior–PCR | 1-4 | 3.0 | 0.5 | 3.0 | 0.5 | 3.0 | 0.5 |
| Problem Behavior–CR | 0-3 | 0.2 | 0.4 | 0.3 | 0.4 | 0.2 | 0.4 |
| Problem Behavior–TRS | 1-4 | 1.4 | 0.4 | 1.4 | 0.4 | 1.4 | 0.4 |
| Problem Behavior–PCR | 1-4 | 1.6 | 0.3 | 1.6 | 0.3 | 1.6 | 0.3 |
| ADHD-Related Behavior–TRS | 1-4 | 1.7 | 0.7 | 1.7 | 0.7 | 1.7 | 0.6 |
| Academics Domain | | | | | | | |
| Academic Competence and Motivation–TRS | 1-5 | 2.9 | 0.9 | 2.9 | 0.9 | 2.9 | 0.9 |
| Engagement with Learning–CR | 1-4 | 3.7 | 0.6 | 3.7 | 0.7 | 3.7 | 0.6 |
| Perceptions of School Climate Domain | | | | | | | |
| Positive School Orientation–CR | 1-4 | 3.2 | 0.7 | 3.2 | 0.7 | 3.2 | 0.7 |
| Negative School Orientation–CR | 1-4 | 1.9 | 0.7 | 1.9 | 0.7 | 1.9 | 0.7 |
| Student Afraid at School–CR | 1-4 | 2.4 | 0.9 | 2.4 | 0.9 | 2.4 | 0.9 |
| Victimization at School–CR | 0-3 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 |
| Sample size—PCR ¹ | | 4,202 | | 2,202 | | 2,000 | |
| Sample size—CR ¹ | | 4,486 | | 2,357 | | 2,129 | |
| Sample size—TRS ¹ | | 4,578 | | 2,405 | | 2,173 | |

¹ Sample size may differ for some outcomes due to nonresponse.

NOTE: Abbreviations are

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

ADHD: Attention deficit hyperactivity disorder

SD: Standard deviation

No findings were found statistically significant at or below the .05 level. Weights, which assign equal weight to each school within each of the programs and to each program across programs, were used in producing the treatment, control, overall means, and standard deviations. Statistical tests were conducted using regressions that included program indicators to account for the sample design and adjusted for clustering at the school level.

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix A: Analysis of Cohorts 1 and 2

Table A.4. Combined Cohorts 1 and 2: Initial characteristics of teachers

| Characteristic | Total | Treatment | Control |
|--|-------|-----------|---------|
| Teacher sample size | 964 | 494 | 470 |
| Gender (percent) | | | |
| Male | 11.8 | 12.2 | 11.4 |
| Female | 88.2 | 87.8 | 88.6 |
| Race/ethnicity (percent) | | | |
| White (non-Hispanic) | 76.0 | 74.5 | 77.4 |
| Black (non-Hispanic) | 16.4 | 17.6 | 15.1 |
| Hispanic | 4.7 | 5.7 | 3.7 |
| Other | 3.0 | 2.1 | 3.8 |
| Number of years teaching (mean) | 12.7 | 12.5 | 12.9 |
| Number of years teaching in this school (mean) | 7.3 | 6.9 | 7.7 |
| Type of teaching certificate (percent) | | | |
| Regular state certificate or advanced professional certificate | 84.6 | 83.7 | 85.6 |
| Provisional certificate (for those in alternative certification programs) | 5.8 | 6.7 | 4.8 |
| Probationary certificate (for those who have satisfied all requirements except for completing the probationary period) | 5.0 | 5.5 | 4.5 |
| Emergency certificate or waiver (for those who must complete a certification program to continue teaching) | 0.0 | 0.0 | 0.0 |
| Other ¹ | 4.6 | 4.0 | 5.1 |
| Education | | | |
| Less than a bachelor's degree | 0.0 | 0.0 | 0.0 |
| Bachelor's degree | 40.3 | 39.4 | 41.2 |
| Master's degree, Ph.D. | 56.1 | 58.2 | 54.0 |
| Specialist degree | 2.0 | 1.0 | 2.9 |
| Other | 1.7 | 1.4 | 1.9 |

¹Categories, including "no certificate" and "temporary certificate," combined to protect confidentiality.

NOTE: No findings were found statistically significant at or below the .05 level. Weights, which assign equal weight to each school within each of the programs and to each program across programs, were used in producing the treatment, control, and overall means. Statistical tests were conducted using regressions that included program indicators to account for the sample design and adjusted for clustering at the school level.

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix A: Analysis of Cohorts 1 and 2

Table A.5. Combined Cohorts 1 and 2: Initial characteristics of schools

| Characteristic | Total | Treatment | Control |
|---|-------|-----------|---------|
| School sample size | 96 | 48 | 48 |
| Student race/ethnicity (percent) | | | |
| White (non-Hispanic) | 36.4 | 36.6 | 36.1 |
| Black (non-Hispanic) | 40.9 | 40.4 | 41.5 |
| Hispanic | 18.8 | 18.7 | 18.9 |
| Other | 3.9 | 4.3 | 3.5 |
| Students eligible for free or reduced-price lunch (percent) | 63.2 | 64.1 | 62.4 |
| Number of students enrolled (mean) | 552.1 | 541.3 | 563.3 |
| Number of full-time teachers (mean) | 35.7 | 34.4 | 36.9 |
| Title I status (percent) | | | |
| Title I eligible school | 76.9 | 76.1 | 77.6 |
| Schoolwide Title I | 68.4 | 66.8 | 69.9 |
| Lowest grade offered (percent) | | | |
| Prekindergarten | 59.1 | 51.4 | 67.0 |
| Kindergarten | 40.9 | 48.6 | 33.0 |
| Highest grade offered (percent) | | | |
| 5th grade | 54.0 | 57.5 | 50.5 |
| 6h grade | 23.5 | 20.2 | 26.8 |
| 8th grade | 21.5 | 20.3 | 22.7 |
| Location of school (percent) | | | |
| City | 57.2 | 58.7 | 55.7 |
| Suburbs | 23.7 | 22.4 | 25.1 |
| Rural | 19.1 | 18.9 | 19.2 |
| Number of years principal has been at this school (mean) | 5.5 | 5.0 | 5.9 |

NOTE: No findings were found statistically significant at or below the .05 level. Weights, which assign equal weight to each school within each of the programs and to each program across programs, were used in producing the treatment, control, and overall means. Statistical tests were conducted using regressions that included program indicators to account for the sample design and adjusted for clustering at the school level. Data are missing from *Love In a Big World* for student race/ethnicity, percentage of students eligible for free or reduced-price lunch, and number of full-time teachers.

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix A: Analysis of Cohorts 1 and 2

Large percentages of principals and teachers (treatment and control) reported using social and character development activities and receiving professional development in their use. The percentages reported were very similar to those reported for Cohort 1, so only a selection of indicators are shown in table A.6. Where there were differences, they favored the treatment teachers, and all the differences that appeared here also appeared in the Cohort 1-only data. These differences may have reflected the fact that the programs had been implemented in most of the study schools before the teachers were surveyed about their use of activities.

Appendix A: Analysis of Cohorts 1 and 2

Table A.6. Combined Cohorts 1 and 2: Teacher initial reports on use of SCD activities and training in SCD activities

| Teacher report | Total | Treatment | Control |
|--|-------|-----------|---------|
| Teachers reporting on using programs or activities in their class to promote the following SCD goals (percent) | | | |
| Violence prevention and peace promotion | 64.4 | 68.2* | 60.7 |
| Social and emotional development | 72.2 | 76.3* | 68.0 |
| Character education | 82.8 | 84.2 | 81.4 |
| Tolerance and diversity | 61.9 | 62.4 | 61.4 |
| Risk prevention and health promotion | 52.0 | 50.8 | 53.1 |
| Civic responsibility and community service | 59.1 | 58.2 | 60.0 |
| Behavior management | 87.3 | 89.1 | 85.4 |
| None of the above | 2.4 | 1.9 | 2.9 |
| Teachers using the following materials in conjunction with social and character development activities (percent) | | | |
| Teacher guides (manuals, curricula) | 66.0 | 72.0** | 60.1 |
| Student materials (workbooks, worksheets) | 50.1 | 51.4 | 48.9 |
| Instructional aids (games, software, videos) | 32.6 | 36.0* | 29.1 |
| Giveaways (bookmarks, stickers) | 48.0 | 45.5 | 50.4 |
| Children's literature | 49.7 | 52.5 | 46.9 |
| Other types of materials | 12.9 | 10.9 | 14.9 |
| Do not use any of the materials listed above | 10.1 | 9.8 | 10.4 |
| Use of instructional strategies to promote SCD (percent) | | | |
| Teachers using any of 20 instructional strategies to promote social and character development in the classroom (percent) | 99.8 | 99.6 | 100.0 |
| Number of the 20 strategies used by teachers to promote social and character development in the classroom (mean) | 11.7 | 12.1* | 11.4 |
| Professional development on promoting SCD (percent) | | | |
| Teachers reporting participation in social and character development training within the past 12 month (percent) | 73.7 | 84.7*** | 62.7 |
| Number of hours of social and character development training teachers report receiving during the past 12 months (mean) | 7.6 | 8.9** | 6.3 |

* Treatment group significantly different from control group at the .05 level.

** Treatment group significantly different from control group at the .01 level.

*** Treatment group significantly different from control group at the .001 level.

NOTE: Weights, which assign equal weight to each school within each of the programs and to each program across programs, were used in producing the treatment, control, and overall means. Statistical tests were conducted using regressions that included program indicators to account for the sample design and adjusted for clustering at the school level. Sample size may differ for some outcomes due to nonresponse.

SOURCE: The Social and Character Development (SCD) Research Program.

Appendix A: Analysis of Cohorts 1 and 2

Cohort 2 significantly differed in some ways from Cohort 1 when comparing students, teachers, and schools (these data are not shown in a table), although some of these comparisons were based on small samples sizes for Cohort 2. At the combined-program level, there were no statistically significant differences between Cohort 1 and Cohort 2 students in terms of gender, race/ethnicity, or age. However, students from Cohort 1 were reported to come from less disadvantaged families than students in Cohort 2. Cohort 1 parents or primary caregivers were statistically significantly more likely to have a bachelor's degree or higher, be employed, be married, live in a household that included both a mother (or stepmother) and a father (or stepfather), have a higher income-to-poverty threshold ratio, and have a lower average community risks scale score (as reported by primary caregivers). With respect to the outcome measures, Cohort 1 students had significantly higher Academic Competence and Motivation, higher Engagement with Learning, fewer Normative Beliefs About Aggression, and a more Positive Orientation Toward School, although they had lower Altruistic Behavior scores (Primary Caregiver Report). The characteristics of teachers were similar in Cohort 1 and Cohort 2, and there were no statistically significant differences between the cohorts in teachers' gender, race/ethnicity, years of experience, or education. The Cohort 1 schools had a statistically significantly greater average number of enrolled students and a greater average number of full-time teachers but there were no differences in the characteristics of the students at the schools, such as the distributions of students across racial/ethnic groups or percentages of students eligible for free or reduced-price lunches. Teacher-reported measures of the school environment on such dimensions as safety, participatory decision making, and work pressure showed no statistically significant differences between Cohort 1 and Cohort 2. There were few significant differences in the use of SADC activities reported by the teachers in both cohorts. More Cohort 1 teachers reported using activities for tolerance and diversity (a difference of 10 percentile points). More Cohort 2 teachers reported using character education (with a difference of less than 2 percentile points) and behavior management activities (a difference of 7 percentile points). Teachers reported no significant differences in the use of materials and strategies for SADC activities and their participation in professional development; however, there was a difference between the cohorts in teacher reports on modeling positive social and character traits with students; this favored Cohort 1 (87 % versus 81 %).

The addition of the Cohort 2 schools did not have a large impact on the percentages of data available for the analysis. Table A.7 compares the consent rates, completion rates, and percentages of sample with data for each report for Cohort 1 only versus Cohorts 1 and 2 combined. The rates for Cohorts 1 and 2 combined are very similar to those of Cohort 1 only. Significant differences between treatment and control groups occur, in most cases, similarly in both. In two cases, the combined cohort data show significant differences between the treatment and control groups (Child Report students with data and students with Teacher Report on Student data, both in spring fourth grade) that were not found for Cohort 1 only. However, the actual magnitudes of the differences are very similar for both.

Table A.7. Cohort 1 versus combined Cohorts 1 and 2: Comparison of consent rates, completion rates, and percentage of sample with data

| Report | Cohort 1 (Fall 3rd grade) | | | Cohorts 1 and 2 (Fall 3rd grade) | | | Cohort 1 (Spring 4th grade) | | | Cohorts 1 and 2 (Spring 4th grade) | | |
|--|------------------------------|----------------|---------|-------------------------------------|----------------|---------|--------------------------------|----------------|---------|---------------------------------------|----------------|---------|
| | Total | Treat- ment | Control | Total | Treat- ment | Control | Total | Treat- ment | Control | Total | Treat- ment | Control |
| Student sample size | 6,567 | 3,367 | 3,200 | 7,357 | 3,764 | 3,593 | 6,415 | 3,327 | 3,088 | 7,255 | 3,747 | 3,508 |
| Child Report (percent) | | | | | | | | | | | | |
| Primary caregiver consent rate | 65 | 67** | 63 | 65 | 67*** | 63 | 67 | 67 | 66 | 66 | 67 | 64 |
| Student completion rate | 94 | 93* | 94 | 93 | 95 | 94 | 95 | 96 | 95 | 96 | 96 | 95 |
| Students with data ¹ | 61 | 62* | 60 | 61 | 63** | 59 | 63 | 65 | 62 | 63 | 64* | 61 |
| Primary Caregiver Report (percent) | | | | | | | | | | | | |
| Primary caregiver consent rate | 63 | 64** | 61 | 62 | 64*** | 60 | 64 | 65 | 63 | 63 | 64 | 62 |
| Primary caregiver completion rate | 92 | 92 | 92 | 92 | 91 | 92 | 78 | 77 | 78 | 77 | 77 | 77 |
| Primary caregivers with data ¹ | 57 | 59** | 56 | 57 | 59* | 56 | 50 | 51 | 49 | 49 | 50 | 48 |
| Teacher Report on Student (percent) | | | | | | | | | | | | |
| Primary caregiver consent rate ² | 65 | 67*** | 63 | 65 | 67*** | 63 | 67 | 67 | 66 | 66 | 67 | 64 |
| Teacher completion rate | 96 | 96 | 96 | 96 | 95 | 97 | 100 | 100 | 99 | 100 | 100 | 99 |
| Students with data ¹ | 62 | 64** | 61 | 62 | 64** | 60 | 66 | 67 | 65 | 65 | 67* | 64 |
| Teacher Report on Classroom and School (3rd- to 5th-grade teachers) (percent) | | | | | | | | | | | | |
| Teacher consent rate | 96 | 98*** | 92 | 95 | 98*** | 93 | 95 | 97 | 94 | 95 | 95 | 94 |
| Teacher completion rate | 91 | 90 | 93 | 91 | 90 | 93 | 94 | 94 | 94 | 93 | 93 | 93 |
| Teachers with data ¹ | 87 | 88 | 86 | 87 | 88 | 86 | 90 | 90 | 89 | 88 | 89 | 88 |

* Treatment group significantly different from control group at the .05 level.

** Treatment group significantly different from control group at the .01 level.

*** Treatment group significantly different from control group at the .001 level.

¹ Calculated as consent rate x completion rate.

² The primary caregiver consent rates for the Child Report and the Teacher Report on Student are identical, as the primary caregiver gave consent to both together.

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix A: Analysis of Cohorts 1 and 2

The opportunity for the teams to add the Cohort 2 schools to the SACD multiprogram evaluation was planned as a means to increase the statistical power of the analyses by increasing the sample size. In practice, Cohort 2 added 12 schools to the sample of 84 schools. The addition of new schools also opened the possibility for a change in the intraclass correlations (the ICC, a measure of the percentage of the total variance in the outcomes that is between schools). An increase in the sample size would reduce the minimum detectable impacts in effect size units (MDES) for each outcome measure; however, changes in the ICCs could offset those reductions. In practice, the MDES for the outcome measures both increased and decreased, with 17 outcomes having changes in the thousandths of a point and 3 having changes in the hundredths (the largest being a decline of .027). Table A.8 compares the MDES for Cohort 1 versus the combined Cohorts 1 and 2.

Table A.8. Comparison of Cohort 1 and Cohorts 1 and 2: Adjusted minimum detectable effect sizes for fourth-grade outcomes for combined-program evaluation

| Outcome measure–Report | Cohort 1 | Cohorts 1 and 2 |
|--|----------|-----------------|
| Social and Emotional Competence Domain | | |
| Self-Efficacy for Peer Interaction–CR | 0.048 | 0.049 |
| Normative Beliefs About Aggression–CR | 0.081 | 0.076 |
| Empathy–CR | 0.078 | 0.071 |
| Behavior Domain | | |
| Altruistic Behavior–CR | 0.057 | 0.056 |
| Altruistic Behavior–PCR | 0.044 | 0.039 |
| Altruistic Behavior–TRS | 0.238 | 0.211 |
| Positive Social Behavior–PCR | 0.042 | 0.048 |
| Positive Social Behavior–TRS | 0.115 | 0.113 |
| Problem Behavior–CR | 0.086 | 0.090 |
| Problem Behavior–PCR | 0.040 | 0.045 |
| Problem Behavior–TRS | 0.086 | 0.082 |
| ADHD-Related Behavior–TRS | 0.082 | 0.083 |
| Academics Domain | | |
| Engagement with Learning–CR | 0.036 | 0.042 |
| Academic Competence and Motivation–TRS | 0.077 | 0.084 |
| Perceptions of School Climate Domain | | |
| Positive School Orientation–CR | 0.123 | 0.113 |
| Negative School Orientation–CR | 0.070 | 0.067 |
| Student Afraid at School–CR | 0.064 | 0.063 |
| Victimization at School–CR | 0.063 | 0.071 |
| Feelings of Safety–TRCS | 0.179 | 0.157 |
| Student Support for Teachers–TRCS | 0.154 | 0.152 |

NOTE: Abbreviations are

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

TRCS: Teacher Report on Classroom and School

ADHD: Attention deficit hyperactivity disorder

The minimum detectable effect (MDE) formula used in the calculations is as follows:

$$MDE = factor(df) * \sqrt{\rho_1 \left(\frac{1}{s_T} + \frac{1}{s_C} \right) + (1 - \rho_1) \left(\frac{1}{s_T n_T} + \frac{1}{s_C n_C} \right)}$$

where s_T and s_C are the number of treatment and comparison schools; n_T and n_C are the average number of students per classroom; ρ_1 is the intraclass correlation (ICC) at the school level; and $factor(df)$ is a constant that depends on the number of degrees of freedom (df) available for analysis (and is 2.802 for the pooled analysis). Estimates were adjusted for fixed program effects as well as baseline covariates.

SOURCE: The Social and Character Development (SACD) Research Program.

Analysis

The analyses used for the combined cohort data were similar to those used with the Cohort 1 data and described in chapter 1. Adjustments were made to account for fewer data collection time points. For example, the analyses of the impacts on the use of SACD activities in the classroom and the school and of the impact on student outcomes used the same analytical methods as did the year-by-year analysis of Cohort 1 fourth-grade student outcomes.

In addition, a similar growth curve analysis was done with the combined cohort data, using student results from three time points (fall third grade, spring third grade, and spring fourth grade) rather than the five time points used with the Cohort 1 growth analysis. For this reason, the combined cohort growth analysis is not directly comparable to the Cohort 1 growth analysis.

Impacts on Use of SACD Activities

The analysis was based on the Teacher Report on Classroom and School data collected when the students were in the fourth grade (school year 2005-06 for Cohort 1 and school year 2006-07 for Cohort 2). In addition to information about the teachers' characteristics and backgrounds, this questionnaire asked third-, fourth-, and fifth-grade teachers in treatment and control group schools to provide information about the social and character development activities they used in their classrooms and about the climate in their schools.

The impacts of the SACD programs on teachers' reported use of SACD activities for the combined cohort analysis were consistent with results from the analyses of Cohort 1 data when students were in the fourth grade. Compared to control group teachers, treatment group teachers were more likely to report engaging in activities to promote social and character development on 12 out of 16 outcomes and to report engaging in similar activities linked to named programs on 14 out of 14 outcomes (table A.9). They also reported using more materials and strategies to promote social and character development for 13 out of 29 outcomes (table A.10) and more participation in SACD-related professional development for 2 out of 9 outcomes (table A.11). For engaging in any SACD activities, the difference between treatment and control group reports was small but significant (95% versus 91%), and for engaging in any SACD activities linked to named programs, the difference was larger (72% versus 43%). For professional development, 66 percent of treatment teachers reported receiving SACD training over the past 12 months versus 51 percent of control teachers. Treatment teachers were not more likely to report teacher and staff attitudes that might be conducive to promoting social and character development (these data are not shown in a table).

Appendix A: Analysis of Cohorts 1 and 2

Table A.9. Combined Cohorts 1 and 2: Impacts on classroom activities

| Classroom activity | Treatment | Control | Impact | p-value |
|---|-----------|---------|--------|---------|
| Teacher sample size | 481 | 459 | | |
| Engagement in any activities to promote SACD goals ¹ (percent) | | | | |
| Activities | | | | |
| Violence prevention and peace promotion | 76.4* | 66.1 | 10.3 | 0.002 |
| Social and emotional development | 84.5* | 61.2 | 23.4 | 0.000 |
| Character education | 91.9* | 77.6 | 14.3 | 0.000 |
| Tolerance and diversity | 74.9* | 61.9 | 13.0 | 0.000 |
| Risk prevention and health promotion | 63.6 | 60.1 | 3.6 | 0.389 |
| Civic responsibility and community service | 60.7 | 60.0 | 0.7 | 0.872 |
| Any activity | 95.0* | 90.8 | 4.2 | 0.025 |
| Behavior management | 92.1* | 83.3 | 8.8 | 0.000 |
| At least 1 hour per week of activities | | | | |
| Violence prevention and peace promotion | 41.9* | 25.3 | 16.7 | 0.000 |
| Social and emotional development | 49.2* | 25.7 | 23.5 | 0.000 |
| Character education | 59.4* | 31.7 | 27.7* | 0.000 |
| Tolerance and diversity | 35.9* | 22.9 | 13.0 | 0.000 |
| Risk prevention and health promotion | 26.9 | 22.0 | 4.9 | 0.174 |
| Civic responsibility and community service | 20.8 | 16.1 | 4.7 | 0.111 |
| Any activity | 83.7* | 73.2 | 10.5 | 0.002 |
| Behavior management | 74.9* | 61.5 | 13.3 | 0.002 |
| Engagement in named activities to promote SACD goals ¹ (percent) | | | | |
| Named activities | | | | |
| Violence prevention and peace promotion | 46.7* | 18.1 | 28.6 | 0.000 |
| Social and emotional development | 53.2* | 11.6 | 41.6 | 0.000 |
| Character education | 56.4* | 14.9 | 41.5 | 0.000 |
| Tolerance and diversity | 36.4* | 8.2 | 28.2 | 0.000 |
| Risk prevention and health promotion | 30.5* | 18.9 | 11.5 | 0.001 |
| Civic responsibility and community service | 14.4* | 5.9 | 8.5 | 0.000 |
| Any named activity | 71.5* | 42.5 | 29.0 | 0.000 |
| At least 1 hour per week of named activities | | | | |
| Violence prevention and peace promotion | 31.5* | 11.7 | 19.8 | 0.000 |
| Social and emotional development | 36.1* | 7.0 | 29.1 | 0.000 |
| Character education | 41.8* | 8.1 | 33.6 | 0.000 |
| Tolerance and diversity | 24.2* | 4.2 | 20.0 | 0.000 |
| Risk prevention and health promotion | 17.4* | 10.8 | 6.6 | 0.035 |
| Civic responsibility and community service | 8.1* | 2.2 | 6.0 | 0.003 |
| Any named activity | 50.7* | 22.6 | 28.1 | 0.000 |

* Treatment group significantly different from control group at the .05 level.

¹ Impact on domain found statistically significant after adjustments made for multiple comparisons within domain.

NOTE: Weights, which assign equal weight to each school within each of the programs and to each program across programs, were used in producing the treatment, control, and overall means.

SOURCE: The Social and Character Development (SACD) Research Program.

Table A.10. Combined Cohorts 1 and 2: Impacts on use of SACD classroom materials and teaching strategies

| SACD material and teaching strategy | Treatment | Control | Impact | p-value |
|--|-----------|---------|--------|---------|
| Teacher sample size | 481 | 459 | | |
| Use of SACD materials (percent) | | | | |
| Teacher guides (manuals, curricula) | 80.4* | 59.5 | 20.9 | 0.000 |
| Student materials (workbooks or sheets) | 66.5* | 54.3 | 12.3 | 0.001 |
| Instructional aids (games, software, videos) | 46.2* | 38.4 | 7.8 | 0.029 |
| Giveaways (bookmarks, stickers) | 53.1 | 49.2 | 3.9 | 0.250 |
| Children's literature | 57.8 | 48.2 | 9.6 | 0.027 |
| Other types of materials | 9.1 | 12.3 | -3.3 | 0.147 |
| Did not use any of these materials | 4.6* | 13.1 | -8.5 | 0.000 |
| Use of teaching strategies (percent) | | | | |
| Role-playing | 88.0* | 67.4 | 20.5 | 0.000 |
| Cooperative learning | 98.2^ | 96.3 | 2.0 | 0.075 |
| Peer group discussions | 92.4 | 89.1 | 3.3 | 0.111 |
| Direct instruction of SACD | 93.4* | 78.0 | 15.4 | 0.000 |
| Skill training | 65.3* | 44.2 | 21.2 | 0.000 |
| Incorporating SACD into academic curriculum | 86.3* | 73.3 | 13.0 | 0.000 |
| Parent training | 11.7 | 9.7 | 2.0 | 0.466 |
| Parent and community involvement | 30.7* | 22.0 | 8.7 | 0.023 |
| Mentoring | 46.0 | 44.8 | 1.1 | 0.741 |
| Good behavior notes sent home daily or weekly | 79.5 | 74.3 | 5.2 | 0.143 |
| Presenting role models | 75.2^ | 69.6 | 5.6 | 0.080 |
| Targeted story reading or writing on social and character development themes | 88.5* | 78.9 | 9.6 | 0.000 |
| Peer mediation | 54.4 | 52.4 | 2.0 | 0.635 |
| Honor roll for positive behavior | 62.0 | 59.9 | 2.1 | 0.639 |
| Pledges or recitations on SACD themes | 48.0 | 44.9 | 3.1 | 0.598 |
| Guided visualization | 60.9* | 48.2 | 12.6 | 0.002 |
| Student-led/student-assisted instruction | 59.6* | 48.5 | 11.1 | 0.002 |
| Journaling | 77.9 | 72.3 | 5.6 | 0.117 |
| Time out for negative behavior | 86.1 | 85.3 | 0.8 | 0.720 |
| Daily or weekly rewards for positive behavior | 93.0 | 90.2 | 2.8 | 0.190 |
| Any strategy (percent) | 100.0 | 100.0 | 0.0 | † |
| Number of strategies (mean) | 13.8* | 12.4 | 1.5 | 0.000 |

† Not applicable.

* Treatment group significantly different from control group at the .05 level.

^ Treatment group significantly different from control group at the .10 to > .05 level.

NOTE: Weights, which assign equal weight to each school within each of the programs and to each program across programs, were used in producing the treatment, control, and overall means.

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix A: Analysis of Cohorts 1 and 2

Table A.11. Combined Cohorts 1 and 2: Impacts on teacher-reported SACD professional development

| SACD professional development ¹ | Treatment | Control | Impact | p-value |
|--|-------------------|---------|--------|---------|
| Teacher sample size | 481 | 459 | | |
| SACD training in past 12 months (percent) | 65.9* | 51.3 | 14.6 | 0.000 |
| Hours of SACD training (mean) | 5.8 | 4.9 | 0.9 | 0.404 |
| Training by goal (percent) | | | | |
| Violence prevention and peace promotion | 19.1 | 14.8 | 4.3 | 0.180 |
| Social and emotional development | 23.0 [^] | 16.6 | 6.4 | 0.066 |
| Character education | 35.1* | 18.4 | 16.8 | 0.000 |
| Tolerance and diversity | 17.5 | 18.9 | -1.4 | 0.650 |
| Risk prevention and health promotion | 14.2 | 14.4 | -0.2 | 0.933 |
| Civic responsibility and community service | 7.4 | 5.3 | 2.0 | 0.232 |
| Behavior management | 29.6 | 25.0 | 4.6 | 0.210 |

* Treatment group significantly different from control group at the .05 level.

[^] Treatment group significantly different from control group at the .10 to > .05 level.

¹ Impact on domain found statistically significant after adjustments made for multiple comparisons within domain for all years.

NOTE: Weights, which assign equal weight to each school within each of the programs and to each program across programs, were used in producing the treatment, control, and overall means.

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix A: Analysis of Cohorts 1 and 2

The impacts of the programs on the SACD activity domains were consistent with results from the analyses of Cohort 1 data when students were in the fourth grade. Table A.12 shows that statistically significant larger percentages of treatment group teachers than control group teachers reported engaging in activities to promote social and character development, using more materials and strategies to promote social and character development, and participating in related professional development. Treatment group teachers were not more likely to report changes in the school environment or in teacher and staff attitudes that might be conducive to promoting social and character development.

Table A.12. Combined Cohorts 1 and 2: Significant impacts on domains of use of SACD activity overall and by program

| Program | SACD activity domain | | | | | |
|---------|----------------------|--|------------------------------------|-----------------------|--------------------------|-------------------------|
| | SACD activities | SACD activities linked to named programs | Classroom materials and strategies | Schoolwide strategies | Professional development | Attitudes and practices |
| Overall | + ^{1,2,3} | + ^{1,2,3} | + ^{1,2,3} | | + ^{2,3} | |
| ABC | | | | | | + ³ |
| CSP | | + ³ | | | + ² | |
| LBW | + ³ | + ³ | | + ² | + ³ | |
| PA | | + ^{1,3} | | | | |
| PATHS | + ^{1,3} | + ^{1,3} | | | | |
| 4Rs | + ^{1,3} | + ^{1,3} | | | | |
| SS | + ^{1,3} | + ^{1,3} | + ³ | | | |

¹Based on univariate statistical tests, at least half of the impacts were positive and statistically significant and no impact was negative and statistically significant.

²The omnibus impact for all the outcomes measured together was positive and statistically significant on the basis of a multivariate statistical test.

³At least one outcome remained positive and statistically significant and no outcome was negative and statistically significant after applying the Benjamini-Hochberg (1995) procedure to adjust significance levels downward to account for the multiple testing of impacts.

NOTE: Abbreviations are

ABC: *Academic and Behavioral Competencies Program*

CSP: *Competence Support Program*

LBW: *Love In a Big World*

PA: *Positive Action*

PATHS: *Promoting Alternative Thinking Strategies*

4Rs: *The 4Rs Program (Reading, Writing, Respect, and Resolution)*

SS: *Second Step*

+ Statistically significant beneficial impact on domain

Blank cell: Finding of no impact

No detrimental impact was found statistically significant at or below the .05 level. For a description of the heuristics used to determine the statistically significant beneficial impact on the domain, see chapter 1.

SOURCE: The Social and Character Development (SACD) Research Program.

Impacts on Student Outcomes: Year-by-Year and Growth Analyses Results

Year-by-Year Analysis

None of the 20 estimated combined-program impacts on fourth-grade child and school outcomes, based on the combined samples of Cohorts 1 and 2, were statistically significantly different from zero at the 5 percent level (table A.13⁴). This varies from the finding of one statistically significant impact (for Student Support for Teachers) in the Cohort 1 analysis. The combined-sample analysis agreed with the Cohort 1 analysis that none of the impacts was substantively important. The estimated impacts in effect size units ranged from a detrimental effect of -0.06 (for child-reported Altruistic Behavior) to a beneficial effect of 0.12 standard deviations (for Student Support for Teachers). When the What Works Clearinghouse heuristics⁵ were applied to the domains to adjust for multiple comparisons within each outcome domain, the fourth heuristic identified the significance of a detrimental impact on children's Social and Emotional Competence (similar to the finding in the Cohort 1 analysis).

