

Marks and Classroom Adjustment as Early Indicators of Mental Health at Age Twenty

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The data are derived from a 15-year longitudinal study of 659 urban children who entered kindergarten in 1968, 371 who were interviewed at the age of 20. Analyses related school adjustment and academic performance in the early primary grades, early adolescence, and middle adolescence to mental health outcomes based on responses to a short form of the MMPI at age 20. The results suggest that poor marks, absence of positive coping behaviors, and presence of negative coping behaviors are indicators of later mental health problems, that the absence of positive coping behaviors may be more indicative of later problems than the presence of negative coping behaviors, and that there are sex differences in the time periods at which indicators of school productivity are important.

The present report addresses the question of whether school adjustment and academic performance during early elementary school years, early adolescence, and middle adolescence may serve as indicators of or paths toward subsequent mental health status in young adulthood and thus suggest if and when to preventively intervene.

Simple reflection suggests that early performance in school should have long-term implications. The child spends a full workday at school. The school setting presents opportunities to learn and relate with others and presents

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the child with task and interpersonal demands of varying degrees of difficulty. How well the child deals with these demands should reflect something about the child's capacity to cope in other and subsequent environments, capacities that may have long-term implications for the child's successful life adjustment. How well the child functions should also affect his or her sense of competence and self-esteem, which in turn should influence the child's approach to and optimism about his or her ability to deal with the world of people and tasks. More specifically, children probably learn in school a variety of skills which prepare them to fulfill meaningful roles in life, roles toward which most children have aspirations.

The idea that early classroom functioning may predict subsequent adjustment is not new. Nursery school behaviors have been shown to be indicative of later problems (Chamberlain & Nader, 1971; Westman, Rice, & Bermann, 1967). Tseng and Sonstegard (1971) and Perry, Guidebaldi, and Kehle (1979) have related behaviors in kindergarten to subsequent school adjustment. School problems during elementary school years have also been related to severe emotional problems in adolescence (Baker & Holzworth, 1961). Glavin (1972) has provided evidence of the persistence of less severe behavioral problems over a 3-year period during primary school years. Cowen and his co-workers (Cowen, Peterson, Babigian, Izzo, & Trost, 1973; Cowen, Zax, Izzo, & Trost, 1966; Zax, Cowen, & Rappaport, 1968) have shown that children exhibiting behavior problems in first grade are more likely than controls to exhibit signs of emotional difficulty 2 to 5 years later and more likely to come into contact with mental health agencies during adolescence. Kraus (1984) has reported that children who show difficulties in the sixth grade tended to show difficulties in the third grade and tended to have problems well into high school. Weikart (1984) has demonstrated that a good preschool experience can help prevent variety of problems well into adolescence and perhaps beyond. There is ample evidence that early aggressiveness and antisocial behavior are high-risk signs for later antisocial and delinquent behavior (Douglas, Ross, Hammond, & Milligan, 1966; Kramer & Loney, 1978; Loeber, 1982; Milligan, Douglas, Hammond, & Tizard, 1963; Robins, 1966; Robins & Wish, 1977; Roff, 1961). Spivack, Marcus, and Swift (1986) have identified specific classroom behaviors in both sexes in early elementary school that are predictive of adolescent delinquency in the school and the community.

The present study adds information to this growing body of data, focusing attention upon such questions as: Is information about school performance and behavioral adjustment of equal value when obtained in the primary grade years, early adolescence, and middle adolescence? Do problems in academic performance or behavior define paths affecting mental health in young adulthood? Do academic performance and behavioral adjustment in

the classroom have different mental health consequences, defined in terms of types of mental health problems? Do longitudinal data suggest periods of life during which preventive intervention would seem to be most warranted? The cohort studied consisted of an urban sample of at-risk children and youth of both sexes, thus focusing upon a population of great interest to those concerned with preventive efforts. Finally, with respect to these questions, the data permit the examination of the relative importance of failure or negative (maladaptive) behaviors and positive (prosocial, effective) behaviors. Little is known about the significance of maladaptive behavior early in life, relative to the presence of positive adjustment in predicting subsequent emotional well-being. Nor do we know if equal effort should be put into enhancing positive adaptive behaviors which may ameliorate early negative signs indicative of being at risk, and working directly to decrease or eliminate negative maladaptive behaviors.

METHOD

The longitudinal data base permitting an examination of these questions consists of 659 children selected randomly from those entering center-city Philadelphia kindergartens in 1968, 371 of whom were followed up with an interview at the age of 20. A wide range of achievement, behavioral, symptomatic, and attitudinal data were collected in the interim, to address a variety of issues. Details of these data and the tracking of subjects have been reported elsewhere (Spivack et al., 1986).

Subjects

The original cohort was selected at random from school files, with the restrictions that it be divided almost equally by sex, children be selected equally from the morning and afternoon kindergarten sessions, and the cohort be dispersed so that no teacher have more than 12 children to rate. The subset of this original cohort from whom mental health data were obtained at age 20 represented approximately 60% who constituted the original sample at the end of kindergarten.

