About the Developmental Studies Center

Our Mission

Developmental Studies Center (DSC) is a nonprofit organization dedicated to children's academic, ethical, and social development. Since 1980, DSC has developed school-based and after-school programs that help children develop capacities to think deeply and critically so they will continue learning throughout their lives and strengthen their commitment to such values as kindness, helpfulness, personal responsibility, and respect for others.

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Making Meaning® • Grades K–8

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The SIPPS program teaches decoding systematically. It is designed specifically for intervention and covers single-syllable decoding, short vowels, simple consonants, complex vowels, consonant digraphs, polysyllabic strategies, and high-frequency sight words.

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Effects of an Elementary School Intervention on Students' "Connectedness" to School and Social Adjustment During Middle School

Victor Battistich
Developmental Studies Center

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Effects of an Elementary School Intervention on Students' "Connectedness" to School and Social Adjustment During Middle School

The Child Development Project (CDP) is a comprehensive, whole-school intervention program that seeks to foster students' social, ethical, and intellectual development through helping elementary schools to become *caring communities of learners*—environments that are characterized by caring and supportive relationships and collaboration among and between students, staff, and parents; a sense of common purpose and a clear commitment to salient norms and values of caring, justice, responsibility, and learning; responsiveness to students' developmental and sociocultural needs; an accessible, meaningful and engaging curriculum; and opportunities for students to meaningfully participate in decision-making and otherwise be actively involved in the intellectual and social life of the classroom and school. The program's theoretical rationale, approach, and practices have been extensively described elsewhere (see: Battistich, Schaps, Solomon, & Watson, 1991; Battistich, Solomon, Watson, & Schaps, 1997; Watson, Solomon, Battistich, Schaps, & Solomon, 1989). In brief, in order to create a social context that can be characterized as a caring community of learners, CDP has incorporated a variety of elements into a coherent, comprehensive program for elementary schools. These include an intensive classroom program (involving three major elements: cooperative learning, a literature-based language arts curriculum, and "developmental discipline," an approach to classroom management that emphasizes the development of students' self-control and personal responsibility), a schoolwide component, and a family involvement component. CDP is an ecological intervention (Bronfenbrenner, 1977) that influences all aspects of the school—curriculum, pedagogy, organization, management, and climate.

As a preventive intervention, CDP differs from most current programs in a number of ways. In particular, consistent with the conception of "resilience education" (Brown, 2001), CDP's emphasis is on the promotion of positive development among all children and youth, rather than on the prevention of disorder among those deemed at risk. CDP thus is a broader and more basic approach to primary prevention than risk-driven programs that concentrate on preventing disorder. Although the potential benefits of promoting positive development among all youth, not just those with identified risk factors, has been recognized by others in the prevention field (e.g., Albee, 1996; Cowen, 1994; Hawkins & Catalano, 1990), it has received far less consideration than the risk-reduction, prevention of disorder model (see: Coie et al., 1993).

The effects of the CDP program were most recently examined in a large, multi-site demonstration trial involving 12 program and 12 matched comparison schools from six school districts across the US. Detailed descriptions of the approach to program implementation, research methodology, and findings of the demonstration trial with respect to program implementation and outcomes may be found in Battistich, Schaps, Watson, Solomon, and Lewis (2000); Kendzior and Dasho (1996); Solomon, Battistich, Watson, Schaps, and Lewis (2000); Watson (1996); and Watson, Battistich, and Solomon (1997). In brief, the findings from this four-year study showed that, when implemented widely throughout a school, the CDP program resulted in a number of significant outcomes for students, including positive effects on their school-related attitudes and motives (e.g., liking for school, achievement motivation), social

attitudes, skills, and values (e.g., concern for others, conflict resolution skill, commitment to democratic values), and involvement in problem behaviors (i.e., reduced use of alcohol and marijuana, and less participation in some forms of delinquency, including violent behaviors such as being involved in “gang fighting”). Moreover, consistent with the program’s theoretical model, structural equations modeling analyses indicated that virtually all of the program’s effects on student outcome variables were mediated through effects on students’ sense of the school as a community (see Solomon et al., 2000; Watson et al., 1997).