⁴ Sample sizes are not reported in the Results tables because they vary by outcome. Table A.20 provides the range of sample sizes for the outcomes within each report.

⁵ See the chapter 1 section headed Year-by-Year Impacts on Students and Perceptions of School Climate, subsection Statistical Significance and Substantively Important Effects, for a discussion of these heuristics.

Table A.13. Combined Cohorts 1 and 2: Combined-program impacts on outcomes for fourth-graders

| Scale–Report | Treatment | Control | Effect size ¹ | p-value ² |
|---|-----------|---------|--------------------------|----------------------|
| Social and Emotional Competence Domain³ | | | | |
| Self-Efficacy for Peer Interactions–CR (+) | 3.17 | 3.20 | -0.05 | 0.194 |
| Normative Beliefs About Aggression–CR (-) | 1.36 | 1.37 | -0.01 | 0.849 |
| Empathy–CR (+) | 2.18 | 2.19 | -0.02 | 0.699 |
| Behavior Domain | | | | |
| Altruistic Behavior–CR (+) | 1.06 | 1.10 | -0.06 | 0.154 |
| Altruistic Behavior–PCR (+) | 2.27 | 2.25 | 0.03 | 0.364 |
| Altruistic Behavior–TRS (+) | 1.38 | 1.36 | 0.05 | 0.686 |
| Positive Social Behavior–PCR (+) | 3.06 | 3.04 | 0.05 | 0.177 |
| Positive Social Behavior–TRS (+) | 3.02 | 3.05 | -0.04 | 0.533 |
| Problem Behavior–CR (-) | 0.37 | 0.36 | 0.01 | 0.901 |
| Problem Behavior–PCR (-) | 1.54 | 1.55 | -0.04 | 0.248 |
| Problem Behavior–TRS (-) | 1.45 | 1.46 | -0.01 | 0.800 |
| ADHD-Related Behavior–TRS (-) | 1.69 | 1.70 | -0.02 | 0.624 |
| Academics Domain | | | | |
| Engagement with Learning–CR (+) | 3.66 | 3.67 | -0.02 | 0.680 |
| Academic Competence and Motivation–TRS (+) | 2.97 | 2.99 | -0.02 | 0.651 |
| Perceptions of School Climate Domain | | | | |
| Positive School Orientation–CR (+) | 2.65 | 2.62 | 0.04 | 0.508 |
| Negative School Orientation–CR (-) | 1.99 | 2.00 | -0.02 | 0.653 |
| Student Afraid at School–CR (-) | 2.24 | 2.28 | -0.04 | 0.402 |
| Victimization at School–CR (-) | 0.68 | 0.71 | -0.03 | 0.533 |
| Feelings of Safety–TRCS (+) | 3.42 | 3.36 | 0.08 | 0.325 |
| Student Support for Teachers–TRCS (+) | 3.51 | 3.41 | 0.12 | 0.099 |

¹ The effect size was calculated by dividing the estimated impact by the standard deviation of the outcome measure for the control group.

² The p-value is from a two-tailed t test to gauge the statistical significance of the impact estimate.

³ Impact on domain found statistically significant and detrimental based on the fourth heuristic, in which the statistical model used to estimate impacts on the individual outcomes was re-estimated using a composite of all the outcome variables under a domain. The domain was found significant if the impact on the composite was significant. The composite was formed by standardizing each outcome variable using its standard deviation, combining the values of the outcome variables, and taking the average of the final value.

NOTE: Abbreviations are

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

TRCS: Teacher Report on Classroom and School

ADHD: Attention deficit hyperactivity disorder

The +/- signs in parentheses indicate the direction of a beneficial outcome. No findings were found statistically significant at or below the .05 level. All impact estimates were calculated using regression models in which each program and school within a program was weighted equally. The standard errors of all estimates account for design effects due to unequal weighting and the clustering of students within schools.

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix A: Analysis of Cohorts 1 and 2

The lack of statistically significant beneficial impact estimates at the combined-program level might have been due to beneficial impacts in some programs that were offset by negative impacts in others. Differences in estimated impacts across programs were tested for as were the statistical significance of program-specific impact estimates.

With two exceptions, the 20 impact estimates did not significantly differ by program. For 18 of the 20 outcomes, the differences in pooled impact estimates across programs were not statistically significant at the 5 percent level. For these outcomes, one or two programs were not driving or masking the estimated impacts in the combined program data. For the other two outcomes (Academic Competence and Motivation, and Feelings of Safety) the ABC program showed a beneficial, statistically significant result so the hypothesis that the estimated impacts were equal across programs was rejected.

From the analyses of the individual SACD programs, 6 of 140 program impact estimates were statistically significant (versus 7 that would be expected by chance and the 7 that were found in the fourth-grade analysis of Cohort 1). Four of these were beneficial and 2 were detrimental (versus the 5 beneficial and 2 detrimental found in the analysis of Cohort 1). For the three programs that did not add a second cohort (Positive Action [PA], the 4Rs Program [4Rs], and Second Step [SS]), results remained the same as in the Cohort 1 analysis (2 significant beneficial impacts, 1 significant detrimental impact, and 2 non-significant but substantively important beneficial impacts: see table 1.27 in chapter 1). For the four programs that included a second cohort, table A.14 identifies the statistically significant and the non-significant substantively important results from the combined cohort analysis and compares them with the similar results found in the Cohort 1 only analysis (table A.15 compares all the results).

With respect to the ABC program, statistically significant beneficial impacts were found on Academic Competence and Motivation (effect size of 0.35) and on Feelings of Safety (effect size of 0.67), and these align with findings from the Cohort 1 analysis. However, the combined cohort analysis did not find a significant detrimental impact on Altruistic Behavior (Child Report), which did appear in the Cohort 1 analysis. With respect to CSP, the combined cohort findings showed a statistically significant detrimental impact on Empathy (effect size of -0.18), which did not occur in the Cohort 1 analysis. CSP's Cohort 1 beneficial impact on Problem Behavior disappeared in the combined cohort analysis. LBW and PATHS had no significant impacts in either the Cohort 1 or the combined cohort analyses.

With respect to non-significant but substantively important results, when the combined cohort analyses were compared to the Cohort 1 analyses, ABC maintained its beneficial impact for Student Support for Teachers (effect size of .40). CSP lost its beneficial effect for Altruistic Behavior and Student Afraid at School. LBW lost its beneficial impact for Student Support for Teachers and its detrimental effect on Altruistic Behavior (Teacher Report on Student), and it gained a detrimental effect on Positive Social Behavior (Teacher Report on Student) (effect size of -.25). PATHS gained a beneficial impact on Altruistic Behavior (Teacher Report on Student).

Table A.14. Comparison of individual programs' statistically significant impacts and nonsignificant substantive impacts between Cohort 1 and combined Cohort 1 and Cohort 2 fourth-graders

| Program ³ | Statistically significant ¹ | | | | Nonstatistically significant but substantive ² | | | |
|----------------------|---|-------------------------|--|-------------------------|---|-------------------------|--|-------------------------|
| | Beneficial impacts | | Detrimental impacts | | Beneficial impacts | | Detrimental impacts | |
| | (Report) | (Effect size) (p-value) | (Report) | (Effect size) (p-value) | (Report) | (Effect size) (p-value) | (Report) | (Effect size) (p-value) |
| Total | | | | | | | | |
| Cohort 1 | 3 | | 1 | | 4 | | 1 | |
| Cohorts 1 and 2 | 2 | | 1 | | 2 | | 1 | |
| ABC | | | | | | | | |
| Cohort 1 | Academic Competence (CR) (.31) (.011) Feelings of Safety (TRCS) (.75) (.003) | | Altruistic Behavior (CR) (-.20) (.029) | | Student Support for Teachers (TRCS) (.27) (.276) | | | |
| Cohorts 1 and 2 | Academic Competence (CR) (.35) (.002) Feelings of Safety (TRCS) (.67) (.001) | | | | Student Support for Teachers (TRCS) (.40) (.105) | | | |
| CSP | | | | | | | | |
| Cohort 1 | Problem Behavior (PCR) (-.21) (.042) | | | | Altruistic Behavior (TRS) (.47) (.132) Student Afraid at School (CR) (-.26) (.090) | | | |
| Cohorts 1 and 2 | | | Empathy (CR) (-.18) (.041) | | | | | |
| LBW | | | | | | | | |
| Cohort 1 | | | | | Student Support for Teachers (TRCS) (.28) (.428) | | Altruistic Behavior (TRS) (-.34) (.270) | |
| Cohorts 1 and 2 | | | | | | | Positive Social Behavior (TRS) (-.25) (.205) | |

See notes at end of table.

Table A.14. Comparison of individual programs' statistically significant impacts and nonsignificant substantive impacts between Cohort 1 and combined Cohort 1 and Cohort 2 fourth-graders—Continued

| Program ³ | Statistically significant ¹ | | | | Nonstatistically significant but substantive ² | | | |
|----------------------|--|----------------------------------|---------------------|----------------------------------|---|----------------------------------|---------------------|----------------------------------|
| | Beneficial impacts | | Detrimental impacts | | Beneficial impacts | | Detrimental impacts | |
| | (Report) | (Effect size) (<i>p</i> -value) | (Report) | (Effect size) (<i>p</i> -value) | (Report) | (Effect size) (<i>p</i> -value) | (Report) | (Effect size) (<i>p</i> -value) |
| PATHS | | | | | | | | |
| Cohort 1 | | | | | | | | |
| Cohorts 1 and 2 | | | | | Altruistic Behavior (TRS) (.34) (.250) | | | |

¹Of the 80 comparisons (4 programs with 20 outcomes apiece) made, 4 would be expected to be statistically significant at the .05 level by chance.

²Defined as impacts that were not statistically significant but were .25 standard deviation units (absolute value) or more in magnitude.

³Only the four programs with a Cohort 2 are shown. The results for the other programs remained the same as those discussed in chapter 1.

NOTE: Abbreviations are

ABC: *Academic and Behavioral Competencies Program*

CSP: *Competence Support Program*

LBW: *Love In a Big World*

PATHS: *Promoting Alternative Thinking Strategies*

CR: Child Report

TRS: Teacher Report on Student

PCR: Primary Caregiver Report

TRCS: Teacher Report on Classroom and School

Blank cell: Finding of no impact

All impact estimates were calculated using regression models in which each school within a program was weighted equally. The standard errors of all estimates account for design effects due to unequal weighting and the clustering of students within schools.

SOURCE: The Social and Character Development (SACD) Research Program.

Table A.15. Cohort 1 and combined Cohorts 1 and 2: Comparison of program effects

Panel 1: ABC Program

| Scale-Report | Cohort 1 (Spring 4th grade) | | | | Combined Cohorts 1 and 2 (Spring 4th grade) | | | |
|---|--------------------------------|---------|-------------------|---------|--|---------|-------------------|---------|
| | Treat- ment | Control | Effect size | p-value | Treat- ment | Control | Effect size | p-value |
| Social and Emotional Competence Domain | | | | | | | | |
| Self-Efficacy for Peer Interactions-CR (+) | 3.31 | 3.29 | 0.03 | 0.770 | 3.27 | 3.24 | 0.04 | 0.697 |
| Normative Beliefs About Aggression-CR (-) | 1.39 | 1.29 | 0.18 | 0.141 | 1.38 [^] | 1.28 | 0.18 | 0.082 |
| Empathy-CR (+) | 2.08 | 2.19 | -0.21 | 0.144 | 2.09 | 2.17 | -0.17 | 0.156 |
| Behavior Domain | | | | | | | | |
| Altruistic Behavior-CR (+) | 0.94 [*] | 1.09 | -0.20 | 0.029 | 1.00 | 1.13 | -0.16 | 0.121 |
| Altruistic Behavior-PCR (+) | 2.14 | 2.19 | -0.06 | 0.595 | 2.19 | 2.23 | -0.04 | 0.710 |
| Altruistic Behavior-TRS (+) | 1.24 | 1.26 | -0.03 | 0.914 | 1.24 | 1.25 | -0.03 | 0.920 |
| Positive Social Behavior-PCR (+) | 3.06 [^] | 2.96 | 0.16 | 0.071 | 3.01 | 2.90 | 0.18 | 0.187 |
| Positive Social Behavior-TRS (+) | 3.01 | 3.02 | -0.01 | 0.961 | 3.05 | 2.95 | 0.13 | 0.504 |
| Problem Behavior-CR (-) | 0.33 | 0.36 | -0.05 | 0.659 | 0.36 | 0.42 | -0.10 | 0.545 |
| Problem Behavior-PCR (-) | 1.56 | 1.61 | -0.11 | 0.229 | 1.58 | 1.65 | -0.16 | 0.198 |
| Problem Behavior-TRS (-) | 1.43 | 1.46 | -0.07 | 0.655 | 1.44 | 1.49 | -0.11 | 0.403 |
| ADHD-Related Behavior-TRS (-) | 1.69 | 1.77 | -0.13 | 0.525 | 1.68 | 1.77 | -0.16 | 0.341 |
| Academics Domain | | | | | | | | |
| Engagement with Learning-CR (+) | 3.68 | 3.63 | 0.10 | 0.281 | 3.69 [^] | 3.60 | 0.14 | 0.093 |
| Academic Competence and Motivation-TRS (+) | 2.92 [*] | 2.65 | 0.31 | 0.011 | 2.93 [*] | 2.63 | 0.35 | 0.002 |
| Perceptions of School Climate Domain | | | | | | | | |
| Positive School Orientation-CR (+) | 2.67 | 2.61 | 0.07 | 0.668 | 2.62 | 2.56 | 0.08 | 0.639 |
| Negative School Orientation-CR (-) | 1.97 | 1.96 | 0.01 | 0.963 | 2.01 | 2.01 | -0.01 | 0.960 |
| Student Afraid at School-CR (-) | 2.21 | 2.36 | -0.17 | 0.263 | 2.23 | 2.39 | -0.17 | 0.211 |
| Victimization at School-CR (-) | 0.58 | 0.66 | -0.11 | 0.213 | 0.71 | 0.70 | 0.02 | 0.923 |
| Feelings of Safety-TRCS (+) | 3.59 [*] | 2.97 | 0.75 | 0.003 | 3.51 [*] | 2.94 | 0.67 | 0.001 |
| Student Support for Teachers-TRCS (+) | 3.48 | 3.26 | 0.27 [°] | 0.276 | 3.49 | 3.15 | 0.40 [°] | 0.105 |

See notes at end of table.

Table A.15. Cohort 1 and combined Cohorts 1 and 2: Comparison of program effects—Continued

Panel 2: CSP

| Scale–Report | Cohort 1 (Spring 4th grade) | | | | Combined Cohorts 1 and 2 (Spring 4th grade) | | | |
|---|--------------------------------|---------|----------------|-----------------|--|---------|----------------|-----------------|
| | Treat- ment | Control | Effect size | <i>p</i> -value | Treat- ment | Control | Effect size | <i>p</i> -value |
| Social and Emotional Competence Domain | | | | | | | | |
| Self-Efficacy for Peer Interactions–CR (+) | 3.15 | 3.15 | 0.00 | 0.978 | 3.16 | 3.13 | 0.05 | 0.475 |
| Normative Beliefs About Aggression–CR (-) | 1.35 | 1.29 | 0.12 | 0.273 | 1.42 | 1.29 | 0.24 | 0.133 |
| Empathy–CR (+) | 2.18 | 2.23 | -0.11 | 0.206 | 2.15* | 2.23 | -0.18 | 0.041 |
| Behavior Domain | | | | | | | | |
| Altruistic Behavior–CR (+) | 1.06 | 1.00 | 0.08 | 0.505 | 1.01 | 1.00 | 0.01 | 0.889 |
| Altruistic Behavior–PCR (+) | 2.33 | 2.31 | 0.03 | 0.849 | 2.34 | 2.28 | 0.08 | 0.452 |
| Altruistic Behavior–TRS (+) | 1.39 | 1.25 | 0.47° | 0.132 | 1.40 | 1.30 | 0.24 | 0.263 |
| Positive Social Behavior–PCR (+) | 3.11 | 3.02 | 0.17 | 0.125 | 3.11 | 3.02 | 0.15 | 0.153 |
| Positive Social Behavior–TRS (+) | 3.02 | 2.93 | 0.12 | 0.426 | 3.02 | 3.05 | -0.05 | 0.702 |
| Problem Behavior–CR (-) | 0.32 | 0.26 | 0.15 | 0.428 | 0.36 | 0.27 | 0.21 | 0.254 |
| Problem Behavior–PCR (-) | 1.50* | 1.56 | -0.21 | 0.042 | 1.50^ | 1.56 | -0.18 | 0.069 |
| Problem Behavior–TRS (-) | 1.48 | 1.50 | -0.03 | 0.852 | 1.46 | 1.44 | 0.04 | 0.784 |
| ADHD-Related Behavior–TRS (-) | 1.70 | 1.74 | -0.06 | 0.585 | 1.70 | 1.68 | 0.04 | 0.733 |
| Academics Domain | | | | | | | | |
| Engagement with Learning–CR (+) | 3.71 | 3.71 | -0.01 | 0.952 | 3.67 | 3.68 | -0.02 | 0.889 |
| Academic Competence and Motivation–TRS (+) | 2.96 | 2.93 | 0.04 | 0.622 | 3.04 | 3.09 | -0.05 | 0.484 |
| Perceptions of School Climate Domain | | | | | | | | |
| Positive School Orientation–CR (+) | 2.64 | 2.65 | -0.02 | 0.922 | 2.56 | 2.58 | -0.02 | 0.898 |
| Negative School Orientation–CR (-) | 1.95 | 1.98 | -0.05 | 0.699 | 2.02 | 2.00 | 0.04 | 0.794 |
| Student Afraid at School–CR (-) | 2.17^ | 2.38 | -0.26° | 0.090 | 2.26 | 2.31 | -0.06 | 0.697 |
| Victimization at School–CR (-) | 0.69 | 0.70 | -0.01 | 0.947 | 0.69 | 0.71 | -0.03 | 0.756 |
| Feelings of Safety–TRCS (+) | 3.60 | 3.64 | -0.05 | 0.834 | 3.63 | 3.65 | -0.02 | 0.919 |
| Student Support for Teachers–TRCS (+) | 3.55 | 3.48 | 0.10 | 0.551 | 3.59 | 3.55 | 0.06 | 0.634 |

See notes at end of table.

Table A.15. Cohort 1 and combined Cohorts 1 and 2: Comparison of program effects—Continued

Panel 3: LBW

| Scale–Report | Cohort 1 (Spring 4th grade) | | | | Combined Cohorts 1 and 2 (Spring 4th grade) | | | |
|--|--------------------------------|---------|--------------------|-----------------|--|---------|--------------------|-----------------|
| | Treat- ment | Control | Effect size | <i>p</i> -value | Treat- ment | Control | Effect size | <i>p</i> -value |
| Social and Emotional Competence Domain | | | | | | | | |
| Self-Efficacy for Peer Interactions–CR (+) | 3.19 | 3.21 | -0.04 | 0.674 | 3.20 | 3.17 | 0.05 | 0.602 |
| Normative Beliefs About Aggression–CR (-) | 1.26 | 1.21 | 0.12 | 0.368 | 1.28 | 1.21 | 0.19 | 0.124 |
| Empathy–CR (+) | 2.30 | 2.30 | -0.01 | 0.963 | 2.30 | 2.31 | -0.03 | 0.752 |
| Behavior Domain | | | | | | | | |
| Altruistic Behavior–CR (+) | 1.02 | 1.16 | -0.20 | 0.191 | 1.00 | 1.13 | -0.18 | 0.192 |
| Altruistic Behavior–PCR (+) | 2.22 | 2.11 | 0.17 | 0.152 | 2.26 [^] | 2.11 | 0.23 | 0.092 |
| Altruistic Behavior–TRS (+) | 1.29 | 1.46 | -0.34 [°] | 0.270 | 1.34 | 1.41 | -0.16 | 0.607 |
| Positive Social Behavior–PCR (+) | 3.12 | 3.04 | 0.13 | 0.250 | 3.10 | 3.03 | 0.12 | 0.262 |
| Positive Social Behavior–TRS (+) | 2.94 | 3.11 | -0.23 | 0.183 | 2.95 | 3.13 | -0.25 [°] | 0.205 |
| Problem Behavior–CR (-) | 0.25 | 0.23 | 0.04 | 0.728 | 0.26 | 0.25 | 0.02 | 0.854 |
| Problem Behavior–PCR (-) | 1.56 | 1.56 | -0.01 | 0.898 | 1.56 | 1.57 | -0.03 | 0.796 |
| Problem Behavior–TRS (-) | 1.46 | 1.40 | 0.13 | 0.117 | 1.49 [^] | 1.39 | 0.22 | 0.063 |
| ADHD-Related Behavior–TRS (-) | 1.73 | 1.64 | 0.13 | 0.105 | 1.78 [^] | 1.68 | 0.16 | 0.077 |
| Academics Domain | | | | | | | | |
| Engagement with Learning–CR (+) | 3.67 | 3.69 | -0.04 | 0.652 | 3.64 | 3.68 | -0.08 | 0.370 |
| Academic Competence and Motivation–TRS (+) | 3.05 | 2.99 | 0.07 | 0.622 | 3.09 | 2.94 | 0.15 | 0.378 |
| Perceptions of School Climate Domain | | | | | | | | |
| Positive School Orientation–CR (+) | 2.77 | 2.79 | -0.03 | 0.794 | 2.77 | 2.82 | -0.07 | 0.551 |
| Negative School Orientation–CR (-) | 1.87 | 1.89 | -0.03 | 0.846 | 1.90 | 1.90 | -0.01 | 0.960 |
| Student Afraid at School–CR (-) | 2.27 | 2.23 | 0.06 | 0.777 | 2.27 | 2.22 | 0.06 | 0.727 |
| Victimization at School–CR (-) | 0.70 | 0.71 | -0.01 | 0.929 | 0.69 | 0.70 | -0.02 | 0.828 |
| Feelings of Safety–TRCS (+) | 3.39 | 3.45 | -0.06 | 0.825 | 3.35 | 3.53 | -0.24 | 0.349 |
| Student Support for Teachers–TRCS (+) | 3.57 | 3.40 | 0.28 [°] | 0.428 | 3.53 | 3.41 | 0.20 | 0.494 |

See notes at end of table.

Table A.15. Cohort 1 and combined Cohorts 1 and 2: Comparison of program effects—Continued

Panel 4: PATHS

| Scale–Report | Cohort 1 (Spring 4th grade) | | | | Combined Cohorts 1 and 2 (Spring 4th grade) | | | |
|--|--------------------------------|---------|----------------|-----------------|--|---------|-------------------|-----------------|
| | Treat- ment | Control | Effect size | <i>p</i> -value | Treat- ment | Control | Effect size | <i>p</i> -value |
| Social and Emotional Competence Domain | | | | | | | | |
| Self-Efficacy for Peer Interactions–CR (+) | 3.18 | 3.28 | -0.16 | 0.261 | 3.12 [^] | 3.26 | -0.21 | 0.084 |
| Normative Beliefs About Aggression–CR (-) | 1.26 | 1.37 | -0.17 | 0.214 | 1.28 | 1.37 | -0.14 | 0.251 |
| Empathy–CR (+) | 2.21 | 2.14 | 0.13 | 0.245 | 2.23 | 2.16 | 0.13 | 0.317 |
| Behavior Domain | | | | | | | | |
| Altruistic Behavior–CR (+) | 1.00 | 0.96 | 0.06 | 0.635 | 1.10 | 1.03 | 0.08 | 0.360 |
| Altruistic Behavior–PCR (+) | 2.06 | 2.19 | -0.16 | 0.140 | 2.18 | 2.21 | -0.04 | 0.756 |
| Altruistic Behavior–TRS (+) | 1.22 | 1.18 | 0.17 | 0.395 | 1.35 | 1.24 | 0.34 [°] | 0.250 |
| Positive Social Behavior–PCR (+) | 3.05 | 3.06 | -0.01 | 0.953 | 3.03 | 3.03 | -0.01 | 0.878 |
| Positive Social Behavior–TRS (+) | 3.14 | 3.04 | 0.15 | 0.503 | 3.06 | 3.06 | 0.00 | 0.997 |
| Problem Behavior–CR (-) | 0.27 | 0.30 | -0.06 | 0.547 | 0.34 | 0.31 | 0.06 | 0.656 |
| Problem Behavior–PCR (-) | 1.53 | 1.53 | 0.00 | 0.987 | 1.54 | 1.54 | 0.02 | 0.869 |
| Problem Behavior–TRS (-) | 1.42 | 1.42 | 0.01 | 0.957 | 1.46 | 1.47 | -0.01 | 0.935 |
| ADHD-Related Behavior–TRS (-) | 1.62 | 1.70 | -0.13 | 0.574 | 1.65 | 1.73 | -0.14 | 0.571 |
| Academics Domain | | | | | | | | |
| Engagement with Learning–CR (+) | 3.70 | 3.69 | 0.01 | 0.954 | 3.68 | 3.69 | -0.03 | 0.758 |
| Academic Competence and Motivation–TRS (+) | 2.95 | 3.05 | -0.09 | 0.272 | 2.85 [^] | 3.03 | -0.21 | 0.093 |

See notes at end of table.

Table A.15. Cohort 1 and combined Cohorts 1 and 2: Comparison of program effects—Continued

Panel 4: PATHS

| Scale–Report | Cohort 1 (Spring 4th grade) | | | | Combined Cohorts 1 and 2 (Spring 4th grade) | | | |
|---------------------------------------|--------------------------------|---------|----------------|---------|--|---------|----------------|---------|
| | Treat- ment | Control | Effect size | p-value | Treat- ment | Control | Effect size | p-value |
| Perceptions of School Climate Domain | | | | | | | | |
| Positive School Orientation–CR (+) | 2.79 | 2.67 | 0.15 | 0.640 | 2.81 | 2.67 | 0.18 | 0.461 |
| Negative School Orientation–CR (-) | 1.87 | 1.90 | -0.05 | 0.765 | 1.95 | 1.93 | 0.02 | 0.825 |
| Student Afraid at School–CR (-) | 2.08 | 2.09 | -0.01 | 0.909 | 2.22 | 2.20 | 0.02 | 0.844 |
| Victimization at School–CR (-) | 0.65 | 0.56 | 0.12 | 0.306 | 0.69 | 0.63 | 0.08 | 0.382 |
| Feelings of Safety–TRCS (+) | 3.36 | 3.18 | 0.20 | 0.615 | 3.09 | 3.11 | -0.01 | 0.962 |
| Student Support for Teachers–TRCS (+) | 3.52 | 3.46 | 0.07 | 0.838 | 3.28 | 3.37 | -0.11 | 0.719 |

* Treatment group significantly different from control group at the .05 level.

^ Treatment group significantly different from control group at the .10 to > .05 level.

° Substantive (but nonsignificant at .05 level) effect size of $\geq .25$ or $\leq -.25$.

NOTE: Abbreviations are

ABC: *Academic and Behavioral Competencies Program*

CSP: *Competence Support Program*

LBW: *Love In a Big World*

PATHS: *Promoting Alternative Thinking Strategies*

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

TRCS: Teacher Report on Classroom and School

ADHD: Attention deficit hyperactivity disorder

The +/- signs in parentheses indicate the direction of a beneficial outcome. All impact estimates were calculated using regression models in which each program and school within a program was weighted equally. The standard errors of all estimates account for design effects due to unequal weighting and the clustering of students within schools. The effect size was calculated by dividing the estimated impact by the standard deviation of the outcome measure for the control group.

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix A: Analysis of Cohorts 1 and 2

Eight subgroup analyses were done (as discussed in chapter 1) to determine whether the SACD programs might be more effective for some groups of children than for others. These subgroups were defined by gender, stayers versus new entrants, five types of risk faced by the children, and fidelity of implementation. The combined cohort subgroup analyses found a total of 20 significant impacts compared to the 22 found in the Cohort 1 subgroup analyses. The combined cohort analysis found 14 of the same significant impacts as the Cohort 1 analysis, failed to find 8 of the Cohort 1 impacts, and found 6 different significant impacts that did not appear in the Cohort 1 analyses. Of the 8 results that were significant in the Cohort 1 analyses but not in the combined cohort analyses, 7 were related to risk subgroups (5 beneficial impacts for high-risk students and 2 detrimental impacts for high-risk students), and 1 impact was beneficial for girls. Of the 6 new findings in the combined cohort analyses, 4 occurred in the stayer versus new entrant subgroup (2 beneficial impacts and 2 detrimental impacts for new entrants), 1 was a detrimental impact for high-risk students, and 1 was a beneficial impact for high-fidelity schools.

Overall, the differences between the subgroup findings from the combined cohort analyses versus the Cohort 1 analysis are primarily less evidence that impacts are more beneficial for higher risk students and mixed evidence on the impacts for stayers versus new entrants. Table A.16 compares the significant subgroup findings from the combined cohort analysis to those of the Cohort 1 analysis, showing each subgroup on a separate panel (exception: no panel displays the socioeconomic risk subgroup analysis as no significant results were found in either the Cohort 1 or the combined cohort analyses).

Table A.16. Cohort 1 versus Cohorts 1 and 2: Comparison of significant impacts by subgroup

Panel 1: Gender

| | Cohort 1 | | | | | Cohorts 1 and 2 | | | | |
|---|-------------|-----------------|--------------------|-----------------|---|--------------------|-----------------|--------------------|-----------------|---|
| | Boys | | Girls | | <i>p</i> -value for test of differences | Boys | | Girls | | <i>p</i> -value for test of differences |
| | Effect size | <i>p</i> -value | Effect size | <i>p</i> -value | | Effect size | <i>p</i> -value | Effect size | <i>p</i> -value | |
| Scale-Report ¹ | | | | | | | | | | |
| Normative Beliefs About Aggression-CR (-) | 0.04 | 0.574 | -0.10 [^] | 0.095 | 0.023* | 0.05 | 0.436 | -0.08 | 0.165 | 0.022* |
| Altruistic Behavior-CR (+) | -0.13* | 0.020 | -0.00 | 0.967 | 0.022* | -0.10 [^] | 0.080 | -0.04 | 0.491 | 0.293 |
| Positive Social Behavior-PCR (+) | 0.10* | 0.032 | -0.02 | 0.653 | 0.033* | 0.10* | 0.036 | -0.02 | 0.658 | 0.021* |
| Engagement with Learning-CR (+) | -0.10* | 0.050 | 0.05 | 0.297 | 0.011* | -0.07 | 0.183 | 0.05 | 0.306 | 0.035* |
| Negative School Orientation-CR (-) | 0.09 | 0.126 | -0.14* | 0.011 | 0.000* | 0.06 | 0.303 | -0.10 [^] | 0.083 | 0.001** |

See notes at end of table.

Panel 2: Stayers and new entrants

| | Cohort 1 | | | | | Cohorts 1 and 2 | | | | |
|------------------------------------|-------------|-----------------|--------------------|-----------------|---|-----------------|-----------------|--------------------|-----------------|---|
| | Stayers | | Entrants | | <i>p</i> -value for test of differences | Stayers | | Entrants | | <i>p</i> -value for test of differences |
| | Effect size | <i>p</i> -value | Effect size | <i>p</i> -value | | Effect size | <i>p</i> -value | Effect size | <i>p</i> -value | |
| Scale-Report ¹ | | | | | | | | | | |
| Altruistic Behavior-CR (+) | -0.03 | 0.516 | -0.14 [^] | 0.066 | 0.132 | -0.03 | 0.565 | -0.14 [^] | 0.055 | 0.041* |
| Positive Social Behavior-PCR (+) | 0.01 | 0.813 | 0.13 [^] | 0.093 | 0.067 [^] | 0.00 | 0.970 | 0.13* | 0.050 | 0.009** |
| Problem Behavior-PCR (-) | -0.05 | 0.244 | -0.11 | 0.160 | 0.195 | -0.00 | 0.993 | -0.14 [^] | 0.074 | 0.005** |
| Negative School Orientation-CR (-) | -0.05 | 0.432 | 0.08 | 0.280 | 0.053 [^] | -0.06 | 0.297 | 0.06 | 0.467 | 0.047* |

See notes at end of table.

