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Trajectories of Failure: The Educational Careers of Children with Mental Health Problems¹

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Abstract

The authors draw on developmental psychopathology, life course sociology, and scholarship on educational processes to develop a conceptual framework for understanding the association of children's mental health problems with educational attainment. They use this framework to address two empirical gaps in prior research: lack of attention to mental health trajectories and the failure to consider diverse explanations. Using data from the Children of the National Longitudinal Surveys of Youth data set, the authors identify latent classes that characterize trajectories of internalizing and externalizing problems from childhood through adolescence. Youths in the classes vary significantly in their likelihoods of high school completion and college entry. The authors evaluate the ability of three sets of mediators to explain these patterns: academic aptitude, disruptive behaviors, and educational expectations. Educational expectations are important mediators independent of academic aptitude and disruptive behaviors. Social responses to youths' mental health problems contribute importantly to their disrupted educational trajectories.

Researchers from many different disciplines study whether, how, and why children's mental health problems affect socioeconomic success in adulthood. Educational researchers evaluate the implications of emotional and behavioral “readiness” at school entry for future academic performance as a means to understand and rectify persistent educational inequalities (e.g., Campbell et al. 2006; Spira and Fischel 2005; Vitaro et al. 2005). Health policy scholars estimate the effects of early-onset mental disorders on socioeconomic attainment to establish the societal relevance of the disorders and to argue for greater attention to mental health policy (e.g., Jayakody, Danziger, and Kessler 1998; Kessler et al. 1995). Epidemiologists in sociology and public health examine whether childhood mental health problems have effects on subsequent socioeconomic attainment in order to test the relative importance of social “selection” and social “causation” explanations for sociodemographic differences in mental health (e.g., Johnson et al. 1999; Miech et al. 1999; Ritsher et al. 2001). Despite commonalities in the measures and methods of these lines of research, they proceed relatively independently with little communication across disciplinary and substantive boundaries.

Our goal in this article is to evaluate what we have and have not learned from these diverse efforts, and to present an analysis that locates these efforts in a comprehensive conceptual framework. The framework we develop draws on insights from developmental psychopathology, life course sociology, and scholarship on educational processes to highlight patterns of mental health among children and adolescents and to develop hypotheses about the

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implications of those patterns for educational attainment. We evaluate our hypotheses using prospective longitudinal data on youths' mental health and educational experiences from ages 6 to 22.

MENTAL HEALTH AND EDUCATIONAL ATTAINMENT: ASSESSING THE EVIDENCE

Although motivated by different theoretical concerns, the disparate strands of research that we identified above converge on a common conclusion. Youths with mental health problems are significantly less likely than other youths to graduate from high school and to enroll in postsecondary education (Coutinho and Denny 1996; Ensminger and Slusarcick 1992; Entwisle, Alexander, and Olson 2005; Greenbaum and Dedrick 1996; Neel et al. 1988; Vitaro et al. 2005; Wagner 1995). The educational failures of youths with mental health problems begin early in the form of relatively low grades in elementary school (Alexander, Entwisle, and Dauber 1993; Farmer and Bierman 2002) and middle school (DiLalla, Marcus, and Wright-Phillips 2004) and extend through high rates of course failure in high school (Needham, Crosnoe, and Muller 2004). The consequences of youths' mental health problems for educational outcomes hold across categorical and dimensional measures of mental health (Vander Stoep et al. 2002) and have been replicated in different cohorts and countries (Gerard, Palyska, and Wysocka 1976; McLeod and Kaiser 2004; Mendiguchia Quijada 1993; Miech et al. 1999; Woodward and Fergusson 2001), attesting to their generalizability.

The consistency in these findings notwithstanding, two important gaps in the knowledge base limit our understanding of the association between youths' mental health problems and educational attainment. First, prior research has not evaluated the timing of the association—whether childhood or adolescent problems have the strongest effects on educational attainment and whether and how the age at which youths experience problems influences the processes that generate those effects. Although psychopathologists have long been interested in the developmental course of youths' mental health problems, that interest has not been integrated into research on educational attainment.

Second, few studies have considered the full range of potential explanations for the association. Regardless of their disciplinary homes, most prior investigators assume that if youths' mental health problems affect educational attainment, they do so because of deficits inherent to the child—the child lacks academic skills or behavioral competencies that are required to succeed in mainstream social institutions. For example, although educational psychologists acknowledge that children's experiences with teachers and peers influence how successful they will be in school (NICHD 2003; Pianta, Steinberg, and Rollins 1995), they rarely include teacher-student interactions in studies of the effects of school readiness on educational attainment. For their immediate purposes, understanding which components of school readiness affect educational outcomes is more important than analyzing the classroom experiences that explain or modify those effects. Similarly, health policy scholars target the disorders themselves as the sites of intervention in their efforts to quantify the societal costs of mental disorders. Even sociologists of mental health, who study the stigma associated with mental illness, do not study the processes through which mental health problems affect educational attainment because they associate social selection processes with genetic explanations for mental disorders (Eaton and Muntaner 1999). In sharp distinction, sociologists of education boast a long tradition of research into the effects of educational institutions on student success (Cicourel and Kitsuse 1963; Oakes 1985; Rist 1973). To date, the insights from that research have not been incorporated into research on mental health and educational attainment. As a result, plausible alternative explanations that implicate the responses of social institutions and important adults have not received the attention they deserve.