In order to examine whether or not the subset recovered at age 20 differed from the original total cohort of 659, the group interviewed ($N = 371$) and those not available for interview were compared on a measure of behavioral aberrance in Grade 3 (which earlier research by Spivack, 1983, identified as indicating a child at risk for later behavioral difficulties), the number of school transfers between Grades 1 and 3, and number of absences during Grade 3. Grade 3 was selected because data were available on the greatest number

of subjects at this time. These items were felt to be reasonable reflections of early adjustment level and evidence of environmental stability. None of the comparisons indicated significant differences between the groups in either sex. The subset on whom data are presented here was predominately black.

Measures

Classroom Behavior Ratings

Devereux Elementary School Behavior Rating Scale: This is a 47-item rating scale filled out by teachers from which 11 factors emerge, tapping how well children adapt to the variety of task and social demands made upon them in the usual, structured classroom. Validity and reliability of the 11 factors are presented in the manual and elsewhere (Spivack & Swift, 1967, 1973). The 11 factors measure the extent to which the child manifests each of the following.

1. Classroom Disturbance: Teases and torments classmates, interferes with others' work, is quickly drawn into noisemaking, and must be reprimanded or controlled.

2. Impatience: Starts work too quickly, works sloppily or without care, is unwilling to go back over work, and rushes through work.

3. Disrespect-defiance: Speaks disrespectfully to teacher, resists doing what is asked, belittles the work being done, and breaks classroom rules.

4. External Blame: Says teacher does not help, never calls on him or her, blames external circumstances when things do not go well, and is quick to say the work assigned is too hard.

5. Achievement anxiety: Gets upset about test scores, worries about knowing the "right" answers, is overly anxious when tests are given, and is sensitive to criticism or correction.

6. External reliance: Looks to others for direction, relies on the teacher for direction, requires precise directions, and has difficulty making decisions.

7. Comprehension: Gets the point of what is going on in class, seems able to apply what has been learned, and knows material when called upon to recite.

8. Inattentive-withdrawn: Loses attention, seems to be oblivious to what transpires in the classroom, and seems difficult to reach or preoccupied.

9. Irrelevant responsiveness: Tells exaggerated stories, gives irrelevant answers, interrupts when the teacher is talking, and makes irrelevant comments during classroom discussion.

10. Creative initiative: Brings things to class that relate to current topics, talks about things in an interesting fashion, initiates classroom discussion, and introduces personal experiences into class discussion.

11. Need for Closeness to Teacher: Seeks out the teacher before or after class, offers to do things for the teacher, is friendly toward the teacher, and likes to be physically close to the teacher.

Scores on Factors 1, 2, 3, 4, 5, 6, 8, and 9 were combined to form an index of *negative* classroom behaviors. Factor 7, 10, and 11 scores were combined to form an index of *positive* classroom behaviors. These groupings derived from the similar concurrent correlates that factors within a group have with academic achievement and other evidence of adjustment (Spivack & Swift, 1967). Scores for positive and negative classroom behaviors were averaged over kindergarten through third grade to obtain an index of each type for early elementary school.

Hahnemann High School Behavior Rating Scale: The HHSB is a standardized and validated instrument created to provide a system for identifying and measuring classroom behaviors of junior and senior high school students. It comprises 13 factors derived from 45 items focusing upon behaviors reflecting how well the student adapts to the variety of intellectual tasks and social demands made in the usual structured classroom. The factor scores have been shown to be related to academic performance independent of IQ and to differentiate normal from problem youngsters (Swift & Spivack, 1969). The factor scores measure:

1. Reasoning Ability: The extent to which the student grasps new ideas quickly, is able to sift through information and work out answers on his own, and is able to apply information and principles to new or unfamiliar problems.

2. Originality: The degree to which a student presents points of view to stimulate the thinking of others, promotes discussion in class, presents unique, yet relevant, ideas and prepares assignments and carries out tasks in an interesting, original fashion.

3. Verbal Interaction: The degree of involvement in the information flow in class.

4. Rapport with the Teacher: The desire for, and willingness to relate positively to the teacher.

5. Anxious Producer: The degree to which the student feels he must produce and put out effort in the classroom.

6. General Anxiety: The extent to which meeting academic and/or interpersonal demands poses problems revealed by open fearfulness, flustering, or tension.

7. Quiet/withdrawn: The level and extent of limitations in verbal interaction, communication, and involvement with peers, the teacher, and class activities.

8. Poor Work Habits: The adequacy of the student's attempts at preparation, organization, and the meeting of requirements for attendance and completion of assignments.

9. Lack of Intellectual Independence: The degree to which a student has difficulty relying upon his or her own intellectual resources to think, work, and persevere when confronted with teacher expectations and peer opinions.