Table A.16. Cohort 1 versus Cohorts 1 and 2: Comparison of significant impacts by subgroup—Continued

Panel 3: Family risk

| Scale–Report | Cohort 1 | | | | Cohorts 1 and 2 | | | |
|---------------------------------|------------------------------------|---|-------------------------------------|--|------------------------------------|---|-------------------------------------|--|
| | Low risk ¹ (p-value) | Average risk ² (p-value) | High risk ³ (p-value) | Marginal effect ⁴ (p-value) | Low Risk ¹ (p-value) | Average risk ² (p-value) | High risk ³ (p-value) | Marginal effect ⁴ (p-value) |
| Student Afraid at School–CR (-) | -0.175* (0.020) | -0.084 (0.192) | 0.006 (0.932) | 0.408* (0.012) | -0.157* (0.029) | -0.063 (0.311) | 0.031 (0.660) | 0.414* (0.007) |

See notes at end of table.

Panel 4: Community risk

| Scale–Report | Cohort 1 | | | | Cohorts 1 and 2 | | | |
|------------------------------------|------------------------------------|---|-------------------------------------|--|------------------------------------|---|-------------------------------------|--|
| | Low risk ¹ (p-value) | Average risk ² (p-value) | High risk ³ (p-value) | Marginal effect ⁴ (p-value) | Low risk ¹ (p-value) | Average risk ² (p-value) | High risk ³ (p-value) | Marginal effect ⁴ (p-value) |
| Problem Behavior–PCR (-) | -0.045 (0.381) | 0.028 (0.446) | 0.101* (0.041) | 0.109* (0.032) | -0.062 (0.208) | 0.028 (0.442) | 0.118* (0.013) | 0.136** (0.005) |
| Problem Behavior–TRS (-) | 0.087 (0.268) | -0.001 (0.994) | -0.089 (0.243) | -0.132* (0.022) | 0.087 (0.254) | 0.020 (0.764) | -0.048 (0.511) | -0.101^ (0.060) |
| ADHD-Related Behavior–TRS (-) | 0.062 (0.389) | -0.021 (0.722) | -0.104 (0.132) | -0.124* (0.029) | 0.048 (0.481) | -0.004 (0.938) | -0.057 (0.380) | -0.079 (0.130) |
| Positive School Orientation–CR (+) | -0.086 (0.361) | 0.030 (0.719) | 0.146 (0.111) | 0.174** (0.007) | -0.051 (0.560) | 0.039 (0.607) | 0.129 (0.124) | 0.135* (0.023) |
| Victimization at School–CR (-) | 0.068 (0.298) | -0.035 (0.485) | -0.138* (0.030) | -0.154* (0.011) | 0.054 (0.432) | -0.026 (0.639) | -0.106 (0.106) | -0.120* (0.037) |

See notes at end of table.

Table A.16. Cohort 1 versus Cohorts 1 and 2: Comparison of significant impacts by subgroup—Continued

Panel 5: Initial child behavior risk as reported by teacher

| Scale–Report | Cohort 1 | | | | Cohorts 1 and 2 | | | |
|--|---|--|--|---|---|--|--|---|
| | Low risk ¹ (<i>p</i> -value) | Average risk ² (<i>p</i> -value) | High risk ³ (<i>p</i> -value) | Marginal effect ⁴ (<i>p</i> -value) | Low risk ¹ (<i>p</i> -value) | Average risk ² (<i>p</i> -value) | High risk ³ (<i>p</i> -value) | Marginal effect ⁴ (<i>p</i> -value) |
| Normative Beliefs About Aggression– CR (-) | 0.127 (0.134) | 0.007 (0.923) | -0.113 (0.191) | -0.012** (0.005) | 0.146 [^] (0.068) | 0.030 (0.671) | -0.086 (0.285) | -0.011** (0.003) |
| Problem Behavior–CR (-) | 0.075 (0.348) | -0.007 (0.922) | -0.089 (0.275) | -0.008* (0.032) | 0.077 (0.320) | 0.013 (0.856) | -0.052 (0.507) | -0.006 [^] (0.068) |
| Problem Behavior–TRS (-) | 0.064 (0.389) | -0.011 (0.872) | -0.085 (0.255) | -0.007* (0.029) | 0.075 (0.323) | 0.022 (0.746) | -0.030 (0.690) | -0.005 [^] (0.099) |
| Academic Competence and Motivation– TRS (+) | -0.108* (0.035) | -0.032 (0.455) | 0.044 (0.391) | 0.007** (0.008) | -0.119* (0.017) | -0.046 (0.277) | 0.027 (0.587) | 0.007** (0.006) |
| Negative School Orientation–CR (-) | 0.057 (0.467) | -0.072 (0.300) | -0.202* (0.013) | -0.013** (0.001) | 0.066 (0.364) | -0.047 (0.457) | -0.160* (0.031) | -0.011** (0.002) |

See notes at end of table.

Table A.16. Cohort 1 versus Cohorts 1 and 2: Comparison of significant impacts by subgroup—Continued

Panel 6: Initial child behavior risk as reported by primary caregiver

| Scale–Report | Cohort 1 | | | | Cohorts 1 and 2 | | | |
|---|------------------------------------|--|-------------------------------------|---|------------------------------------|--|-------------------------------------|---|
| | Low risk ¹ (p-value) | Average risk ² (p-value) | High risk ³ (p-value) | Marginal effect ⁴ (p-value) | Low risk ¹ (p-value) | Average risk ² (p-value) | High risk ³ (p-value) | Marginal effect ⁴ (p-value) |
| Normative Beliefs About Aggression–CR (-) | 0.071 (0.403) | -0.010 (0.893) | -0.092 (0.287) | -0.008* (0.036) | 0.080 (0.325) | 0.010 (0.989) | -0.061 (0.460) | -0.007^ (0.062) |
| Empathy–CR (+) | -0.083 (0.217) | -0.007 (0.897) | 0.068 (0.318) | 0.008* (0.042) | -0.056 (0.375) | -0.003 (0.948) | 0.049 (0.445) | 0.005 (0.138) |
| Altruistic Behavior–TRS (+) | -0.049 (0.780) | 0.029 (0.864) | 0.107 (0.542) | 0.008* (0.050) | -0.004 (0.979) | 0.060 (0.693) | 0.123 (0.429) | 0.006^ (0.095) |
| Positive Social Behavior–PCR (+) | -0.086^ (0.083) | -0.007 (0.852) | 0.072 (0.147) | 0.008* (0.015) | -0.080 (0.106) | -0.015 (0.701) | 0.051 (0.310) | 0.006* (0.037) |
| Problem Behavior–PCR (-) | -0.021 (0.691) | 0.036 (0.363) | 0.092^ (0.080) | 0.006 (0.101) | -0.028 (0.571) | 0.037 (0.323) | 0.103* (0.043) | 0.007* (0.048) |
| Engagement with Learning–CR (+) | -0.089 (0.127) | -0.004 (0.925) | 0.081 (0.178) | 0.009* (0.028) | -0.071 (0.196) | 0.016 (0.707) | 0.102^ (0.070) | 0.009* (0.018) |
| Negative School Orientation–CR (-) | 0.055 (0.492) | 0.055 (0.492) | -0.178* (0.030) | -0.012** (0.002) | 0.056 (0.447) | -0.044 (0.501) | -0.143^ (0.056) | -0.010** (0.006) |

See notes at end of table.

Table A.16. Cohort 1 versus Cohorts 1 and 2: Comparison of significant impacts by subgroup—Continued

Panel 7: Fidelity of implementation

| | Cohort 1 | | | | | | | Cohorts 1 and 2 | | | | | | |
|---|-----------------|-----------------|-------------------|-----------------|------------------|-----------------|---|-----------------|-----------------|-------------------|-----------------|------------------|-----------------|---|
| | Low effect size | | Mixed effect size | | High effect size | | <i>p</i> -value for test of differences | Low effect size | | Mixed effect size | | High effect size | | <i>p</i> -value for test of differences |
| | Effect size | <i>p</i> -value | Effect size | <i>p</i> -value | Effect size | <i>p</i> -value | | Effect size | <i>p</i> -value | Effect size | <i>p</i> -value | Effect size | <i>p</i> -value | |
| Scale-Report | | | | | | | | | | | | | | |
| Normative Beliefs About Aggression-CR (-) | 0.06 | 0.419 | 0.04 | 0.584 | -0.14 | 0.148 | 0.068 [^] | 0.11 | 0.174 | 0.05 | 0.547 | -0.14 | 0.129 | 0.042 [*] |

* Significantly different from zero at the .05 level.
 ** Significantly different from zero at the .01 level.
[^] Significantly different from zero at the .10 to > .05 level.
¹ One standard deviation below the mean risk level.
² At the mean risk level.
³ One standard deviation above the mean risk level.
⁴ Change in impact as risk level increases by one unit.

NOTE: Abbreviations are
 CR: Child Report
 PCR: Primary Caregiver Report
 TRS: Teacher Report on Student
 ADHD: Attention deficit hyperactivity disorder

The +/- signs in parentheses indicate the direction of a beneficial outcome. All impact estimates were calculated using regression models in which each program and school within a program was weighted equally. The standard errors of all estimates account for design effects due to unequal weighting and the clustering of students within schools. *P*-values for the effect sizes are shown within the parentheses below the effect size.

SOURCE: The Social and Character Development (SACD) Research Program.

Growth Analysis

Regarding the growth analysis, none of the 18 estimated combined program impacts on growth in fourth-grade child and school outcomes was statistically significantly different from zero at the 5 percent level (table A.17). The lack of statistically significant beneficial impact estimates at the combined-program level did not appear to be due to beneficial impacts in some programs or subgroups that were offset by negative impacts in others.

Table A.17. Combined Cohorts 1 and 2: Impacts on growth of child outcomes from combined-program analysis

| Scale–Report | Mean score at implementation ² | Average growth in the score per year ¹ | | | | Standard error of impact | p-value of impact |
|---|---|---|---------------|-------------------------------|--------------------------|--------------------------|-------------------|
| | | Treatment group | Control group | Impact on growth ³ | Effect size ⁴ | | |
| Social and Emotional Competence Domain | | | | | | | |
| Self-Efficacy for Peer Interactions–CR (+) | 2.92 | 0.18 | 0.18 | 0.00 | 0.00 | 0.02 | 0.854 |
| Normative Beliefs About Aggression–CR (-) | 1.24 | 0.09 | 0.08 | 0.00 | 0.01 | 0.03 | 0.885 |
| Empathy–CR (+) | 2.41 | -0.16 | -0.15 | -0.01 | -0.02 | 0.02 | 0.705 |
| Behavior Domain | | | | | | | |
| Altruistic Behavior–CR (+) | 1.45 | -0.25 | -0.24 | -0.02 | -0.02 | 0.03 | 0.549 |
| Altruistic Behavior–PCR (+) | 2.31 | -0.06 | -0.05 | -0.01 | -0.02 | 0.02 | 0.559 |
| Altruistic Behavior–TRS (+) | 1.40 | -0.02 | 0.01 | -0.04 | -0.08 | 0.05 | 0.498 |
| Positive Social Behavior–PCR (+) | 2.98 | 0.05 | 0.04 | 0.01 | 0.03 | 0.01 | 0.371 |
| Positive Social Behavior–TRS (+) | 3.03 | -0.04 | 0.01 | -0.05 | -0.07 | 0.04 | 0.205 |
| Problem Behavior–CR (-) | 0.25 | 0.08 | 0.08 | 0.00 | 0.01 | 0.02 | 0.827 |
| Problem Behavior–PCR (-) | 1.57 | -0.02 | -0.01 | -0.01 | -0.02 | 0.01 | 0.486 |
| Problem Behavior–TRS (-) | 1.38 | 0.06 | 0.07 | -0.01 | -0.02 | 0.02 | 0.654 |
| ADHD-Related Behavior–TRS (-) | 1.74 | -0.01 | 0.00 | -0.01 | -0.02 | 0.03 | 0.624 |
| Academics Domain | | | | | | | |
| Engagement with Learning–CR (+) | 3.67 | -0.01 | -0.02 | 0.01 | 0.02 | 0.02 | 0.591 |
| Academic Competence–TRS (+) | 2.90 | 0.04 | 0.06 | -0.02 | -0.02 | 0.03 | 0.460 |

See notes at end of table.

Table A.17. Combined Cohorts 1 and 2: Impacts on growth of child outcomes from combined-program analysis—Continued

| Scale–Report | Mean score at implementation ² | Average growth in the score per year ¹ | | | | Standard error of impact | p-value of impact |
|--------------------------------------|---|---|---------------|-------------------------------|--------------------------|--------------------------|-------------------|
| | | Treatment group | Control group | Impact on growth ³ | Effect size ⁴ | | |
| Perceptions of School Climate Domain | | | | | | | |
| Positive School Orientation–CR (+) | 3.13 | -0.31 | -0.33 | 0.02 | 0.03 | 0.03 | 0.365 |
| Negative School Orientation–CR (-) | 1.87 | 0.08 | 0.09 | -0.01 | -0.02 | 0.02 | 0.528 |
| Student Afraid at School–CR (-) | 2.42 | -0.13 | -0.08 | -0.05 | -0.05 | 0.03 | 0.102 |
| Victimization at School–CR (-) | 0.79 | -0.08 | -0.03 | -0.04 | -0.05 | 0.03 | 0.134 |

¹Pertains to the estimated slope of the outcome for the treatment or control groups.

²The average score at implementation was calculated across treatment and control groups, using regression models for adjustment on covariates.

³Estimated difference between the slope of the treatment and control groups.

⁴The slope of the treatment group minus the slope of the control group divided by the standard deviation of the outcome for the multisite control group (the standard deviation was calculated without accounting for school-level clustering or regression adjustments).

NOTE: Abbreviations are

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

ADHD: Attention deficit hyperactivity disorder

The +/- signs in parentheses indicate the direction of a beneficial outcome. No findings were found statistically significant at or below the .05 level. All impact estimates were calculated using HLM 6.06. Sample weights were used in all analyses to (1) give each *program* equal weight within each time period, (2) give each *school* equal weight in each program (within each time period), and (3) give each *time period* equal weight in the analysis.

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix A: Analysis of Cohorts 1 and 2

From the program-level analysis, 12 impact estimates were found to be statistically significant out of 126 results (more than the 6 that would be expected by chance). These are listed in table A.18, which shows that 4 were beneficial impacts on growth in student outcomes, and 8 were detrimental impacts.

Table A.18. Combined Cohorts 1 and 2: Statistically significant impacts from the growth curve analyses of the individual programs

| Program | Significant beneficial impacts (Report) (Effect size) (<i>p</i> -value) | Significant detrimental impacts (Report) (Effect size) (<i>p</i> -value) |
|---------|---|--|
| Total | 4 | 8 |
| ABC | Positive Social Behavior (PCR) (0.20) (0.046) | |
| CSP | Victimization at School (CR) (-0.18) (0.038) | Academic Competence (TRS) (-0.15) (0.025) Normative Beliefs About Aggression (CR) (0.33) (0.031) |
| LBW | | Problem Behavior (CR) (0.14) (0.031) Normative Beliefs About Aggression (CR) (0.13) (0.030) |
| PA | Altruistic Behavior (PCR) (0.19) (0.021) | |
| PATHS | | |
| 4Rs | Problem Behavior (TRS) (-0.21) (0.048) | |
| SS | | Academic Competence (TRS) (-0.15) (0.013) Positive Social Behavior (TRS) (-0.35) (0.008) Problem Behavior (TRS) (0.40) (0.010) ADHD-Related Behavior (TRS) (0.28) (0.000) |

NOTE: Abbreviations are

- ABC: *Academic and Behavioral Competencies Program*
- CSP: *Competence Support Program*
- LBW: *Love In a Big World*
- PA: *Positive Action*
- PATHS: *Promoting Alternative Thinking Strategies*
- 4Rs: *The 4Rs Program (Reading, Writing, Respect, and Resolution)*
- SS: *Second Step*
- CR: Child Report
- PCR: Primary Caregiver Report
- TRS: Teacher Report on Student
- ADHD: Attention deficit hyperactivity disorder
- Blank cell: Finding of no impact

All impact estimates were calculated using HLM 6.06. Sample weights were used in all analyses to (1) give each *program* equal weight within each time period, (2) give each *school* equal weight in each program (within each time period), and (3) give each *time period* equal weight in the analysis.

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix A: Analysis of Cohorts 1 and 2

The subgroup analyses found 12 impact estimates that significantly differed by subgroup out of the 126 results (more than the 6 that would be expected by chance). Table A.19 shows the statistically significant impacts for the subgroups. The gender analysis found 1 significant beneficial impact for girls: a decline in Negative School Orientation. New entrants had detrimental impacts for growth in both Positive School Orientation and Negative School Orientation. For the initial risk analyses, 9 impacts were found to be significant, with 8 showing beneficial impacts on growth for high-risk students and 1 showing detrimental impacts on high-risk students. Subgroup-specific regression results showed that 2 of the beneficial impacts were actually due to detrimental growth effects for low-risk students (Academic Competence in regards to child behavior risk as reported by both the teacher and the primary caregiver). In addition, they showed that the one finding of a detrimental impact on high-risk students was due to a beneficial impact on low-risk students (Problem Behavior reported in the Primary Caregiver Report in regards to community risk).

Table A.19. Combined Cohorts 1 and 2: Statistically significant impacts from the growth curve analyses of the subgroups

| Subgroup | Outcome | Impact on subgroup |
|---------------------------|---|--|
| Gender | Negative School Orientation (<i>p</i> -value of impact = 0.033) | Beneficial to girls |
| New entrants/stayers | Positive School Orientation (<i>p</i> -value of impact = 0.049) | Detrimental to new entrants |
| | Negative School Orientation (<i>p</i> -value of impact = 0.034) | |
| Socioeconomic risk | Academic Competence (Interaction term = 0.05) (<i>p</i> -value of impact = 0.032) | Beneficial to high risk |
| Family risk | Victimization at School (Interaction term = -0.20) (<i>p</i> -value of impact = 0.026) | Beneficial to high risk |
| Community risk | Problem Behavior (PCR) (Interaction term = 0.04) (<i>p</i> -value of impact = 0.013) | Detrimental to high risk due to beneficial for low risk |
| | Problem Behavior (TRS) (Interaction term = -0.05) (<i>p</i> -value of impact = 0.025) | Beneficial to high risk |
| | Positive School Orientation (Interaction term = 0.11) (<i>p</i> -value of impact = 0.001) | Beneficial to high risk |
| Child behavior risk (TRS) | Academic Competence (Interaction term = 0.03) (<i>p</i> -value of impact = 0.002) | Beneficial to high risk due to detrimental for low risk |
| | Positive Social Behavior (PCR) (Interaction term = 0.02) (<i>p</i> -value of impact = 0.016) | Beneficial to high risk |
| Child behavior risk (PCR) | Academic Competence (Interaction term = 0.02) (<i>p</i> -value of impact = 0.010) | Beneficial to high risk due to detrimental for low risk |
| | Positive Social Behavior (PCR) (Interaction term = 0.02) (<i>p</i> -value of impact = 0.002) | Beneficial to high risk |

NOTE: Abbreviations are

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

All impact estimates were calculated using HLM 6.06. Sample weights were used in all analyses to (1) give each *program* equal weight within each time period, (2) give each *school* equal weight in each program (within each time period), and (3) give each *time period* equal weight in the analysis.

SOURCE: The Social and Character Development (SACD) Research Program.

Summary

As a result of an effort to increase the sample size and corresponding statistical power of the SACD evaluation, a second cohort of 12 schools was added in Year 2. Six of the schools implemented one of four SACD programs while the other six acted as their control schools. Overall, the analyses of the combined cohort sample produced results similar to those of the analyses of the Cohort 1 data.

Responses from students, primary caregivers, and teachers from the original 83 and the 12 new schools during the year students were in the fourth grade were combined. The combined treatment and control groups remained similar, as they were in the Cohort 1 study, although the Cohort 2 students were significantly different from the Cohort 1 students in that they came from more disadvantaged households and communities. The analyses done with the fourth-grade Cohort 1 students were replicated with the students of Cohorts 1 and 2 combined.

The results of the analysis of teachers' activities and professional development, pooled across programs, were similar to the results for the Cohort 1 data. These results showed that statistically significant larger percentages of treatment group teachers than control group teachers reported engaging in activities to promote social and character development, using materials and strategies to promote social and character development, and participating in related professional development. Treatment group teachers were no more likely to report changes in the school environment or in teacher and staff's attitudes that might be conducive to promoting social and character development.

The findings from the combined cohort study were similar to those from the Cohort 1 study. In the year-by-year analysis, the seven SACD combined programs had no significant impact on the 20 outcomes as compared to the impact on one outcome (Student Support for Teachers) found in the analysis of Cohort 1. Regarding the domains, the analysis found a significant detrimental effect on the domain of Social and Emotional Competence. The lack of impacts at the combined-program level was not due to beneficial impacts of some programs being offset by detrimental impacts of other programs. For 18 of the 20 outcomes, there were no statistically significant differences in impacts across the programs (the two exceptions were due to significant positive impacts by the ABC Program).

The individual program impacts for the four programs that had Cohort 2 students showed little or no improvement over those of the Cohort 1 analysis. One program lost a significant beneficial impact and gained a significant detrimental impact (CSP). One program lost a substantively important beneficial impact and a substantively important detrimental impact and gained a substantively important detrimental impact (LBW). One program gained a substantively important beneficial impact (PATHS), and one program lost a significant detrimental effect (ABC).

The findings from subgroup analyses of the combined cohorts were the same for 14 out of 22 impacts that were found significant in the Cohort 1 subgroup analysis. The differences between the findings were primarily that the analyses of the combined cohorts provided less evidence of more beneficial impacts for higher risk students and mixed evidence regarding impacts for stayers versus new entrants.

For the growth curve analysis, the results, though not directly comparable to the Cohort 1 analysis, were similar. The seven SACD programs, combined, had no significant impact on the 18 outcomes. The individual program analysis found a small number of significant impacts on student growth in outcomes but two-thirds of these were detrimental impacts. One difference was that the initial risk analyses had slightly more findings than would be expected by chance, and the majority of these showed more beneficial impacts for higher risk students.

Appendix A: Analysis of Cohorts 1 and 2

Table A.20. Sample size ranges for outcome analyses

| Outcome analysis | Group | Report | Minimum of range | Maximum of range | |
|---------------------|-----------|-----------|------------------|------------------|-----|
| Combined programs | Treatment | CR | 2,389 | 2,409 | |
| | | PCR | 1,833 | 1,859 | |
| | | TRS | 2,450 | 2,498 | |
| | | TRCS | 478 | 479 | |
| | Control | CR | 2,098 | 2,121 | |
| | | PCR | 1,651 | 1,671 | |
| | | TRS | 2,208 | 2,221 | |
| | | TRCS | 458 | 459 | |
| Individual programs | ABC | Treatment | CR | 258 | 259 |
| | | | PCR | 182 | 185 |
| | | | TRS | 259 | 271 |
| | | | TRCS | 55 | 55 |
| | | Control | CR | 342 | 345 |
| | | | PCR | 257 | 257 |
| | | | TRS | 357 | 357 |
| | | | TRCS | 72 | 72 |
| | CSP | Treatment | CR | 428 | 436 |
| | | | PCR | 323 | 326 |
| | | | TRS | 420 | 444 |
| | | | TRCS | 81 | 81 |
| | | Control | CR | 406 | 416 |
| | | | PCR | 339 | 341 |
| | | | TRS | 433 | 433 |
| | | | TRCS | 82 | 82 |
| LBW | Treatment | CR | 359 | 360 | |
| | | PCR | 312 | 316 | |
| | | TRS | 379 | 387 | |
| | | TRCS | 75 | 76 | |
| | Control | CR | 282 | 284 | |
| | | PCR | 225 | 227 | |
| | | TRS | 295 | 297 | |
| | | TRCS | 56 | 56 | |
| PA | Treatment | CR | 280 | 284 | |
| | | PCR | 212 | 214 | |
| | | TRS | 289 | 302 | |
| | | TRCS | 43 | 43 | |
| | Control | CR | 220 | 225 | |
| | | PCR | 181 | 183 | |
| | | TRS | 249 | 251 | |
| | | TRCS | 39 | 39 | |

See notes at end of table.

Appendix A: Analysis of Cohorts 1 and 2

Table A.20. Sample size ranges for outcome analyses—Continued

| Outcome analysis | Group | Report | Minimum of range | Maximum of range |
|----------------------------|--------------|--------|------------------|------------------|
| PATHS | Treatment | CR | 305 | 308 |
| | | PCR | 233 | 239 |
| | | TRS | 315 | 315 |
| | | TRCS | 74 | 74 |
| | Control | CR | 262 | 263 |
| | | PCR | 198 | 199 |
| | | TRS | 271 | 271 |
| | | TRCS | 76 | 76 |
| 4Rs | Treatment | CR | 372 | 377 |
| | | PCR | 241 | 246 |
| | | TRS | 399 | 404 |
| | | TRCS | 90 | 91 |
| | Control | CR | 292 | 299 |
| | | PCR | 206 | 209 |
| | | TRS | 307 | 320 |
| | | TRCS | 82 | 82 |
| SS | Treatment | CR | 383 | 387 |
| | | PCR | 330 | 335 |
| | | TRS | 381 | 383 |
| | | TRCS | 59 | 60 |
| | Control | CR | 288 | 291 |
| | | PCR | 245 | 255 |
| | | TRS | 292 | 293 |
| | | TRCS | 51 | 52 |
| Subgroups Gender | Boys | CR | 2,124 | 2,144 |
| | | PCR | 1,643 | 1,669 |
| | | TRS | 2,240 | 2,261 |
| | Girls | CR | 2,363 | 2,386 |
| | | PCR | 1,825 | 1,845 |
| | | TRS | 2,400 | 2,441 |
| New entrants | Stayers | CR | 3,461 | 3,495 |
| | | PCR | 2,699 | 2,731 |
| | | TRS | 3,607 | 3,651 |
| | New entrants | CR | 1,026 | 1,036 |
| | | PCR | 785 | 799 |
| | | TRS | 1,051 | 1,069 |
| Initial socioeconomic risk | | CR | 4,062 | 4,106 |
| | | PCR | 3,407 | 3,448 |
| | | TRS | 4,218 | 4,261 |

See notes at end of table.

Appendix A: Analysis of Cohorts 1 and 2

Table A.20. Sample size ranges for outcome analyses—Continued

| Outcome analysis | Group | Report | Minimum of range | Maximum of range |
|---|-------|--------|------------------|------------------|
| Initial family risk | | CR | 3,068 | 3,099 |
| | | PCR | 2,531 | 2,561 |
| | | TRS | 3,195 | 3,222 |
| Initial community risk | | CR | 3,019 | 3,051 |
| | | PCR | 2,501 | 2,529 |
| | | TRS | 3,140 | 3,166 |
| Initial child behavior risk (Teacher Report) | | CR | 3,288 | 3,322 |
| | | PCR | 2,582 | 2,610 |
| | | TRS | 3,430 | 3,468 |
| Initial child behavior risk (Primary Caregiver Report) | | CR | 3,050 | 3,082 |
| | | PCR | 2,522 | 2,551 |
| | | TRS | 3,179 | 3,206 |
| Fidelity of implementation | High | CR | 1,749 | 1,767 |
| | | PCR | 1,423 | 1,442 |
| | | TRS | 1,788 | 1,813 |
| | Mixed | CR | 848 | 851 |
| | | PCR | 677 | 684 |
| | | TRS | 893 | 904 |
| | Low | CR | 1,887 | 1,909 |
| | | PCR | 1,381 | 1,402 |
| | | TRS | 1,974 | 2,001 |

NOTE: Abbreviations are

ABC: *Academic and Behavioral Competencies Program*

CSP: *Competence Support Program*

LBW: *Love In a Big World*

PA: *Positive Action*

PATHS: *Promoting Alternative Thinking Strategies*

4Rs: *The 4Rs Program (Reading, Writing, Respect, and Resolution)*

SS: *Second Step*

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

TRCS: Teacher Report on Classroom and School

SOURCE: The Social and Character Development (SACD) Research Program.

**Appendix B: Technical Notes on the Development of
Outcome Measures, Selection of Covariates, Construction of
Sample Weights, and Sensitivity Analyses**

This page is intentionally blank.

Technical Notes on the Development of Outcome Measures, Selection of Covariates, Construction of Sample Weights, and Sensitivity Analyses

This technical appendix supplements the Study Design and Methodology section of chapter 1 with additional details on the methods used for the SACD impact analysis. It provides information about the development of the outcome measures, the selection of covariates that were included in the regression models, the sample weights, and the sensitivity analysis used to examine the robustness of the impact estimates to alternative parameter assumptions and specifications.

Development of the Outcome Measures

This section describes the procedures used to create and validate the survey-based child and school outcome measures. The majority of the discussion concerns the 18 student-level outcome measures, with the 2 school-level outcome measures discussed at the end of the section. The development of the outcome measures was directed by the Social and Character Development (SACD) Statistical Workgroup, which was made up of representatives from the National Center for Education Research, Institute of Education Sciences (IES), U.S. Department of Education; the Division of Violence Prevention in the National Center for Injury Prevention and Control, Centers for Disease Control and Prevention (CDC); SACD grantees; Mathematica Policy Research, Inc. (MPR); and the University of Missouri-St. Louis. Each outcome measure is a scale composite of multiple Likert-type items, derived from initial (fall 2004) survey responses to the Child Report, Primary Caregiver Report, and the Teacher Report on Student.¹ For example, the five student-level measures created from the Teacher Report on Student are Positive Social Behavior, Problem Behavior, Altruistic Behavior, ADHD-Related Behavior, and Academic Competence and Motivation. A list of all scales for each respondent group is provided in table B.1.

The surveys were either self-administered or, for some primary caregivers, administered as a computer-assisted telephone interview. The items included in the initial versions of the teacher-, primary caregiver-, and child-report surveys were largely taken from instruments used in previous research. Four measures (child responsibility, child and teacher perceptions of school safety, and primary caregiver perceptions of community resources) were generated by SACD Consortium members due to a lack of adequate existing measures of those constructs. Preliminary analyses of the measures administered in the initial wave of data collection revealed that, although most of the scales performed adequately and as expected, some predefined scales had poor internal consistency (Cronbach's alphas ≤ 0.60 for primary caregiver report on the Behavior Assessment System for Children [BASC] Conduct Problems Subscale and child report on the Nonconflict Subscale items of the Children's Self-Efficacy for Peer Interaction Scale). Furthermore, a small number of the scale or subscale scores were highly intercorrelated (for example, $r \geq 0.80$ for the correlation between teacher report on the Responsibility Scale and teacher report on the Social Competence Scale). Consequently, the SACD Statistical Workgroup conducted more rigorous analyses of the items to determine whether a set of outcome measures with better psychometric characteristics could be derived.

¹ In fall 2004, data collection began at an original cohort of schools and focused on students who were beginning third grade. Students at these schools were followed through spring of fifth grade. A second cohort of schools was subsequently included in the study; data collection at these schools focused on students who started third grade in fall 2005; these students were followed through the spring of fourth grade. The analyses discussed here pertain to the first cohort of schools and students.

Table B.1. Scales and internal consistency for child outcomes, by report type

| Scale (Cronbach's α) | |
|---|---|
| Teacher Report on Student | Child Report |
| Positive Social Behavior (0.97) | Positive School Orientation (0.86) |
| Problem Behavior (0.95) | Engagement with Learning (0.84) |
| Altruistic Behavior (0.89) | Student Afraid at School (0.79) |
| ADHD-Related Behavior (0.91) | Negative School Orientation (0.78) |
| Academic Competence and Motivation (0.95) | Self-Efficacy for Peer Interaction (0.83) |
| | Normative Beliefs About Aggression (0.83) |
| Primary Caregiver Report | Empathy (0.78) |
| Positive Social Behavior (0.93) | Altruistic Behavior (0.88) |
| Problem Behavior (0.86) | Problem Behavior (0.86) |
| Altruistic Behavior (0.88) | Victimization at School (0.86) |

NOTE: Internal consistency is Cronbach's α (alpha), measured using a random sample of one-half of the respondents to the fall 2004 survey administration. Consistency remained similarly high at all waves. Listwise deletion of cases with missing data was used in all analyses. ADHD is the abbreviation for attention deficit hyperactivity disorder.

