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Natural Experiments and the Educational Context: The Environment and Effects of an Alternative Inner-City Public School on Adolescents[1]

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The 1-year impact of attending a public alternative high school on two cohorts of adolescents who gained entrance to the school through a lottery was studied. Adolescents who had applied to the school but were not selected in the lottery served as a control group. The nature of the alternative high school environment is described, and the outcome of this natural experiment

[1]An evaluation of this scope requires the active assistance of many people. To Willis Hawley, whose energy and initiative propelled the overall evaluation during the years reported in the present study, we are particularly grateful. Shirley Frey-McConahay and Judith Gruber were, in addition, active and productive contributors to the evaluation effort. In the New Haven Public Schools, Samuel Nash, Director of Research, Evaluation and Planning, was particularly generous with time, energy, and ideas involving the evaluation. George Foote, Ed Linehan, and the teachers and students at High School in the Community and the "feeder" schools gave freely of their time. Data analysis was conducted by Les Sapir. Support for the writing of this report was provided by the Hazen Foundation, Yale University's Institution for Social and Policy Studies, and the University of Maryland's General Research Board.
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defined in terms of reactions to school, attitude change, and student achievement. In general, the alternative school positively affected student satisfaction with a variety of aspects of school life and induced some positive change in interracial attitudes while not harming student achievement. Race effects were found in the areas of achievement and interracial attitudes. Implications for the study of natural experiments in general and the specific data in particular are drawn.

The evolution of social interventions has conceptual and methodological importance for psychologists concerned with the policy implications of social experiments (e.g., Campbell & Stanley, 1966; Cook & Campbell, 1979; Cowen, 1973; Zigler & Valentine, 1979). This report provides the results of a natural experiment involving the effects on two cohorts of inner-city adolescents of attending an urban public alternative high school.

The school itself was created by a local school system to better accommodate the diverse needs of its high school students within its existing educational structures. The opportunity for a natural experiment examining its outcomes derived from overenrollment for the alternative school during the 2 years of the planned evaluation. A lottery procedure was used to determine attendance, creating two randomly assigned groups—those attending and those not attending the alternative school—both motivated to leave the traditional school.

Two general orientations lie behind the presentation of this study. First is the importance of attending not only to outcomes but to the processes created by social innovations that presumably mediate outcomes. With respect to the alternative school, this requires a description of the educational philosophy underlying the creation of the school and the psychosocial environment experienced by the students. Second, a comprehensive assessment of school effects must include both cognitive and noncognitive factors (Zigler & Trickett, 1978). While increasing achievement may be one relevant benchmark against which to evaluate school success, it is narrow and mischievous when used as a sole criterion. Such a singular criterion is particularly inappropriate for alternative schools, many of which are established to address "quality of life" issues and educational processes rather than focusing primarily on academic achievement. In the present study, this perspective is operationalized by assessing such aspects of the school experience as respect for one's teachers, self-esteem, and racial attitudes, in conjunction with standardized measures of achievement.

The following section outlines several issues affecting the evaluation of alternative schools, followed by a review of empirical research examining alternative schools similar to the one studied here.

ISSUES IN THE EVALUATION OF ALTERNATIVE SCHOOLS

The history of alternative schools can be traced back to the progressive educational reforms of Dewey and others (Jennings & Nathan, 1977), and perhaps as many as 710,000 alternative schools have emerged during the last decade (Barr, 1975). Nevertheless, relatively few of these schools have been the subject of rigorous evaluations, and a heated debate continues regarding the appropriate goals and methods for their assessment.

One of the challenges for evaluators concerns the diversity of the schools encompassed by the alternative school movement. In the absence of an accepted definition (Doob, 1977), alternative schools have typically included any program that purports to differ from the conventional public schools (e.g., sectarian, military, Summerhillian, compensatory, vocational) with respect to ideology or structure. Moreover, the alternative public secondary school is often highly individualized and unconventional in its use of community resources, its structuring of the educational experience, and its management of student activities. This diversity and idiosyncracy has led some proponents of nontraditional evaluation methods to contend that the most appropriate evaluation assesses how a school and its students are progressing toward their own objectives (Hickey, 1972; Skager, 1973). This approach, while illuminating the uniqueness of the alternative school, seriously limits the generalizability of the evaluation data. Moreover, it can bias results toward favorable assessments of alternative schools when goals appropriate to traditional schools are not reflected in the evaluation measures. A more meaningful evaluation would avail itself of both traditional hard-nosed methodology and outcome criteria as well as less conventional assessments tailored to the specific objectives of the particular schools being studied.

Other difficulties arise from constraints placed on designing evaluations that permit valid inferences about school effects. Constituting an appropriate comparison group can be thwarted by self-selection into alternative schools or by the small, at-risk populations served by some alternative schools (e.g., Mann & Gold's 1981 study of a school for students with long-standing behavior problems). Indeed, some investigators have omitted comparison groups entirely in favor of an internal evaluation (see Wofford & Ross's 1972, evaluation of the Parkway Program, and the Orleans Parish School Board's 1971, evaluation of the Gateway High School).

Although a number of studies have compared students in alternative schools with students not in those schools, the lack of specific information on the comparison groups often clouds interpretation of the data. For example, Heinle (1977) failed to define the criteria for comparison group selection in her evaluation of California's Alternative Program of Instruction (API) (see also Pendleton, 1978; Gaite & Rankin, 1975).

EMPIRICAL STUDIES OF ALTERNATIVE SCHOOLS

We restricted our review of the empirical literature to evaluations of schools that represented an option for any student in the school system (like the one studied here), used relatively sophisticated methodologies (e.g., use of well-defined comparison groups, pre- and posttesting, or some other quasi-experimental design), and discussed process variables. Few met the dual criteria of using appropriate control groups and of providing sufficient description of school structures and processes to elucidate their links to student outcomes. The following studies do, however, form the best current foundation for the present study.