10. Dogmatic/inflexible: The extent to which the student is "closed" to the ideas of others and is unwilling or unable to deal with or weigh the opinions and ideas of others.

11. Verbal Negativism: The extent to which there is a verbalized negative attitude toward all facets of involvement in education.

12. Disturbance/restlessness: The level of active, obstreperous behavior.

13. Expressed Inability: The degree to which the student feels unable to cope with the work demands of the classroom.

Scores on these factors (obtained from English and math classes) were combined into two categories: (a) overall *positive* classroom behavior (factors 1–5) and (b) overall *negative* classroom behavior (Factors 6–13). Factors within groupings have similar concurrent correlates with academic achievement and measures of adjustment (Swift & Spivack, 1969). Scores for each of these composites were averaged separately over the 8th and 9th grades and over the 10th and 11th grades to yield scores for early versus middle adolescence.

School Performance

The measure of school performance used was an average of teacher's *school marks* in all classes during each grade. The final measure took the mean of marks in Grades 2 and 3 as the early elementary school measure, the mean of marks in Grades 6 through 8 as the early adolescent school performance measure, and those received in Grades 9 and 10 as the middle adolescence measure. These provided measures of school productivity in early childhood and in early and middle adolescence.

The final measures covered approximately similar points in time: Positive and negative classroom behavior ratings were averaged over kindergarten and Grades 1 through 3, over the 8th and 9th grades, and then 10th and 11th grades; school productivity (marks) were averaged over Grades 2 and 3, 6th through 8th grades, and 9th and 10th grades. We realize the grades sampled in early and middle adolescence were not precisely the same for our measures of school behavior and performance. Behavior ratings were not available to use in Grades 6 and 7, and so, while overlapping, the ranges of these ratings are slightly older than for marks. However, it is quite likely that the grades sampled for marks are representative of the same periods as the behavior ratings, since the correlations between adjacent grade periods for marks were all statistically significant, the median being .44. We also wanted to assess two periods in adolescence in order to see if earlier

adolescence (CA 12–14) differs from middle (CA 15–17) in its significance relative to post-high school mental health status.

Mental Health Measures (MMPI-Mini-Mult)

We sought a reliable and valid measure of mental status that could be employed by nonprofessionals as part of an interview attempting to tap a variety of life adjustment information. Time limitations made it necessary that mental health data be obtainable within 20 to 30 minutes. The Mini-Mult short form of the Minnesota Multiphasic Personality Inventory (MMPI) met these criteria. The Mini-Mult is highly reliable and its scales correlate very well with the full-scale MMPI. It is able to predict full-scale MMPI profile types and can be administered orally as well as in written form with equivalent results within 20 to 30 minutes (Faschingbauer & Newmark, 1978). To avoid the issue of reading ability, this 71-item scale was administered verbally, with the subject required to check a yes or no response on an answer sheet.

The overall interview portion of the study was presented to subjects as an attempt to learn about the opinions, experiences, and feelings of a group of Philadelphia youth who had entered a kindergarten in center-city Philadelphia in 1968, and had lived their lives in Philadelphia. Subjects were informed that (a) their responses would be confidential, (b) the interview would take about 1 hour and be held in an office or elsewhere if this were absolutely necessary, and (c) that participants would be paid \$20 for the interview. At the time of the interview, participants were also told they could terminate the interview at any point they wished and were asked to sign an informed consent form.

The distribution of scores on each of the eight clinical scales indicated a broad range of scores for analysis. For example, the following percent of the cohort obtained *t* scores on the scale exceeding 70, indicative of significant disturbance in the area: 8% hypochondriasis (Hs); 19% depression (D); 7% hysteria (Hy); 34% psychopathic deviate (Pd); 31% paranoia (Pa); 26% psychasthenia (Pt); 38% schizophrenia (Sc); and 27% hypomania (Ma). What may appear as significant amounts of psychopathology in this cohort may merely reflect the fact that while the issue of possible bias in MMPI results for blacks remains unresolved, it is generally assumed that blacks may be overpathologized using the usual standard MMPI interpretative criteria (Newmark, 1985). This presents no problem in the present instance, however, since the concern is only with sufficient spread of scores and not diagnosis or amplitude of groups means. Kuder-Richardson reliability coefficients varied from .42 to .72 and median item analysis and point biserial correlations ranged from .33 to .45, these indicating adequate levels of internal con-

sistency. The Lie scores were all within the acceptable range, indicating that the subjects were responding honestly.

Since there were no specific hypotheses regarding individual clinical scales, and combined scores would enhance reliability, five composite scores were derived from the Mini-Mult following guidelines offered regarding profile types (Good, King-Ellison, & Brantner, 1974).