SOURCE: The Social and Character Development (SACD) Research Program.

The approach the SACD Statistical Workgroup used was, first, to conduct exploratory factor analyses. Using half of the sample, selected randomly, researchers looked at the individual items of the fall 2004 survey separately for each group of respondents (teachers, primary caregivers, and children). These analyses were conducted separately for each group of respondents because the survey instruments for teachers, primary caregivers, and children contained different sets of items. Although a small number of measures were administered to more than one respondent group (see below), most of the measures were administered to only a single group of respondents. Potential outcome scales identified in these exploratory analyses were then subjected to confirmatory factor analyses with the remaining half of the sample (hereafter referred to as the "validation sample") using structural equation modeling procedures.

For each of the three survey respondent groups, a set of exploratory factor analyses was undertaken using the principal axis method. Based on both conceptual and empirical (such as eigenvalues) criteria, varying numbers of factors were extracted and rotated in these analyses, and then compared with respect to the conceptual clarity of the factors, the nature and extent of cross-loading of items, the extent to which factors were defined by a very small number of items (or single items), and parsimony (the absence of multiple factors appearing to assess the same basic construct). On the basis of these analyses, it was decided that the item responses of teachers, primary caregivers, and children were optimally represented by 5, 3, and 10 underlying factors, respectively. The names and internal consistencies of the scales are listed in table B.1.²

Confirmatory Factor Analyses of Student-Level Outcome Measures

The factors identified in the exploratory analyses were subjected to empirical confirmation using the validation samples. Analyses of model fit were conducted using LISREL software for the analysis of covariance structures. The focus was on two measures of model fit: the comparative fit index (CFI) and the root mean square error of approximation (RMSEA). The CFI runs from 0 to 1 and gauges the percentage improvement in reproducing the input covariance matrix obtained by using the proposed measurement model as compared to a null model that assumes no shared variance (and thus no latent factors). Higher

² A small number of items were dropped from further analyses because they did not load on any of the identified factors (loadings were not ≥ 0.30 on any factor). Specifically, 8 of 91 items in the child survey (9%), 3 of 74 items in the teacher survey (4%), and 6 of 59 items in the primary caregiver survey (10%) were dropped from analysis. Items that cross-loaded on other factors (an item was considered to cross-load on two or more factors when factor loadings were greater than 0.30) were included on the factor for which the loading was stronger.

Appendix B: Technical Notes

values represent improved fit and, while all fit standards are somewhat arbitrary, researchers have variously suggested either .90 or .95 as cutoffs for good fit. The RMSEA is an index of lack of fit (based on the χ^2 per degree of freedom). The RMSEA also runs from 0 to 1, but higher values reflect poorer fit. Suggested cutoffs for acceptable fit vary from .08 to .10.

For the teacher, the primary caregiver, and the child respondents, the hypothesized factor representations provided a good fit to the data, as estimated using LISREL structural equations modeling software. As shown in table B.2, for the 71 items in the teacher survey, the confirmatory factor analysis of five latent factors yielded a CFI value of 0.98 and an RMSEA of 0.090 (90% confidence interval [CI] = 0.089, 0.091). For the 53 primary caregiver items, the confirmatory factor analysis of three latent factors yielded a CFI of 0.94 and an RMSEA of 0.087 (90% CI = 0.086, 0.088); for the 83 child items, the confirmatory factor analysis of 10 latent factors yielded a CFI of 0.91 and an RMSEA of 0.060 (90% CI = 0.059, 0.061).

Table B.2. Fit indexes from confirmatory factor analyses, five-factor measurement model: First four waves of data collection, by respondent type

| Respondent type/Time of data collection | Sample size | RMSEA | CFI |
|---|-------------|-------|-------|
| Teachers (5 factors) | | | |
| Initial | 2,040 | 0.090 | 0.980 |
| Follow-up 1 | 3,538 | 0.114 | 0.967 |
| Follow-up 2 | 3,410 | 0.102 | 0.969 |
| Follow-up 3 | 3,580 | 0.107 | 0.970 |
| Follow-up 4 | 3,178 | 0.110 | 0.969 |
| Primary Caregivers (3 factors) | | | |
| Initial | 1,389 | 0.087 | 0.940 |
| Follow-up 1 | 2,643 | 0.079 | 0.956 |
| Follow-up 2 | 2,745 | 0.081 | 0.957 |
| Follow-up 3 | 2,639 | 0.082 | 0.954 |
| Follow-up 4 | 2,355 | 0.084 | 0.957 |
| Children (10 factors) | | | |
| Initial | 1,314 | 0.060 | 0.910 |
| Follow-up 1 | 3,074 | 0.064 | 0.943 |
| Follow-up 2 | 3,247 | 0.067 | 0.947 |
| Follow-up 3 | 3,307 | 0.066 | 0.952 |
| Follow-up 4 | 3,412 | 0.066 | 0.954 |

NOTE: Abbreviations are

CFI: Comparative fit index

RMSEA: Root mean square error of approximation

Listwise deletion of cases with missing data was used in all analyses. Confirmatory factor models were estimated using the LISREL structural equation modeling package, with latent factor variances fixed to 1.0 to scale the factors. Initial data were collected in fall 2004. Follow-up 1 was in spring 2005, Follow-up 2 was in fall 2005, Follow-up 3 was in spring 2006, and Follow-up 4 was in spring 2007. The fall 2004 results are from analyses of random samples of one-half of the fall 2004 respondents of each respective respondent type. Results for the follow-ups are derived from analyses of full samples (after listwise deletion).

SOURCE: The Social and Character Development (SACD) Research Program.

Robustness Checks

The analyses of the fall 2004 data indicated that, for the sample as a whole, the child outcome variables could be adequately represented by a relatively small number of scales. Further analyses were performed to test the robustness of the model (1) for major demographic subgroups, (2) across samples at different study sites, (3) to treatment of missing data, (4) to different estimation approaches, and (5) across different survey waves.

Demographic and Site Checks

A series of multigroup confirmatory analyses were conducted to investigate whether the identified measurement models held across major child demographic groups (gender and race/ethnicity) and across the seven individual SACD programs. In each case, a measurement model in which all factor loadings and factor covariances were constrained to be equal across groups (but error variances were allowed to vary) provided a

Appendix B: Technical Notes

good fit to the multigroup data.³ The basic measurement model thus proved to be valid across child gender, across child race/ethnicity, and for each of the seven SACD programs.

Missing Items

A second set of confirmatory analyses were conducted to examine whether the measurement models were robust to differences in the treatment of missing item-response data. Primary analyses were restricted to observations with no missing items. Although preliminary analyses indicated that missing responses to individual survey items were infrequent among each of the respondent groups (no more than 5% of the responses were missing for any survey item), listwise deletion had a cumulative effect of excluding one-third or more of the respondents in each group. Analyses of missing data showed that respondents with valid scores on the outcome measures were similar to those with missing data, suggesting that data were missing at random. Nonetheless, to investigate potential biases due to exclusion of cases with missing responses to survey items, the confirmatory factor analyses were re-run with missing item responses imputed using the Expectation-Maximization (EM) algorithm.⁴ For each respondent group, the use of EM imputation resulted in a fit as good as or better than that of models on samples that used listwise deletion.

Estimation Procedures

Approaches to evaluating model fit vary across software packages. LISREL uses a “weighted least squares” chi-square independence model. By contrast, another structural equation modeling package, EQS, uses a “minimum fit function” chi-square independence model. For equivalent models, LISREL and EQS should produce the same normal theory chi-square and RMSEA values but would produce different measures of relative fit, such as CFI, due to the use of different chi-square independence models. Analyses performed using EQS showed that, as expected, LISREL yielded a higher CFI for each model than EQS.⁵ However, the other fit indexes, which are not based on choice of chi-square independence model, were actually better as estimated by EQS than LISREL, and both software packages indicated that the measurement models provided a good fit to the data.

Successive Data Waves

Finally, it is possible that the SACD programs might influence not only the mean scores on the measured outcomes but also the correlations among the measured outcomes, and thus have an impact on the quality of the measurement model. Analyses were performed to test the continuing fit of the model with each new wave of data. In addition to presenting measures of model fit from the initial survey wave, table B.2 also presents corresponding measures for each of the succeeding follow-up waves for the original cohort. Those results confirm that the model has held up well over time. There was minimal variation in either of the fit statistics across survey waves.

³ All multigroup confirmatory factor analyses were conducted using the random half-samples of respondents used in the initial confirmatory analyses.

⁴ The EM algorithm (see Dempster, Laird, and Rubin 1977) is an iterative, maximum-likelihood procedure that uses information from observed data to successively estimate, evaluate, and re-estimate values for missing data until it converges on a unique maximum-likelihood estimate.

⁵ The independence model specifies that the covariance matrix of the observed variables is a diagonal matrix with all observed variables uncorrelated. Although the computational formulas are complicated (see Joreskog et al. 2003), the weighted least squares independence model chi-square (LISREL default) yields larger values than the minimum fit function independence model chi-square (EQS default). As a result, incremental fit indexes such as the CFI will be larger in LISREL than in EQS, because all such indexes are computed as some function of the chi square ($1 - [\text{model chi-square}/\text{independence chi-square}]$). As should be the case, when the same chi-square independence model is used to evaluate model fit in LISREL and EQS, the two software packages produce virtually identical estimates of CFI and all other model fit indexes that are evaluated against the independence model.

Construct and Reporter-Based Variance

The measurement models described above all derived measures separately for each respondent group (children, primary caregivers, and teachers). However, comparable measures were found among the respondent groups—such as Altruistic Behavior, Positive Social Behavior, and Problem Behavior. A series of exploratory “multitrait, multirespondent” (MTMR) analyses were undertaken to investigate the extent of convergence across respondents in these commonly measured outcomes—whether responses predominantly reflected common perceptions of child behaviors across respondents or whether they were largely idiosyncratic to the respondent. That is, these efforts represented an attempt to distinguish construct variance from systematic variance due to the respondent (as well as random measurement error).

Systematic differences between respondents may represent reporter bias or may reflect differences associated with the different types of information available to each respondent when making judgments. For example, primary caregivers and teachers differ in their overall familiarity with a child and in the nature of the situations in which they are able to observe the child’s behavior. These differences in available information are quite likely to influence their judgments about the child’s characteristics. Thus it is important to acknowledge that systematic variance between respondents might not necessarily indicate error in observation, recollection, or reporting, but rather they could reflect real differences in child behavior in different environments and contexts.

The SACD Statistical Workgroup conducted multiple analyses with “construct” latent variables (e.g., Problem Behavior, Altruistic Behavior) and “reporter” latent variables (e.g., primary caregiver). The central finding of these MTMR analyses was that for the set of outcomes measured, there was substantial variance attributable to both the respondent and the constructs being measured. Thus, for example, the correlations between a single respondent’s assessments across constructs—such as a teacher’s perceptions of a child’s Problem Behavior and Altruistic Behavior—were similar to the correlations between respondents for the same construct—such as the teacher’s assessment of that child’s Problem Behavior and the corresponding assessment by the primary caregiver. In addition, the path coefficients for the construct and reporter latent variables were of generally similar magnitude to one another. The data used in these analyses do not permit determination of whether the latent reporter effects reflected bias on the part of respondents or differences in the information available to different respondents.

Psychometric Properties of School-Level Outcome Measures

In addition to the individual, student-level outcome measures described above, two school-level measures of possible SACD program outcomes were included in the impact analyses. These measures were included in separate teacher surveys (Teacher Report on Classroom and School) administered in fall 2004 and each follow-up period, and the measures focused on assessments of the school environment. One of the measures, Student Support for Teachers, assessed teacher perceptions of student positive and negative behavior and teacher-student relations; the other, Feelings of Safety, assessed teacher perceptions of the extent to which students were not fearful of being psychologically or physically harmed at school. Principal components analyses revealed that both measures were unidimensional, with all items having large positive loadings ($\geq .69$) on the first unrotated component and the component accounting for 62 percent to 77 percent of the variance in item responses. Similarly, internal consistency analyses revealed that both measures were highly reliable, with alpha coefficients between .89 and .91 at each survey wave for the Student Support for Teachers index and between .88 and .90 at each wave for the Feelings of Safety index.

Selection of Covariates

This section provides details on the selection of covariates for estimating regression-adjusted intervention impacts on the key child and school outcomes. The approach described here significantly benefited from discussions with the SACD Statistical Workgroup, composed of principal investigators across the seven SACD study sites and representatives of IES and CDC, in addition to staff at MPR and MPR’s subcontractor, University of Missouri-St. Louis. This approach was used to choose the covariates for the Year 1 analysis and

Appendix B: Technical Notes

made use of the Year 1 outcome data. The covariates that were selected using the Year 1 data were also used in the Year 2 and Year 3 analyses to ensure comparability of results.⁶

Objectives in Selecting Covariates

Because the primary goal of the multiprogram study was to estimate program impacts, criteria were adopted for selecting covariates to improve the precision and accuracy of the impact estimates. The goal was not to build structural models explaining how the SADC interventions work or to identify mediating variables. Therefore, there was no focus on the signs or interpretations of the estimated coefficients on the covariates.

The random assignment design ensured that the main difference between treatment and control group schools at baseline was the opportunity to receive SADC program services. Therefore, simple differences in mean outcomes between the treatment and control groups provided unbiased impact estimates of the offer of SADC program services on key outcomes. However, regression models were used to estimate the impacts for the following two reasons:

To Increase the Precision of Impact Estimates

Statistical power was a particularly important issue for the SADC evaluation because of clustering effects due to the correlation of student outcomes within schools. This was particularly true at the site level due to the small number of schools. The inclusion of baseline covariates in the regression models increased the precision of the impact estimates (that is, reduced intraclass correlations) by explaining some of the variation in mean outcomes across schools. The inclusion of school-level covariates (which varied only between schools), however, also resulted in a loss in degrees of freedom available for statistical tests, which reduced statistical power. This precision loss was important at the site level, where there were relatively small numbers of schools.

To Adjust for Baseline Differences Between the Treatment and Control Group Schools

Although random assignment produced statistically equivalent treatment and control groups, there were some residual differences in the average characteristics of the two research groups due to random sampling. In the benchmark models, MPR adjusted for these residual differences using regression models. The inclusion of these baseline variables, however, affected the impact estimates only if they were also correlated with the outcome variables. Thus, as discussed in the following section, a covariate with a treatment-control group difference at baseline was selected only if it also had some predictive power in the regression models.

Tailoring Covariates to Specific Outcomes and Sites

The options for selecting covariates lie between picking a set that is the same across all outcomes and sites and picking a set that is tailored specifically for each outcome within each site. While the former is advantageous because of its parsimony, there is the risk of losing precision by including covariates that might not be correlated with the particular outcome (due to reductions in degrees of freedom) or by excluding covariates with predictive power. Completely tailoring sets for each outcome and site maximizes precision but is computationally intensive. Therefore, recognizing that outcomes obtained from a specific reporter tend to be somewhat correlated, and balancing the trade-offs between being too parsimonious and too unwieldy, covariate sets were chosen that *differed* by site but were the *same* within reporter in each site and for the pooled analysis. Thus, the same set of covariates was used to estimate impacts on child-reported outcomes in a particular site (or for the pooled analysis), but the set was allowed to vary across sites (and similarly for outcomes from the Primary Caregiver Report, Teacher Report on Student, and Teacher Report on Classroom and School).

⁶ As a sensitivity analysis for the use of the covariates selected with the Year 1 outcome data in the analyses of all 3 years of data, the covariates were reselected with the same approach but using the Year 2 outcome data. For the combined-program analysis, the results of the Year 1 and Year 2 analyses were not sensitive to which set of covariates were included. There were several differences in the individual program analyses.

Appendix B: Technical Notes

The one exception to the rule of uniform sets within a reporter was that the baseline measure of the outcome (pretest) was always included as a covariate in the regression models. As noted in the following discussion, stepwise regressions found that the pretests explained a relatively large proportion of the variance in the outcomes.

Implementation of the Covariate Selection Procedure

Table B.3 lists the Year 1 (spring 2005) outcome variables for the analysis. The outcomes include 10 measures from the Child Report, three measures from the Primary Caregiver Report, five measures from the Teacher Report on Student, and two measures from the Teacher Report on Classroom and School. These measures were constructed from original scale items using factor analytic methods.

Appendix B: Technical Notes

Table B.3. Child and school outcomes used for covariate selection and the percentage missing at spring 2005 (Year 1) analysis

| Outcome | Percent missing in combined-program sample | Average percent missing across programs | Minimum missing across programs | Maximum missing across programs |
|-------------------------------------|--|---|---------------------------------|---------------------------------|
| Child-reported | | | | |
| Positive School Orientation | 4.97 | 4.92 | 0.64 | 8.40 |
| Engagement with Learning | 4.57 | 4.53 | 0.64 | 8.25 |
| Student Afraid at School | 5.08 | 5.04 | 0.80 | 8.70 |
| Negative School Orientation | 5.01 | 4.97 | 0.80 | 8.40 |
| Self-Efficacy for Peer Interactions | 5.06 | 5.03 | 0.96 | 8.55 |
| Normative Beliefs About Aggression | 5.22 | 5.17 | 0.80 | 8.55 |
| Empathy | 5.10 | 5.06 | 0.80 | 8.40 |
| Altruistic Behavior | 5.08 | 5.04 | 0.80 | 8.70 |
| Problem Behavior | 5.20 | 5.14 | 1.28 | 8.55 |
| Victimization at School | 5.06 | 5.03 | 1.12 | 8.55 |
| Primary caregiver-reported | | | | |
| Positive Social Behavior | 22.53 | 22.14 | 12.96 | 33.02 |
| Problem Behavior | 22.51 | 22.12 | 12.96 | 32.75 |
| Altruistic Behavior | 23.79 | 23.43 | 14.08 | 34.24 |
| Teacher-reported | | | | |
| Positive Social Behavior | 1.86 | 1.77 | 0.15 | 4.06 |
| Problem Behavior | 1.70 | 1.61 | 0.15 | 4.06 |
| ADHD-Related Behavior | 1.75 | 1.66 | 0.15 | 4.06 |
| Altruistic Behavior | 4.48 | 4.33 | 0.87 | 10.77 |
| Academic Competence and Motivation | 1.68 | 1.57 | 0.16 | 4.60 |
| Student Support for Teachers | 0.59 | 0.65 | 0.00 | 2.91 |
| Feelings of Safety | 0.59 | 0.57 | 0.00 | 1.15 |

NOTE: ADHD is the abbreviation for attention deficit hyperactivity disorder.
SOURCE: The Social and Character Development (SACD) Research Program.

Table B.4 lists the full set of candidate covariates constructed from the baseline (fall 2004) data at the time of the Year 1 (spring 2005) analysis. (Note that because the first set of data was collected after program implementation began at many sites, these data are referred to as “initial data” rather than “baseline data” in the main body of this report.) The set of potential covariates included three types of baseline variables.⁷ First, the covariates included child demographic measures and, from the Child Report, pretest scores. Second, the covariates included primary caregiver characteristics and child pretest scores from the Primary Caregiver Report. Finally, the covariates included child and primary caregiver involvement pretest scores from the Teacher Report on Student.

⁷ Including covariates to measure the characteristics of teachers was considered but this approach was rejected for the analysis of child outcomes because teachers were likely to change over the 3-year follow-up period, and because the SACD interventions might affect the types of teachers who entered and exited the study schools. Teacher demographic characteristics were included as covariates for the analysis of the two teacher-reported outcomes from the TRCS.

Appendix B: Technical Notes

Table B.4. Potential covariates and the percentage missing at spring 2005 (Year 1) analysis

| Potential covariate | Percent missing in combined-program sample | Average percent missing across programs | Minimum missing across programs | Maximum missing across programs |
|---|--|---|---------------------------------|---------------------------------|
| Child-reported | | | | |
| Female | 1.08 | 1.06 | 0.00 | 2.25 |
| White (non-Hispanic) | 9.03 | 8.64 | 2.56 | 21.79 |
| Black (non-Hispanic) | 9.03 | 8.64 | 2.56 | 21.79 |
| Hispanic | 9.03 | 8.64 | 2.56 | 21.79 |
| Other ethnicity | 9.03 | 8.64 | 2.56 | 21.79 |
| Age (in years) | 1.08 | 1.06 | 0.00 | 2.25 |
| Scales | | | | |
| Student Afraid at School | 13.61 | 13.47 | 8.64 | 17.19 |
| Altruistic Behavior | 13.86 | 13.73 | 8.64 | 17.05 |
| Empathy | 13.93 | 13.80 | 8.80 | 17.05 |
| Engagement with Learning | 13.59 | 13.44 | 8.32 | 17.19 |
| Negative School Orientation | 13.70 | 13.56 | 8.64 | 17.19 |
| Normative Beliefs About Aggression | 13.75 | 13.61 | 8.64 | 17.05 |
| Positive School Orientation | 13.49 | 13.35 | 8.32 | 17.19 |
| Problem Behavior | 14.00 | 13.86 | 8.80 | 17.05 |
| Self-Efficacy for Peer Interactions | 13.82 | 13.69 | 8.80 | 17.05 |
| Victimization at School | 14.05 | 13.90 | 8.80 | 17.05 |
| Primary caregiver-reported | | | | |
| Age (in years) | 10.57 | 10.04 | 3.04 | 27.47 |
| Completed high school education or equivalent | 9.01 | 8.62 | 2.56 | 22.19 |
| Some college | 9.01 | 8.62 | 2.56 | 22.19 |
| Bachelor's or higher degree | 9.01 | 8.62 | 2.56 | 22.19 |
| Highest level of education in household— Completed high school or equivalent | 9.08 | 8.67 | 2.56 | 22.46 |
| Highest level of education in household— Some college | 9.08 | 8.67 | 2.56 | 22.46 |
| Highest level of education in household— Bachelor's or higher degree | 9.08 | 8.67 | 2.56 | 22.46 |
| Mother present in home life | 8.80 | 8.41 | 2.56 | 21.92 |
| Mother and father present | 8.83 | 8.43 | 2.56 | 22.06 |
| Respondent someone other than mother or father | 8.92 | 8.53 | 2.56 | 22.19 |
| Number of people in household | 9.01 | 8.62 | 2.56 | 22.06 |
| Household income: \$20,000 to \$40,000 | 11.63 | 11.14 | 3.52 | 27.20 |
| Household income: \$40,000 to \$60,000 | 11.63 | 11.14 | 3.52 | 27.20 |
| Household income: More than \$60,000 | 11.63 | 11.14 | 3.52 | 27.20 |
| Income-to-poverty-threshold ratio— Below 135 percent | 11.61 | 11.12 | 3.52 | 27.33 |
| Income-to-poverty-threshold ratio— Between 135 and 185 percent | 11.61 | 11.12 | 3.52 | 27.33 |
| Income-to-poverty-threshold ratio— Above 185 percent | 11.61 | 11.12 | 3.52 | 27.33 |

See notes at end of table.

Appendix B: Technical Notes

Table B.4. Potential covariates and the percentage missing at spring 2005 (Year 1) analysis—Continued

| Potential covariate | Percent missing in combined-program sample | Average percent missing across programs | Minimum missing across programs | Maximum missing across programs |
|--|--|---|---------------------------------|---------------------------------|
| Full-time employment | 9.13 | 8.73 | 2.72 | 22.60 |
| Part-time employment | 9.13 | 8.73 | 2.72 | 22.60 |
| Parental scales | | | | |
| APQ—Poor Monitoring and Supervision Subscale | 18.94 | 18.15 | 8.32 | 39.78 |
| APQ—Positive Parenting Subscale | 18.97 | 18.18 | 8.48 | 39.51 |
| Child-Centered Social Control | 18.87 | 18.08 | 8.32 | 39.51 |
| Confusion, Hubbub, and Order | 19.24 | 18.45 | 8.80 | 39.78 |
| Community Resources | 19.52 | 18.70 | 9.44 | 40.60 |
| Community Risk | 20.99 | 20.19 | 9.60 | 43.30 |
| Parent and Teacher Involvement | 21.10 | 20.41 | 11.36 | 42.49 |
| Child scales | | | | |
| Altruistic Behavior | 18.90 | 18.08 | 8.48 | 39.51 |
| Positive Social Behavior | 18.69 | 17.88 | 8.32 | 39.11 |
| Problem Behavior | 19.29 | 18.52 | 8.80 | 39.24 |
| Teacher-reported | | | | |
| Child scales | | | | |
| Academic Competence and Motivation | 11.33 | 10.95 | 5.28 | 19.76 |
| ADHD-Related Behavior | 11.33 | 10.96 | 5.12 | 19.22 |
| Altruistic Behavior | 12.55 | 12.13 | 6.24 | 21.52 |
| Positive Social Behavior | 11.49 | 11.12 | 5.60 | 19.49 |
| Problem Behavior | 11.33 | 10.96 | 5.12 | 19.22 |
| Parent involvement | | | | |
| Parent-teacher involvement | 20.74 | 20.24 | 10.65 | 30.31 |
| Teacher characteristics (for school outcomes only) | | | | |
| Teacher—Female | 0.00 | 0.00 | 0.00 | 0.00 |
| Teacher—Black (non-Hispanic) | 0.24 | 0.27 | 0.00 | 0.97 |
| Teacher—Hispanic | 0.24 | 0.27 | 0.00 | 0.97 |
| Teacher—Other race | 0.24 | 0.27 | 0.00 | 0.97 |
| Total experience | 0.00 | 0.00 | 0.00 | 0.00 |
| Experience at current school | 0.12 | 0.15 | 0.00 | 1.05 |
| Regular certification | 0.00 | 0.00 | 0.00 | 0.00 |
| Other certification | 0.00 | 0.00 | 0.00 | 0.00 |
| Teacher's highest degree—Bachelor's degree | 0.00 | 0.00 | 0.00 | 0.00 |

NOTE: Abbreviations are

ADHD: Attention deficit hyperactivity disorder

APQ: Alabama Parenting Questionnaire

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix B: Technical Notes

Handling of Missing Values

Before selecting covariates for Year 1 (spring 2005) impact analyses, the missing values of potential covariates and outcomes were considered. Tables B.3 and B.4 list the percentages of observations with missing values for each spring 2005 outcome measure and each potential covariate. The analysis to select covariates used a base for the child-related outcomes of all children with either a Child Report, a Primary Caregiver Report, or a Teacher Report on Student at the first follow-up (and excluded study non-consenters). This universe of children who had data on at least one of the three child-level reports (the Child Report, the Primary Caregiver Report, or the Teacher Report on Student) included 4,351 observations and varied from 460 to 739 observations across programs. The base for the school outcomes included 850 third-, fourth-, and fifth-grade teachers with Teacher Report on Classroom and School data and varied from 95 to 174 teachers across programs. Outcome measures were constructed if about 80 percent or more of pertinent scale items were completed.⁸ Thus, missing outcomes pertain to two types of cases in the sample universe: (1) survey respondents who completed fewer than 80 percent of scale items, and (2) survey non-respondents.

For the analysis, missing values for covariates were imputed using mean cell imputation procedures, but missing values were not imputed for outcome measures. The following steps were used for the covariate imputations in the child-level data:

- For covariates unlikely to vary over time, such as demographic characteristics, data that became available during follow-up data collection were used before conducting the cell mean imputations. Except for baseline values of the scales, these measures included all child and primary caregiver characteristics, such as the race/ethnicity of a child, the educational attainment of the primary caregiver, and whether the household income was within a certain range of income. Thus, if fall 2004 data on a covariate that was unlikely to vary over time were unavailable, spring 2005 data were used when available.
- Imputation cells were defined on the basis of school, gender, and race/ethnicity. Sample members were allocated to cells defined by school, gender, and, race/ethnicity (White non-Hispanic, Black non-Hispanic, Hispanic, and other). Excluded from the imputation analysis were cases with missing values for the variables used to define cells for the cell mean imputations, such as cases for which a child's gender or race/ethnicity was unknown.
- Imputations for cases with missing covariates in a particular cell were obtained using mean values for cases with nonmissing covariate values in the same cell. Where cases with missing covariates also had missing values for the data that defined the cells (such as school, race/ethnicity, or sex), the imputations were performed within broader cells defined by the nonmissing characteristics. In addition, if a cell size was below five, the definition of the cell was sequentially broadened until a cell size of at least five was obtained.
- Race/ethnicity was imputed using school and gender. After imputations on other covariates were performed, cases with missing values for race/ethnicity were imputed using mean cell imputations, where cells were defined by school and gender.

For teacher covariates used in estimating impacts on Teacher Report on Classroom and School school-level outcomes, a similar procedure was followed:

- For all covariates, the fall 2004 data were used if available.
- If fall 2004 data were missing, the spring 2005 data were used.

⁸ The specific cutoff that was used for the construction of outcome measures depended on the number of scale items. For example, a cutoff of 75 percent (3 out of 4) was used when the outcome was based on four scale items.

Appendix B: Technical Notes

- If a value for the covariate was still missing, imputation was based on the mean value for all teachers in the school.

Filling in missing values of baseline data had two closely related benefits. First, the selection of covariates for the Year 1 impact analyses could be based on as many records as possible. After missing baseline covariate data were filled in through the use of follow-up data or cell mean imputation, the covariates used in the benchmark models were selected through a stepwise procedure that used Year 1 outcomes as dependent variables (see Stepwise Regression Procedures later in this appendix). Second, and similarly, after covariates were selected, the estimation procedure used to generate impact results could be based on as many records as possible. In this way, estimating the results was not hampered by missing initial data.

Filling in missing values for baseline data for the Year 2 and Year 3 impact analyses. After the benchmark model covariates were selected and the Year 1 analyses were conducted, additional follow-up data became available for the 2005-06 and 2006-07 school years. Data from these follow-up periods were used to fill in missing baseline covariate data for new students who entered the study schools after the spring 2005 data collection and for students who had been in the study schools from the start of the study (thus avoiding the need to use cell mean imputation). Tables B.5 and B.6 show the percentages of observations with missing values for each spring 2006 (Year 2) outcome measure and each potential covariate, and tables B.7 and B.8 show the percentages of observations with missing values for each spring 2007 (Year 3) outcome measure and each potential covariate.

The procedure to fill in missing data for the covariates used in the Year 2 (spring 2006) and the Year 3 (spring 2007) regression analyses was similar to that used for the Year 1 (spring 2005) analyses. If fall 2004 initial data were available, then those data were used. If not, then spring 2005 data on covariates, such as the race/ethnicity of the child and the educational attainment of the primary caregiver, were used if possible (that is, if the spring 2005 data item was available and if the data item was unlikely to vary over time). If fall 2004 data and spring 2005 data were unavailable, then fall 2005 data were used to fill in the baseline data. Next, spring 2006 data were used. Finally, spring 2007 data were used. If the information was unavailable from all these data collection efforts, or if the data item was likely to vary over time (as is the case with pretest data), the cell mean imputation process was used to fill in the missing data.

Table B.5. Child and school outcomes used for covariate selection and the percentage missing at spring 2006 (Year 2) analysis

| Outcome | Percent missing in combined-program sample | Average percent missing across programs | Minimum missing across programs | Maximum missing across programs |
|-------------------------------------|--|---|---------------------------------|---------------------------------|
| Child-reported | | | | |
| Positive School Orientation | 5.48 | 5.43 | 1.17 | 9.22 |
| Engagement with Learning | 5.10 | 5.06 | 0.73 | 8.32 |
| Student Afraid at School | 5.50 | 5.43 | 1.03 | 8.15 |
| Negative School Orientation | 5.50 | 5.44 | 0.73 | 9.04 |
| Self-Efficacy for Peer Interactions | 5.64 | 5.59 | 1.17 | 9.04 |
| Normative Beliefs About Aggression | 5.85 | 5.77 | 1.32 | 9.38 |
| Empathy | 5.74 | 5.66 | 0.88 | 9.65 |
| Altruistic Behavior | 6.04 | 5.95 | 1.32 | 9.65 |
| Problem Behavior | 6.02 | 5.93 | 1.32 | 9.51 |
| Victimization at School | 6.09 | 6.00 | 1.47 | 9.65 |
| Primary caregiver-reported | | | | |
| Positive Social Behavior | 25.47 | 25.24 | 13.49 | 38.18 |
| Problem Behavior | 25.47 | 25.24 | 13.49 | 38.18 |
| Altruistic Behavior | 26.43 | 26.20 | 15.69 | 39.27 |
| Teacher-reported | | | | |
| Positive Social Behavior | 0.87 | 0.82 | 0.00 | 1.63 |
| Problem Behavior | 0.89 | 0.85 | 0.00 | 1.63 |
| ADHD-Related Behavior | 0.84 | 0.80 | 0.00 | 1.63 |
| Altruistic Behavior | 2.29 | 2.18 | 0.16 | 4.51 |
| Academic Competence and Motivation | 1.03 | 0.95 | 0.00 | 2.17 |
| Student Support for Teachers | 0.36 | 0.33 | 0.00 | 0.89 |
| Feelings of Safety | 0.36 | 0.37 | 0.00 | 0.89 |

NOTE: ADHD is the abbreviation for attention deficit hyperactivity disorder.
SOURCE: The Social and Character Development (SACD) Research Program.