The Follow-Up Study

This paper presents preliminary findings from a follow-up study of a subsample of former CDP program and comparison students while they were in middle school. Specifically, the focus is on students from three CDP program elementary schools and their matched comparison schools (the matching was on the basis of student demographic characteristics and prior achievement), all of which served large numbers of "at risk" students. Each of the program schools showed large and widespread changes from baseline in program-relevant teacher practices and attitudes during three years of intervention. One of the program schools was in a rural area and served a population that was 100% African-American students from poor families (as indexed by the percentage of students eligible for free/reduced price school lunch). Average achievement at this school was at about the 10th percentile on norm-referenced tests. The other two schools were in urban areas, and each served an ethnically-mixed population (60% white, 40% African-American). Virtually all students were from poor families at one of these schools, and about half were from poor families at the other. Average achievement at these two schools was at about the 40th and 60th percentiles, respectively.

Sample and Methods

Students from the three program schools and their matched comparison schools who had participated in the study during elementary school (assessments were limited to students in grades 3-5 at the elementary schools) were located at 11 middle schools in the participating districts. With two exceptions, each of the middle schools was attended by students from both program and comparison elementary schools.

Middle school data were initially collected during the spring of 1997, two years following the end of the elementary school intervention. Additional assessments were conducted the spring of 1998, 1999, and 2000, by which time the final cohort of students who had participated in the elementary school study completed middle school. Assessments included group administered student questionnaires, teacher questionnaires and ratings of student behaviors, and examination of student records.

A total of 525 students (334 program, 191 comparison) whose parents had provided written informed consent for their participation (approximately 50% of the students who were located) were assessed at one or more grade levels during the four year follow-up study. The sample is predominantly composed of white (53%) and African-American youth (46%), with only 1% of students being of other ethnicities. There are slightly more girls (54%) than boys (46%) in the sample. Although the sample includes proportionately more program (64%) than comparison

students (36%), the program and comparison groups do not differ by gender ($\chi^2(1) = .04$, $p = .85$) or ethnicity ($\chi^2(1) = 1.81$, $p = .18$).

Results

Findings from the student questionnaires, school record data, and teacher ratings of student behavior during middle school are summarized in Table 1. Overall, 20 of the 40 outcome variables examined showed statistically significant ($p < .05$) differences favoring program students. An additional 6 variables showed "marginally" significant ($p < .10$) differences favoring program students. Overall, then, almost two-thirds (65%) of the outcome variables examined during middle school showed differences favoring program students, with most of the effects ranging between one-fifth and one-third of a standard deviation in magnitude. There were no statistically reliable differences favoring comparison students.

Table 1 here

School-Related Attitudes and Academic Performance

The most widespread area of significant program effects during middle school was with respect to students' school-related attitudes and academic performance. Fully 10 of the 11 variables in this area in Table 1 show differences favoring program students, including sense of school as a community ($F[1,760] = 6.43$, $p < .02$), educational aspirations ($F[1,759] = 8.35$,$p < 01$), trust in and respect for teachers ($F[1,758] = 7.93$, $p < .005$), and liking for school ($F[1,761] = 8.61$, $p < .004$). Program students also had significantly higher grade-point-averages ($F[1,962] = 25.43$, $p < .0001$) and achievement test scores ($F[1,839] = 9.91$, $p < .002$) than comparison students. The only outcome variable that did not show a difference favoring program students was task orientation toward learning, for which a significant Status x Grade interaction was observed (Status x Linear Grade contrast $t = 3.35$, $p < .001$): program students scored higher than comparison students on this measure of learning motivation in 6th grade but subsequently declined, whereas scores for comparison students increased after 6th grade.

Personal and Social Attitudes

Program students scored significantly higher than comparison students in sense of efficacy during middle school ($F[1,760] = 4.60$, $p < .04$). The two groups of students did not differ in concern for others or global self-esteem.