A *neuroticism* score was derived employing the Hs, D, and Hy clinical scales. Subjects with high scores typically reported a variety of somatic complaints (e.g., stomachaches or headaches), vague pains, irritability, worrisomeness, depression, and fatigue. Such individuals are said to respond to stress with physiological symptoms more than affect and to lack aggressive and sexual drive. A subject's score combined his performance on the three scales by assigning a score of 0 to each when a *t* score was <30, a 1 when it was between 30 and 39, a 2 when between 40 and 49, a 3 when between 50 and 59, a 4 when between 60 and 69, and a 5 when >69. A subject's total neuroticism scores could thus range from 0 to 15.

A second score was derived by combining the Pd and Sc clinical scales, employing the same calculation system as used for the neuroticism scale. Total scores could vary from 0 to 10, a high score indicating a person who is unpredictable, nonconforming, and often delinquent but not aggressive. These individuals are viewed as peculiar or odd, get into difficulty with others because they are inept, emotionally in conflict, or drawn passively into problem situations because of the people with whom they get involved. This dimension was labeled as *schizoid*.

A third score combined the Pd and Ma clinical scales and was labeled *aggressive acting out*. Individuals with high scores, calculated the same way as those already described, are typically self-centered, excitable, have low frustration tolerance, are insensitive and hostile, and sometimes violent. They consistently get into conflict with authority, in general have poor relationships with others, and are diagnosed as having a personality disorder.

A fourth score combined the clinical scales Pa, Pt, Sc, and Ma, and was called *serious disturbance*. The score could range from 0 to 4, with 1 point obtained each time a clinical scale exceeded a *t* score of 70. Our goal was to have a score indicative of serious aberration, encompassing thought disturbance, troubles dealing with feelings, personality disorganization, and in extreme instances, evidence of delusions or hallucinations. Individuals with high profiles in this grouping often have chronic, long-standing personal difficulties and insecurities which at times lead to severe social withdrawal or suspiciousness.

A fifth and final score was a measure of *manifest anxiety*. Sixteen of the original 50 items of the Iowa Manifest Anxiety Scale were present in the

Mini-Mult and served as the basis for the scale (see Dahlstrom, 1980). The Kuder-Richardson reliability coefficient for the subset of items was .70, and the median item analysis, point biserial correlation was .45. A high score reflects admission of a variety of signs of anxiety, tension, and low self-esteem.

Analyses

Causal path analysis was used to assess the relative effects of indirect and direct pathways between school performance and behavior from early childhood and adolescence to later mental health status. This was done in order to assess the importance of particular time periods in children's lives relative to subsequent mental health status in young adulthood, and the paths of effects across time periods. Because there is no theory that relates early school behavior and academic performance to each other in any systematic way, each of the three groups of our independent variables were analyzed separately. These were (1) positive and (2) negative school behavior, and (3) school performance in (a) early childhood and (b) early and (c) middle adolescence. Causal pathways were constructed within each set of variables (1, 2, and 3) from point a to b and b to c with the dependent variable d as the end point (see Figure 1). Pathways to each of the five mental health dependent variables were examined separately. Marks and data on mental health status were available for at least 152 girls and 128 boys. The comparable figures for ratings of classroom behavior were 159 girls and 147 boys.

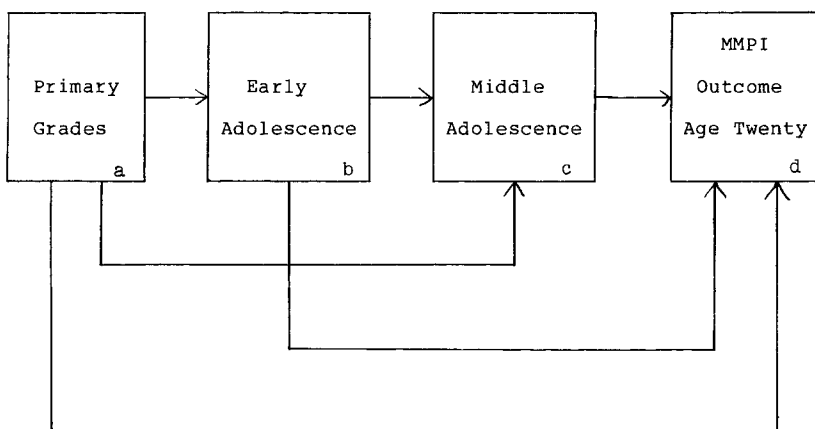


Fig. 1. Paths of independent variables to outcome MMPI variables.

Sample sizes were larger in some analyses. Tests of significance were based on the smallest sample sizes available between time periods.

In recursive causal analysis (Duncan, 1975; Kerlinger & Pedhazur, 1973) it is assumed that paths go in one direction. Since the data were gathered at successive points in time, this assumption was not violated in the analyses. Path coefficients are estimated by the standardized beta weights obtained from multiple regression analyses; the variable representing the "goal" of each path is regressed on all of the variables leading to it. Thus, the path coefficient between a and b is obtained by regressing the value of b on a. The path coefficients leading to c are obtained by regressing c simultaneously on b and a. The coefficients for the direct paths between each school variable and each dependent variable (a to d, b to d, and c to d) are obtained by regressing the dependent variable simultaneously on all the independent variables in the model. The value of the *direct* effects between each independent and the dependent are equal to the beta weights resulting from this analysis.