Appendix B: Technical Notes

Table B.6. Potential covariates and the percentage missing at spring 2006 (Year 2) analysis

| Potential covariate | Percent missing in combined-program sample | Average percent missing across programs | Minimum missing across programs | Maximum missing across programs |
|---|--|---|---------------------------------|---------------------------------|
| Child-reported | | | | |
| Female | 0.47 | 0.48 | 0.00 | 0.90 |
| White (non-Hispanic) | 6.53 | 6.26 | 2.20 | 15.35 |
| Black (non-Hispanic) | 6.53 | 6.26 | 2.20 | 15.35 |
| Hispanic | 6.53 | 6.26 | 2.20 | 15.35 |
| Other ethnicity | 6.53 | 6.26 | 2.20 | 15.35 |
| Age (in years) | 0.23 | 0.24 | 0.00 | 0.54 |
| Scales | | | | |
| Student Afraid at School | 27.57 | 27.54 | 23.61 | 34.36 |
| Altruistic Behavior | 27.76 | 27.74 | 23.90 | 34.72 |
| Empathy | 27.79 | 27.76 | 24.05 | 34.72 |
| Engagement with Learning | 27.55 | 27.53 | 23.31 | 34.54 |
| Negative School Orientation | 27.62 | 27.59 | 23.76 | 34.36 |
| Normative Beliefs About Aggression | 27.65 | 27.62 | 23.90 | 34.36 |
| Positive School Orientation | 27.48 | 27.46 | 23.46 | 34.36 |
| Problem Behavior | 27.81 | 27.78 | 24.05 | 34.72 |
| Self-Efficacy for Peer Interactions | 27.69 | 27.66 | 24.05 | 34.36 |
| Victimization at School | 27.88 | 27.85 | 24.05 | 34.90 |
| Primary caregiver-reported | | | | |
| Age (in years) | 6.84 | 6.53 | 2.64 | 16.30 |
| Completed high school education or equivalent | 6.46 | 6.18 | 2.05 | 15.49 |
| Some college | 6.46 | 6.18 | 2.05 | 15.49 |
| Bachelor's or higher degree | 6.46 | 6.18 | 2.05 | 15.49 |
| Highest level of education in household— Completed high school or equivalent | 6.44 | 6.17 | 2.05 | 15.35 |
| Highest level of education in household— Some college | 6.44 | 6.17 | 2.05 | 15.35 |
| Highest level of education in household— Bachelor's or higher degree | 6.44 | 6.17 | 2.05 | 15.35 |
| Mother present in home life | 6.44 | 6.16 | 2.05 | 15.49 |
| Mother and father present | 6.44 | 6.16 | 2.05 | 15.49 |
| Respondent someone other than mother or father | 6.48 | 6.20 | 2.05 | 15.76 |
| Number of people in household | 6.55 | 6.29 | 2.35 | 15.49 |
| Household income: \$20,000 to \$40,000 | 8.12 | 7.77 | 2.79 | 19.43 |
| Household income: \$40,000 to \$60,000 | 8.12 | 7.77 | 2.79 | 19.43 |
| Household income: More than \$60,000 | 8.12 | 7.77 | 2.79 | 19.43 |
| Income-to-poverty-threshold ratio— Below 135 percent | 8.22 | 7.86 | 3.08 | 19.57 |
| Income-to-poverty-threshold ratio— Between 135 and 185 percent | 8.22 | 7.86 | 3.08 | 19.57 |

See notes at end of table.

Appendix B: Technical Notes

Table B.6. Potential covariates and the percentage missing at spring 2006 (Year 2) analysis—Continued

| Potential covariate | Percent missing in combined-program sample | Average percent missing across programs | Minimum missing across programs | Maximum missing across programs |
|---|--|---|---------------------------------|---------------------------------|
| Income-to-poverty-threshold ratio— Above 185 percent | 8.22 | 7.86 | 3.08 | 19.57 |
| Full-time employment | 6.55 | 6.27 | 2.05 | 15.76 |
| Part-time employment | 6.55 | 6.27 | 2.05 | 15.76 |
| Parental scales | | | | |
| APQ—Poor Monitoring and Supervision Subscale | 31.60 | 30.99 | 23.02 | 50.68 |
| APQ—Positive Parenting Subscale | 31.65 | 31.04 | 23.17 | 50.41 |
| Child-Centered Social Control | 31.44 | 30.85 | 22.73 | 50.14 |
| Confusion, Hubbub, and Order | 31.84 | 31.24 | 23.46 | 50.27 |
| Community Resources | 31.93 | 31.31 | 24.00 | 50.68 |
| Community Risk | 32.89 | 32.27 | 23.90 | 52.58 |
| Parent and teacher Involvement | 33.47 | 32.92 | 25.37 | 52.85 |
| Child scales | | | | |
| Altruistic Behavior | 31.53 | 30.91 | 23.17 | 50.54 |
| Positive Social Behavior | 31.32 | 30.70 | 23.02 | 50.00 |
| Problem Behavior | 31.91 | 31.30 | 23.61 | 50.41 |
| Teacher-reported | | | | |
| Child scales | | | | |
| Academic Competence and Motivation | 25.63 | 25.39 | 19.33 | 34.54 |
| ADHD-Related Behavior | 25.61 | 25.38 | 19.11 | 34.72 |
| Altruistic Behavior | 26.66 | 26.40 | 19.11 | 37.43 |
| Positive Social Behavior | 25.77 | 25.53 | 19.11 | 34.72 |
| Problem Behavior | 25.61 | 25.38 | 19.11 | 34.72 |
| Parent involvement | | | | |
| Parent and teacher involvement | 33.47 | 33.06 | 22.44 | 43.34 |
| Teacher characteristics (for school outcomes only) | | | | |
| Teacher—Female | 0.00 | 0.00 | 0.00 | 0.00 |
| Teacher—Black (non-Hispanic) | 0.48 | 0.41 | 0.00 | 1.16 |
| Teacher—Hispanic | 0.48 | 0.41 | 0.00 | 1.16 |
| Teacher—Other race | 0.48 | 0.41 | 0.00 | 1.16 |
| Total experience | 0.24 | 0.30 | 0.00 | 1.22 |
| Experience at current school | 0.24 | 0.30 | 0.00 | 1.22 |
| Regular certification | 0.00 | 0.00 | 0.00 | 0.00 |
| Other certification | 0.00 | 0.00 | 0.00 | 0.00 |
| Teacher's highest degree— Bachelor's degree | 0.00 | 0.00 | 0.00 | 0.00 |

NOTE: Abbreviations are

ADHD: Attention deficit hyperactivity disorder

APQ: Alabama Parenting Questionnaire

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix B: Technical Notes

Table B.7. Child and school outcomes used for covariate selection and the percentage missing at spring 2007 (Year 3) analysis

| Outcome | Percent missing in combined-program sample | Average percent missing across programs | Minimum missing across programs | Maximum missing across programs |
|-------------------------------------|--|---|---------------------------------|---------------------------------|
| Child-reported | | | | |
| Positive School Orientation | 4.33 | 4.34 | 0.44 | 9.79 |
| Engagement with Learning | 4.07 | 4.06 | 0.74 | 9.79 |
| Student Afraid at School | 4.43 | 4.44 | 0.30 | 9.95 |
| Negative School Orientation | 4.33 | 4.35 | 0.74 | 9.95 |
| Self-Efficacy for Peer Interactions | 4.41 | 4.42 | 0.59 | 9.79 |
| Normative Beliefs About Aggression | 4.36 | 4.35 | 0.74 | 9.95 |
| Empathy | 4.41 | 4.41 | 0.44 | 9.79 |
| Altruistic Behavior | 4.53 | 4.53 | 0.74 | 9.79 |
| Problem Behavior | 4.62 | 4.63 | 0.44 | 9.79 |
| Victimization at School | 4.65 | 4.64 | 0.89 | 9.95 |
| Primary caregiver-reported | | | | |
| Positive Social Behavior | 31.28 | 31.04 | 16.89 | 48.10 |
| Problem Behavior | 31.25 | 31.02 | 16.89 | 47.96 |
| Altruistic Behavior | 32.22 | 31.98 | 18.07 | 49.56 |
| Teacher-reported | | | | |
| Positive Social Behavior | 2.00 | 1.99 | 0.58 | 6.20 |
| Problem Behavior | 1.90 | 1.89 | 0.44 | 6.04 |
| ADHD-Related Behavior | 1.97 | 1.96 | 0.58 | 6.36 |
| Altruistic Behavior | 3.83 | 4.04 | 0.73 | 11.95 |
| Academic Competence and Motivation | 1.88 | 1.84 | 0.15 | 5.88 |
| Student Support for Teachers | 0.61 | 0.63 | 0.00 | 1.90 |
| Feelings of Safety | 0.85 | 0.83 | 0.00 | 2.40 |

NOTE: ADHD is the abbreviation for attention deficit hyperactivity disorder.

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix B: Technical Notes

Table B.8. Potential covariates and the percentage missing at spring 2007 (Year 3) analysis

| Potential covariate | Percent missing in combined-program sample | Average percent missing across programs | Minimum missing across programs | Maximum missing across programs |
|--|--|---|---------------------------------|---------------------------------|
| Child-reported | | | | |
| Female | 0.60 | 0.61 | 0.15 | 1.47 |
| White (non-Hispanic) | 7.44 | 7.32 | 1.93 | 17.49 |
| Black (non-Hispanic) | 7.44 | 7.32 | 1.93 | 17.49 |
| Hispanic | 7.44 | 7.32 | 1.93 | 17.49 |
| Other ethnicity | 7.44 | 7.32 | 1.93 | 17.49 |
| Age (in years) | 12.91 | 13.14 | 6.81 | 19.85 |
| Scales | | | | |
| Student Afraid at School | 34.48 | 34.68 | 27.41 | 43.55 |
| Altruistic Behavior | 34.67 | 34.88 | 27.26 | 43.74 |
| Empathy | 34.70 | 34.90 | 27.41 | 43.74 |
| Engagement with Learning | 34.43 | 34.64 | 27.11 | 43.74 |
| Negative School Orientation | 34.53 | 34.72 | 27.41 | 43.55 |
| Normative Beliefs About Aggression | 34.58 | 34.78 | 27.26 | 43.55 |
| Positive School Orientation | 34.41 | 34.61 | 27.11 | 43.55 |
| Problem Behavior | 34.70 | 34.90 | 27.41 | 43.74 |
| Self-Efficacy for Peer Interactions | 34.63 | 34.83 | 27.41 | 43.55 |
| Victimization at School | 34.79 | 34.99 | 27.41 | 43.93 |
| Primary caregiver-reported | | | | |
| Age (in years) | 7.95 | 7.82 | 1.93 | 18.51 |
| Completed high school education or equivalent | 7.39 | 7.27 | 1.93 | 17.64 |
| Some college | 7.39 | 7.27 | 1.93 | 17.64 |
| Bachelor's or higher degree | 7.39 | 7.27 | 1.93 | 17.64 |
| Highest level of education in household— | | | | |
| Completed high school or equivalent | 7.44 | 7.31 | 2.07 | 17.49 |
| Highest level of education in household— | | | | |
| Some college | 7.44 | 7.31 | 2.07 | 17.49 |
| Highest level of education in household— | | | | |
| Bachelor's or higher degree | 7.44 | 7.31 | 2.07 | 17.49 |
| Mother present in home life | 7.37 | 7.24 | 1.93 | 17.64 |
| Mother and father present | 7.37 | 7.24 | 1.93 | 17.64 |
| Respondent someone other than mother or father | 7.44 | 7.31 | 1.93 | 17.64 |
| Number of people in household | 7.56 | 7.45 | 2.07 | 17.49 |
| Household income: \$20,000 to \$40,000 | 9.03 | 8.87 | 2.67 | 21.28 |
| Household income: \$40,000 to \$60,000 | 9.03 | 8.87 | 2.67 | 21.28 |
| Household income: More than \$60,000 | 9.03 | 8.87 | 2.67 | 21.28 |
| Income-to-poverty-threshold ratio— | | | | |
| Below 135 percent | 9.15 | 9.00 | 2.67 | 21.28 |
| Income-to-poverty-threshold ratio— | | | | |
| Between 135 and 185 percent | 9.15 | 9.00 | 2.67 | 21.28 |
| Income-to-poverty-threshold ratio— | | | | |
| Above 185 percent | 9.15 | 9.00 | 2.67 | 21.28 |
| Full-time employment | 7.49 | 7.36 | 1.93 | 17.78 |
| Part-time employment | 7.49 | 7.36 | 1.93 | 17.78 |

See notes at end of table.

Appendix B: Technical Notes

Table B.8. Potential covariates and the percentage missing at spring 2007 (Year 3) analysis—Continued

| Potential covariate | Percent missing in combined-program sample | Average percent missing across programs | Minimum missing across programs | Maximum missing across programs |
|--|--|---|---------------------------------|---------------------------------|
| Parental scales | | | | |
| APQ—Poor Monitoring and Supervision Subscale | 38.02 | 37.73 | 26.67 | 55.69 |
| APQ—Positive Parenting Subscale | 38.07 | 37.79 | 26.81 | 55.54 |
| Child-Centered Social Control | 37.92 | 37.65 | 26.37 | 55.25 |
| Confusion, Hubbub, and Order | 38.29 | 38.01 | 27.11 | 55.25 |
| Community Resources | 38.43 | 38.13 | 27.56 | 55.83 |
| Community Risk | 39.25 | 38.94 | 27.41 | 57.73 |
| Parent and Teacher Involvement | 39.66 | 39.45 | 28.59 | 57.43 |
| Child scales | | | | |
| Altruistic Behavior | 37.92 | 37.62 | 26.81 | 55.69 |
| Positive Social Behavior | 37.76 | 37.46 | 26.67 | 55.10 |
| Problem Behavior | 38.31 | 38.03 | 27.26 | 55.25 |
| Teacher-reported | | | | |
| Child scales | | | | |
| Academic Competence and Motivation | 32.65 | 32.67 | 24.89 | 42.77 |
| ADHD-Related Behavior | 32.65 | 32.69 | 24.89 | 43.16 |
| Altruistic Behavior | 33.57 | 33.58 | 25.93 | 45.47 |
| Positive Social Behavior | 32.80 | 32.82 | 25.33 | 43.16 |
| Problem Behavior | 32.65 | 32.69 | 24.89 | 43.16 |
| Parent involvement | | | | |
| Parent and teacher involvement | 39.73 | 39.51 | 29.25 | 49.52 |
| Teacher characteristics (for school outcomes only) | | | | |
| Teacher—Female | 0.24 | 0.23 | 0.00 | 1.60 |
| Teacher—Black (non-Hispanic) | 0.49 | 0.45 | 0.00 | 1.60 |
| Teacher—Hispanic | 0.49 | 0.45 | 0.00 | 1.60 |
| Teacher—Other race | 0.49 | 0.45 | 0.00 | 1.60 |
| Total experience | 0.37 | 0.32 | 0.00 | 1.60 |
| Experience at current school | 0.49 | 0.45 | 0.00 | 1.60 |
| Regular certification | 0.00 | 0.00 | 0.00 | 0.00 |
| Other certification | 0.00 | 0.00 | 0.00 | 0.00 |
| Teacher's highest degree—Bachelor's degree | 0.24 | 0.23 | 0.00 | 1.60 |

NOTE: Abbreviations are

ADHD: Attention deficit hyperactivity disorder

APQ: Alabama Parenting Questionnaire

SOURCE: The Social and Character Development (SACD) Research Program.

Stepwise Regression Procedures

For the selection of covariates to be used in the benchmark impact models, stepwise regression methods were used to identify potential covariates with significant explanatory power.⁹ The treatment binary variable (measuring estimated impacts); program-specific binary variables (for the pooled models); and the age, gender, and race/ethnicity of the child were included (these covariates were separately tested as to whether they would be selected under the implementation rules). At each step of the stepwise procedure, the variable with the smallest p -value below a preset threshold level was included in the model while variables already selected were evaluated to see if any could be removed; the variable with a p -value greater than the critical p -value of 0.32 and whose removal would least lower the adjusted R^2 value was removed. The critical p -value was set at 0.32 to correspond to a t -statistic of 1, which is the smallest value of the t -statistic at which the addition of a variable in a model increases the adjusted R^2 value.¹⁰

Rules for Selecting Covariates Using Year 1 Data

The rules for selecting covariates had two key features: (1) they identified covariates that had a treatment-control group difference at baseline and that showed some explanatory power in the regression models, and (2) they identified covariates that had no treatment-control group difference at baseline and that had substantial explanatory power in the regression models for a majority of outcomes. Specifically, based on regressions using spring 2005 (Year 1) outcomes, a unique set of covariates by reporter and program were selected using sequential rules. First, a variable was included that had a statistically significant treatment-control group baseline difference in the variable, and that was selected in the final stepwise model for at least one of the outcomes for a given reporter. Second, a variable with no treatment-control group difference at baseline was included if it was selected by the stepwise regressions for about 60 percent or more of the outcomes. Third, covariates were included to increase face validity. That is, variables that measured age, gender, race, and ethnicity of the child (or of the teacher for Teacher Report on Classroom and School outcomes) were included if they had not already been selected. Finally, for completeness, covariates were selected if they completed a set of categorical variables if one of the categories had been previously selected.

Tables B.9 through B.12 list the sets of covariates selected as a result of these rules. The covariates are listed separately for the combined-program analysis and the program-specific analyses. Table B.9 provides details for all child-reported outcomes, table B.10 provides details for all primary caregiver-reported outcomes, table B.11 does the same for all teacher-reported child outcomes, and table B.12 does so for all teacher-reported school outcomes.

Key features of the selected covariates are as follows:

- While baseline values of the scale under consideration were always selected as covariates, many scales were also selected across outcomes and reporters. For example, 7 of the 10 child-reported scales and 2 of the 6 teacher-reported scales were selected as covariates for child-reported outcomes in the combined-program sample (table B.9). Similarly, for primary caregiver-reported outcomes, 5 of the 10 child-reported scales, 2 of the 3 primary caregiver-reported scales, and 3 of the 6 teacher-reported scales were selected as covariates in the combined-program sample (table B.10). Finally, at the combined-program level, 3 of the 10 child-reported scales, all 3 primary caregiver-reported scales, and 4 of the 6 teacher-reported scales were selected as covariates for the teacher-reported child-level outcomes (table B.11).

⁹ The PROC REG procedure in SAS was used with the SELECTION option set to STEPWISE.

¹⁰ The stepwise procedure in SAS did not adjust for clustering effects. Thus, after selecting covariates from the stepwise procedure, these covariates were used to re-estimate the models in SAS PROC MIXED (which accounts for school-level clustering effects) and the final covariate sets were refined accordingly. Because of small clustering effects, however, these refinements were minor.

Appendix B: Technical Notes

- Most demographic and socioeconomic characteristics of the primary caregiver were selected as covariates for primary caregiver-reported outcomes. However, these measures were selected less consistently for the child- and teacher-reported outcomes.
- Considerable variation existed in the selected covariates across programs. This result likely reflected differences in study populations across programs.
- The baseline value of the outcome under consideration typically explained the highest proportion of variance in the outcome among all covariates. Using spring 2005 data, tables B.13 and B.14 compare the adjusted R^2 values of the models that included only the corresponding baseline pretest value with models that included the final selected set of covariates. Results are reported for models run at the child and school levels. The tables indicate that R^2 values did not increase substantially when covariates other than the pretests were included in the models. For Year 2 (spring 2006 data), tables B.15 and B.16 show similar information and results, and tables B.17 and B.18 show this information for Year 3 (spring 2007 data).

Appendix B: Technical Notes

Table B.9. Covariates selected for child-reported outcomes, for the combined-program sample and program-specific samples

| Potential covariate | Combined-program sample | ABC | PA | SS | 4Rs | CSP | PATHS | LBW |
|--|-------------------------|-----|----|----|-----|-----|-------|-----|
| Total number of covariates | 26 | 11 | 20 | 11 | 10 | 17 | 18 | 6 |
| Child-reported | | | | | | | | |
| Female | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Black (non-Hispanic) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Hispanic | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Other ethnicity | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Age (in years) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Scales | | | | | | | | |
| Student Afraid at School | | | | | | | | |
| Altruistic Behavior | ✓ | ✓ | ✓ | | | ✓ | | |
| Empathy | ✓ | | | | | | | |
| Engagement with Learning | ✓ | | | | | ✓ | | |
| Negative School Orientation | ✓ | ✓ | | | | ✓ | | |
| Normative Beliefs About Aggression | | | ✓ | | ✓ | | | |
| Positive School Orientation | ✓ | | | ✓ | | | | |
| Problem Behavior | | | ✓ | | | | | |
| Self-Efficacy for Peer Interactions | ✓ | | | | | | ✓ | |
| Victimization at School | ✓ | | ✓ | | | ✓ | | |
| Primary caregiver-reported | | | | | | | | |
| Age (in years) | | | | | ✓ | | | |
| Completed high school education or equivalent | ✓ | | ✓ | ✓ | | ✓ | | |
| Some college | ✓ | | ✓ | ✓ | | ✓ | | |
| Bachelor's or higher degree | ✓ | | ✓ | ✓ | | ✓ | | |
| Highest level of education in household— Completed high school or equivalent | ✓ | | ✓ | | | ✓ | ✓ | |
| Highest level of education in household— Some college | ✓ | | ✓ | | | ✓ | ✓ | |
| Highest level of education in household— Bachelor's or higher degree | ✓ | | ✓ | | | ✓ | ✓ | |
| Mother present in home life | | | | | | | | |
| Mother and father present | ✓ | | | | | | | |
| Respondent someone other than mother or father | ✓ | | | | | | | |
| Number of people in household | | | | | | | | |
| Household income: \$20,000 to \$40,000 | ✓ | | ✓ | | ✓ | | ✓ | |
| Household income: \$40,000 to \$60,000 | ✓ | | | | | | ✓ | |
| Household income: More than \$60,000 | ✓ | | | | | | ✓ | |

See notes at end of table.

Appendix B: Technical Notes

Table B.9. Covariates selected for child-reported outcomes, for the combined-program sample and program-specific samples—Continued

| Potential covariate | Combined-program sample | | | | | | | |
|---|-------------------------|----|----|-----|-----|-------|-----|--|
| | ABC | PA | SS | 4Rs | CSP | PATHS | LBW | |
| Income-to-poverty-threshold ratio— Below 135 percent | | ✓ | | | | | | |
| Income-to-poverty-threshold ratio— Between 135 and 185 percent | | ✓ | | | | | | |
| Full-time employment | ✓ | | | | ✓ | ✓ | | |
| Part-time employment | ✓ | | | | ✓ | ✓ | | |
| Parental scales | | | | | | | | |
| APQ—Poor Monitoring and Supervision Subscale | ✓ | | | | | ✓ | | |
| APQ—Positive Parenting Subscale | | | | | | | | |
| Child-Centered Social Control | | | | | | | | |
| Confusion, Hubbub, and Order | | ✓ | | | | | | |
| Community Resources | | | | | | | | |
| Community Risk | | | | | | ✓ | | |
| Parent and Teacher Involvement | | | | | | | | |
| Child scales | | | | | | | | |
| Altruistic Behavior | | | ✓ | | | | ✓ | |
| Positive Social Behavior | ✓ | | | ✓ | | | | |
| Problem Behavior | | | | ✓ | | | | |
| Teacher-reported | | | | | | | | |
| Child scales | | | | | | | | |
| Academic Competence and Motivation | | | ✓ | | | | | |
| ADHD-Related Behavior | ✓ | ✓ | | | | ✓ | | |
| Altruistic Behavior | | | | | | | | |
| Positive Social Behavior | ✓ | | | | | | | |
| Problem Behavior | | | | | | | | |
| Parent and Teacher Involvement | | | | | | ✓ | | |

NOTE: Abbreviations are

ABC: *Academic and Behavioral Competencies Program*

CSP: *Competence Support Program*

LBW: *Love In a Big World*

PA: *Positive Action*

PATHS: *Promoting Alternative Thinking Strategies*

4Rs: *The 4Rs Program (Reading, Writing, Respect, and Resolution)*

SS: *Second Step*

ADHD: Attention deficit hyperactivity disorder

APQ: Alabama Parenting Questionnaire

✓: Covariate used

Blank cell: Covariate not used

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix B: Technical Notes

Table B.10. Covariates selected for primary caregiver-reported child outcomes, for the combined-program and program-specific samples

| Potential covariate | Combined-program sample | | | | | | | |
|---|-------------------------|----|----|-----|-----|-------|-----|----|
| | ABC | PA | SS | 4Rs | CSP | PATHS | LBW | |
| Total number | 35 | 13 | 26 | 28 | 26 | 24 | 27 | 25 |
| Child-reported | | | | | | | | |
| Female | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Black (non-Hispanic) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Hispanic | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Other ethnicity | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Age (in years) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Scales | | | | | | | | |
| Student Afraid at School | | | | ✓ | ✓ | | | |
| Altruistic Behavior | | | | | | ✓ | | |
| Empathy | | | | ✓ | ✓ | | | ✓ |
| Engagement with Learning | ✓ | | ✓ | | | | | |
| Negative School Orientation | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Normative Beliefs About Aggression | ✓ | | ✓ | ✓ | | ✓ | | |
| Positive School Orientation | ✓ | | | ✓ | | | | |
| Problem Behavior | | | ✓ | | ✓ | | ✓ | |
| Self-Efficacy for Peer Interactions | ✓ | ✓ | | | | ✓ | ✓ | ✓ |
| Victimization at School | | | ✓ | | | | | ✓ |
| Primary caregiver-reported | | | | | | | | |
| Age (in years) | | ✓ | ✓ | | ✓ | | | ✓ |
| Completed high school education or equivalent | ✓ | | ✓ | ✓ | ✓ | ✓ | | |
| Some college | ✓ | | ✓ | ✓ | ✓ | ✓ | | |
| Bachelor's or higher degree | ✓ | | ✓ | ✓ | ✓ | ✓ | | |
| Highest level of education in household— Completed high school or equivalent | ✓ | | | ✓ | | ✓ | ✓ | ✓ |
| Highest level of education in household— Some college | ✓ | | | ✓ | | ✓ | ✓ | ✓ |
| Highest level of education in household— Bachelor's or higher degree | ✓ | | | ✓ | | ✓ | ✓ | ✓ |
| Mother present in home life | ✓ | ✓ | | ✓ | | | ✓ | |
| Mother and father present | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| Respondent someone other than mother or father | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| Number of people in household | ✓ | | ✓ | ✓ | ✓ | | | |
| Household income: \$20,000 to \$40,000 | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Household income: \$40,000 to \$60,000 | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Household income: More than \$60,000 | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Income-to-poverty-threshold ratio— Below 135 percent | ✓ | | ✓ | | ✓ | | ✓ | ✓ |
| Income-to-poverty-threshold ratio— Between 135 and 185 percent | ✓ | | ✓ | | ✓ | | ✓ | ✓ |
| Full-time employment | ✓ | | ✓ | | ✓ | | ✓ | ✓ |
| Part-time employment | ✓ | | ✓ | | ✓ | | ✓ | ✓ |

See notes at end of table.

Appendix B: Technical Notes

Table B.10. Covariates selected for primary caregiver-reported child outcomes, for the combined-program and program-specific samples—Continued

| Potential covariate | Combined-program sample | | | | | | | |
|--|-------------------------|----|----|-----|-----|-------|-----|---|
| | ABC | PA | SS | 4Rs | CSP | PATHS | LBW | |
| Parental scales | | | | | | | | |
| APQ—Poor Monitoring and Supervision Subscale | ✓ | ✓ | | ✓ | | ✓ | ✓ | |
| APQ—Positive Parenting Subscale | ✓ | | ✓ | | | | | ✓ |
| Child-Centered Social Control | | | | | ✓ | | | |
| Confusion, Hubbub, and Order | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| Community Resources | | | | | | | | ✓ |
| Community Risk | ✓ | ✓ | ✓ | ✓ | | | | |
| Parent and Teacher Involvement | | | | | | ✓ | | |
| Child scales | | | | | | | | |
| Altruistic Behavior | | | ✓ | | | | | |
| Positive Social Behavior | ✓ | ✓ | ✓ | | | | | |
| Problem Behavior | ✓ | | ✓ | ✓ | | ✓ | | |
| Teacher-reported | | | | | | | | |
| Child scales | | | | | | | | |
| Academic Competence and Motivation | | | ✓ | | ✓ | | | |
| ADHD-Related Behavior | | ✓ | | ✓ | | | | ✓ |
| Altruistic Behavior | ✓ | ✓ | ✓ | | ✓ | ✓ | | |
| Positive Social Behavior | ✓ | | | | | | | |
| Problem Behavior | ✓ | ✓ | | | | ✓ | | |
| Parent and Teacher Involvement | | | | | | ✓ | | |

NOTE: Abbreviations are

ABC: *Academic and Behavioral Competencies Program*

CSP: *Competence Support Program*

LBW: *Love In a Big World*

PA: *Positive Action*

PATHS: *Promoting Alternative Thinking Strategies*

4Rs: *The 4Rs Program (Reading, Writing, Respect, and Resolution)*

SS: *Second Step*

ADHD: Attention deficit hyperactivity disorder

APQ: Alabama Parenting Questionnaire

✓: Covariate used

Blank cell: Covariate not used

SOURCE: The Social and Character Development (SACD) Research Program.

Table B.11. Covariates selected for teacher-reported child outcomes, for the combined-program and program-specific samples

| Potential covariate | Combined-program sample | | | | | | | |
|---|-------------------------|----|----|-----|-----|-------|-----|----|
| | ABC | PA | SS | 4Rs | CSP | PATHS | LBW | |
| Total number of covariates | 28 | 24 | 22 | 21 | 20 | 25 | 27 | 21 |
| Child-reported | | | | | | | | |
| Female | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Black (non-Hispanic) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Hispanic | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Other ethnicity | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Age (in years) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Scales | | | | | | | | |
| Student Afraid at School | | ✓ | | ✓ | | | ✓ | |
| Altruistic Behavior | ✓ | ✓ | | | | ✓ | | ✓ |
| Empathy | | | | ✓ | ✓ | | | ✓ |
| Engagement with Learning | ✓ | ✓ | | | ✓ | ✓ | | |
| Negative School Orientation | | | ✓ | ✓ | | | ✓ | |
| Normative Beliefs About Aggression | | | ✓ | ✓ | ✓ | | | |
| Positive School Orientation | | ✓ | | ✓ | | ✓ | | |
| Problem Behavior | ✓ | | ✓ | | | | | |
| Self-Efficacy for Peer Interactions | | | ✓ | | | | ✓ | ✓ |
| Victimization at School | | | | | ✓ | ✓ | ✓ | |
| Primary caregiver-reported | | | | | | | | |
| Age (in years) | | ✓ | ✓ | | ✓ | ✓ | | |
| Completed high school education or equivalent | ✓ | | ✓ | ✓ | ✓ | ✓ | | |
| Some college | ✓ | | ✓ | ✓ | ✓ | ✓ | | |
| Bachelor's or higher degree | ✓ | | ✓ | ✓ | ✓ | ✓ | | |
| Highest level of education in household— Completed high school or equivalent | ✓ | ✓ | | | | ✓ | ✓ | |
| Highest level of education in household— Some college | ✓ | ✓ | | | | ✓ | ✓ | |
| Highest level of education in household— Bachelor's or higher degree | ✓ | ✓ | | | | ✓ | ✓ | |
| Mother present in home life | ✓ | ✓ | | | ✓ | ✓ | ✓ | |
| Mother and father present | ✓ | ✓ | ✓ | | ✓ | | | |
| Respondent someone other than mother or father | ✓ | ✓ | ✓ | | ✓ | | | |
| Number of people in household | ✓ | ✓ | ✓ | | | | | ✓ |
| Household income: \$20,000 to \$40,000 | | | | | | ✓ | ✓ | ✓ |
| Household income: \$40,000 to \$60,000 | | | | | | ✓ | ✓ | ✓ |
| Household income: More than \$60,000 | | | | | | ✓ | ✓ | ✓ |
| Income-to-poverty-threshold ratio— Below 135 percent | ✓ | | | | | | | ✓ |
| Income-to-poverty-threshold ratio— Between 135 and 185 percent | ✓ | | | | | | | ✓ |
| Full-time employment | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Part-time employment | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |

See notes at end of table.