The evaluation of the Parkway Program in Philadelphia, the prototypical "school without walls," provides a useful example of a report that traded external validity for an in-depth assessment of the internal functioning of the school. The evaluation provides a detailed description of the school's objectives and the process by which it seeks to meet them (Barr, Colston, & Parrett, 1977) but omitted comparison groups, academic performance data, dropout rates, and other hard data. By intent, the school sought evaluators who would measure the school by its own yardstick, serving essentially as participant observers in classrooms, tutorials, and staff meetings (Wofford & Ross, 1972). The evaluators found the program "justified in terms of its goals as seen through the eyes of its major constituencies." Included here were student and staff satisfaction with a variety of aspects of school life as well as use of the community as a learning resource.

Christensen, Spotts, Evenson, and Watkins (1975) did employ a comparison group of students not attending the alternative school in their evaluation of the Far West School in Oakland, California—an experience-based school that employs community members and sites as sources of learning. This evaluation used a multimethod approach, including on-site observation, questionnaires and rating scales, interview schedules, and performance samples. Sampling at both the beginning and end of the school year, Christenson et al. compared Far West students with students selected randomly from the applicants who were not able to attend the school (the reasons for nonattendance were not specified). The evaluators confirmed three hypotheses derived from the program's objectives, including (a) more positive attitudes toward school among the Far West students, (b) a similar rate of progress in skills in both groups, and (c) greater progress for the Far West students in self-growth and carreer and future planning. Unfortunately, the authors provided no description of school policies and structures, thus restricting any interpretation of factors that enabled the students to meet program objectives.

Three evaluation studies reported natural experiments in which lotteries were used to determine randomly which applicants were admitted to the

alternative school and which were used as the control group of students remaining in the traditional school: Chicago's Metro School, Philadelphia's Alternative Schools Project, and Toronto's School of Experimental Education (SEE).

The evaluation of Chicago's Metro High School (Moore, Wilson, Wilson, & Johnson, 1973) stands as the clearest evidence for a relationship between various processes within an education program and patterns of effects observed among students. Using attitude tests, structured interviews, personal observations, and school records, Moore and his colleagues attempted to illuminate the key social processes within the school, the school's effects on its students, and the relationship of school processes to these effects. As compared to lottery-assigned control students, Metro students held significantly different perceptions of their school's overall humanistic climate, evidenced a significant increase in reading achievement, and had more contact with a variety of urban individuals and institutions.

Evaluations of Philadelphia's Alternative Schools Project (Dobb, 1977; Gibboney & Langsdorf, 1972) present complex and potentially contradictory evidence. A 1-year evaluation of the program revealed that the program students scored significantly lower on both reading and math tests, as compared to traditional school controls. This program, however, did attain its self-determined objective of encouraging more positive student attitudes toward teachers, courses, school, and learning experiences, although participation in school governance did not improve. These contradictory results regarding lower achievement and positive student attitudes highlight the importance of understanding the structures and psychosocial dimensions of school environments that are likely to mediate these outcomes.

Simon, Levin, Fieldstone, and Johnson's (1973) evaluation of Toronto's School of Experiential Education—a program that used the community as a learning resource—replicates the findings of improved student attitudes, academic interest, and self-reported growth found in Philadelphia and Chicago. In this case, second-year SEE students exhibited "impressive gains" over first-year students, thus suggesting a cumulative effect of the environment on students. Comparisons of SEE students to unsuccessful applicants, based entirely on students' subjective reports, revealed that SEE students viewed themselves as better able to set goals and meet deadlines. They also judged the overall quality of their work higher than did the control students. However, the SEE students earned relatively fewer diploma credits per year.

The intent of the present study is to build on this useful, though limited, empirical foundation by assessing the processes and outcomes of an alternative public inner-city high school, New Haven, Connecticut's High School in the Community (HSC). The study adds to previous literature by (a) its attention to describing the structures and psychosocial environment

of the school; (b) its use of appropriate control groups based on stratified random samples of students, matched on preference for attending HSC, whose school assignment (HSC vs. traditional school) was based on a lottery; (c) its attention to employing measures that were balanced with respect to the goals of both HSC and the traditional school; and (d) its use of two cohorts of students over a 2-year period, thus allowing a replication of the yearlong impact of attending the school.

METHOD

High School in the Community: A Description of the Setting

As was true for many alternative schools, the roots of HSC are found in the urban unrest of the 1960s when rapid demographic changes and widespread urban and social tensions were reflected in New Haven's inner-city high schools (Ellison, 1974). Altthough heavily influenced by Philadelphia's Parkway Program, the structure of New Haven's HSC was based on specific ideological assumptions: Students learn more when (a) the curriculum is tailored to their needs and interests, (b) the learning environment is supportive and characterized by mutual respect and affection among students and between students and teachers, (c) students are encouraged to assume increased responsibility for their education, (d) both students and teachers identify their own objectives and define the means to achieve their goals, and (e) parents are involved in both governing the school and sharing their children's in-school experiences.[3] Any student in the public high schools could apply for admission to the school, and, as will be fully explained later, admission during the 2 years covered in this report was by lottery. The per pupil cost during the 2 years covered in this report was equal to or lower than that for students in the traditional high schools.

The educational philosophy of the school was operationalized through its structure and the kinds of relationships that it fostered between students and faculty. Its basic organizational structure included two Units, with approximately 150 students and 10 staff in each. These numbers of students, of course, differed at different points during the school year due to withdrawal, absence from school, etc. These Units, operating under the same educational philosophy, were based administratively in autonomous quart-

[3]Extensive documentation of HSC as a learning environment and of student and parent participation in the school can be found in Hawley, McConahay, Frey-McConahay, Nelson, and Gruber (1973) and McConahay, Frey-McConahay, Trickett, Gruber, and Hawley (1973).

ers (e.g., not as part of an existing school building) and held the majority of their classes in donated space in the community. Based on a belief in the importance of the community as a context for learning, a Community Orientation Program (COP) provided the structure for developing individualized classes with such local resources as lawyers, hairdressers, mechanics, and a variety of other volunteer teachers. Students were encouraged to construct much of their own curriculum to take advantage of this structure. Grading of students consisted primarily of written evaluations of students based in part on how well students fulfilled the learning goals they set for themselves. Governance of each unit of the school was accomplished through a 15-person Policy Council consisting of 5 students, 5 parents, and 5 school staff members. The power of this council was quite broad and included decisions about the hiring of staff, allocaton of discretionary budgetary funds, and the development of rules covering student discipline.