The amount of variance accounted for is also obtained from this multiple regression analysis. Indirect effects are computed from the sum of the products of all path coefficients between variables. There are three indirect paths between a and d; a b c d, a b d, and a c d. Thus, the total indirect effect of a on d is the sum of the products resulting from multiplying the values of the path coefficients a b c d, a b d, and a c d. The total indirect effect of b on d is the product of b c d because there is only one indirect path between b and d. Because there was no assessment of any variables intervening between middle adolescence and age 20, there is only a direct path between c and the dependent variable, d. Thus there were no indirect effects between c and d.

There are no conventional tests of significance for indirect effects. By convention, indirect effects are considered significant if they sum to at least .10. Effects between .10 and .19 are considered modest. Those between .20 and .29 are considered moderate, and those .30 or greater substantial. The significance of direct effects equals the *p* values of the beta weights derived from the multiple regression analyses.

The adequacy of a causal model is assessed from several factors. One factor is the degree to which the sum of the direct and indirect effects between antecedent variables and the dependent variable is equal to the simple correlations between them. This determines the fit of the model. Another factor is the amount of variance in the outcome variable accounted for by *all* the variables, an indication of their predictive strength, as in any application of multiple linear regression. However, in causal path analysis it is not only the statistical significance of the coefficient that is considered important but its value relative to other paths. By convention, if the coefficient has a value of .10 or more (is 10% of the standard deviation), it is thought

to be of some importance in the model, even though, as an indication of a direct effect, it may be statistically insignificant.

RESULTS

Analyses of the results indicated that only direct effects were of sufficient significance to be reported. Very few indirect effects could be considered significant, and when they were they were very modest in size. Thus, Tables I and II report only the direct effect results of the multiple regression analyses for males and females, respectively, with each mental health score regressed on each set of three independent variables. Also in Table I and II are the amount of variance accounted for by each set of independence variables, the F ratios, and the degrees of freedom on which the p values are based (the smallest n available on any two variables). The absence of indirect effects in the presence of significant direct effects suggests that academic performance and behavior have unique significance at particular developmental stages, a significance that is not transmitted through time even though the academic performance or behavior in question may correlate with the same measure across time. Put simply, it appears that it is not just what is happening that is important for mental health outcomes, but when it happens!

Males

Marks: Table I indicates that marks have a significant direct effect (F ratios) upon aggressive acting out and schizoid scores, and that such marks have particular saliency in middle adolescence. It may be more than coincidental that both syndromes typify individuals with acting-out problems, albeit for different reasons, and that poor marks as a high-risk sign emerge during the adolescent period typified by the types of misconduct that may interfere with academic performance. In contrast, the relationship of marks to neuroticism emerges during the primary grades, perhaps reflecting very early capacity to cope (or not cope) with the new learning environment.

Behavior: The most striking feature of these data is the relatively consistent (4 out of 5) significant F ratios for positive behavior and the absence of significance for negative behaviors. It appears that, at least for males, it is the presence (or absence) of positive coping behaviors that signifies good (or poor) mental health outcomes more than the presence (or absence) of disturbed or inadequate coping behaviors. Further, it appears that the presence of such positive behaviors has unique significance during early adolescence, at the point of stressful transition into adolescence. During this period, manifestations of originality and good reasoning ability, together with

Table I. Direct Effect Results of Multiple Regression Analyses: Males^a

Independent variables	Age period			Variance accounted for all three ages	F	df (3, N)	Dependent variables
	Primary grades	Adolescence Early	Mid				
Marks	-.08	-.02	-.23 ^c	.08	3.40 ^c	124	Aggressive acting out
	-.08	-.04	-.21 ^b	.07	3.33 ^c	124	Schizoid
	-.27 ^d	-.04	-.04	.07	3.23 ^c	124	Neuroticism
	-.16	-.08	.03	.04	1.77	124	Manifest anxiety
Positive classroom adjustment	-.22	0	0	.05	2.03	124	Serious disturbance
	-.08	-.16	.07	.03	1.67	143	Aggressive acting out
	-.09	-.26 ^d	.11	.08	4.31 ^a	143	Schizoid
	-.10	-.19 ^c	.03	.05	2.60 ^c	143	Neuroticism
Negative classroom adjustment	-.10	-.20 ^c	.10	.06	2.83 ^c	143	Manifest anxiety
	-.13	-.18 ^c	.18 ^c	.06	3.22 ^c	143	Serious disturbance
	.12	.12	.06	.02	0.92	143	Aggressive acting out
	.12	.03	.02	.02	0.94	143	Schizoid
	.04	.07	.10	.02	1.22	143	Neuroticism
	.13	.08	0	.03	1.55	143	Manifest anxiety
	.22	0	0	.05	2.54	143	Serious disturbance

^aTrend values are reported only when the F value was significant.^bp < .10.^cp < .05.^dp < .01.