Positive and Negative Behaviors

Positive program effects were found for half of the 10 measures of positive and negative behaviors in Table 1. Program students reported being victimized at school less often than comparison students ($F[1,759] = 9.58$, $p < .003$), engaged in less misconduct at school ($F[1,756] = 9.25$, $p < .003$), and engaged in fewer acts of delinquency ($F[1,756] = 4.67$, $p < .04$). Program students also were more involved than comparison students in positive youth activities

(e.g., sports, community youth groups) during middle school ($F[1,758] = 11.70$, $p < .001$), and attended religious services more frequently ($F[1,747] = 3.89$, $p < .05$). The two groups of students did not differ significantly during middle school in their reported frequency of engaging in altruistic behavior, or in their reported use of alcohol and other drugs.

Friends' Positive and Negative Behaviors

Not only did program students appear to be more involved in school and positive youth activities and less involved in negative behaviors than comparison students during middle school, they also reported that more of their friends (i.e., "the kids you hang out with most often") are similarly engaged. Significant differences favoring program students were observed for four of the six measures of friends' behavior in Table 1. Program students reported that more of their friends were positively involved in school (e.g., worked hard, completed assignments) than did comparison students ($F[1,758] = 8.03$, $p < .005$), and that fewer of their friends were involved in misconduct at school ($F[1,759] = 5.46$, $p < 02$), used drugs ($F[1,754] = 3.25$, $p < .08$), or engaged in delinquent behaviors ($F[1,754] = 4.14$, $p < .05$). Program students also reported that more of their friends attended religious services and were involved in positive youth activities than did comparison students, but these differences were not statistically reliable.

Teacher Ratings of Behavior

Middle school teachers rated the extent to which each of ten behavioral descriptors was characteristic of the program and comparison students in their classes (see Table 1). Six of these ratings showed significant effects favoring program students. Program students were rated by their teachers as being more reliable and hardworking students ($F[1,345] = 3.46$, $p < .07$) and more actively engaged in class than comparison students ($F[1,344] = 5.45$, $p < .02$); as being more socially skilled and popular ($F[1,344] = 8.67$, $p < .003$), more assertive ($F[1,343] = 2.70$, $p < .10$), and less socially inept ($F[1,343] = 3.96$, $p < .05$); and as being more considerate, respectful, and helpful to others than comparison students ($F[1,343] = 2.64$, $p < .10$).

Discussion

Overall, the findings strongly suggest that the Child Development Project had a number of continuing positive effects on students after they had left the program environment of their elementary schools. Some of the effects observed in middle school were continuations of effects that were found during elementary school (e.g., sense of school community, liking for school, sense of efficacy), and some were new effects on outcomes that had not been examined in elementary school (e.g., misconduct at school, involvement in positive youth activities, peer behaviors). In one case, alcohol and marijuana use, program effects that were observed during elementary school were not found during follow-up in middle school.

With respect to resilience education, it is particularly encouraging that, relative to comparison students, CDP students in middle school appeared to be much more “connected” to school (e.g., liked school more, worked harder and were more engaged in their courses, had greater trust in and respect for teachers, had higher educational aspirations). Prior research (e.g., Battistich & Hom, 1997; Resnick et al., 1997) has found that school connectedness is protective against a

wide range of negative outcomes for youth. In addition, CDP students had significantly higher test scores and grades in core academic subjects, were more involved in positive youth activities, and engaged in less misconduct at school and less delinquency than comparison students. CDP students also reported that more of their friends were positively involved in school and fewer of their friends engaged in misconduct at school or delinquent behaviors than did comparison students. Given these findings, it is disappointing that there no significant effects in the area of alcohol and other drug use, particularly since, as noted above, significant program effects on alcohol and marijuana use were found during the elementary school study. However, the relatively low prevalence rates for drug use observed during middle school (see Table 1) and the much smaller sample size for the follow-up study militated against detecting statistically reliable effects on these outcome variables.

Although clearly encouraging, it is important to keep in mind that these are preliminary analyses and the findings are limited in important ways. In particular, the longitudinal nature of the data was ignored in these analyses because to do otherwise would have severely restricted the sample size. This is largely because there are substantial data that are missing by design. For example, students who were assessed in 8th grade in 1997 would be completely missing data from their 6th and 7th grade years. Of the four age-cohorts that were assessed during the middle school study, one had only a single year of data, and a second had only two years of data. Thus, restricting the analyses to the two cohorts of students who had three years of middle school data would have thrown out half of the sample. Additional data are missing for a variety of other reasons (e.g., not all teachers completed the rating booklets each year), most of which, like the data missing by design, can be considered missing at random. Rather than discard these cases, multiple imputation (Rubin, 1987; Schafer, 1997) will be used in the future to construct several complete longitudinal data sets, which can then be analyzed using typical "complete case" methods (e.g., repeated measures ANOVA, growth modeling), but with uncertainty due to missing data taken appropriately into account in making inferences from these analyses.