School Philosophy and the Normative Classroom Environment

A description of structures, while useful, is insufficient to describe the actual quality of life for adolescents in a school. While containing the potential for the realization of certain goals dictated by ideology, structures may unintentionally generate an atmosphere which contradicts their intent. Thus, additional information of the nature of the school environment was necessary. To generate this information, we administered the Classroom Environment Scale (CES), developed by Trickett and Moos (1973), to a sample of classrooms in HSC and the two traditional high schools from which HSC students had come. The CES is a 90-item measure that assesses nine dimensions of the classroom psychosocial environment as perceived by students. By sampling classes in a school and then aggregating those data within the school, an average or normative classroom environment can be derived for any school (the logic of this approach is discussed in Trickett, 1978; its usefulness as a measure not only of the classroom but also of other aspects of the school is discussed in Trickett, Trickett, Castro, & Schaffner, 1982).

More specifically, normative classroom profiles for HSC and the traditional schools were constructed in the followng way. One class of each regular teacher at HSC was selected at random to form the HSC normative classroom sample (n = 21 classrooms, including 156 students). From each of the two traditional schools, randomly selected classrooms of randomly selected teachers in the four basic areas of English, math, science, and social studies were selected (n = 21 classes, including 277 students). The two traditional schools were combined because none of the nine CES subscales differentiated these schools. Figure 1 presents these data, comparing the alternative and traditional schools in terms of a normative sample of 315 pub-

lic school classrooms reported in Moos and Trickett (1974).[4] The solid line in the middle of Figure 1 indicates the national norm.

Figure 1 clarifies that the classrooms in the alternative school are both quite different from those in the traditional schools *and* different from the normative sample of 315 public school classrooms. CES subscales of Involvement, Affiliation (among students), and Teacher Support assess relationships in the classroom. Compared with the traditional schools classes, the HSC classes show significantly more emphasis on all three of these relationship dimensions as well as innovation in teaching practices. On the other hand, HSC places significantly less emphasis on Competition for grades and Teacher Control of students through strict rules governing classroom behavior ($p < .05$, in all instances). HSC shows this same pattern of differences with respect to the normative sample as well, while the normative sample and the two traditional schools are quite comparable in average classroom environment.

These data suggest that the structures of the school and the educational philosophy of the school are congruent with the way students perceive their classes. HSC can be viewed as emphasizing the importance of student–student and student–teacher relationships more so than the traditional schools, with less emphasis on maintaining authority-based relationships between students and faculty and with a minimum of competition as part of the classroom ethic. It is not a freewheeling, unstructured place, however, sharing with the traditional schools an average degree of emphasis on task orientation in the classroom and on clarity of rules governing student behavior. These results, plus the various structures described previously, provide a coherent picture of the kind of environment experienced by students at HSC and clarify how this school differed from the schools from which they came.

Selection of Students: Rationale and Procedures for the Lottery

As part of the political processes underlying the creation of the school, it was decided that the student body of HSC would be selected in such a way that it would reflect the percentage of blacks and whites in the schools from which the applicants to HSC came. Since more students of both races applied than could be admitted, a lottery was decided upon as the best means of deciding whom to admit. This lottery was stratified by race so that black students would be drawn in one lottery and white students in another in numbers which maintained the ratio of black and white students in the regular public schools. Thus, a randomly selected control group was created of nonadmitted students whose motivation to participate in the program was, on the average, equal to that of the admitted students. This is particularly

[4]Because the procedures and the data were essentially the same for the 2 years of the study, only the first year is reported here.