Table II. Direct Effect Results of Multiple Regression Analyses: Females^a

Independent variables	Age period			Variance accounted all three ages	F	df (3, N)	Dependent variables
	Primary grades	Adolescence Early	Mid				
Marks	-.12	-.16 ^b	-.07	.08	4.31 ^d	148	Aggressive acting out
	-.11	-.17 ^b	-.08	.08	4.57 ^d	148	Schizoid
	-.07	-.12	-.01	.03	1.33	148	Neuroticism
	-.15 ^b	-.16	-.08	.10	5.64 ^d	148	Manifest anxiety
	-.18 ^c	-.21 ^c	.07	.09	4.94 ^d	148	Serious disturbance
Positive classroom adjustment	-.08	0	-.17 ^c	.04	2.36	155	Aggressive acting out
	-.06	-.08	-.17	.06	3.35 ^c	155	Schizoid
	-.13	.02	-.09	.03	1.58	155	Neuroticism
	-.14	-.03	-.20 ^c	.09	4.95 ^d	155	Manifest anxiety
	-.15 ^b	-.03	-.12	.06	3.01 ^c	155	Serious disturbance
Negative classroom adjustment	.08	.20 ^c	.02	.06	3.43 ^c	155	Aggressive acting out
	.17 ^c	.15	.02	.08	4.38 ^d	155	Schizoid
	.12	.04	0	.02	1.00	155	Neuroticism
	.14	.10	-.03	.04	2.14	155	Manifest anxiety
	.07	.17	-.02	.04	2.20	155	Serious disturbance

^aTrend values are reported only when the F value was significant.

^bp < .10.

^cp < .05.

^dp < .01.

good social interaction skills in males, may be salient indicators of good adjustment 6 to 7 years later.

Females

Marks: Table I indicates that, as with males, marks have significant direct effects upon subsequent aggressive acting out, schizoid, manifest anxiety, and serious disturbance patterns, the F ratios exceeding those in males. In contrast to males, however, middle adolescence does not emerge as a critical period. Rather, earlier periods tend to have saliency, with direct effects emerging or suggested by trends during early adolescence for schizoid and aggressive problems, and as early as primary years for serious disturbance and anxious behavior problems. The strongest direct effects thus emerge at both primary years and early adolescence, suggesting that over an extended period of early school years poor marks are potentially significant indicators of a variety of later disturbance among females.

Behavior: The findings for positive coping behaviors among females is similar to that for the males. The significant F ratios are for the same mental health outcomes: schizoid, manifest anxiety, and serious disturbance, with a trend toward significance for aggressive acting out, $F = 2.36, p = .07$. The sexes differ relative to positive behaviors in that while direct effects emerge among males during early adolescence, the significant age period in females for schizoid and anxiety is middle adolescence, with a trend in the primary years for serious disturbance.

In more marked contrast with the males, negative coping behaviors also emerged as salient for females in early adolescence for aggressive acting out and during primary years for the schizoid outcome. Though there were more significant F ratios for positive coping (three) than for negative coping (two), both emerged as significant indicators of later mental health status.

Mental Health Outcomes

Examination of the tables also reveals that the best predicted mental health outcome was for the schizoid pattern, with significant F ratios in five of six analyses. In contrast, only one of six F ratios was significant for the neuroticism outcome, with the other three mental health outcomes having three of six significant. It appears that schizoid mental health outcomes characterized by social ineptness, peculiar behaviors, and the tendency to be drawn into problems due to passivity with other people have early precursors in the inability to work productively in school and behaviorally cope with classroom demands. In contrast, it appears that an early adult symptom pic-

ture characterized by somatic complaints, vague fears, and worries are not distinguished by such early school signs.

Aggressive acting out in males has a forerunner in poor marks in middle adolescence, and in females in both poor marks and negative coping behaviors in early adolescence. Manifest anxiety is presaged by the absence of positive coping during early adolescence in males, and in poor primary grade marks and the absence of positive coping behavior in middle adolescence among females. Finally, a seriously disturbed mental health outcome is presaged by the absence of positive coping in males during early and middle adolescence, and in females by the absence of good marks and positive coping during the primary school years, and also the absence of good marks in early adolescence. It is worth noting that for both schizoid and serious disturbance outcomes, both of which probably reflect more chronic conditions, poor school adaptation is evident by direct effects that cover two or three age periods for each sex, whereas this is true of only one or at most two periods for the other three mental health outcomes.