Even with multiply-imputed, complete-case data sets, analyses of mean differences such as those conducted here will not answer questions about *how* these longer-term effects in middle school of an elementary school intervention were obtained. That is, they do not address questions about how the different experiences of program and comparison students during elementary school led to different approaches to adapting to the middle school environment. One possibility suggested by the findings is differential association theory (Sutherland & Cressey, 1960). As indicated by the present findings, program and comparison students in middle school associated with different peer groups, which may have differentially influenced their tendencies to engage in prosocial or antisocial behaviors. Another possibility is the social development model (Hawkins & Weiss, 1985), which incorporates elements of differential association theory, as well as aspects of social control (Hirschi, 1969) and social learning theories (Bandura & Walters, 1963), but which places causal primacy on bonding to school. In future analyses, these (and other) plausible models will be examined using structural equations modeling techniques to assess their fit with the observed relationships in the data.

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Table 1

Adjusted[1] Mean Scores (Standard Deviations) for Outcome Variables Assessed During Middle School by Program Status and Grade

Variable	Group	Grade 6	Grade 7	Grade 8	Sig. of Status Diff. (Effect Size)
School-Related Attitudes					
Sense of School Community[2]	Comparison	2.72 (.59)	2.79 (.57)	2.76 (.59)	<.02 (.21)
	Program	2.92 (.54)	2.82 (.59)	2.88 (.57)	
Educational Aspirations[2]	Comparison	4.11 (1.32)	4.31 (1.22)	4.56 (1.02)	<.01 (.23)
	Program	4.45 (1.22)	4.65 (.92)	4.62 (.89)	
Educational Expectations[2]	Comparison	3.86 (1.38)	4.09 (1.34)	4.18 (1.17)	<.10 (.14)
	Program	4.21 (1.12)	4.21 (1.13)	4.19 (1.15)	
Trust in and Respect for teachers[2]	Comparison	2.10 (.46)	2.07 (.45)	2.13 (.47)	<.005 (.23)
	Program	2.27 (.37)	2.14 (.44)	2.21 (.45)	
Positive Teacher-Student Relations[2]	Comparison	2.95 (1.01)	2.90 (.98)	3.01 (1.03)	<.001 (.29)
	Program	3.40 (.87)	3.10 (.95)	3.18 (.97)	

Table 1 (cont.)

Variable	Group	Grade 6	Grade 7	Grade 8	Sig. of Status Diff. (Effect Size)
Liking for School[2]	Comparison	3.19 (.97)	3.16 (.92)	3.29 (.90)	<.004 (.24)
	Program	3.59 (.79)	3.31 (.95)	3.39 (.90)	
Task Orientation Toward Learning[2]	Comparison	3.28 (1.00)	3.57 (.90)	3.58 (.78)	
	Program	3.67 (.72)	3.41 (.85)	3.41 (.90)	
Academic Self-Esteem[2]	Comparison	3.87 (.88)	3.81 (1.03)	4.01 (.88)	<.04 (.17)
	Program	3.97 (1.01)	4.14 (.84)	4.06 (.99)	
Loneliness at School[3]	Comparison	1.34 (.44))	1.34 (.40)	1.28 (.40)	<.10 (-.13)
	Program	1.34 (.38)	1.27 (.39)	1.21 (.35)	
<u>Academic Achievement</u>					
Grade Point Average[4] (core academic subjects)	Comparison	2.04 (1.28)	2.05 (1.08)	1.98 (1.15)	<.0001 (.37)
	Program	2.45 (1.06)	2.26 (1.16)	2.45 (1.05)	
Achievement Test Scores[5]	Comparison	37.59 (4.15)	42.40 (6.89)	45.66 (10.82)	<.002 (.37)
	Program	42.42 (6.38)	44.76 (8.32)	48.33 (12.22)	

Table 1 (cont.)