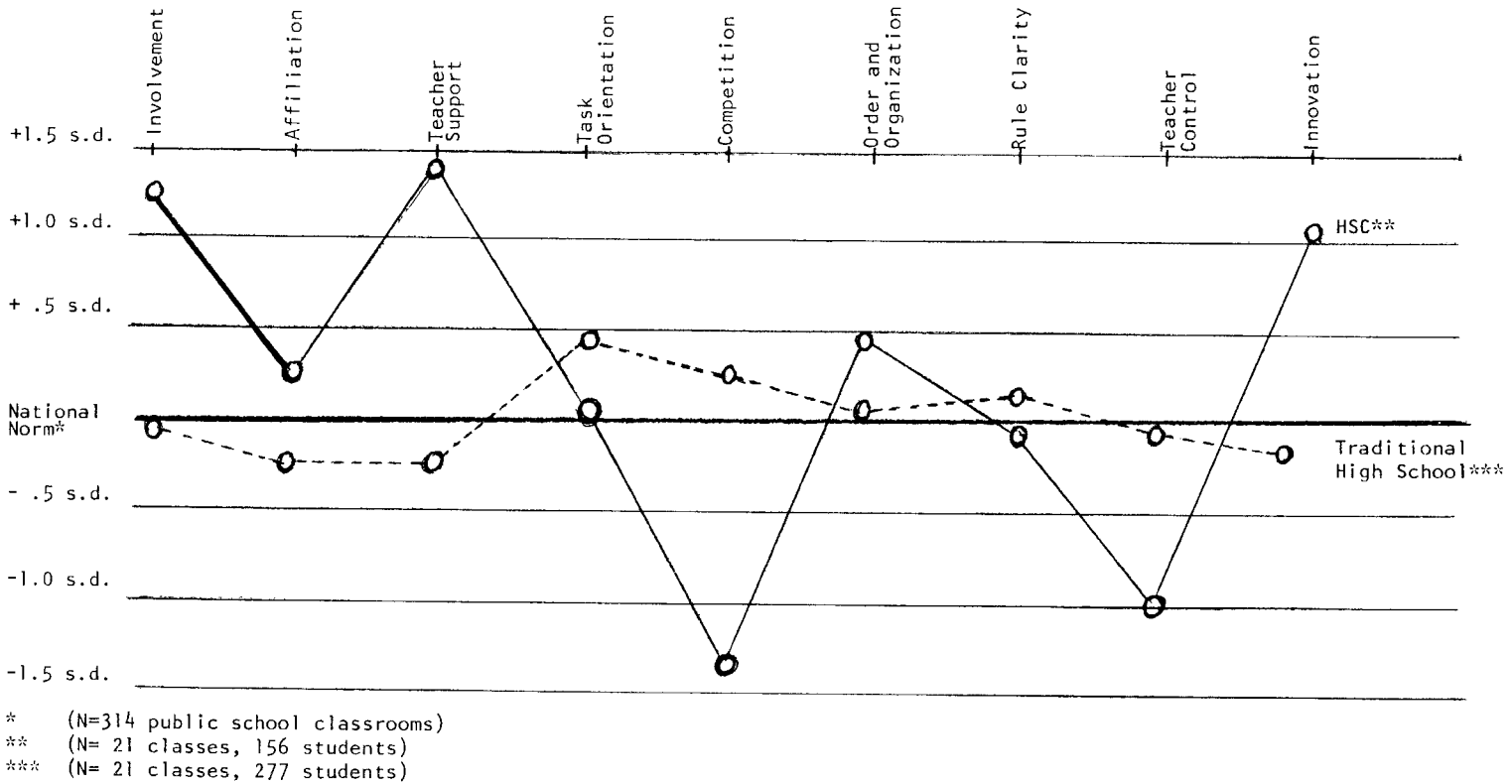

Fig. 1. Normative classroom environment in HCS and the two traditional schools in CES dimensions.

important because it is plausible that the greater motivation of the self-selected students in alternative schools may account for the success of some experimental educational programs.

Recruitment of Subjects

Psychologists have often reported on ways in which the ecology of the setting and the politics surrounding the evaluation process affect its course (e.g., Brickell, 1978). The differing procedures of subject recruitment during the 2 years reported here attest to that phenomenon.The preference of the evaluation team was to draw a random stratified sample of students at HSC and in the control group and to put resources into insuring a very high rate of participation. During the first year, however, both the grant project officer and personnel at HSC wanted the evaluation team to test everyone in the control and experimental groups rather than sampling. Despite a $2 payment for participation in the study and release time from class, we were able to recruit only 46–52% of those eligible for any single testing session during the first year. Thus, this first-year sample includes approximately 50% of those students who were eligible to be sampled in both HSC and the control group. In terms of comparability, the proportion of students from HSC and the control groups who completed the tests and surveys did not differ significantly from one another in terms of race, grade in school, or academic performance. Neither did they differ on these dimensions from students who did not participate in the testing sessions. To this extent, the results of our first-year assessment do not seem to be due to systematic sampling error that differentiates the groups.[5] During the second year, a stratified sampling procedure was used which resulted in a 90% turnout rate in HSC and the two regular high schools. Data were gathered during the May of each of those years from students who had begun HSC the previous September and from control group students who had applied to the school the previous May but were unsuccessful in the lottery.

Table I presents the sample sizes for the 2 years. The samples are combined across gender and grade level because, as will be described more fully, those student characteristics did not yield meaningful differences in the data. Descriptively, however, the sample was approximately 57% male across both years, with the greater percentage (62%) being in Grades 11 and 12.

[5]There are two primary sources of possibble sampling bias due to attendance of students between the time of selection into HSC and the time of testing after their first year in the school; attrition due to dropping out and, in the traditional schools, attrition through leaving for *another* alternative when not selected to enter HSC. Although both these sources of attrition were present, this affected less than 10% of the initial sample of students each year. Thus, there does not seem to be a meaningful bias due to these sources.

TABLE 1. Composition of the Samples for Each of the Two Years by School and Race

	School			
	HSC		Traditional	
Race	Year 1	Year 2	Year 1	Year 2
Black	71	35	14	30
White	89	41	25	22

Goals of the Evaluation

The overall evaluation of HSC was designed to cover a variety of aspects of the school, including its governance process, the effects on teachers of teaching in this kind of environment, the use of the community as a laboratory for learning, and the reaction of parents to their role in the school and their childrens' education. For purposes of this report, however, our focus is on those effects on students that fall into three general categories. (a) *School attitudes*: Because a primary motivation to create HSC involved discontent with both the teacher and student environment in the large, traditional high school, HSC devoted considerable energy to creating a satisfying and stimulating psychosocial environment. How students felt about the school, its opportunities, and their role in developing those opportunities were aspects of the first area of concern to the evaluatoin effort. (b) *Social attitudes and personal qualities*: Both the ideology behind the creation of the school and its structure strongly suggested that HSC was designed to foster certain kinds of attitudes in its students and to enhance selected qualities. In the former, for example, were attitudes about race and race discrimination, whereas an example of the latter was the importance of increasing the amount of control over one's life. In general, students at HSC were predicted to increase their appreciation of persons from other cultural backgrounds and develop a greater sense of personal control. (c) *Academic impact*: HSC had, as part of its self-designed evaluation, aspired to produce the same level of academic achievement as the regular schools and at the same time to improve other aspects of the student experience. Thus, they predicted that in the areas of reading, writing, and math their students would do as well on standardized tests as students in the control group.

Measures

Measures designed to assess goals within these three general areas combined previously developed and standardized instruments with instruments developed within the context of the current evaluation.

(1) *School Attitudes and School Satisfaction*: Attitudes about and satisfaction with school included five scales designed to tap issues of the quality of life for students. (a) The Perceived Ability to Influence School Policy scale contained six items relating to student influence (e.g., "I feel that I have a real influence on the way my school is run" "The members of the administration are likely to consider the wishes of students whenever they make a decision"); (b) the Mutual Affection scale contained five items focusing on students' evaluation of mutual liking among students and teachers as well as teachers' approachability and success at their work (e.g., "Teachers are easily available to talk to or get help from" "The teachers in my school are generally doing a good job"); (c) the Mutual Respect scale consisted of two items tapping that aspect of teacher-student relationships (e.g., "Most students at my school have respect for the teachers as people"); (d) the Importance of Assuming Personal Responsibility scale included four items that addressed the extent to which students can take initiative for their education (e.g., "Having a chance to work on my own on some subject I want to learn about is important to me" "If things don't go the way I want them to in this school, I should try to change the things that are wrong"); (e) the General School Satisfaction scale contained seven items tapping general satisfaction with the school (e.g., "Most of the time I'm proud that I go to my school" "The courses I'm taking are generally suited to my needs"). The School Attitude scales were developed by the evaluation team in consultation with the HSC Policy Council. Although we do not have any independent data on the construct validity of these scales, the items are face-valid measures of the goals of the HSC community.