DISCUSSION

The present results reflect analyses relating a series of school events over the childhood and adolescent years to a single set of outcomes at age 20 in a group of individuals that grew up in an at-risk urban environment. The number of significant results suggest that among such individuals signs of inability to be productive in school, whether by way of poor marks, the absence of positive coping behaviors, or the presence of negative coping behaviors, may be considered early red flags of high risk for later mental health problems, especially of a schizoid or seriously disturbed nature.

The data parallel other reported results relative to the significance of the same indices of school productivity and adjustment to post-high school employment history and moves toward independent living (Spivack & Marcus, 1985). In contrast to these analyses, however, the present significant findings only of direct effects indicate the particular importance of school functioning at particular developmental periods as indicators of possible subsequent mental health problems, and suggest there may very well be differences in significance for positive and negative coping behaviors at different times depending upon sex.

The finding of only direct effects suggests that there are ages or life stages at which evidence of life success or failure are especially significant in the sense that similar evidence at a different stage would tell little about subsequent events. The significance, developmentally speaking, is that evidence of success or failure to cope may at a particular stage indicate the

existence or evolution of adaptive processes or personality structures or capacities crucial to later life adjustment. Such capacity to cope may or may not be manifest in the same fashion (e.g., behaviors) at another stage, depending upon other factors (e.g., peer norms; rebellion against adult expectations). Thus, positive behavioral coping among early adolescent males may signify the capacity to weather the storm of a life transition (e.g., into adolescence), but such behavior during middle adolescence may not signify such capacity, reflecting perhaps at this stage only a phenotypic conformity that has an underlying mixture of motives and significances. That signs of such positive coping behaviors among females during middle adolescence have significance, though not during the early adolescent transition, might suggest that positive coping in females during adolescence signifies a successful resolution of a difficult earlier transition period, but that the potential for such positive coping during the transition itself may be masked or attenuated by the emotional and social turbulence of this period in females.

The finding that evidence of positive behavioral coping (as well as good marks in school) may have more interpretive and prognostic significance than evidence of maladjustment has implications for our thinking about development of psychopathology as well as for preventive intervention. Developmentally, the suggestion is that success in traversing life toward a reasonably emotionally healthy outcome may depend more than we have previously appreciated upon how well we accumulate a variety of positive social and emotional skills that abet the sense of self-efficacy and self-esteem. Strayhorn (1983) has articulated the relevance and potential utility of a diagnostic axis that uses the language of positive emotional and social skills, suggesting it may have more therapeutic relevance than a symptom-cluster scheme, is less pejorative than disorder labels, lends itself to scientific grounding, and is useful when applied to preventive mental health. In a similar vein, Bloom (1985) has highlighted the shift from the orthodox prevention of specific disorder approach to one that emphasizes competence building. Cowen (1985) has also pointed to the advantage of the competence enhancement approach in prevention, emphasizing however the need to maintain a developmental approach since needed competencies may change as a function of age. The theorizing of Sroufe and Rutter (1984) addresses this issue, proposing that there may be age-specific positive competencies. The growing child must develop competencies (similar to those offered by Strayhorn) which lay the groundwork for the evolution of a healthy adolescent and adult. While the present evidence of such positive competencies or skills, as manifested in the classroom during adolescence, undoubtedly only sample a broad range of behaviors, they suggest cognitive elements (e.g., ability to be flexible and open in problem solving), social elements (e.g., ability to relate to adults and become involved with peers in a learning situation), and a motivational element (e.g., striving to succeed and accomplish).

Pursuing the implications for prevention, the present findings raise the issue of timing of interventions so as to prevent eventual psychological dysfunction. The data are not specifically informative in this regard. If taken at face value, they suggest that in males competence-building interventions should be applied during the transition into early adolescence or just before, so as to support the coping capacity of the youngster as he faces this transition period. Elias (1984) found that instituting a preventive social problem solving program in schools just prior to the transition into junior high school did in fact reduce the stress experienced by his cohort after entering junior high school. For females, the data suggest that such intervention to enhance competence may best be applied in middle adolescence or perhaps during the period of transition into adolescence (e.g., ages 13–14). Unfortunately, such a concrete reading of the present results may be erroneous in that the appearance of a significant positive behavioral sign at one age does not preclude the possibility that the groundwork for this positive behavior may have been laid well before, only emerging as significant later given the demands of that later period and the constraints of the new social setting (e.g., peer values and pressures; relationships with adults and authority institutions, attitudes about academic achievement). Those with a strong early childhood developmental orientation would undoubtedly be prone to such a view, although others might still hold that the development of relevant competencies is significant at any age, later competency development making up for earlier lost opportunities. Hunt (1979) has been quite explicit regarding this issue, noting that while early experience may be quite significant in the individual ontogeny of human competencies that underpin later development, the human organism is quite plastic, the concept of “critical” periods might better be replaced by the softer concept of “sensitive” periods, and that the deficiencies in early development (given our plasticity) might very well be compensated for by subsequent development-fostering growth-inducing experiences.