Appendix B: Technical Notes

Table B.11. Covariates selected for teacher-reported child outcomes, for the combined-program and program-specific samples—Continued

| Potential covariate | Combined-program sample | | | | | | | |
|--|-------------------------|----|----|-----|-----|-------|-----|---|
| | ABC | PA | SS | 4Rs | CSP | PATHS | LBW | |
| Parental scales | | | | | | | | |
| APQ—Poor Monitoring and Supervision Subscale | | ✓ | | | | | ✓ | ✓ |
| APQ—Positive Parenting Subscale | ✓ | | | ✓ | | | | |
| Child-Centered Social Control | | | | | | | ✓ | |
| Confusion, Hubbub, and Order | | ✓ | ✓ | | ✓ | | | |
| Community Resources | | | | | | | ✓ | |
| Community Risk | | | | | | | ✓ | ✓ |
| Parent and Teacher Involvement | | | | | | | ✓ | ✓ |
| Child scales | | | | | | | | |
| Altruistic Behavior | ✓ | | | ✓ | | | | ✓ |
| Positive Social Behavior | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| Problem Behavior | ✓ | | | ✓ | | | | |
| Teacher-reported | | | | | | | | |
| Child scales | | | | | | | | |
| Academic Competence and Motivation | ✓ | | | ✓ | | | | |
| ADHD-Related Behavior | ✓ | ✓ | | ✓ | | ✓ | ✓ | |
| Altruistic Behavior | ✓ | | ✓ | ✓ | | | | |
| Positive Social Behavior | | | ✓ | | ✓ | | | ✓ |
| Problem Behavior | | ✓ | | | | ✓ | ✓ | |
| Parent and Teacher Involvement | ✓ | | | | ✓ | | ✓ | |

NOTE: Abbreviations are

ABC: *Academic and Behavioral Competencies Program*

CSP: *Competence Support Program*

LBW: *Love In a Big World*

PA: *Positive Action*

PATHS: *Promoting Alternative Thinking Strategies*

4Rs: *The 4Rs Program (Reading, Writing, Respect, and Resolution)*

SS: *Second Step*

ADHD: Attention deficit hyperactivity disorder

APQ: Alabama Parenting Questionnaire

✓: Covariate used

Blank cell: Covariate not used

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix B: Technical Notes

Table B.12. Covariates selected for teacher-reported school outcomes, for the combined-program and program-specific samples

| Potential covariate | Combined-program sample | ABC | PA | SS | 4Rs | CSP | PATHS | LBW |
|------------------------------------|-------------------------|-----|----|----|-----|-----|-------|-----|
| Total number | 8 | 8 | 7 | 8 | 6 | 9 | 5 | 5 |
| Teacher-reported | | | | | | | | |
| Female | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Black (non-Hispanic) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Hispanic | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Other ethnicity | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Total teaching experience | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Total experience in current school | | | | | | ✓ | | ✓ |
| Regular certificate | ✓ | ✓ | ✓ | ✓ | | ✓ | | |
| Other certificate | ✓ | ✓ | ✓ | ✓ | | ✓ | | |
| Highest degree—Bachelor's | ✓ | ✓ | | ✓ | ✓ | ✓ | | |

NOTE: Abbreviations are

ABC: *Academic and Behavioral Competencies Program*

CSP: *Competence Support Program*

LBW: *Love In a Big World*

PA: *Positive Action*

PATHS: *Promoting Alternative Thinking Strategies*

4Rs: *The 4Rs Program (Reading, Writing, Respect, and Resolution)*

SS: *Second Step*

✓: Covariate used

Blank cell: Covariate not used

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix B: Technical Notes

Table B.13. Adjusted R² values from models using spring 2005 (Year 1) outcomes, with pretest only and with the full covariate set, for the combined-program sample

| Outcome | Child level | | Collapsed to school level | |
|-------------------------------------|--------------|--------------------|---------------------------|--------------------|
| | Pretest only | Full covariate set | Pretest only | Full covariate set |
| Child-reported | | | | |
| Empathy | 0.19 | 0.24 | 0.34 | 0.56 |
| Student Afraid at School | 0.13 | 0.18 | 0.64 | 0.76 |
| Altruistic Behavior | 0.20 | 0.23 | 0.60 | 0.67 |
| Engagement with Learning | 0.09 | 0.13 | 0.33 | 0.49 |
| Negative School Orientation | 0.20 | 0.26 | 0.83 | 0.88 |
| Problem Behavior | 0.26 | 0.31 | 0.71 | 0.82 |
| Self-Efficacy for Peer Interactions | 0.20 | 0.21 | 0.22 | 0.54 |
| Victimization at School | 0.20 | 0.21 | 0.47 | 0.60 |
| Normative Beliefs About Aggression | 0.11 | 0.15 | 0.39 | 0.67 |
| Positive School Orientation | 0.18 | 0.24 | 0.71 | 0.83 |
| Primary caregiver-reported | | | | |
| Altruistic Behavior | 0.22 | 0.23 | 0.53 | 0.65 |
| Positive Social Behavior | 0.43 | 0.46 | 0.74 | 0.83 |
| Problem Behavior | 0.37 | 0.40 | 0.51 | 0.49 |
| Teacher-reported (child) | | | | |
| ADHD-Related Behavior | 0.52 | 0.54 | 0.64 | 0.71 |
| Academic Competence and Motivation | 0.60 | 0.62 | 0.85 | 0.88 |
| Altruistic Behavior | 0.27 | 0.28 | 0.32 | 0.28 |
| Positive Social Behavior | 0.55 | 0.58 | 0.81 | 0.87 |
| Problem Behavior | 0.51 | 0.54 | 0.78 | 0.84 |
| Teacher-reported (school) | | | | |
| Student Support for Teachers | 0.62 | 0.63 | 0.91 | 0.91 |
| Feelings of Safety | 0.47 | 0.48 | 0.78 | 0.80 |

NOTE: ADHD is the abbreviation for attention deficit hyperactivity disorder.

SOURCE: The Social and Character Development (SACD) Research Program.

Table B.14. Adjusted R² values from models using spring 2005 (Year 1) outcomes with pretest only and with the full covariate set, by site

| Outcome | LBW | | CSP | | SS | | ABC | | PATHS | | PA | | 4Rs | |
|-------------------------------------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|
| | Pre-test only | Full set | Pre-test only | Full set | Pre-test only | Full set | Pre-test only | Full set | Pre-test only | Full set | Pre-test only | Full set | Pre-test only | Full set |
| Child-reported | | | | | | | | | | | | | | |
| Empathy | 0.21 | 0.24 | 0.19 | 0.27 | 0.25 | 0.26 | 0.22 | 0.24 | 0.19 | 0.26 | 0.11 | 0.18 | 0.13 | 0.17 |
| Student Afraid at School | 0.05 | 0.08 | 0.10 | 0.15 | 0.20 | 0.21 | 0.09 | 0.13 | 0.15 | 0.20 | 0.07 | 0.11 | 0.09 | 0.13 |
| Altruistic Behavior | 0.17 | 0.18 | 0.20 | 0.22 | 0.24 | 0.28 | 0.30 | 0.32 | 0.22 | 0.25 | 0.10 | 0.13 | 0.13 | 0.14 |
| Engagement with Learning | 0.13 | 0.16 | 0.03 | 0.04 | 0.11 | 0.15 | 0.09 | 0.15 | 0.11 | 0.14 | 0.06 | 0.10 | 0.12 | 0.14 |
| Negative School Orientation | 0.19 | 0.20 | 0.14 | 0.16 | 0.18 | 0.21 | 0.15 | 0.17 | 0.20 | 0.32 | 0.08 | 0.15 | 0.14 | 0.20 |
| Problem Behavior | 0.23 | 0.26 | 0.18 | 0.26 | 0.28 | 0.30 | 0.29 | 0.33 | 0.28 | 0.35 | 0.10 | 0.17 | 0.27 | 0.32 |
| Self-Efficacy for Peer Interactions | 0.19 | 0.20 | 0.14 | 0.14 | 0.25 | 0.27 | 0.23 | 0.23 | 0.25 | 0.26 | 0.16 | 0.21 | 0.17 | 0.17 |
| Victimization at School | 0.18 | 0.20 | 0.17 | 0.18 | 0.21 | 0.22 | 0.19 | 0.21 | 0.27 | 0.27 | 0.16 | 0.18 | 0.13 | 0.13 |
| Normative Beliefs About Aggression | 0.06 | 0.06 | 0.07 | 0.15 | 0.02 | 0.03 | 0.14 | 0.19 | 0.12 | 0.17 | 0.05 | 0.11 | 0.19 | 0.20 |
| Positive School Orientation | 0.13 | 0.12 | 0.11 | 0.17 | 0.20 | 0.20 | 0.23 | 0.27 | 0.13 | 0.26 | 0.07 | 0.16 | 0.20 | 0.27 |
| Primary caregiver-reported | | | | | | | | | | | | | | |
| Altruistic Behavior | 0.14 | 0.20 | 0.18 | 0.22 | 0.23 | 0.34 | 0.19 | 0.24 | 0.26 | 0.32 | 0.19 | 0.22 | 0.20 | 0.25 |
| Positive Social Behavior | 0.35 | 0.39 | 0.42 | 0.46 | 0.47 | 0.50 | 0.54 | 0.56 | 0.50 | 0.54 | 0.40 | 0.46 | 0.32 | 0.36 |
| Problem Behavior | 0.33 | 0.40 | 0.38 | 0.43 | 0.50 | 0.53 | 0.37 | 0.40 | 0.43 | 0.51 | 0.40 | 0.44 | 0.22 | 0.26 |
| Teacher-reported (child) | | | | | | | | | | | | | | |
| ADHD-Related Behavior | 0.48 | 0.54 | 0.52 | 0.53 | 0.55 | 0.57 | 0.51 | 0.54 | 0.57 | 0.59 | 0.46 | 0.54 | 0.50 | 0.54 |
| Academic Competence and Motivation | 0.53 | 0.56 | 0.61 | 0.63 | 0.70 | 0.72 | 0.51 | 0.55 | 0.69 | 0.72 | 0.51 | 0.56 | 0.54 | 0.57 |
| Altruistic Behavior | 0.17 | 0.19 | 0.34 | 0.36 | 0.28 | 0.34 | 0.28 | 0.33 | 0.36 | 0.38 | 0.15 | 0.20 | 0.31 | 0.35 |
| Positive Social Behavior | 0.51 | 0.56 | 0.42 | 0.47 | 0.55 | 0.59 | 0.51 | 0.56 | 0.58 | 0.64 | 0.54 | 0.60 | 0.52 | 0.54 |
| Problem Behavior | 0.38 | 0.42 | 0.47 | 0.50 | 0.47 | 0.51 | 0.45 | 0.52 | 0.67 | 0.70 | 0.50 | 0.56 | 0.50 | 0.52 |
| Teacher-reported (school) | | | | | | | | | | | | | | |
| Student Support for Teachers | 0.42 | 0.43 | 0.43 | 0.44 | 0.31 | 0.36 | 0.64 | 0.63 | 0.70 | 0.70 | 0.61 | 0.62 | 0.50 | 0.52 |
| Feelings of Safety | 0.26 | 0.29 | 0.22 | 0.30 | 0.32 | 0.36 | 0.52 | 0.52 | 0.48 | 0.49 | 0.38 | 0.36 | 0.53 | 0.53 |

NOTE: Abbreviations are

ABC: Academic and Behavioral Competencies Program

CSP: Competence Support Program

LBW: Love In a Big World

SS: Second Step

PA: Positive Action

PATHS: Promoting Alternative Thinking Strategies

4Rs: The 4Rs Program (Reading, Writing, Respect, and Resolution)

ADHD: Attention deficit hyperactivity disorder

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix B: Technical Notes

Table B.15. Adjusted R² values from models using spring 2006 (Year 2) outcomes, with pretest only and with the full covariate set, for the combined-program sample

| Outcome | Child level | | Collapsed to school level | |
|-------------------------------------|--------------|--------------------|---------------------------|--------------------|
| | Pretest only | Full covariate set | Pretest only | Full covariate set |
| Child-reported | | | | |
| Empathy | 0.11 | 0.16 | 0.32 | 0.48 |
| Student Afraid at School | 0.07 | 0.12 | 0.51 | 0.65 |
| Altruistic Behavior | 0.09 | 0.11 | 0.34 | 0.42 |
| Engagement with Learning | 0.03 | 0.07 | 0.25 | 0.30 |
| Negative School Orientation | 0.13 | 0.19 | 0.71 | 0.72 |
| Problem Behavior | 0.16 | 0.24 | 0.62 | 0.77 |
| Self-Efficacy for Peer Interactions | 0.10 | 0.13 | 0.36 | 0.58 |
| Victimization at School | 0.08 | 0.10 | 0.16 | 0.18 |
| Normative Beliefs About Aggression | 0.08 | 0.14 | 0.30 | 0.57 |
| Positive School Orientation | 0.13 | 0.18 | 0.63 | 0.69 |
| Primary caregiver-reported | | | | |
| Altruistic Behavior | 0.19 | 0.21 | 0.43 | 0.67 |
| Positive Social Behavior | 0.32 | 0.37 | 0.42 | 0.71 |
| Problem Behavior | 0.27 | 0.30 | 0.37 | 0.52 |
| Teacher-reported (child) | | | | |
| ADHD-Related Behavior | 0.23 | 0.29 | 0.31 | 0.46 |
| Academic Competence and Motivation | 0.37 | 0.42 | 0.62 | 0.78 |
| Altruistic Behavior | 0.06 | 0.09 | 0.09 | 0.01 |
| Positive Social Behavior | 0.22 | 0.32 | 0.35 | 0.64 |
| Problem Behavior | 0.24 | 0.31 | 0.62 | 0.76 |
| Teacher-reported (school) | | | | |
| Student Support for Teachers | 0.49 | 0.49 | 0.85 | 0.85 |
| Feelings of Safety | 0.37 | 0.38 | 0.68 | 0.69 |

NOTE: ADHD is the abbreviation for attention deficit hyperactivity disorder.

SOURCE: The Social and Character Development (SACD) Research Program.

Table B.16. Adjusted R² values from models using spring 2006 (Year 2) outcomes with pretest only and with the full covariate set selected for each program, by program

| Outcome | ABC | | PA | | SS | | 4Rs | | CSP | | PATHS | | LBW | |
|-------------------------------------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|
| | Pre-test only | Full set | Pre-test only | Full set | Pre-test only | Full set | Pre-test only | Full set | Pre-test only | Full set | Pre-test only | Full set | Pre-test only | Full set |
| Child-reported | | | | | | | | | | | | | | |
| Empathy | 0.12 | 0.17 | 0.04 | 0.12 | 0.09 | 0.17 | 0.07 | 0.12 | 0.06 | 0.12 | 0.12 | 0.22 | 0.08 | 0.10 |
| Student Afraid at School | 0.07 | 0.12 | 0.01 | 0.04 | 0.03 | 0.08 | 0.03 | 0.04 | 0.02 | 0.06 | 0.08 | 0.18 | 0.01 | 0.04 |
| Altruistic Behavior | 0.10 | 0.13 | 0.06 | 0.08 | 0.06 | 0.11 | 0.05 | 0.06 | 0.09 | 0.14 | 0.11 | 0.12 | 0.05 | 0.07 |
| Engagement with Learning | 0.03 | 0.04 | 0.02 | 0.04 | 0.04 | 0.05 | 0.03 | 0.09 | 0.01 | 0.05 | 0.05 | 0.10 | 0.03 | 0.05 |
| Negative School Orientation | 0.04 | 0.07 | 0.04 | 0.10 | 0.08 | 0.12 | 0.03 | 0.09 | 0.03 | 0.06 | 0.20 | 0.29 | 0.08 | 0.09 |
| Problem Behavior | 0.13 | 0.20 | 0.04 | 0.16 | 0.10 | 0.16 | 0.15 | 0.23 | 0.06 | 0.15 | 0.15 | 0.28 | 0.06 | 0.11 |
| Self-Efficacy for Peer Interactions | 0.10 | 0.15 | 0.05 | 0.17 | 0.08 | 0.10 | 0.09 | 0.09 | 0.09 | 0.10 | 0.17 | 0.21 | 0.10 | 0.11 |
| Victimization at School | 0.10 | 0.11 | 0.04 | 0.07 | 0.12 | 0.11 | 0.07 | 0.07 | 0.06 | 0.11 | 0.11 | 0.11 | 0.04 | 0.06 |
| Normative Beliefs About Aggression | 0.07 | 0.12 | 0.03 | 0.09 | 0.01 | 0.06 | 0.08 | 0.10 | 0.02 | 0.09 | 0.04 | 0.16 | 0.14 | 0.15 |
| Positive School Orientation | 0.12 | 0.17 | 0.06 | 0.24 | 0.03 | 0.03 | 0.07 | 0.12 | 0.03 | 0.10 | 0.17 | 0.33 | 0.06 | 0.06 |
| Primary caregiver-reported | | | | | | | | | | | | | | |
| Altruistic Behavior | 0.15 | 0.16 | 0.18 | 0.19 | 0.22 | 0.26 | 0.17 | 0.17 | 0.13 | 0.12 | 0.24 | 0.32 | 0.10 | 0.15 |
| Positive Social Behavior | 0.36 | 0.41 | 0.35 | 0.39 | 0.33 | 0.42 | 0.16 | 0.19 | 0.26 | 0.33 | 0.36 | 0.39 | 0.33 | 0.42 |
| Problem Behavior | 0.34 | 0.36 | 0.31 | 0.32 | 0.27 | 0.33 | 0.09 | 0.12 | 0.23 | 0.30 | 0.41 | 0.45 | 0.26 | 0.32 |
| Teacher-reported (child) | | | | | | | | | | | | | | |
| ADHD-Related Behavior | 0.22 | 0.25 | 0.14 | 0.24 | 0.27 | 0.33 | 0.20 | 0.26 | 0.25 | 0.29 | 0.33 | 0.36 | 0.20 | 0.28 |
| Academic Competence and Motivation | 0.35 | 0.42 | 0.27 | 0.34 | 0.39 | 0.47 | 0.27 | 0.31 | 0.30 | 0.42 | 0.54 | 0.57 | 0.30 | 0.35 |
| Altruistic Behavior | 0.02 | 0.05 | 0.00 | 0.08 | 0.00 | 0.04 | 0.00 | 0.03 | 0.02 | 0.05 | 0.01 | 0.00 | 0.02 | 0.10 |
| Positive Social Behavior | 0.17 | 0.27 | 0.19 | 0.30 | 0.16 | 0.29 | 0.26 | 0.32 | 0.14 | 0.26 | 0.33 | 0.46 | 0.12 | 0.21 |
| Problem Behavior | 0.20 | 0.28 | 0.20 | 0.30 | 0.18 | 0.32 | 0.20 | 0.25 | 0.25 | 0.29 | 0.36 | 0.46 | 0.17 | 0.21 |
| Teacher-reported (school) | | | | | | | | | | | | | | |
| Student Support for Teachers | 0.28 | 0.26 | 0.53 | 0.54 | 0.30 | 0.28 | 0.31 | 0.29 | 0.29 | 0.31 | 0.56 | 0.56 | 0.18 | 0.23 |
| Feelings of Safety | 0.42 | 0.42 | 0.48 | 0.50 | 0.12 | 0.11 | 0.36 | 0.35 | 0.12 | 0.18 | 0.41 | 0.41 | 0.16 | 0.21 |

NOTE: Abbreviations are

ABC: *Academic and Behavioral Competencies Program*

CSP: *Competence Support Program*

LBW: *Love In a Big World*

SS: *Second Step*

PA: *Positive Action*

PATHS: *Promoting Alternative Thinking Strategies*

4Rs: *The 4Rs Program (Reading, Writing, Respect, and Resolution)*

ADHD: *Attention deficit hyperactivity disorder*

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix B: Technical Notes

Table B.17. Adjusted R² values from models using spring 2007 (Year 3) outcomes, with pretest only and with the full covariate set, for the combined-program sample

| Outcome | Child level | | Collapsed to school level | |
|-------------------------------------|--------------|--------------------|---------------------------|--------------------|
| | Pretest only | Full covariate set | Pretest only | Full covariate set |
| Child-reported | | | | |
| Empathy | 0.09 | 0.14 | 0.40 | 0.67 |
| Student Afraid at School | 0.06 | 0.12 | 0.51 | 0.70 |
| Altruistic Behavior | 0.06 | 0.08 | 0.41 | 0.56 |
| Engagement with Learning | 0.02 | 0.07 | 0.01 | 0.29 |
| Negative School Orientation | 0.11 | 0.17 | 0.53 | 0.64 |
| Problem Behavior | 0.14 | 0.23 | 0.55 | 0.74 |
| Self-Efficacy for Peer Interactions | 0.06 | 0.08 | 0.15 | 0.30 |
| Victimization at School | 0.06 | 0.07 | 0.25 | 0.28 |
| Normative Beliefs About Aggression | 0.06 | 0.11 | 0.35 | 0.46 |
| Positive School Orientation | 0.11 | 0.16 | 0.47 | 0.67 |
| Primary caregiver-reported | | | | |
| Altruistic Behavior | 0.16 | 0.20 | 0.40 | 0.74 |
| Positive Social Behavior | 0.26 | 0.32 | 0.54 | 0.69 |
| Problem Behavior | 0.19 | 0.23 | 0.31 | 0.64 |
| Teacher-reported (child) | | | | |
| ADHD-Related Behavior | 0.20 | 0.26 | 0.05 | 0.69 |
| Academic Competence and Motivation | 0.32 | 0.37 | 0.49 | 0.70 |
| Altruistic Behavior | 0.06 | 0.07 | 0.10 | 0.20 |
| Positive Social Behavior | 0.22 | 0.30 | 0.30 | 0.60 |
| Problem Behavior | 0.22 | 0.28 | 0.42 | 0.61 |
| Teacher-reported (school) | | | | |
| Student Support for Teachers | 0.47 | 0.47 | 0.78 | 0.77 |
| Feelings of Safety | 0.30 | 0.30 | 0.50 | 0.48 |

NOTE: ADHD is the abbreviation for attention deficit hyperactivity disorder.

SOURCE: The Social and Character Development (SACD) Research Program.

Table B.18. Adjusted R² values from models using spring 2007 (Year 3) outcomes, with pretest only and with the full covariate set selected for each program, by program

| Outcome | LBW | | CSP | | SS | | ABC | | PATHS | | PA | | 4Rs | |
|-------------------------------------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|---------------|----------|
| | Pre-test only | Full set | Pre-test only | Full set | Pre-test only | Full set | Pre-test only | Full set | Pre-test only | Full set | Pre-test only | Full set | Pre-test only | Full set |
| Child-reported | | | | | | | | | | | | | | |
| Empathy | 0.08 | 0.13 | 0.07 | 0.14 | 0.06 | 0.15 | 0.05 | 0.06 | 0.03 | 0.11 | 0.04 | 0.11 | 0.03 | 0.09 |
| Student Afraid at School | 0.03 | 0.06 | 0.01 | 0.05 | 0.03 | 0.12 | 0.04 | 0.10 | 0.06 | 0.17 | 0.01 | 0.07 | 0.02 | 0.05 |
| Altruistic Behavior | 0.04 | 0.08 | 0.08 | 0.08 | 0.05 | 0.09 | 0.05 | 0.08 | 0.03 | 0.09 | 0.04 | 0.05 | 0.03 | 0.04 |
| Engagement with Learning | 0.06 | 0.07 | 0.00 | 0.04 | 0.09 | 0.13 | 0.02 | 0.04 | 0.05 | 0.12 | 0.02 | 0.07 | 0.01 | 0.07 |
| Negative School Orientation | 0.05 | 0.08 | 0.04 | 0.10 | 0.07 | 0.14 | 0.07 | 0.08 | 0.19 | 0.28 | 0.04 | 0.12 | 0.01 | 0.05 |
| Problem Behavior | 0.12 | 0.17 | 0.05 | 0.16 | 0.07 | 0.15 | 0.11 | 0.13 | 0.22 | 0.33 | 0.02 | 0.18 | 0.07 | 0.17 |
| Self-Efficacy for Peer Interactions | 0.04 | 0.05 | 0.08 | 0.11 | 0.05 | 0.09 | 0.07 | 0.11 | 0.09 | 0.12 | 0.04 | 0.09 | 0.05 | 0.06 |
| Victimization at School | 0.02 | 0.02 | 0.05 | 0.07 | 0.07 | 0.09 | 0.04 | 0.07 | 0.13 | 0.17 | 0.02 | 0.07 | 0.02 | 0.03 |
| Normative Beliefs About Aggression | 0.07 | 0.12 | 0.01 | 0.14 | 0.01 | 0.06 | 0.01 | 0.05 | 0.03 | 0.13 | 0.03 | 0.08 | 0.07 | 0.12 |
| Positive School Orientation | 0.07 | 0.07 | 0.02 | 0.08 | 0.02 | 0.07 | 0.09 | 0.12 | 0.09 | 0.28 | 0.04 | 0.18 | 0.02 | 0.07 |
| Primary caregiver-reported | | | | | | | | | | | | | | |
| Altruistic Behavior | 0.08 | 0.21 | 0.15 | 0.16 | 0.13 | 0.24 | 0.13 | 0.19 | 0.20 | 0.28 | 0.09 | 0.16 | 0.17 | 0.17 |
| Positive Social Behavior | 0.22 | 0.29 | 0.29 | 0.33 | 0.31 | 0.35 | 0.23 | 0.28 | 0.35 | 0.40 | 0.22 | 0.28 | 0.12 | 0.19 |
| Problem Behavior | 0.23 | 0.26 | 0.19 | 0.24 | 0.21 | 0.28 | 0.17 | 0.23 | 0.25 | 0.28 | 0.18 | 0.20 | 0.09 | 0.17 |
| Teacher-reported (child) | | | | | | | | | | | | | | |
| ADHD-Related Behavior | 0.19 | 0.25 | 0.25 | 0.32 | 0.26 | 0.28 | 0.14 | 0.20 | 0.24 | 0.28 | 0.13 | 0.25 | 0.15 | 0.26 |
| Academic Competence and Motivation | 0.28 | 0.33 | 0.25 | 0.36 | 0.35 | 0.41 | 0.27 | 0.32 | 0.34 | 0.40 | 0.20 | 0.27 | 0.27 | 0.33 |
| Altruistic Behavior | 0.00 | 0.02 | 0.06 | 0.11 | 0.01 | 0.05 | 0.00 | 0.01 | 0.01 | 0.05 | 0.03 | 0.07 | 0.00 | 0.06 |
| Positive Social Behavior | 0.14 | 0.22 | 0.21 | 0.32 | 0.15 | 0.27 | 0.11 | 0.15 | 0.27 | 0.41 | 0.17 | 0.29 | 0.19 | 0.24 |
| Problem Behavior | 0.19 | 0.24 | 0.19 | 0.26 | 0.09 | 0.21 | 0.15 | 0.19 | 0.36 | 0.48 | 0.24 | 0.31 | 0.13 | 0.18 |
| Teacher-reported (school) | | | | | | | | | | | | | | |
| Student Support for Teachers | 0.11 | 0.14 | 0.19 | 0.22 | 0.27 | 0.27 | 0.37 | 0.43 | 0.55 | 0.54 | 0.58 | 0.59 | 0.23 | 0.22 |
| Feelings of Safety | 0.21 | 0.20 | 0.17 | 0.27 | 0.08 | 0.11 | 0.31 | 0.30 | 0.32 | 0.29 | 0.39 | 0.41 | 0.19 | 0.20 |

NOTE: Abbreviations are

ABC: *Academic and Behavioral Competencies Program*

CSP: *Competence Support Program*

LBW: *Love In a Big World*

SS: *Second Step*

PA: *Positive Action*

PATHS: *Promoting Alternative Thinking Strategies*

4Rs: *The 4Rs Program (Reading, Writing, Respect, and Resolution)*

ADHD: Attention deficit hyperactivity disorder

SOURCE: The Social and Character Development (SACD) Research Program.

Construction of Sample Weights

Two sets of weights were constructed for the year-by-year SACD analysis: (1) *base* weights assigned equal weight to each program and to each school within a program, and (2) *adjusted* weights modified the base weights for study nonconsent, interview nonresponse, and students who entered the study schools after fall 2004 (new entrants). The weighting approach means that the combined-program impacts were the simple averages of the program impacts (based on the same covariates within the regression), the program impacts were the simple averages of the school impacts, and the school impacts were weighted averages of the impacts in each classroom, with weights proportional to classroom size. The weighting approach was chosen to generate the average impact across schools (and programs) in the sample. This approach was grounded in the study design, in which random assignment was conducted at the school level within programs. This weighting approach produced *unbiased* estimates of the average treatment effect for the study schools and programs that were purposively selected for the evaluation. This approach was consistent with an analysis in which the 84 school means were used in the regression models (that is, a between-school analysis), and the model included treatment-by-program interactions that were weighted equally to estimate the overall cross-site impact.

Base Weights

For each spring (2005-07) follow-up instrument, base weights were constructed with the following properties:

- Within each school, each survey respondent had the same weight.
- Within each program, the weights in each school summed to the same value.
- The weights in each program summed to the same value (equal to the average program sample size).
- The sum of all the weights was equal to twice the original sample size (because, through random assignment, the control and treatment groups each represented the sample).

To satisfy these objectives, the base weights for the student-level outcome measures were calculated using the following formula:

$$(1) \text{ baseweight}_{sp} = \left(\frac{\bar{n}_{sp}}{n_{sp}} \right) * \left(\frac{\overline{sch}_p}{sch_p} \right)$$

where baseweight_{sp} is the weight for a child respondent in school s and program p , \bar{n}_{sp} is the average number of child respondents per study school, n_{sp} is the number of respondents in school s and program p , \overline{sch}_p is the average number of schools per program, and sch_p is the number of schools in program p .

Equation (1) was also used to construct base weights for the school-level outcome measures from the Teacher Report on Classroom and School data. However in this case, the first term on the right-hand side of equation (1) refers to the number of third-, fourth-, and fifth-grade teacher respondents in the school instead of the number of child respondents. That is, the numerator of the first term is the average number of teacher respondents per study school, and the denominator is the number of teacher respondents in school s and program p .

Base weights were constructed using the total number of respondents who completed each instrument, regardless of the incidence of missing data for specific variables in the instruments.

Adjusted Weights

To account for study nonconsent and interview nonresponse, adjusted weights were constructed for the student-level and the school-level outcome measures so that the impact estimates could be generalized to the

Appendix B: Technical Notes

full sample universe, rather than to those with follow-up data only. For the student-level outcome measures, the original cohort children (stayers) in a *classroom* who responded to an instrument were assumed to be representative of *all* original cohort children (stayers) in that classroom. This approach adjusted for different survey response rates across classrooms and used the following equation:

$$(2) \quad adj_wt_child_{csp} = \left(\frac{\bar{n}_{csp}}{n_{csp}} \right) * \left(\frac{\bar{c}_{sp}}{c_{sp}} \right) * \left(\frac{\overline{sch}_p}{sch_p} \right)$$

Thus, $adj_wt_child_{csp}$ is the adjusted weight based on enrollment for an original cohort child (stayer) in school s and program p , \bar{n}_{csp} refers to the average number of fifth-grade stayers per classroom c in school s at program p , n_{csp} refers to the number of stayer respondents in a specific classroom c in school s at program p , \bar{c}_{sp} refers to the average number of classrooms in schools across programs, and c_{sp} refers to the number of classrooms in school s at program p .