(2) *Social attitudes and Personal Qualities*: Social attitudes and personal qualities were assessed by five different scales focusing on different variables of concern to HSC. Three scales dealt with social attitudes involving relations among students of different races and tolerance for diversity. (a) The Social and Political Diversity scale included 16 items to assess students' tolerance for the expression of communist, black, militant, atheist, and feminist philosophies in high school and public settings (e.g., "Should a communist be allowed to teach in your high school?" "Should books by people in Women's Liberation be available in the libraries of the city?"[6]; (b)

[6]This overall scale contained three moderately correlated subscales focusing on specific groups. The Black/Communist Tolerance scale contained six items tapping students' tolerance for the expression of Communist and Black Militant philosophies in the high school setting (e.g., "Should books by Communists be available in your school library?" "Should a 'black militant' be allowed to speak at an assembly at your high school?"). The Women's Liberation Tolerance scale contained four items tapping specific sentiments for tolerance of expression of feminist philosophy (e.g., "Should someone in Women's Liberation be allowed to teach in your school?"). The Atheism Tolerance scale included four items relating to tolerance of the expression of atheist philosophy in high school and public settings (e.g., "Should someone who doesn't believe in God or religion be allowed to teach in your high school?"). Because these separate scales correlated highly with the total scale and do not provide any differential predictive utility, they are omitted as separate scales for the present study.

the Social Distance scale contained four items directed at student tolerance for being involved with whites or blacks in a variety of situations (e.g., sharing a locker at school, having as a close relative by marriage); (c) the Black Fault for Discrimination scale consisted of six forced-choice items tapping student opinions of the extent to which blacks should be held responsible for discrimination (e.g., "The best opportunities always go to the whites vs. blacks have not prepared themselves to take advantage of the opportunities which come their way" or "Even when blacks make an attempt to 'fit in' they still meet with serious discrimination vs. any black who is educated and does what is proper will be accepted").

Two additional measures were included to assess personal qualities related to the intended outcome of HSC on students. (d) Rotter's (1966) Internal–External Locus of Control (I-E) scale was selected to assess students' general sense of personal control over and responsibility for events. (e) The Social Approval and Self-Esteem scale represents a combining of two of the subscales of the California Psychological Inventory (Gough, 1957), based on item properties found in the present evaluation. It includes five items tapping students' general self-confidence and assertiveness in social situations (e.g., "When in a group of people, I usually do what the others want rather than make suggestions" or "It's hard for me to find anything to talk about when I meet a new person").

(3) *Academic Achievement*: Measures of academic achievement were derived from the Educational Testing Service (ETS), Sequential Tests of Educational Progress (STEP), Series II, Form 2A.[7] English expression was measured by Part I of English Expression STEP Form 2A (detecting errors in grammar and usage). Mathematics was evaluated through problems selected from the Computation Form 2A (fundamental operations with reading reduced to a minimum). Reading was evaluated by Part I of Reading STEP Form 2A (comprehension of words and sentences).

Table II lists the names of the scales, the number of items in each, the alpha coefficient for each scale, the number of observations on which that coefficient was based, and the format in which the scale was presented. All scales have alpha coefficients that demonstrate reliability sufficient for group comparison.

RESULTS

The first step in the analysis of the data was to clarify the relationships among the dependent variables. The 13 scales were intercorrelated across the

[7]Since we did not give complete tests in any of the areas of performance and the conditions of testing were not standardized according to ETS procedures, comparison of performance to national norms is inappropriate. However, we can use these tests quite reliably and validly for comparisons over time and with our own control group.

Table II. Scales Used in the Evaluation

Scale	No. of items	Format	Alpha coefficient	No. of observations[a]
School Attitudes and Satisfaction				
1. Perceived ability to influence school policy	6	4 point	.64	269
2. Mutual affection	5	4 point	.75	693
3. Mutual respect	2	4 point	.67	744
4. Importance of assuming personal responsibility	4	5 point	.55	691
5. General school satisfaction	7	5 point	.59	643
Social Attitudes and Personal Qualities				
6. Social and political diversity	16	Forced choice	.89	675
7. Social distance	4	—	.76	469
8. Black fault for discrimination		Forced choice	.59	558
9. I-E		Forced choice	.51	488
10. Social approval and self-esteem		Forced choice	.53	673
Academic Achievement				
11. English expression	—	—	—	—
12. Mathematics	—	—	—	—
13. Reading	—	—	—	—

[a]The numbers for these scales include data collected on these instruments from HSC students and students in the traditional high schools during two additional years of the evaluation not reported in the present study because of lack of a true experimental design. Differences in numbers reflect degrees of incomplete data.

Table III. Intercorrelations of the Scales[a]

Scale items	2	3	4	5	6	7	8	9	10	11	12	13
1. Perceived ability to influence school policy	.56	.25	.10	.48	.05	−.10	−.06	−.12	.01	−.14	−.12	−.12
2. Mutual affection		−.27	.21	.58	.12	.14	−.07	−.09	.07	−.14	−.11	−.11
3. Mutual respect			−.02	−.26	−.07	.26	.12	.06	−.03	.14	.16	.05
4. Importance of assuming personal responsibility				.26	.12	−.11	−.15	−.01	−.16	−.25	−.21	−.24
5. General school satisfaction					.11	.02	−.03	−.10	−.12	−.12	−.03	−.08
6. Social and political diversity						−.07	−.08	−.09	−.15	−.36	−.29	−.40
7. Social distance							−.09	−.01	−.15	.26	.21	.31
8. Black fault for discrimination								−.17	.05	.10	.21	.33
9. I-E									.09	−.06	−.10	−.09
10. Social approval and self-esteem										−.14	−.14	.19
11. English expression											.64	.79
12. Math												.61
13. Reading												

[a]*n*s vary from 182 to 301 depending on completeness of data on all scales except #1. The *n* for Scale 1 is 120 because it was constructed for the second year only.