Variable	Group	Grade 6	Grade 7	Grade 8	Sig. of Status Diff. (Effect Size)
Personal and Social Attitudes					
Concern for Others[2]	Comparison	3.24 (.65)	3.30 (.70)	3.31 (.70)	
	Program	3.31 (.69)	3.35 (.78)	3.35 (.74)	
Sense of Efficacy[2]	Comparison	3.05 (.76)	3.17 (.70)	3.27 (.67)	<.04 (.12)
	Program	3.27 (.67)	3.26 (.69)	3.32 (.72)	
Global Self-Esteem[2]	Comparison	3.78 (1.18)	3.95 (1.06)	4.02 (1.04)	
	Program	3.94 (1.06)	3.98 (1.02)	4.00 (1.02)	
Positive and Negative Behaviors					
Victimization at School[2]	Comparison	2.16 (.87)	2.07 (.76)	1.88 (.69)	<.003 (-.26)
	Program	1.88 (.63)	1.89 (.71)	1.79 (.77)	
Tobacco Use[6] (past 30 days)	Comparison	.13 (.33)	.16 (.36)	.16 (.37)	
	Program	.07 (.27)	.13 (.34)	.16 (.37)	
Alcohol Use[6] (past 30 days)	Comparison	.09 (.28)	.16 (.37)	.16 (.37)	
	Program	.05 (.23)	.09 (.29)	.15 (.36)	

Table 1 (cont.)

Variable	Group	Grade 6	Grade 7	Grade 8	Sig. of Status Diff. (Effect Size)
Marijuana Use[6] (past 30 days)	Comparison	.06 (.25)	.10 (.30)	.10 (.30)	
	Program	.03 (.15)	.07 (.25)	.11 (.31)	
Other Illicit Drug Use[6] (past 30 days)	Comparison	.13 (.33)	.11 (.32)	.05 (.22)	
	Program	.08 (.27)	.08 (.27)	.05 (.22)	
Delinquent Behaviors[2]	Comparison	1.44 (.67)	1.41 (.63)	1.32 (.48)	<.04 (-.18)
	Program	1.32 (.54)	1.28 (.52)	1.30 (.50)	
Misconduct at School[2]	Comparison	1.83 (.74)	1.88 (.92)	1.91 (.77)	<.003 (-.25)
	Program	1.54 (.55)	1.70 (.65)	1.81 (.76)	
Involvement in Positive Youth Activities	Comparison	1.77 (1.36)	1.89 (1.48)	2.06 (1.52)	<.001 (.29)
	Program	2.12 (1.45)	2.34 (1.58)	2.52 (1.52)	
Altruistic Behavior[2]	Comparison	2.58 (.74)	2.48 (.72)	2.57 (.85)	
	Program	2.53 (.73)	2.49 (.80)	2.56 (.86)	
Attendance at Religious Services[2]	Comparison	3.48 (1.60)	3.35 (1.49)	3.29 (1.55)	<.05 (.16)
	Program	3.63 (1.39)	3.70 (1.35)	3.60 (1.43)	

Table 1 (cont.)

Variable	Group	Grade 6	Grade 7	Grade 8	Sig. of Status Diff. (Effect Size)
Friends' Positive and Negative Behaviors					
Friends' Drug Use[2]	Comparison	1.74 (.83)	1.97 (.98)	2.16 (1.01)	<.08 (-.15)
	Program	1.63 (.81)	1.83 (.84)	2.01 (.97)	
Friends' Delinquent Behaviors[2]	Comparison	1.82 (.74)	1.91 (.82)	1.87 (.75)	<.05 (-.17)
	Program	1.74 (.75)	1.72 (.72)	1.79 (.76)	
Friends' Misconduct at School[2]	Comparison	2.39 (.89)	2.52 (.93)	2.47 (.90)	<.02 (-.20)
	Program	2.20 (.95)	2.30 (.90)	2.36 (.95)	
Friends' Positive Involvement in School[2]	Comparison	3.23 (.76)	3.16 (.89)	3.31 (.85)	<.005 (.23)
	Program	3.46 (.87)	3.36 (.95)	3.50 (.87)	
Friends' Involvement in Positive Youth Activities[2]	Comparison	3.07 (1.01)	3.04 (1.11)	2.88 (1.12)	
	Program	3.16 (1.15)	3.08 (1.14)	3.14 (1.13)	
Friends' Attendance at Religious Services[2]	Comparison	3.12 (1.23)	2.89 (1.20)	2.86 (1.22)	
	Program	3.19 (1.24)	3.01 (1.26)	2.99 (1.27)	