The results also suggest there may be sex differences in when significant early indicators emerge, although the manifestation of these differences may vary as a function of the behavioral outcomes considered. As already discussed, positive classroom behavior emerges as significant for both sexes, though later for females than males. As suggested, this difference may reflect sex differences in the emotional impact of the stress of the transition into adolescence, this impact masking the significance of evolving positive competencies in girls more so than in boys. In contrast, in middle adolescence positive coping skills in girls may reflect early success in weathering this turbulent prior early adolescent period. In boys, positive behavioral competencies may be only a phenotypic phenomenon reflecting the effects of a mixture of conflicting conformity–rebellion issues or attempts to come to terms with

peer values regarding academic involvement, all of which confuse the interpretive meaning of positive behaviors for them.

A second sex difference emerged for negative classroom behaviors, in that such behaviors were significant indicators for subsequent schizoid and aggressive acting out behaviors in females but not in males. Considering the fact that the frequency of occurrence of such negative classroom behaviors in males always exceeds that of females, it may very well be that such behaviors are less discriminating events among males. When girls manifest them, they are less consistent with expected sex-role functioning and thus a purer distillate of inability to cope. Boys are "expected" to behave this way, and thus behaving this way occurs over a broad spectrum of boys with varying adaptive capacities.

The findings for marks regarding sex differences are less clear in what they suggest for interpretation. Perhaps it is best to say only that the results support Kohlberg, Ricks, and Snarer (1984), who conclude, after reviewing the field of childhood development as a predictor of adult adaptation, that academic achievement is an early indication of later mental health status, but that the findings suggest the wisdom of pursuing the specific factors that underlie such achievement if one attempts to fathom the true causative precursors to psychological dysfunctioning. Here they pinpoint the variables that correlate with academic achievement, including a variety of abilities to cope (e.g., self-control) as well as cognitive capacities (e.g., attentive power).

For the male group, the present findings contrast with findings reported earlier with this cohort, which revealed a high-risk negative behavior pattern during the primary years (CA 5-8) for later delinquency in the school as well as community (Spivack et al., 1986). This high-risk behavior pattern emerged for both sexes and was labeled poor self-regulation. It is defined by DESB Factors 1, 2, 3, and 9, indicating the youngster who is overly and disruptively involved socially, and who fails to modulate his own behavior to accommodate to others. Considering the fact that these behaviors are part of the present negative classroom adjustment grouping, it appears that preventive efforts to address this pattern in males would be worthwhile only if one's concern were eventual delinquency but not other forms of behavioral deviance or psychological dysfunction. This finding perhaps helps refine the repeated findings that antisocial behavior, particularly of a severe type, is a powerful predictor of a variety of adult maladjustments (Loeber, 1982). The suggestion is that poor self-regulation is a relatively specific high-risk indicator of delinquency when evidenced at ages 5-8, but becomes prognostic of other forms of maladaptation only if later there emerges more severe antisocial behavior, with its negative societal feedback and consequent emotional undercurrents and negative attitude formation. This contrast in findings in the male group is not evidenced in the female group, wherein early

negative behaviors are prognostic of both later delinquency and mental health problems. The present data indicate early direct effects for both schizoid and aggressive acting out behavior. The latter is consistent with the earlier data, although not significant until early adolescence. It is worth noting that poor self-regulation occurred much more frequently in the present cohort in males than females even at ages 5–8. Clearly, little boys are more often made of “snakes and snails, and puppy-dog’s tails,” and as suggested earlier such difficult-to-manage behaviors may thus be less indicative (at least early in life) of problems, thus receiving less negative adult feedback than in girls, wherein such behavior is less sex-role consistent. When such poor self-regulating behaviors occur in girls, therefore, they may very well constitute specific indices of a range of difficulties that have significance for later adjustment.

A final caveat: It must be remembered that the present findings involved a specific group of urban, disadvantaged children and youth, mostly black, at risk due to their socioeconomic and related circumstances. It is difficult to know whether the same results would have emerged if the cohort had been more heterogeneous. It may be that poor academic productivity or behavior problems in a suburban middle-class school would have greater significance for long-term mental health outcomes, being less supported by the surrounding behavioral environment and cultural attitudes about school and the value of education, and thus more reflective of internal incapacities with long-term significance. It could very well be that negative coping behavior would be more predictive in a less at-risk environment, whereas positive coping behaviors would be more significant in the disadvantaged one. As reported, there tended to be more direct paths for positive than negative behaviors in the present cohort. In any case, the high base rate of early academic and behavioral problems in the present sample (reported elsewhere: Spivack, 1983) and the multiple personal and environmental causes of such problems suggest that attempts to predict later outcomes from these problems would lead to many false positives. The significance of the present findings is the discovery that even considering this issue, it may be possible to distinguish those *most* at risk so that preventive action may be taken, after targeting specific age groups and behaviors, especially preventive programs that may enhance positive competencies.

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