2-year sample, and the results are presented in Table III. Though over one-third of these correlations are significant at the .01 level, it is their overall configurations and degree of relationship that are of most concern here.

The intercorrelations reveal that most of the scales represent a clustering of conceptually related variables, though with a meaningful degree of independent information as well. Some substantial intercorrelations were found among conceptually related school attitude measures, where perception of ability to influence school policy is positively correlated with affection for others at the school (.56) and greater school satisfaction (.48 reversed by scoring), while affection for students and teachers and general school satisfaction are also highly positively correlated (.58). However, the measures of social attitudes and personal qualities (Scales 6–10) are quite distinct from each other and from the measures of school attitudes (Scales 1–5), with only one correlation greater than .2 and none greater than .3. As expected, the three achievement measures (Scales 11–13) cluster together, with intercorrelations ranging from .61 to .79. In addition, these academic variables are also positively correlated with an increased tolerance of diversity among students, less social distance from persons of other races, less likelihood of blaming blacks for discrimination, and more likelihood of affirming the importance of taking responsibility for their own education (all greater than .2).

Outcomes of Attending HSC[8]

Although the primary intent of the study was to examine the impact of attending an alternative high school on a random sample of black and white students, the design also allowed the possibility of assessing both gender differences and grade differences. To ascertain how important all four independent variables (school, race, gender, and grade level) might be, four-way ANOVAs were done on each of the 13 scales separately for Years 1 and 2. For each of these four independent variables, chi-square analyses were then conducted to compare the number of main effects and interactions expected at the .05 level with the number actually found in the analyses. For both gender and grade level, the number of significant main effects and interactions did not exceed change in both years. Thus the data reported below derive from 2 × 2 (type of school by race) unweighted means analyses

[8]Although the organizational structure of HSC included two units of approximately equal size, subsequent analyses showed essentially no differences between black and white students attending these units. Thus, they were combined into an "HSC group" of blacks and whites, constituting, in effect, the whole school rather than its two separate units.

of variance performed on each of the 13 scales. Because the design involved a replication, each year was analyzed separately. Presentation of the results is organized according to the three general domains of outcome variables: school attitudes and school satisfaction, social attitudes and personal qualities, and academic achievement.

School Attitudes and School Satisfaction. Significant replicated school effects were found on four of the five scales of attitudes toward and satisfaction with school. Means, *SD*s, and *F* values for these five scales are in Table IV. For both years, HSC students reported more mutual affection between teachers and students and expressed more general school satisfaction than did students in the control group. In addition, they reported more perceived ability to influence school policy on a scale constructed for the second year of the evaluation. On the scale assessing mutual respect between students and teachers, however, the main effect shows greater reported respect from control group students than from students at HSC. No school differences were found in the area of assuming personal responsibility for one's own education.

In general, black and white students did not express differential school attitudes either at HSC or the control schools, and those differences that were found were not replicated. Black and white students did differ in Year 1 on their mutual affection scores, with whites reporting more mutual liking between themselves and their teachers than blacks. In addition, a School × Race interaction was found in Year 2 on the mutual respect scale. Black students at HSC perceived greater mutual respect between students and teachers than did whites, whereas white students in the control group perceived greater mutual respect between teachers and students than did their black classmates.

Personal Qualities and Social Attitudes. This domain included five scales: three address social attitudes involving race relations and tolerance of diversity and two assess personal qualities (I-E and Social Approval/Self-Esteem). Table V contains the means, *SD*s, and *F* values for students on these five variables.

With respect to social attitudes, replicated significant differences were found on two of the three scales. A significant main effect for Tolerance for Social and Political Diversity during both years revealed that HSC students expressed a greater tolerance for the expression of nontraditional philosophies in the high school in particular, and in public settings in general than did control students attending the traditional schools. Similarly, a significant effect for type of school was found for both years on the Black Fault for Discrimination scale, with HSC students placing less blame upon blacks for discrimination than did the control group. However, no school effects were found either year for the Social Distance scale, which places a greater emphasis upon perceptions of interracial social behavior than on so-

Table IV. School Attitudes and Satisfaction

Scale item	Source of variance	Year 1			Year 2		
		df	*F*	*p*	*df*	*F*	*p*
1. Perceived ability to influence school policy	School				1	49.226	.001
	Race				1	0.19	ns
	School × Race				1	3.00	.09
	Residual				117		
2. Mutual affection	School	1	25.74	.001	1	18.60	.001
	Race	1	4.63	.04	1	1.69	ns
	School × Race	1	1.23	ns	1	0.27	ns
	Residual	168			118		
3. Mutual respect	School	1	6.13	.02	1	14.96	.001
	Race	1	1.52	ns	1	0.27	ns
	School × Race	1	0.34	ns	1	11.88	.001
	Residual	164			118		
4. Importance of assuming personal responsibility	School	1	2.20	ns	1	0.77	ns
	Race	1	2.13	ns	1	0.99	ns
	School × Race	1	0.65	ns	1	0.18	ns
	Residual	166			118		
5. General school satisfaction	School	1	16.76	.001	1	20.78	.001
	Race	1	0.05	ns	1	0.65	ns
	School × Race	1	3.48	.07	1	0.04	ns
	Residual	166			120		