Because new entrants were less likely to get parental consent than the original cohort of children, the adjusted weights for the child assessments were constructed separately for the two groups of children. There were very few new entrants within some classrooms, so the nonresponse and nonconsent adjustments were conducted at the school level for this group. The equation for the adjusted weights for new entrants, which does not include a classroom-level component, is as follows:

$$(3) \quad adj_wt_new_entrant_{sp} = \left(\frac{\bar{n}_{sp}}{n_{sp}} \right) * \left(\frac{\overline{sch}_p}{sch_p} \right)$$

where $adj_wt_new_entrant_{sp}$ is the adjusted weight based on enrollment for a new entrant child in school s and program p , \bar{n}_{sp} is the average population of new entrants per study school, and n_{sp} is the number of new entrant respondents in school s and program p .

For the school-level outcome measures, the responding teachers were assumed to be representative of third-, fourth-, and fifth-grade teachers in that school, which means that there is no classroom-level component in the construction of the Teacher Report on Classroom and School adjusted weights. The equation for these weights is as follows:

$$(4) \quad adj_wt_TRCS_{sp} = \left(\frac{\bar{n}_{sp}}{n_{sp}} \right) * \left(\frac{\overline{sch}_p}{sch_p} \right)$$

where \bar{n}_{sp} is the average population of teachers per study school and n_{sp} is the number of teacher respondents in school s and program p .

Weights for the Growth Curve Analysis

The growth curve analysis included data from every survey wave. Weights were constructed specifically for the growth curve analysis in order to maintain the equal representation of programs in the analysis. The growth curve weights were constructed only at the child level because the growth curve analysis was only performed for child-level outcomes. Growth curve weights were constructed with the following properties:

- Within each school and survey period, each student had the same weight.
- Within each program and survey period, the weights in each school summed to the same value.
- Within each survey period, the weights in each program summed to the same value.
- The weights within each survey period summed to the same value for all survey periods.

Appendix B: Technical Notes

The formula for the growth weights is as follows:

$$(5) \quad GCweight_{t,i,p} = \left(\frac{\bar{r}}{r_t}\right) * \left(\frac{\bar{n}_{t,kids}}{n_{t,i,p}}\right) * \left(\frac{\overline{sch}_t}{sch_{t,p}}\right)$$

where $GCweight_{t,i,p}$ is the weight for students at survey period t , in school i in program p ; $\bar{n}_{t,kids}$ represents the average number of students in a school at survey period t ; $n_{t,i,s}$ represents the number of students in school i in program s at survey period t ; \overline{sch}_t represents the average number of schools in a program at survey period t ; and $sch_{t,s}$ represents the number of schools in program s at survey period t . The average number of students in a survey period is represented by \bar{r} , while r_t represents the number of students within survey period t .

Sensitivity Analysis

The hierarchical linear modeling (HLM) framework for estimating the impacts of the SACD programs on key child and school outcomes estimated impacts using regression models, where the standard errors of the impact estimates accounted for design effects due to school-level clustering and precision gains due to the inclusion of baseline covariates in the models (Bryk and Raudenbush 1992).

To implement the HLM framework, it was necessary to make decisions about key model parameter specifications and estimation methods. A set of sensitivity analyses was done to determine if these model assumptions affected the results from the combined-program impact analysis for the 18 student-level outcome measures. Ten sensitivity tests were done and these included the following variations:

- No initial covariates were included in the regression models.
- The sample weights were not adjusted for study nonconsent and interview nonresponse and when models were estimated without weights.
- The error structure included classroom-level random effects.
- The error structure accounted for the pairwise matching of schools.
- The pretests were treated as dependent variables rather than as covariates.
- The impacts were estimated using alternative estimation routines (statistical software packages).
- Missing outcome measures were imputed using multiple imputation procedures.
- Combined-program impact estimates were obtained by averaging the program-level impact estimates.
- Various sets of covariates were included in the regression models.
- New entrants were excluded from the analysis.

The number of sensitivity analyses done declined each year as the pattern of impact results from the original model proved robust to a variety of model specifications. All 10 sensitivity analyses were done with the Year 1 data. The first 9 sensitivity tests were done with the Year 2 data. The sample of new entrants grew large enough in Years 2 and 3 to do separate analyses of new entrants versus stayers (in place of the 10th sensitivity test) and these were included in the subgroup analyses discussed in chapter 1. The 1st, 2nd (except for the estimation without weights), 3rd, and 4th sensitivity tests were done using the Year 3 data. The sensitivity analyses and their results are discussed below.

Excluding Covariates

Under the experimental design, the inclusion of baseline covariates was not required to obtain unbiased impact estimates. However, covariates were used because they increased the precision of the impact estimates by explaining some of the variations in the outcome measures between schools and across students within schools. In addition, covariates adjusted for residual differences between the baseline characteristics of treatment and control group members due to random sampling, study nonconsent, and interview nonresponse.

As a specification test, the combined-program models were estimated with no covariates except for site binary variables (table B.19). As with the original impact estimates, no significant impacts were found from these simple differences-in-means estimates.

Table B.19. Combined-program impacts in effect size units when baseline covariates are excluded from the models

| Scale–Report | Year 1 (Spring 2005) | | Year 2 (Spring 2006) | | Year 3 (Spring 2007) | |
|---|-------------------------|--|-------------------------|--|-------------------------|--|
| | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² |
| Social and Emotional Competence Domain | | | | | | |
| Self-Efficacy for Peer Interactions–CR (+) | -0.05 | 0.281 | -0.07 | 0.164 | -0.04 | 0.295 |
| Normative Beliefs About Aggression–CR (-) | -0.01 | 0.766 | -0.01 | 0.912 | 0.03 | 0.673 |
| Empathy–CR (+) | 0.06 | 0.298 | -0.04 | 0.524 | -0.07 | 0.254 |
| Behavior Domain | | | | | | |
| Altruistic Behavior–CR (+) | -0.06 | 0.295 | -0.06 | 0.208 | -0.02 | 0.626 |
| Altruistic Behavior–PCR (+) | 0.05 | 0.274 | 0.01 | 0.836 | -0.01 | 0.861 |
| Altruistic Behavior–TRS (+) | 0.12 | 0.253 | 0.02 | 0.910 | -0.05 | 0.695 |
| Positive Social Behavior–PCR (+) | -0.01 | 0.898 | 0.04 | 0.532 | 0.01 | 0.907 |
| Positive Social Behavior–TRS (+) | 0.02 | 0.830 | -0.05 | 0.597 | -0.01 | 0.917 |
| Problem Behavior–CR (-) | 0.02 | 0.741 | 0.03 | 0.738 | 0.08 | 0.341 |
| Problem Behavior–PCR (+) | -0.04 | 0.483 | -0.07 | 0.142 | -0.06 | 0.283 |
| Problem Behavior–TRS (+) | 0.03 | 0.762 | 0.00 | 0.989 | 0.00 | 0.994 |
| ADHD-Related Behavior–TRS (-) | 0.01 | 0.871 | -0.01 | 0.867 | -0.03 | 0.610 |
| Academics Domain | | | | | | |
| Engagement with Learning–CR (+) | -0.06 | 0.183 | -0.05 | 0.217 | -0.06 | 0.237 |
| Academic Competence and Motivation–TRS (+) | -0.06 | 0.333 | -0.07 | 0.298 | -0.07 | 0.290 |
| Perceptions of School Climate Domain | | | | | | |
| Positive School Orientation–CR (+) | 0.01 | 0.933 | 0.00 | 0.993 | -0.09 | 0.363 |
| Negative School Orientation–CR (-) | -0.02 | 0.735 | 0.01 | 0.942 | 0.02 | 0.753 |
| Student Afraid at School–CR (-) | -0.04 | 0.480 | -0.05 | 0.488 | 0.00 | 0.981 |
| Victimization at School–CR (-) | -0.02 | 0.637 | -0.04 | 0.458 | 0.00 | 0.978 |

¹ Impacts are in effect size (standard deviation) units and were calculated by dividing the estimated impact by the standard deviation of the outcome measure for the control group.

² The *p*-value is from a two-tailed *t* test to gauge the statistical significance of the impact estimate.

NOTE: Abbreviations are

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

ADHD: Attention deficit hyperactivity disorder

The +/- signs in parentheses indicate the direction of a beneficial outcome. No findings were found statistically significant at or below the .05 level. All impact estimates were calculated using regression models, where each program and school within a program was weighted equally. The standard errors of all estimates account for design effects due to unequal weighting and the clustering of students within schools.

SOURCE: The Social and Character Development (SACD) Research Program.

Employing Alternative Weighting Schemes

As discussed earlier in this appendix, the impact models were estimated using sample weights. The weights were constructed so that each site and each school within a site were given equal weight in the analysis, and survey respondents were assumed to represent not only themselves but also study nonconsenters and survey nonrespondents in the same classroom (by new entrant/original cohort status).

To examine the sensitivity of results to different weighting schemes, models were estimated using weights not adjusted for study nonconsent and survey nonresponse for each of the 3 years (table B.20). In addition, models were estimated without weights for Years 1 and 2 (table B.21). The alternative weighting schemes did not change the statistical significance of the estimated impacts with one exception: a detrimental impact was found for Altruistic Behavior (CR) in Year 1 when weights were not adjusted for study nonconsent and survey nonresponse.

Table B.20. Combined-program impacts in effect size units when weights are not adjusted for study nonconsent or survey nonresponse

| Scale–Report | Year 1 (Spring 2005) | | Year 2 (Spring 2006) | | Year 3 (Spring 2007) | |
|---|-------------------------|--|-------------------------|--|-------------------------|--|
| | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² |
| Social and Emotional Competence Domain | | | | | | |
| Self-Efficacy for Peer Interactions–CR (+) | -0.05 | 0.236 | -0.07 [^] | 0.073 | -0.04 | 0.298 |
| Normative Beliefs About Aggression–CR (-) | 0.00 | 0.950 | -0.02 | 0.773 | 0.02 | 0.788 |
| Empathy–CR (+) | 0.05 | 0.272 | 0.00 | 0.962 | -0.03 | 0.529 |
| Behavior Domain | | | | | | |
| Altruistic Behavior–CR (+) | -0.07 [*] | 0.041 | -0.04 | 0.384 | -0.03 | 0.452 |
| Altruistic Behavior–PCR (+) | 0.06 [^] | 0.078 | -0.02 | 0.530 | 0.04 | 0.445 |
| Altruistic Behavior–TRS (+) | 0.06 | 0.483 | -0.01 | 0.959 | -0.07 | 0.548 |
| Positive Social Behavior–PCR (+) | 0.00 | 0.870 | 0.05 | 0.134 | 0.04 | 0.321 |
| Positive Social Behavior–TRS (+) | 0.01 | 0.767 | -0.02 | 0.748 | 0.04 | 0.522 |
| Problem Behavior–CR (-) | 0.01 | 0.819 | 0.00 | 0.942 | 0.04 | 0.396 |
| Problem Behavior–PCR (+) | 0.00 | 0.985 | -0.06 | 0.119 | -0.03 | 0.504 |
| Problem Behavior–TRS (+) | 0.03 | 0.503 | -0.04 | 0.402 | -0.06 | 0.279 |
| ADHD-Related Behavior–TRS (-) | 0.01 | 0.866 | -0.05 | 0.347 | -0.13 | 0.122 |
| Academics Domain | | | | | | |
| Engagement with Learning–CR (+) | -0.05 | 0.154 | -0.01 | 0.721 | -0.04 | 0.308 |
| Academic Competence and Motivation–TRS (+) | -0.02 | 0.365 | 0.00 | 0.929 | 0.01 | 0.924 |
| Perceptions of School Climate Domain | | | | | | |
| Positive School Orientation–CR (+) | 0.03 | 0.547 | 0.04 | 0.634 | -0.07 | 0.387 |
| Negative School Orientation–CR (-) | -0.03 | 0.320 | -0.04 | 0.365 | -0.02 | 0.726 |
| Student Afraid at School–CR (-) | -0.05 | 0.211 | -0.07 | 0.145 | 0.00 | 0.970 |
| Victimization at School–CR (-) | 0.00 | 0.940 | -0.04 | 0.391 | 0.00 | 0.959 |

* Significantly different from zero at the .05 level.

[^] Significantly different from zero at the .10 to > .05 level.

¹ Impacts are in effect size (standard deviation) units and were calculated by dividing the estimated impact by the standard deviation of the outcome measure for the control group.

² The *p*-value is from a two-tailed *t* test to gauge the statistical significance of the impact estimate.

NOTE: Abbreviations are

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

ADHD: Attention deficit hyperactivity disorder

The +/- signs in parentheses indicate the direction of a beneficial outcome. All impact estimates were calculated using regression models, where each program and school within a program was weighted equally. The standard errors of all estimates account for design effects due to unequal weighting and the clustering of students within schools.

SOURCE: The Social and Character Development (SACD) Research Program.

Appendix B: Technical Notes

Table B.21. Combined-program impacts in effect size units when weights are not used

| Scale–Report | Year 1 (Spring 2005) | | Year 2 (Spring 2006) | |
|---|-------------------------|---|-------------------------|---|
| | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² |
| Social and Emotional Competence Domain | | | | |
| Self-Efficacy for Peer Interactions–CR (+) | -0.05 | 0.211 | -0.07 | 0.124 |
| Normative Beliefs About Aggression–CR (-) | -0.01 | 0.825 | 0.00 | 0.973 |
| Empathy–CR (+) | 0.04 | 0.474 | -0.04 | 0.551 |
| Behavior Domain | | | | |
| Altruistic Behavior–CR (+) | -0.07 | 0.190 | -0.07 | 0.181 |
| Altruistic Behavior–PCR (+) | 0.04 | 0.402 | -0.01 | 0.858 |
| Altruistic Behavior–TRS (+) | 0.11 | 0.298 | 0.01 | 0.925 |
| Positive Social Behavior–PCR (+) | 0.00 | 0.974 | 0.01 | 0.851 |
| Positive Social Behavior–TRS (+) | 0.01 | 0.934 | -0.05 | 0.571 |
| Problem Behavior–CR (-) | 0.02 | 0.740 | 0.02 | 0.827 |
| Problem Behavior–PCR (+) | -0.02 | 0.672 | -0.07 | 0.112 |
| Problem Behavior–TRS (+) | 0.04 | 0.644 | -0.01 | 0.946 |
| ADHD-Related Behavior–TRS (-) | 0.03 | 0.636 | -0.02 | 0.765 |
| Academics Domain | | | | |
| Engagement with Learning–CR (+) | -0.07 | 0.120 | -0.04 | 0.301 |
| Academic Competence and Motivation–TRS (+) | -0.05 | 0.410 | -0.06 | 0.314 |
| Perceptions of School Climate Domain | | | | |
| Positive School Orientation–CR (+) | 0.01 | 0.932 | 0.01 | 0.881 |
| Negative School Orientation–CR (-) | -0.01 | 0.889 | -0.01 | 0.870 |
| Student Afraid at School–CR (-) | -0.04 | 0.483 | -0.06 | 0.336 |
| Victimization at School–CR (-) | -0.02 | 0.725 | -0.05 | 0.246 |

¹Impacts are in effect size (standard deviation) units and were calculated by dividing the estimated impact by the standard deviation of the outcome measure for the control group.

²The *p*-value is from a two-tailed *t* test to gauge the statistical significance of the impact estimate.

NOTE: Abbreviations are

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

ADHD: Attention deficit hyperactivity disorder

The +/- signs in parentheses indicate the direction of a beneficial outcome. No findings were found statistically significant at or below the .05 level. All impact estimates were calculated using regression models, where each program and school within a program was weighted equally. The standard errors of all estimates account for design effects due to unequal weighting and the clustering of students within schools.

SOURCE: The Social and Character Development (SACD) Research Program.

Including Classroom-Level Random Effects in the Error Structure

In the original models, adjustments were made for the clustering of students within schools but not for the clustering of students within classrooms. This is because classrooms were not sampled for the study; instead, all classrooms within the study schools were included in the evaluation. Thus, the impact estimates generalized to the set of classrooms and teachers that were in the study schools at the time of the evaluation.

An alternative view would be that the estimated impact findings generalized to a broader, but unknown, population of classrooms within the study schools. To accommodate this view, classroom-level random effects were included in the models using a three-level HLM model that was indexed by students (i), classrooms (c), schools (s), and fixed site effects (d):

$$(6) \quad \begin{array}{ll} \text{Level 1: Students:} & Y_{icsd} = \alpha_{0csd} + X_{icsd}\beta + e_{icsd} \\ \text{Level 2: Classrooms:} & \alpha_{0csd} = \lambda_{00sd} + W_{csd}\pi + \eta_{csd} \\ \text{Level 3: Schools:} & \lambda_{00sd} = \gamma_0 + \gamma_1 T_{sd} + \theta_d G_d + Z_{sd}\delta + u_{sd} \end{array}$$

In this model, Y_{icsd} is an outcome measure for a student; α_{0csd} is a classroom-level random intercept; λ_{00sd} is school-level random intercept; X_{icsd} are student-level baseline covariates; W_{csd} are teacher-level baseline covariates; T_{sd} is a binary variable equal to 1 for treatment group schools and 0 for control group schools; G_d are binary variables for each grantee; Z_{sd} are school-level baseline covariates¹¹; β , π , γ_0 , γ_1 , θ_d , and δ are parameter vectors to be estimated; e_{icsd} are assumed to be $iid N(0, \sigma_e^2)$ student- or teacher-level random error terms; η_{csd} are $iid N(0, \sigma_\eta^2)$ classroom-specific error terms that are assumed to be distributed independently of the Level 1 error terms; and u_{sd} are $iid (0, \sigma_u^2)$ school-specific error terms that are assumed to be distributed independently of the Level 1 and 2 error terms.

Inserting the Level 2 and 3 equations into the Level 1 equation yields the following unified model:

$$(7) \quad Y_{icsd} = \gamma_0 + \gamma_1 T_{sd} + \theta_d G_d + Z_{sd}\delta + W_{csd}\pi + X_{icsd}\beta + [u_{sd} + \eta_{csd} + e_{icsd}]$$

In this formulation, the estimate of the parameter, γ_1 , is the regression-adjusted, multisite impact estimate. This equation is similar to the two-level benchmark model in equation (1) in the main report except that it includes the random classroom effect η_{csd} in the error term. As with the original impact estimates, no significant impacts were found when addressing the clustering of students within classroom (table B.22).

¹¹ In practice, school-level covariates were not used in estimation.

Appendix B: Technical Notes

Table B.22. Combined-program impacts in effect size units when accounting for classroom-level clustering

| Scale–Report | Year 1 (Spring 2005) | | Year 2 (Spring 2006) | | Year 3 (Spring 2007) | |
|---|-------------------------|--|-------------------------|--|-------------------------|--|
| | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² |
| Social and Emotional Competence Domain | | | | | | |
| Self-Efficacy for Peer Interactions–CR (+) | -0.02 | 0.548 | -0.07 [^] | 0.055 | -0.06 | 0.114 |
| Normative Beliefs About Aggression–CR (-) | -0.01 | 0.796 | -0.01 | 0.776 | 0.00 | 0.970 |
| Empathy–CR (+) | 0.06 | 0.186 | -0.02 | 0.746 | -0.05 | 0.254 |
| Behavior Domain | | | | | | |
| Altruistic Behavior–CR (+) | -0.06 | 0.115 | -0.06 | 0.162 | -0.03 | 0.408 |
| Altruistic Behavior–PCR (+) | 0.07 [^] | 0.066 | -0.01 | 0.871 | -0.02 | 0.609 |
| Altruistic Behavior–TRS (+) | 0.15 [^] | 0.077 | 0.05 | 0.545 | -0.03 | 0.671 |
| Positive Social Behavior–PCR (+) | -0.01 | 0.632 | 0.04 | 0.264 | 0.02 | 0.526 |
| Positive Social Behavior–TRS (+) | 0.01 | 0.703 | 0.01 | 0.849 | 0.05 | 0.400 |
| Problem Behavior–CR (-) | 0.00 | 0.993 | 0.00 | 0.940 | 0.05 | 0.299 |
| Problem Behavior–PCR (+) | 0.01 | 0.876 | -0.03 | 0.336 | -0.03 | 0.435 |
| Problem Behavior–TRS (+) | 0.03 | 0.506 | -0.03 | 0.598 | -0.02 | 0.678 |
| ADHD-Related Behavior–TRS (-) | 0.00 | 0.935 | -0.05 | 0.344 | -0.03 | 0.492 |
| Academics Domain | | | | | | |
| Engagement with Learning–CR (+) | -0.04 | 0.240 | -0.02 | 0.643 | -0.03 | 0.509 |
| Academic Competence and Motivation–TRS (+) | -0.01 | 0.614 | -0.01 | 0.772 | 0.00 | 0.928 |
| Perceptions of School Climate Domain | | | | | | |
| Positive School Orientation–CR (+) | 0.03 | 0.554 | 0.04 | 0.611 | -0.08 | 0.310 |
| Negative School Orientation–CR (-) | -0.05 | 0.180 | -0.04 | 0.451 | -0.01 | 0.885 |
| Student Afraid at School–CR (-) | -0.06 | 0.144 | -0.08 | 0.101 | -0.01 | 0.867 |
| Victimization at School–CR (-) | -0.02 | 0.661 | -0.05 | 0.321 | 0.00 | 0.958 |

[^] Significantly different from zero at the .10 to > .05 level.

¹ Impacts are in effect size (standard deviation) units and were calculated by dividing the estimated impact by the standard deviation of the outcome measure for the control group.

² The *p*-value is from a two-tailed *t* test to gauge the statistical significance of the impact estimate.

NOTE: Abbreviations are

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

ADHD: Attention deficit hyperactivity disorder

The +/- signs in parentheses indicate the direction of a beneficial outcome. No findings were found statistically significant below the .05 level. All impact estimates were calculated using regression models, where each program and school within a program was weighted equally. The standard errors of all estimates account for design effects due to unequal weighting and the clustering of students within schools.

SOURCE: The Social and Character Development (SACD) Research Program.

Accounting for the Pairwise Matching of Schools

Under an experimental design where the random assignment of units is conducted within strata, it is customary to account for the stratified design in the analysis by including binary variables of the strata as covariates in the regression models. Under a clustered design, the inclusion of these variables will reduce design effects to the extent that they are correlated with the outcome measures. Stated differently, under stratified designs, intraclass correlations (ICCs) pertain to design effects *within* strata. Thus, stratified sampling will reduce ICCs if mean school outcomes tend to be more similar within strata than across strata.

This procedure, however, cannot be used for a design where random assignment is conducted for units within matched pairs. This is because when pair binary variables and pair-by-treatment interaction terms are included as model covariates, the school-level variance term represents the extent to which mean school outcomes vary *within pairs* and within a research group (Murray 1998). Thus, because there is only one treatment and one control group unit per pair, there are not enough degrees of freedom to estimate the within-pair variance terms.

To account for this problem, the pairs were treated as another HLM level. Specifically, the following three-level HLM model was estimated, where pairs were indexed by p :

$$(8) \begin{array}{ll} \text{Level 1: Students/Teachers:} & Y_{ispd} = \alpha_{0spd} + X_{ispd}\beta + e_{ispd} \\ \text{Level 2: Schools:} & \alpha_{0spd} = \gamma_{0pd} + \gamma_{1pd}T_{spd} + \theta_d G_d + Z_{spd}\delta + u_{spd} \\ \text{Level 3: Pairs:} & \gamma_{0pd} = \lambda_0 + \phi_{pd}; \gamma_{1pd} = \lambda_1 + \tau_{pd} \end{array}$$

In this model, ϕ_{pd} and τ_{pd} are independent and identically distributed $N(0, \sigma_\phi^2)$ and independent and identically distributed $N(0, \sigma_\tau^2)$ pair-level random error terms, respectively. Recursively inserting the Level 2 and 3 equations into the Level 1 equation yields the following unified model:

$$(9) Y_{ispd} = \lambda_0 + \lambda_1 T_{spd} + \theta_d G_d + Z_{spd}\delta + X_{ispd}\beta + [\tau_p T_{spd} + \phi_p + u_{spd} + e_{ispd}]$$

Under this model, the key estimatable component of the variance expression for the impact estimate is (σ_τ^2/P) , where P is the total number of pairs. This variance component signifies the extent to which *impacts* vary across pairs. In contrast, the leading term in the variance expression for the benchmark approach is $(2\sigma_u^2/P)$, which signifies the extent to which *mean outcomes* vary across schools.

It is unclear a priori whether the pairwise matching model will produce more precise impact estimates than the original approach. On the one hand, precision gains could occur if $\sigma_\tau^2 < 2\sigma_u^2$ which will likely be the case as long as there is some correlation between mean outcomes for the treatment and control group schools within the same pairs (that is, if the matching was somewhat “successful”). On the other hand, precision losses will occur due to a reduction in the number of degrees of freedom available for analysis, because there are only half as many pairs as there are schools. Thus, it is an empirical issue as to which approach will yield more precise impact estimates.

Accounting for pairwise matching in the analysis did not change the statistical significance of the estimated impacts with one exception: a detrimental impact was found for Altruistic Behavior (CR) in Year 1 (table B.23).

Table B.23. Combined-program impacts in effect size units when accounting for pairwise matching

| Scale–Report | Year 1 (Spring 2005) | | Year 2 (Spring 2006) | | Year 3 (Spring 2007) | |
|---|-------------------------|--|-------------------------|--|-------------------------|--|
| | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² |
| Social and Emotional Competence Domain | | | | | | |
| Self-Efficacy for Peer Interactions–CR (+) | -0.03 | 0.386 | -0.07 | 0.135 | -0.05 | 0.217 |
| Normative Beliefs About Aggression–CR (-) | 0.00 | 0.951 | 0.00 | 0.957 | 0.01 | 0.876 |
| Empathy–CR (+) | 0.05 | 0.302 | -0.02 | 0.742 | -0.05 | 0.343 |
| Behavior Domain | | | | | | |
| Altruistic Behavior–CR (+) | -0.07* | 0.036 | -0.03 | 0.444 | -0.03 | 0.477 |
| Altruistic Behavior–PCR (+) | 0.05 | 0.118 | -0.03 | 0.420 | -0.06 | 0.157 |
| Altruistic Behavior–TRS (+) | 0.08 | 0.374 | 0.02 | 0.910 | -0.02 | 0.868 |
| Positive Social Behavior–PCR (+) | -0.02 | 0.528 | 0.01 | 0.772 | 0.02 | 0.606 |
| Positive Social Behavior–TRS (+) | 0.01 | 0.709 | -0.03 | 0.618 | 0.05 | 0.470 |
| Problem Behavior–CR (-) | 0.01 | 0.797 | -0.01 | 0.906 | 0.02 | 0.759 |
| Problem Behavior–PCR (+) | -0.01 | 0.814 | -0.02 | 0.602 | -0.05 | 0.371 |
| Problem Behavior–TRS (+) | 0.03 | 0.444 | -0.02 | 0.720 | -0.05 | 0.405 |
| ADHD-Related Behavior–TRS (-) | 0.02 | 0.648 | -0.02 | 0.712 | -0.09 | 0.105 |
| Academics Domain | | | | | | |
| Engagement with Learning–CR (+) | -0.05 [^] | 0.083 | -0.03 | 0.508 | -0.06 | 0.201 |
| Academic Competence and Motivation–TRS (+) | -0.03 | 0.345 | -0.04 | 0.338 | -0.02 | 0.718 |
| Perceptions of School Climate Domain | | | | | | |
| Positive School Orientation–CR (+) | 0.01 | 0.852 | 0.04 | 0.395 | -0.05 | 0.424 |
| Negative School Orientation–CR (-) | -0.03 | 0.303 | -0.07 | 0.192 | -0.03 | 0.543 |
| Student Afraid at School–CR (-) | -0.06 [^] | 0.089 | -0.05 | 0.328 | 0.04 | 0.440 |
| Victimization at School–CR (-) | 0.00 | 0.999 | -0.03 | 0.370 | 0.01 | 0.791 |

* Significantly different from zero at the .05 level.

[^] Significantly different from zero at the .10 to > .05 level.

¹ Impacts are in effect size (standard deviation) units and were calculated by dividing the estimated impact by the standard deviation of the outcome measure for the control group.

² The *p*-value is from a two-tailed *t* test to gauge the statistical significance of the impact estimate.

NOTE: Abbreviations are

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

ADHD: Attention deficit hyperactivity disorder

The +/- signs in parentheses indicate the direction of a beneficial outcome. All impact estimates were calculated using regression models, where each program and school within a program was weighted equally. The standard errors of all estimates account for design effects due to unequal weighting and the clustering of students within schools.

SOURCE: The Social and Character Development (SACD) Research Program.

Treating Pretest Measures as Dependent Variables

In the original model, initial measures of the outcomes were included as covariates in the regression models. An alternative approach was to treat these pretests as dependent variables. This approach was implemented in two ways using Year 1 and Year 2 data. First, models were estimated where the dependent variable was defined as the *difference* between posttest and pretest scores (that is, *gain* scores), which yields a difference-in-difference estimator.¹² Second, the pretest and posttest scores were stacked as separate observations and the model included time-by-treatment interaction terms as covariates as shown here:

$$(10) \quad Y_{isd} = \gamma_0 + \gamma_1 T_{sd} + \gamma_2 Post + \gamma_3 Post * T_{sd} + X_{isd} \beta + \theta_d + Z_{sd} \delta + [u_{sd} + Post * \eta_{sd} + e_{isd}]$$

where

- Y_{isd} is an outcome measure for student (or teacher) i ;
- X_{isd} are student-level (or teacher-level) baseline covariates;
- T_{sd} is a binary variable equal to 1 for treatment group schools and 0 for control group schools;
- θ_d are site-specific fixed effects;
- Z_{sd} are school-level baseline covariates;¹³
- $Post$ is a binary variable that equals 1 for the posttest observations and 0 for the pretest observations;
- β , γ_0 , γ_1 , γ_2 , γ_3 , and δ are fixed parameter vectors to be estimated; and
- e_{isd} are independent and identically distributed $N(0, \sigma_e^2)$ student-level (or teacher-level) random error terms.

Furthermore, u_{sd} and η_{sd} are independent and identically distributed $N(0, \sigma_u^2)$ and $N(0, \sigma_\eta^2)$ school-level random error terms, respectively, that capture the correlations between the outcomes of students in the same schools and time periods and that are distributed independently of the student-level (or teacher-level) error terms. In this formulation, the estimate of γ_3 is the difference-in-difference impact estimate, and the leading term in the variance expression for the impact estimate is a function of σ_η^2 , which signifies the extent to which gain scores vary across schools within programs.

For each estimation approach, the new entrants were excluded from the analysis sample because of missing pretest scores.¹⁴ Thus, the models were estimated using only original cohort members.

In the original model, none of the 36 estimated impacts was found to be significant. The treatment of the pretests as dependent variables rather than as covariates gave similar results with two exceptions. When using the gain score as the dependent variable, a statistically significant beneficial impact was found for Negative School Orientation (in Year 2 with an effect size of -0.15) and Student Afraid at School (in Year 1 with an effect size of 0.09) (table B.24). When using pretests and posttests as dependent variables, a beneficial impact on Negative School Orientation was found in Year 2 (effect size of -0.16) and on Student Afraid at School in Year 1 (effect size of 0.10) (table B.25).

¹² In these models, the pretests were excluded from the model covariates, although other covariates remained the same as in the benchmark models.

¹³ For teacher-level outcomes, the Z variables included teacher-level baseline covariates. Although the initial model specified the use of school-level covariates, none were used in the empirical estimation.

¹⁴ Using the mean-imputed pretests for the new entrants would yield standard errors that are biased downward.