Table 1 (cont.)

Variable	Group	Grade 6	Grade 7	Grade 8	Sig. of Status Diff. (Effect Size)
Teacher Ratings of Behavior					
Comes to class and completes assignments on time, tries to learn the material, and does the best work he/she can.[7]	Comparison	3.26 (1.96)	4.79 (1.95)	4.10 (1.94)	<.07 (.31)
	Program	4.21 (1.27)	4.71 (1.73)	4.82 (1.74)	
Is quiet and withdrawn in class, and avoids getting involved with other students.[7]	Comparison	2.37 (1.91)	2.71 (1.75)	3.02 (1.77)	
	Program	2.27 (1.39)	2.80 (1.61)	2.45 (1.67)	
Likes to set his/her own tasks and goals, and works well without explicit direction from the teacher.[7]	Comparison	2.86 (1.46)	4.24 (1.53)	2.97 (1.74)	
	Program	3.06 (1.90)	3.79 (1.80)	3.90 (1.82)	
Insults or teases others, tries to get others into trouble, and/or starts fights or destroys other's property.[7]	Comparison	2.82 (2.27)	2.09 (1.46)	2.13 (1.57)	
	Program	2.72 (1.49)	2.15 (1.56)	2.34 (1.60)	
Gets along well with others, is sought out by his/her fellow students, and has many friends.[7]	Comparison	2.61 (1.03)	4.37 (1.50)	4.14 (1.71)	<.003 (.48)
	Program	4.30 (.86)	4.25 (1.76)	4.81 (1.50)	
Is not interested in what goes on in class and participates minimally, with little apparent enjoyment.[7]	Comparison	3.40 (2.09)	2.88 (1.65)	3.11 (1.82)	
	Program	3.25 (1.49)	2.85 (1.60)	2.65 (1.67)	

Table 1 (cont.)

Variable	Group	Grade 6	Grade 7	Grade 8	Sig. of Status Diff. (Effect Size)
Does not hesitate to state opinions, even when others disagree with his/her views.[7]	Comparison	3.08 (2.12)	4.26 (1.89)	3.51 (1.83)	<.10 (.27)
	Program	4.08 (1.47)	3.88 (1.80)	4.33 (1.68)	
Is engaged in class: participates in discussions, stays on the topic, and generally takes an active part in whatever the class is doing.[7]	Comparison	2.89 (1.64)	4.02 (1.90)	3.44 (1.74)	<.02 (.39)
	Program	3.79 (1.63)	4.02 (1.78)	4.56 (1.78)	
Appears to be socially awkward and inept: tends to say the "wrong thing," and to be rebuffed or ridiculed by other students.[7]	Comparison	2.79 (1.69)	2.50 (1.49)	2.14 (1.36)	<.05 (-.33)
	Program	1.80 (.88)	2.30 (1.27)	2.02 (1.34)	
Considers others' feelings, treats them with respect, and offers and gives help to those who need it.[7]	Comparison	3.29 (1.92)	4.79 (1.48)	4.10 (1.82)	<.10 (.27)
	Program	4.19 (1.23)	4.55 (1.62)	4.73 (1.65)	

Note. Sample sizes are approximately 775 for the attitude and behavior variables, 900 for the academic achievement data, and 350 for the teacher ratings.

[1]Adjusted for gender and ethnicity.
[2]Range: 1 – 5.
[3]Range: 1 – 3.
[4]F = 0, A = 4.
[5]T-scored within district and year (*M* = 50, SD = 10).
[6]No = 0, Yes = 1.
[7]Range: 1 – 7.