Table V. Social Attitudes and Personal Qualities

Scale item	Source of variance	Year 1			Year 2		
		df	*F*	*p*	*df*	*F*	*p*
6. Social political diversity	School	1	5.72	.02	1	14.91	.001
	Race	1	5.60	.02	1	0.36	ns
	School × Race	1	0.09	ns	1	0.30	ns
	Residual	170			118		
7. Social distance[a]	School	1	1.72	ns	1	2.65	ns
	Race	1	4.76	.04	1	5.11	.03
	School × Race	1	0.07	ns	1	3.21	.08
	Residual	78			98		
8. Black fault for discrimination	School	1	4.92	.03	1	9.43	.001
	Race	1	.66	ns	1	0.01	ns
	School × Race	1	1.75	ns	1	1.51	ns
	Residual	169			97		
9. I-E	School	1	0.08	ns	1	0.01	ns
	Race	1	0.58	ns	1	0.17	ns
	School × Race	1	0.23	ns	1	1.32	ns
	Residual	161			106		
10. Social approval and self-esteem	School	1	.01	ns	1	.53	ns
	Race	1	.04	ns	1	1.23	ns
	School × Race	1	.01	ns	1	.47	ns
	Residual	174			121		

[a]Small sample size with this scale resulted from missing information due to confusion about how to follow instructions in completing the scale.

Table VI. Academic Achievement

Scale item	Source of variance	Year 1[a]			Year 2		
		df	*F*	*p*	*df*	*F*	*p*
1. English expression	School	1	0.94	ns	1	0.05	ns
	Race	1	43.96	.001	1	19.30	.001
	School × Race	1	0.74	ns	1	0.81	ns
	Residual	103			121		
2. Writing	School	1	0.09	ns	1	0.21	ns
	Race	1	44.19	.001	1	11.47	.001
	School × Race	1	0.91	ns	1	3.08	.09
	Residual	98			120		
3. Math	School	1	0.47	ns	1	0.35	ns
	Race	1	54.70	.001	1	23.70	.001
	School × Race	1	0.92	ns	1	0.45	ns
	Residual	103			118		

[a]Usable data on these variables ranged from 51 to 53% due to incomplete information.

cial attitudes and values. With respect to race effects, the only finding replicated across both years was for the Social Distance scale. Each year whites reported less social distance from blacks than did blacks from whites. In addition, during Year 1, whites also reported greater tolerance for political and social diversity than blacks, though this result was not replicated during the second year. There were no School × Race interactions on any of these scales. In terms of the personal qualities of Locus of Control and Social Approval/Self-Esteem, Table V shows no school or race effects for either of the scales.

Academic Achievement. Table VI contains the means, *SD*s, and *F* values for students on the three academic achievement variables. It shows that in all areas, academic achievement was not differentially affected by type of school. However, significant effects were found for race on all these variables, with blacks scoring consistently lower than whites. These effects were replicated for both years of the study. No significant Race × School interactions were found.

DISCUSSION

The intent of this project was to present a perspective on the evaluation of alternative educational programs that attends not only to outcomes but to processes, structures, and psychosocial features of the environment as mediators of outcomes. Indeed, the success or failure of social experiments such as HSC is often determined more by the specific ways in which the program's goals are translated into social environments than by the appropriateness and value of the goals per se. Although the design of HSC and its evaluation did not provide for linking *specific* aspects of HSC with specific student outcomes, we were able to document the program's translation from goals to the social environment. Specifically, as shown by the data comparing the normative classroom environments of HSC and the traditional schools, the HSC students experienced their classes in ways that differed significantly from the students at traditional schools along dimensions reflecting the basic values of HSC. Thus, in the language of laboratory research, it is plausible to view this educational experiment as having created an "experimental situation" appropriate to the test of its hypotheses.

In terms of its hypotheses—its hopes for yielding certain kinds of changes in its students—in many areas, HSC's goals for the student experience were realized. The teachers created the kinds of classroom environments they believed in, and HSC students reported greater general satisfaction with school than did controls, perceived themselves as having more ability to influence school policy, and reported more affection or liking between teachers and students. In addition, HSC students reported significant attitudinal differ-

ences relating to reduced prejudice toward persons of other races and persons with different belief systems. Further, they achieved at a level comparable to control students. Thus, achievement was not harmed, satisfaction was higher, positive interpersonal relationships between teacher and student were better, and some indices suggested that attendance at HSC produced declines in prejudiced attitudes over those found in control students.

There were, however, areas where changes were anticipated but not realized and one instance in which the direction of a significant finding was opposite to that anticipated. For example, HSC did not differentially affect students' locus of control or self-esteem, trait measures of personal qualities that are somewhat stable over time. With respect to I-E, though students did report ability to influence school policy, this more limited or situational perception of control apparently did not generalize to a more basic change. At least two interpretations are plausible. One is that it is illogical to assume that perceiving control over some aspect of the school experience *should* indeed become incorporated into a more basic personal quality. Many other aspects of the everyday lives of urban adolescents may indeed mitigate against it. Another interpretation is that 1 year is an insufficient time to allow for what may be appropriately deemed a basic change in an important dimension of personality, particularly when the intervention does not occur until adolescence. Following a subset of these students through 2 or 3 years would thus provide an appropriate test of this hypothesis. Similar kinds of issues may be raised about the lack of a school effect in the area of self-esteem.

In the area of mutual respect between teachers and students it was found that students at the control schools reported greater respect than did students at HSC. It is possible that the informality and diminishing of the authority distinctions which characterized teacher–student relationships at HSC diluted the notion of respect. Alternatively, in the HSC setting, the connotations of the term *respect* may have taken on a negative authoritarian character. Along these lines, there was a significant negative correlation across all students between the mutual affection and mutual respect measures (–.27), suggesting that these two concepts were seen as somewhat antithetical. Still, because the wording of the mutual respect scale specifically involves the respect that teachers and students show for each other "as people," this finding seems puzzling and not clearly consistent with other data.

Two other nonreplicated effects were found: a main effect in Year 1 showing whites reporting greater tolerance for social and political diversity, and an interaction in Year 2, with blacks at HSC perceiving more mutual respect between students and teachers than did whites, whereas the reverse was true at the traditional schools. These findings suggest that in some areas, at some time, and around some issues, race differences made a difference in terms of the outcomes of the school experience, though not in any pattern

clearly detrimental to either black or white students. The general lack of significant School × Race interactions suggests that HSC was not distinctively successful with either black or white students when compared to controls in the traditional schools.