Appendix B: Technical Notes

Table B.24. Combined-program impacts in effect size units when dependent variable is the pretest-posttest difference (gain score)

| Scale–Report | Year 1 (Spring 2005) | | Year 2 (Spring 2006) | |
|---|-------------------------|--|-------------------------|--|
| | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² |
| Social and Emotional Competence Domain | | | | |
| Self-Efficacy for Peer Interactions–CR (+) | 0.01 | 0.883 | -0.04 | 0.342 |
| Normative Beliefs About Aggression–CR (-) | 0.02 | 0.628 | 0.01 | 0.864 |
| Empathy–CR (+) | 0.03 | 0.663 | -0.01 | 0.805 |
| Behavior Domain | | | | |
| Altruistic Behavior–CR (+) | -0.09 [^] | 0.057 | -0.04 | 0.482 |
| Altruistic Behavior–PCR (+) | 0.04 | 0.356 | -0.04 | 0.430 |
| Altruistic Behavior–TRS (+) | 0.08 | 0.585 | -0.08 | 0.603 |
| Positive Social Behavior–PCR (+) | -0.02 | 0.569 | 0.03 | 0.546 |
| Positive Social Behavior–TRS (+) | -0.03 | 0.599 | -0.08 | 0.360 |
| Problem Behavior–CR (-) | 0.03 | 0.605 | -0.03 | 0.587 |
| Problem Behavior–PCR (+) | 0.01 | 0.882 | 0.01 | 0.872 |
| Problem Behavior–TRS (+) | 0.08 | 0.249 | 0.00 | 0.998 |
| ADHD-Related Behavior–TRS (-) | 0.06 | 0.320 | 0.00 | 0.989 |
| Academics Domain | | | | |
| Engagement with Learning–CR (+) | -0.03 | 0.444 | 0.03 | 0.539 |
| Academic Competence and Motivation–TRS (+) | -0.04 | 0.470 | -0.04 | 0.540 |
| Perceptions of School Climate Domain | | | | |
| Positive School Orientation–CR (+) | 0.00 | 0.989 | 0.07 | 0.239 |
| Negative School Orientation–CR (-) | -0.06 | 0.126 | -0.15* | 0.007 |
| Student Afraid at School–CR (-) | -0.09* | 0.028 | -0.04 | 0.433 |
| Victimization at School–CR (-) | 0.00 | 0.973 | -0.02 | 0.639 |

* Significantly different from zero at the .05 level.

[^] Significantly different from zero at the .10 to > .05 level.

¹ Impacts are in effect size (standard deviation) units and were calculated by dividing the estimated impact by the standard deviation of the outcome measure for the control group.

² The *p*-value is from a two-tailed *t* test to gauge the statistical significance of the impact estimate.

NOTE: Abbreviations are

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

ADHD: Attention deficit hyperactivity disorder

The +/- signs in parentheses indicate the direction of a beneficial outcome. All impact estimates were calculated using regression models, where each program and school within a program was weighted equally. The standard errors of all estimates account for design effects due to unequal weighting and the clustering of students within schools.

SOURCE: The Social and Character Development (SACD) Research Program.

Table B.25. Combined-program impacts in effect size units when posttest and pretest are treated as separate dependent variables

| Scale–Report | Year 1 (Spring 2005) | | Year 2 (Spring 2006) | |
|---|-------------------------|---|-------------------------|---|
| | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² |
| Social and Emotional Competence Domain | | | | |
| Self-Efficacy for Peer Interactions–CR (+) | 0.01 | 0.818 | -0.04 | 0.417 |
| Normative Beliefs About Aggression–CR (-) | 0.03 | 0.486 | 0.02 | 0.799 |
| Empathy–CR (+) | 0.02 | 0.708 | -0.03 | 0.654 |
| Behavior Domain | | | | |
| Altruistic Behavior–CR (+) | -0.09 [^] | 0.062 | -0.07 | 0.341 |
| Altruistic Behavior–PCR (+) | 0.03 | 0.567 | -0.04 | 0.461 |
| Altruistic Behavior–TRS (+) | 0.07 | 0.607 | -0.09 | 0.627 |
| Positive Social Behavior–PCR (+) | -0.03 | 0.544 | 0.02 | 0.598 |
| Positive Social Behavior–TRS (+) | -0.02 | 0.645 | -0.08 | 0.369 |
| Problem Behavior–CR (-) | 0.03 | 0.521 | -0.02 | 0.786 |
| Problem Behavior–PCR (+) | 0.01 | 0.785 | 0.02 | 0.715 |
| Problem Behavior–TRS (+) | 0.04 | 0.345 | 0.01 | 0.912 |
| ADHD-Related Behavior–TRS (-) | 0.04 | 0.390 | 0.00 | 0.988 |
| Academics Domain | | | | |
| Engagement with Learning–CR (+) | -0.05 | 0.419 | 0.01 | 0.843 |
| Academic Competence and Motivation–TRS (+) | -0.01 | 0.683 | -0.03 | 0.535 |
| Perceptions of School Climate Domain | | | | |
| Positive School Orientation–CR (+) | -0.01 | 0.827 | 0.07 | 0.311 |
| Negative School Orientation–CR (-) | -0.06 | 0.238 | -0.16 [*] | 0.024 |
| Student Afraid at School–CR (-) | -0.10 [*] | 0.043 | -0.05 | 0.394 |
| Victimization at School–CR (-) | 0.00 | 0.944 | -0.02 | 0.692 |

* Significantly different from zero at the .05 level.

[^] Significantly different from zero at the .10 to > .05 level.

¹ Impacts are in effect size (standard deviation) units and were calculated by dividing the estimated impact by the standard deviation of the outcome measure for the control group.

² The *p*-value is from a two-tailed *t* test to gauge the statistical significance of the impact estimate.

NOTE: Abbreviations are

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

ADHD: Attention deficit hyperactivity disorder

The +/- signs in parentheses indicate the direction of a beneficial outcome. All impact estimates were calculated using regression models, where each program and school within a program was weighted equally. The standard errors of all estimates account for design effects due to unequal weighting and the clustering of students within schools.

SOURCE: The Social and Character Development (SACD) Research Program.

Using Alternative Software Packages

The original models were estimated using the PROC MIXED procedure in SAS. To check the sensitivity of the results, the impacts were estimated using alternative statistical packages—SUDAAN PROC REGRESS and HLM6—that account for clustering effects in slightly different ways than SAS PROC MIXED. SAS PROC MIXED uses a maximum-likelihood approach to general linear mixed models, whereas the SUDAAN procedure is based on the Taylor-series linearization method, combined with variance estimation formulas specific to the sample design. Similar to SAS PROC MIXED, HLM6 uses a restricted maximum likelihood approach to estimate the parameters, but HLM6 uses the Expectation-Maximization algorithm to obtain the estimates, whereas SAS PROC MIXED uses a ridge-stabilized Newton-Raphson algorithm.

The three statistical packages produced similar impact and standard error estimates (table B.26) with one exception. When SUDAAN was used, the estimate for Altruistic Behavior (Primary Caregiver Report) showed a beneficial statistically significant effect in Year 1 (with an effect size of 0.07).

Appendix B: Technical Notes

Table B.26. Combined-program impacts in effect size units when using different statistical software packages

| Scale–Report | Year 1 (Spring 2005) | | | | Year 2 (Spring 2006) | | | |
|---|-------------------------|--|---------------------|--|-------------------------|--|---------------------|--|
| | SUDAAN | | HLM6 | | SUDAAN | | HLM6 | |
| | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² |
| Social and Emotional Competence Domain | | | | | | | | |
| Self-Efficacy for Peer Interactions–CR (+) | -0.02 | 0.518 | -0.04 | 0.291 | -0.07 [^] | 0.084 | -0.06 | 0.209 |
| Normative Beliefs About Aggression–CR (-) | -0.01 | 0.875 | 0.01 | 0.896 | -0.03 | 0.603 | 0.03 | 0.624 |
| Empathy–CR (+) | 0.06 | 0.148 | 0.05 | 0.223 | -0.02 | 0.729 | -0.01 | 0.779 |
| Behavior Domain | | | | | | | | |
| Altruistic Behavior–CR (+) | -0.06 [^] | 0.092 | -0.06 | 0.105 | -0.06 | 0.144 | -0.03 | 0.430 |
| Altruistic Behavior–PCR (+) | 0.07 [*] | 0.037 | 0.05 | 0.213 | 0.00 | 0.963 | -0.02 | 0.605 |
| Altruistic Behavior–TRS (+) | 0.08 | 0.288 | 0.08 | 0.480 | 0.06 | 0.629 | -0.09 | 0.617 |
| Positive Social Behavior–PCR (+) | -0.01 | 0.707 | 0.00 | 0.901 | 0.04 | 0.178 | 0.01 | 0.787 |
| Positive Social Behavior–TRS (+) | 0.02 | 0.625 | 0.01 | 0.812 | -0.02 | 0.728 | -0.03 | 0.691 |
| Problem Behavior–CR (-) | 0.01 | 0.872 | 0.04 | 0.436 | -0.01 | 0.893 | 0.02 | 0.756 |
| Problem Behavior–PCR (+) | 0.00 | 0.940 | -0.04 | 0.308 | -0.03 | 0.300 | -0.02 | 0.633 |
| Problem Behavior–TRS (+) | 0.02 | 0.572 | 0.02 | 0.662 | -0.01 | 0.800 | -0.03 | 0.543 |
| ADHD-Related Behavior–TRS (-) | 0.00 | 0.942 | 0.02 | 0.696 | -0.02 | 0.497 | -0.02 | 0.768 |
| Academics Domain | | | | | | | | |
| Engagement with Learning–CR (+) | -0.04 | 0.182 | -0.07 [^] | 0.053 | -0.03 | 0.400 | -0.03 | 0.521 |
| Academic Competence and Motivation–TRS (+) | -0.02 | 0.365 | -0.08 [^] | 0.053 | -0.02 | 0.498 | -0.05 | 0.282 |

See notes at end of table.

Table B.26. Combined-program impacts in effect size units when using different statistical software packages—Continued

| Scale–Report | Year 1 (Spring 2005) | | | | Year 2 (Spring 2006) | | | |
|--------------------------------------|-------------------------|--|---------------------|--|-------------------------|--|---------------------|--|
| | SUDAAN | | HLM6 | | SUDAAN | | HLM6 | |
| | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² |
| Perceptions of School Climate Domain | | | | | | | | |
| Positive School Orientation–CR (+) | 0.03 | 0.467 | 0.00 | 0.973 | 0.05 | 0.432 | 0.03 | 0.703 |
| Negative School Orientation–CR (-) | -0.05 | 0.127 | -0.01 | 0.869 | -0.04 | 0.344 | -0.06 | 0.364 |
| Student Afraid at School–CR (-) | -0.06 | 0.127 | -0.04 | 0.391 | -0.06 | 0.166 | -0.04 | 0.500 |
| Victimization at School–CR (-) | -0.01 | 0.765 | 0.02 | 0.648 | -0.04 | 0.370 | -0.03 | 0.506 |

* Significantly different from zero at the .05 level.

^ Significantly different from zero at the .10 to > .05 level.

¹ Impacts are in effect size (standard deviation) units and were calculated by dividing the estimated impact by the standard deviation of the outcome measure for the control group.

² The *p*-value is from a two-tailed *t* test to gauge the statistical significance of the impact estimate.

NOTE: Abbreviations are

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

ADHD: Attention deficit hyperactivity disorder

The +/- signs in parentheses indicate the direction of a beneficial outcome. All impact estimates were calculated using regression models, where each program and school within a program was weighted equally. The standard errors of all estimates account for design effects due to unequal weighting and the clustering of students within schools.

SOURCE: The Social and Character Development (SACD) Research Program.

Imputing Missing Outcomes

In the original models, missing outcome data were not imputed for (1) study nonconsenters, (2) survey nonrespondents, and (3) survey respondents who did not provide enough information to construct the outcomes. Instead, adjustments for missing outcome data were made using sample weights so that the impact estimates could be generalized to the full sample universe (and not just to survey respondents).

As a sensitivity test, models were estimated with imputed outcome data. Nearly all students with missing data were study nonconsenters for whom baseline data were not available. Thus, imputation methods that used covariates as predictor variables could not be used. Instead, missing outcome data were imputed using a hotdeck imputation procedure (Rubin 1987), where a missing value for a child was replaced by a nonmissing value for a randomly selected child in the same classroom. Five imputed data sets were generated and estimated impacts (I_i) and variances (V_i) were made for each one. The overall impact estimates were calculated as the average of the five impact estimates. Variances of the estimated impacts were obtained using the following formula:

$$(11) \quad \bar{V} + \left(1 + \frac{1}{m}\right)B$$

where \bar{V} is the average of the V_i s across the five data sets, $m = 5$ is the number of imputed data sets, and B is the following between-imputation variance estimate:

$$(12) \quad B = \frac{1}{m-1} \sum_{i=1}^m (I_i - \bar{I})^2$$

Because child-level covariates were not available for study nonconsenters, the regression models were estimated without covariates, except for program-level binary variables.

As with the original impact estimates, no significant impacts were found when using the multiple imputation approach (table B.27).

Table B.27. Combined-program impacts in effect size units when using imputation procedures for missing outcome data

| Scale–Report | Year 1 (Spring 2005) | | Year 2 (Spring 2006) | |
|---|-------------------------|--|-------------------------|--|
| | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² |
| Social and Emotional Competence Domain | | | | |
| Self-Efficacy for Peer Interactions–CR (+) | -0.05 | 0.293 | -0.06 | 0.296 |
| Normative Beliefs About Aggression–CR (-) | -0.01 | 0.883 | -0.02 | 0.733 |
| Empathy–CR (+) | 0.06 | 0.375 | -0.04 | 0.543 |
| Behavior Domain | | | | |
| Altruistic Behavior–CR (+) | -0.06 | 0.307 | -0.07 | 0.274 |
| Altruistic Behavior–PCR (+) | 0.06 | 0.305 | -0.01 | 0.831 |
| Altruistic Behavior–TRS (+) | 0.12 | 0.278 | 0.05 | 0.722 |
| Positive Social Behavior–PCR (+) | -0.01 | 0.891 | 0.01 | 0.859 |
| Positive Social Behavior–TRS (+) | 0.01 | 0.868 | -0.06 | 0.530 |
| Problem Behavior–CR (-) | 0.03 | 0.697 | 0.02 | 0.803 |
| Problem Behavior–PCR (+) | -0.05 | 0.428 | -0.06 | 0.248 |
| Problem Behavior–TRS (+) | 0.03 | 0.724 | 0.01 | 0.913 |
| ADHD-Related Behavior–TRS (-) | 0.01 | 0.831 | -0.02 | 0.743 |
| Academics Domain | | | | |
| Engagement with Learning–CR (+) | -0.06 | 0.236 | -0.05 | 0.265 |
| Academic Competence and Motivation–TRS (+) | -0.05 | 0.440 | -0.08 | 0.211 |
| Perceptions of School Climate Domain | | | | |
| Positive School Orientation–CR (+) | 0.00 | 0.981 | 0.02 | 0.821 |
| Negative School Orientation–CR (-) | -0.02 | 0.788 | 0.00 | 0.954 |
| Student Afraid at School–CR (-) | -0.04 | 0.549 | -0.05 | 0.511 |
| Victimization at School–CR (-) | -0.02 | 0.661 | -0.06 | 0.279 |

¹ Impacts are in effect size (standard deviation) units and were calculated by dividing the estimated impact by the standard deviation of the outcome measure for the control group.

² The *p*-value is from a two-tailed *t* test to gauge the statistical significance of the impact estimate.

NOTE: Abbreviations are

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

ADHD: Attention deficit hyperactivity disorder

The +/- signs in parentheses indicate the direction of a beneficial outcome. No findings were found statistically significant at or below the .05 level. All impact estimates were calculated using regression models, where each program and school within a program was weighted equally. The standard errors of all estimates account for design effects due to unequal weighting and the clustering of students within schools.

SOURCE: The Social and Character Development (SACD) Research Program.

Averaging Program-Level Impact Estimates

An alternative approach for estimating combined-program impacts was to calculate the simple average of the seven program-specific impact estimates. This procedure was done in two ways. First, the seven program-by-treatment interaction terms (that is, $\theta_p * T_{ip}$ terms) were added as covariates to the original combined-program model, and the treatment status binary variable was excluded from the model. In this formulation, the parameter estimate on a specific program-by-treatment interaction term was the impact estimate for that program. Using this approach, the combined-program impact estimate was calculated as the simple average of the parameter estimates on the seven interaction terms, and the associated standard error (SE) was calculated using the following formula:

$$(13) \quad SE(\text{site average}) = \frac{1}{7} \sqrt{\sum_{p=1}^7 V_p + 2 \sum_{j=1}^7 \sum_{k>j}^7 C_{jk}}$$

where V_p is the estimated variance of the impact in program p and C_{jk} is the estimated covariance between the impacts in programs j and k .

In the second approach, combined-program impact estimates were calculated by averaging the impact estimates from the HLM models that were estimated *separately* by program. Equation (13) was used to calculate the standard errors with C_{jk} set to 0 (because observations were independent across programs). This approach differed slightly from the first approach for several reasons. First, a different set of baseline covariates was used for each program-specific model, whereas a common covariate set was used in the pooled model. Second, in the pooled model, a single (average) clustering effect was applied to all programs, whereas, in the program-specific models, the clustering effects were allowed to vary across programs.

As table B.28 shows, the combined-program impact estimates from these two approaches in which program-specific impact estimates were calculated directly and then averaged were very similar to the original results that relied on weights to give each program equal weight in the analysis. The only difference was that a beneficial significant impact (effect size of 0.07) was found for Positive Social Behavior (PCR) in Year 2 when using the average of the estimates from the seven program-level models.

Table B.28. Combined-program impacts in effect size units using averages of program-specific impacts

| | Year 1 (Spring 2005) | | | | Year 2 (Spring 2006) | | | |
|---|-------------------------|-----------------------------------|-----------------------------|-----------------------------------|-------------------------|-----------------------------------|-----------------------------|-----------------------------------|
| | Program by treatment | | Seven separate estimates | | Program by treatment | | Seven separate estimates | |
| | Impact ¹ | p-value of impact ² | Impact ¹ | p-value of impact ² | Impact ¹ | p-value of impact ² | Impact ¹ | p-value of impact ² |
| Scale-Report | | | | | | | | |
| Social and Emotional Competence Domain | | | | | | | | |
| Self-Efficacy for Peer Interactions-CR (+) | -0.02 | 0.543 | -0.01 | 0.717 | -0.07 | 0.107 | -0.06 | 0.145 |
| Normative Beliefs About Aggression-CR (-) | -0.01 | 0.871 | -0.01 | 0.754 | -0.02 | 0.748 | -0.01 | 0.535 |
| Empathy-CR (+) | 0.06 | 0.176 | 0.07 | 0.150 | -0.02 | 0.721 | -0.02 | 0.596 |
| Behavior Domain | | | | | | | | |
| Altruistic Behavior-CR (+) | -0.06 | 0.107 | -0.07 [^] | 0.057 | -0.06 | 0.193 | -0.08 | 0.100 |
| Altruistic Behavior-PCR (+) | 0.07 [^] | 0.058 | 0.07 [^] | 0.095 | 0.00 | 0.965 | -0.01 | 0.810 |
| Altruistic Behavior-TRS (+) | 0.08 | 0.378 | 0.07 | 0.460 | 0.02 | 0.902 | 0.06 | 0.868 |
| Positive Social Behavior-PCR (+) | -0.01 | 0.725 | -0.01 | 0.774 | 0.05 | 0.177 | 0.07 [*] | 0.037 |
| Positive Social Behavior-TRS (+) | 0.01 | 0.709 | 0.01 | 0.860 | -0.02 | 0.768 | 0.00 | 0.957 |
| Problem Behavior-CR (-) | 0.01 | 0.892 | 0.01 | 0.886 | 0.00 | 0.998 | 0.02 | 0.879 |
| Problem Behavior-PCR (+) | 0.00 | 0.930 | 0.01 | 0.811 | -0.03 | 0.341 | -0.04 | 0.271 |
| Problem Behavior-TRS (+) | 0.02 | 0.607 | 0.03 | 0.545 | -0.01 | 0.782 | -0.02 | 0.513 |
| ADHD-Related Behavior-TRS (-) | 0.00 | 0.958 | 0.00 | 0.970 | -0.03 | 0.508 | -0.05 | 0.416 |
| Academics Domain | | | | | | | | |
| Engagement with Learning-CR (+) | -0.04 | 0.217 | -0.04 | 0.345 | -0.03 | 0.490 | -0.03 | 0.555 |
| Academic Competence and Motivation-TRS (+) | -0.02 | 0.433 | -0.02 | 0.448 | -0.02 | 0.653 | 0.01 | 0.835 |

See notes at end of table.

Table B.28. Combined-program impacts in effect size units using averages of program-specific impacts—Continued

| | Year 1 (Spring 2005) | | | | Year 2 (Spring 2006) | | | |
|--------------------------------------|-------------------------|--|--------------------------|--|-------------------------|--|--------------------------|--|
| | Program by treatment | | Seven separate estimates | | Program by treatment | | Seven separate estimates | |
| | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² |
| Scale–Report | | | | | | | | |
| Perceptions of School Climate Domain | | | | | | | | |
| Positive School Orientation–CR (+) | 0.03 | 0.586 | 0.04 | 0.438 | 0.03 | 0.735 | 0.03 | 0.695 |
| Negative School Orientation–CR (-) | -0.05 | 0.167 | -0.05 | 0.209 | -0.03 | 0.503 | -0.02 | 0.653 |
| Student Afraid at School–CR (-) | -0.06 | 0.171 | -0.06 | 0.140 | -0.06 | 0.218 | -0.09 | 0.101 |
| Victimization at School–CR (-) | -0.01 | 0.793 | -0.01 | 0.763 | -0.04 | 0.431 | -0.02 | 0.639 |

* Significantly different from zero at the .05 level.

^ Significantly different from zero at the .10 to > .05 level.

¹ Impacts are in effect size (standard deviation) units and were calculated by dividing the estimated impact by the standard deviation of the outcome measure for the control group.

² The *p*-value is from a two-tailed *t* test to gauge the statistical significance of the impact estimate.

NOTE: Abbreviations are

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

ADHD: Attention deficit hyperactivity disorder

The +/- signs in parentheses indicate the direction of a beneficial outcome. All impact estimates were calculated using regression models, where each program and school within a program was weighted equally. The standard errors of all estimates account for design effects due to unequal weighting and the clustering of students within schools.

SOURCE: The Social and Character Development (SACD) Research Program.

Excluding New Entrants

About 7.5 percent of children in the spring 2005 follow-up sample were new entrants who enrolled in the study schools after fall 2004. For several reasons, the inclusion of these children in the analysis sample could have affected the impact estimates. First, new entrants were exposed to the SACD interventions for a shorter period than were original cohort children, which could have depressed the impact estimates. Second, new entrants may have had different characteristics than did original cohort members, which could have led to different program effects across the two groups. For example, the description of consent rates in chapter 1 showed that new entrants had lower consent rates (and percentages of the sample with data) than did original cohort members, potentially reflecting such differences. Third, the new entrants in the treatment schools could have differed from those in the control schools if the SACD interventions had an effect on school entry.¹⁵ Finally, the imputation of baseline pretest scores for the new entrants (based on mean pretest scores of original cohort members in the same class) could have influenced the impact estimates.

As a sensitivity test, models were estimated that excluded new entrants from the analysis sample using Year 1 and Year 2 data. As with the original impact estimates, no significant impacts were found when new entrants were excluded (table B.29).

For Years 2 and 3, the numbers of new entrants grew large enough to do separate analyses of new entrants and original members of the sample. These analyses are discussed in chapter 1 as part of the subgroup analyses. They include the finding of no significant impacts on the 18 outcomes for either group and the finding of no significant differences between the impacts on the new entrants versus the original cohort members.

¹⁵ Similarly, the original cohort *stayers* in the treatment and control group schools could differ if the interventions had an effect on school exit rates.

Table B.29. Combined-program impacts in effect size units when excluding new entrants

| Scale–Report | Year 1 (Spring 2005) | | Year 2 (Spring 2006) | |
|---|-------------------------|--|-------------------------|--|
| | Impact ¹ | <i>p</i> -value of impact ² | Impact ¹ | <i>p</i> -value of impact ² |
| Social and Emotional Competence Domain | | | | |
| Self-Efficacy for Peer Interactions–CR (+) | -0.06 | 0.139 | -0.06 | 0.176 |
| Normative Beliefs About Aggression–CR (-) | 0.00 | 0.908 | 0.00 | 0.996 |
| Empathy–CR (+) | 0.06 | 0.260 | -0.01 | 0.798 |
| Behavior Domain | | | | |
| Altruistic Behavior–CR (+) | -0.07 [^] | 0.080 | -0.03 | 0.516 |
| Altruistic Behavior–PCR (+) | 0.05 | 0.184 | -0.01 | 0.807 |
| Altruistic Behavior–TRS (+) | 0.14 | 0.204 | 0.02 | 0.903 |
| Positive Social Behavior–PCR (+) | -0.02 | 0.620 | 0.01 | 0.813 |
| Positive Social Behavior–TRS (+) | 0.01 | 0.822 | -0.03 | 0.651 |
| Problem Behavior–CR (-) | 0.01 | 0.887 | -0.02 | 0.759 |
| Problem Behavior–PCR (+) | -0.04 | 0.411 | -0.05 | 0.244 |
| Problem Behavior–TRS (+) | 0.03 | 0.438 | -0.03 | 0.534 |
| ADHD-Related Behavior–TRS (-) | 0.02 | 0.721 | -0.03 | 0.590 |
| Academics Domain | | | | |
| Engagement with Learning–CR (+) | -0.08 [^] | 0.064 | -0.03 | 0.533 |
| Academic Competence and Motivation–TRS (+) | -0.07 | 0.108 | -0.07 | 0.170 |
| Perceptions of School Climate Domain | | | | |
| Positive School Orientation–CR (+) | 0.01 | 0.927 | 0.05 | 0.561 |
| Negative School Orientation–CR (-) | -0.01 | 0.805 | -0.05 | 0.432 |
| Student Afraid at School–CR (-) | -0.06 | 0.167 | -0.05 | 0.359 |
| Victimization at School–CR (-) | -0.01 | 0.879 | -0.05 | 0.353 |

[^] Significantly different from zero at the .10 to > .05 level.

¹ Impacts are in effect size (standard deviation) units and were calculated by dividing the estimated impact by the standard deviation of the outcome measure for the control group.

² The *p*-value is from a two-tailed *t* test to gauge the statistical significance of the impact estimate.

NOTE: Abbreviations are

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

ADHD: Attention deficit hyperactivity disorder

The ± signs in parentheses indicate the direction of a beneficial outcome. No findings were found statistically significant at or below the .05 level. All impact estimates were calculated using regression models, where each program and school within a program was weighted equally. The standard errors of all estimates account for design effects due to unequal weighting and the clustering of students within schools.

SOURCE: The Social and Character Development (SACD) Research Program.

Including Restricted Sets of Covariates in the Regression Models

Two sets of regression models were estimated using restricted sets of covariates. In the first set, the covariates included only the pretest of the outcome measure. In the second set, the covariates included only the child and primary caregiver demographic measures (listed in the first section of this appendix). As with the original impact estimates, no significant impacts were found when using the restricted sets of covariates (table B.30).

Table B.30. Combined-program impacts in effect size units using restricted sets of covariates (pretest of outcomes only and child and primary caregiver demographic measures only)

| Scale–Report | Year 1 (Spring 2005) | | | | Year 2 (Spring 2006) | | | |
|---|---|-----------------------------------|--|-----------------------------------|---|-----------------------------------|--|-----------------------------------|
| | Covariates for pretest of outcomes only | | Covariates for child and primary caregiver | | Covariates for pretest of outcomes only | | Covariates for child and primary caregiver | |
| | Impact ¹ | p-value of impact ² | Impact ¹ | p-value of impact ² | Impact ¹ | p-value of impact ² | Impact ¹ | p-value of impact ² |
| Social and Emotional Competence Domain | | | | | | | | |
| Self-Efficacy for Peer Interactions–CR (+) | -0.02 | 0.520 | -0.05 | 0.240 | -0.06 | 0.155 | -0.08 [^] | 0.082 |
| Normative Beliefs About Aggression–CR (-) | 0.00 | 0.911 | -0.02 | 0.549 | -0.01 | 0.919 | -0.02 | 0.656 |
| Empathy–CR (+) | 0.06 | 0.271 | 0.07 | 0.144 | -0.03 | 0.589 | -0.03 | 0.625 |
| Behavior Domain | | | | | | | | |
| Altruistic Behavior–CR (+) | -0.07 | 0.103 | -0.07 | 0.125 | -0.07 | 0.125 | -0.07 | 0.122 |
| Altruistic Behavior–PCR (+) | 0.06 | 0.148 | 0.04 | 0.307 | 0.01 | 0.866 | 0.00 | 0.919 |
| Altruistic Behavior–TRS (+) | 0.07 | 0.424 | 0.13 | 0.236 | 0.01 | 0.964 | 0.02 | 0.914 |
| Positive Social Behavior–PCR (+) | -0.01 | 0.745 | 0.01 | 0.893 | 0.05 | 0.230 | 0.06 | 0.219 |
| Positive Social Behavior–TRS (+) | 0.01 | 0.864 | 0.04 | 0.568 | -0.05 | 0.517 | -0.03 | 0.719 |
| Problem Behavior–CR (-) | 0.01 | 0.788 | 0.00 | 0.938 | 0.01 | 0.848 | 0.00 | 0.966 |
| Problem Behavior–PCR (+) | 0.01 | 0.825 | -0.04 | 0.431 | -0.03 | 0.470 | -0.08 [^] | 0.062 |
| Problem Behavior–TRS (+) | 0.03 | 0.593 | 0.00 | 0.948 | 0.00 | 0.937 | -0.02 | 0.765 |
| ADHD-Related Behavior–TRS (-) | 0.00 | 0.917 | 0.00 | 0.933 | -0.02 | 0.664 | -0.04 | 0.661 |
| Academics Domain | | | | | | | | |
| Engagement with Learning–CR (+) | -0.04 | 0.267 | -0.05 | 0.194 | -0.03 | 0.363 | -0.04 | 0.246 |
| Academic Competence and Motivation–TRS (+) | -0.01 | 0.597 | -0.04 | 0.440 | -0.02 | 0.701 | -0.05 | 0.340 |

See notes at end of table.

Table B.30. Combined-program impacts in effect size units using restricted sets of covariates (pretest of outcomes only and child and primary caregiver demographic measures only)—Continued

| | Year 1 (Spring 2005) | | | | Year 2 (Spring 2006) | | | |
|--------------------------------------|---|-----------------------------------|--|-----------------------------------|---|-----------------------------------|--|-----------------------------------|
| | Covariates for pretest of outcomes only | | Covariates for child and primary caregiver | | Covariates for pretest of outcomes only | | Covariates for child and primary caregiver | |
| | Impact ¹ | p-value of impact ² | Impact ¹ | p-value of impact ² | Impact ¹ | p-value of impact ² | Impact ¹ | p-value of impact ² |
| Scale-Report | | | | | | | | |
| Perceptions of School Climate Domain | | | | | | | | |
| Positive School Orientation-CR (+) | 0.02 | 0.747 | 0.02 | 0.772 | 0.02 | 0.824 | 0.01 | 0.887 |
| Negative School Orientation-CR (-) | -0.05 | 0.354 | -0.04 | 0.496 | -0.02 | 0.729 | -0.01 | 0.868 |
| Student Afraid at School-CR (-) | -0.05 | 0.258 | -0.04 | 0.397 | -0.05 | 0.424 | -0.05 | 0.394 |
| Victimization at School-CR (-) | -0.02 | 0.609 | -0.03 | 0.593 | -0.04 | 0.420 | -0.05 | 0.389 |

[^] Significantly different from zero at the .10 to > .05 level.

¹ Impacts are in effect size (standard deviation) units and were calculated by dividing the estimated impact by the standard deviation of the outcome measure for the control group.

² The p-value is from a two-tailed t test to gauge the statistical significance of the impact estimate.

NOTE: Abbreviations are

CR: Child Report

PCR: Primary Caregiver Report

TRS: Teacher Report on Student

ADHD: Attention deficit hyperactivity disorder

The +/- signs in parentheses indicate the direction of a beneficial outcome. No findings were found statistically significant below the .05 level. All impact estimates were calculated using regression models, where each program and school within a program was weighted equally. The standard errors of all estimates account for design effects due to unequal weighting and the clustering of students within schools.

SOURCE: The Social and Character Development (SACD) Research Program.