A final comment upon the race effects is in order. The important story of HSC as an educational experiment is found in the many replicated main effects for school seting. HSC, for all students—white and black—was able to achieve a number of objectives, some of which were unrelated directly to race, such as satisfaction with school, and some of which involved a concern with racial prejudice which had flared up in the high schools shortly before HSC was created. Some of the race effects were predictable. The whites in the HSC and comparison group samples scored higher than the blacks in the two samples on standardized academic achievement tests, as has been reported in numerous other studies (see Crain & Mahard, 1978, 1981, for reviews).

Of more interest, particularly in light of HSC's stated purposes, was the replicated main effect involving the Social Distance scales. Each year, white students reported wanting less social distance from blacks than the blacks did from whites. Since this was the case in both the HSC and traditional school samples, the finding is not something specific to the HSC setting. Two potentially reinforcing factors may be operating here. First, research (McConahay, 1983) on contemporary racial attitudes in whites has found that whites are quite ambivalent in their feelings toward blacks. Though their feelings are not as strongly negative as the feelings of older generations, many whites still harbor negative feelings toward blacks and at the same time feel conflicted because these negative feelings are counterbalanced by their belief in the American Creed (Myrdal, 1944). Hence, when race is salient and contextual pressures are present to behave in an egalitarian manner, the ambivalent whites overreact and even discriminate in favor of blacks over whites (Gaertner & Dovidio, 1981; McConahay, 1983). Since the Social Distance scales used in this study were reactive in the sense that the egalitarian answer was obvious and research has shown that whites change their behavior on reactive scales to appear more or less racist depending upon the context (McConahay, Hardee, & Batta, 1981), it is possible that the white students were overreacting in the egalitarian direction. Black racial attitudes have not been studied as thoroughly as white attitudes (Sears & McConahay, 1981), but what we do know suggests that blacks are not as ambivalent as whites and thus would not show the extremes of behavior (in either the prejudiced or egalitarian directions) that whites do.

A second factor producing less expressed social distance for whites than for blacks may have to do with differences in initial motivation for applying to HSC. The whites, both those winning in the lottery and those losing, may

have been attracted more by the atmosphere aspects of the HSC setting, including the opportunities for friendly interracial contact and less attracted by the academic opportunities. Hence, the white applicants may have been among the most egalitarian of the white student population. The blacks may have been more attracted to HSC by the academic opportunities and less attracted by the interracial contact aspects. Hence, blacks in the applicant pool would not necessarily have been the most racially egalitarian.

SUMMARY COMMENTS

When evaluating these findings, several aspects of this project should be kept in mind. First, unlike many reports of evaluation of alternative schools (e.g., Mann & Gold, 1981), the adolescents who chose to attend HSC were not identified as at-risk students by any traditional criteria. The school was created as an option for all high school students. Although the students who chose to apply to HSC were not a random sample of high school students, they were not, in general, more at-risk for academic failure or behavioral difficulty than their peers in the traditional schools (Hawley, McConahay, Frey-McConahay, Nelson, & Gruber, 1973).

Second, it is useful to restate that this evaluation, in contrast to much of the literature bearing on the issue of educational alternatives (e.g., Duke, 1978; Smith, Gregory, & Pugh, 1981; Trickett, 1978), was not a comparison of alternative schools and traditional schools per se. Rather, it compared the effectiveness of the alternative school for students who wished to attend and were accepted into the school with the experience of those students who wished to attend but were not accepted. Generalizability of findings are thus constrained to its usefulness for that population of students who might choose to apply to such a school.

Third, it is important to keep in mind that, in almost all instances, reports of significant results represent essentially a replication of findings during two consecutive years of the school. That is, similar results were found in two consecutive cohorts of students experiencing the same school. During these 2 years, the school maintained the same structures, and student reports of their classroom environments were similar—both in HSC and in the traditional schools. This is important for several reasons. Institutions, especially those created recently, often change their character as they evolve (see Sarason, 1972; Perkins, Nieva, & Lawler, 1983), for evolutionary issues in the creation and development of settings) so that over time they become different institutions with different climates. In the case of educational experiments such as HSC, if the institution changes in tangible ways, it is important to document such changes as a means of assessing changes in outcome. The consistency of the HSC environment as described in the present study cou-

pled with the replication of the outcome findings present a strong case for their validity.

In addition, the use of two consecutive years of data also argues against the plausible hypotheses that effects of such educational experiments as this are due to a Hawthorne effect. Because each year we selected students who were new to the school, one may argue that, particularly in the attitudinal realm, the freshness of the experience would be reflected in the student responses. Similarly, the almost boundless energy, which is often involved in the initial phases of creating a new and exciting venture (see Sarason, 1972), might be viewed by some as an artifact that would mitigate against a pure test of the school as an *educational* program.

While acknowledging the importance of these issues in the evolution of any social experiment, several competing factors suggest that the data reflect endurng features of HSC's educational approach. With respect to the possibility of students responding to the newness of the situation, the data gathered on these students was in May of the school year. After a full year in HSC, one would expect that initial impressions and hopes would not obscure or distort the actual experience of attending this new social setting. In addition, data from other research at HSC (Gooden, 1976; Schreck, 1977) suggest that in such areas as satisfaction with school, students at HSC reported greater school satisfaction than students in the traditional schools regardless of how long they had attended HSC. With respect to effects deriving from the energy and excitement that accompanies the formative stage of a new school, it is important to clarify that the years reported in this project were the second and third years of the school's existence, when preliminary zeal should be giving way to less exciting consolidation efforts.

To conclude, natural experiments are possible to find and study. In the case of alternative schools, our experience suggests that such work can be responsive to both the canons of scientific inquiry and the political and ideological processes surrounding the particular institution. When institutional goals are individualized, the need to develop setting-relevant measures arises; when the need for external credibility of the setting assumes center stage, the value of well-recognized and respected measurement techniques is heightened. Moreover, while not the central focus of this report, the relationship between the research/evaluation team and the school also deserves careful consideration in developing a full picture of the study of natural experiments.

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