We integrate these concerns in an analysis of prospective, longitudinal data that follow children from ages 6–8 through ages 20–22. We identify meaningful trajectories of mental health problems from childhood through adolescence and estimate the associations of these trajectories with central indicators of socioeconomic success in adulthood—high school completion and college entry. We then evaluate the extent to which these associations can be explained by differences in academic aptitude, school-related disruptive behaviors, and the social responses of others. Beyond the specific empirical gaps it addresses, our analysis speaks to more general questions regarding continuity versus discontinuity and the role of person-environment interactions in human development.

IMPORTANCE OF TIMING

The first issue we consider is the timing of the association between youths' mental health problems and early adult educational attainment, by which we mean: (1) the point in the life course at which the youth's mental health problems occur (childhood vs. adolescence), and (2) their short- or long-term effects on school experiences. Because different intervention strategies are required to manage mental health problems that begin early versus later in the life course, it is imperative that research carefully consider the timing of problems in relation to educational failures.

Time and timing have been integrated into prior research on children with mental health problems in only a limited way. Studies by education researchers in psychology and sociology typically follow children from the preschool or kindergarten years into their first few years of formal schooling (e.g., Alexander et al. 1993; Farmer and Bierman 2002), leaving open the question of how far their school-related problems extend into the future. (We discuss two noteworthy exceptions below: Ensminger and Slusarcick [1992] and Entwisle et al. [2005].)

In contrast, most studies by health policy scholars begin with psychiatric disorders at age 15 and move forward in time, using either prospective or retrospective accounts (e.g., Bardone et al. 1996; Kessler et al. 1995; Miech et al. 1999). These studies confirm that persons whose mental health problems begin by adolescence are at greater risk for educational disruptions than are persons whose problems begin at later ages, but because they do not incorporate information on mental health or school experiences at younger ages, the studies are unable to speak to the persistence of the effects of early mental health problems over the life course.

The strengths of these two types of studies are combined in analyses of data from long-term panel studies that span the early elementary and young adult years. The few such analyses suggest the importance of considering early-life mental health problems in studies of educational attainment. Using data from the Children of the National Longitudinal Surveys of Youth data set, McLeod and Kaiser (2004) observed significant effects of childhood internalizing and externalizing problems on high school degree receipt and college enrollment that were independent of adolescent mental health. Ensminger and Slusarcick (1992) reported that children who were aggressive in first grade were less likely to graduate from school than nonaggressive children (see also Barrington and Hendricks 1989; Cairns, Cairns, and Neckerman 1989). Most recently, Entwisle, Alexander, and Olson (2005) showed that teacher ratings of children's dispositions in first grade (e.g., happy, timid) significantly predicted educational status at age 22.

Together, these studies suggest that children's mental health problems, and the associated behavior problems they index, have consequences for early-adult socioeconomic attainment. They are also limited, however, by their failure to consider trajectories of mental health problems over time. Ensminger and Slusarcick (1992) and Entwisle et al. (2005) only had access to measures of behavior and temperament at one point in time and, thus, were unable to evaluate the relevance of behavioral and dispositional continuity for educational success.

McLeod and Kaiser (2004) took a first step toward acknowledging the relevance of mental health trajectories but used an analytic strategy that relied on measures of mental health taken at different ages. Such measures tend to be highly correlated, which complicates attempts to estimate their independent effects on outcomes. The use of separate measures also fails to acknowledge the potential existence of distinct patterns of increase and decrease in mental health problems over time.

We build on this body of research by identifying developmental trajectories for mental health problems through the elementary, middle, and high school years and estimating their associations with early adult attainment. Prior research provides evidence for both continuity and discontinuity in mental health over time. Although estimates vary, most studies find that somewhere between 30% and 60% of people who meet criteria for a specific disorder during childhood meet criteria for the same or a related disorder in late adolescence or adulthood (Bardone et al. 1996; Barkley et al. 1990; Cohen, Cohen, and Brook 1993; Esser et al. 1990; Harrington et al. 1990). Thus, some, but not all, adolescents with mental health problems will have first experienced those problems at an earlier age, and some, but not all, children with mental health problems will continue to have those problems in adolescence.

Theories of developmental continuity and discontinuity support contradictory expectations regarding the relative importance of childhood and adolescent mental health problems for educational attainment (see Schulenberg, Maggs, and O'Malley [2003] for a review). Theories of continuity view early life experiences as formative and, in that sense, determinative of later life outcomes. Early life experiences create enduring dispositions that are important forces in their own right, but also as they are reinforced in social interaction (Caspi, Bem, and Elder 1989; Elder 1997) and as they set into motion processes of cumulative advantage and disadvantage (Dannefer 2003; O'Rand 1996). Theories of developmental continuity support the expectation that children who display high levels of mental health problems in childhood will have poorer outcomes than children who display high levels of mental health problems only in adolescence. Their poorer outcomes are attributable both to their subsequent involvement in social interactions and contexts that discourage academic success as well as to the difficulty youths face in catching up when they fall behind in their early school years (Rosenbaum 1978).

In contrast, theories of developmental discontinuity emphasize the potential for change in individual characteristics or in their underlying function or meaning during major life transitions. The potential for change implies that temporally proximal experiences are the most important determinants of emotional and behavioral outcomes. Applied to this specific case, theories of developmental discontinuity support the expectation that youths who have high levels of mental health problems in adolescence will have poorer educational outcomes than youths who have mental health problems during childhood. According to this line of reasoning, whatever problems youths have early in their school years diminish in importance as they mature and move into social contexts that offer new opportunities for growth and change (McLeod and Almazan 2003).

The limited relevant empirical evidence provides support for both expectations. Caspi et al. (1989) found that ill-tempered boys from the Berkeley Guidance Study (initiated in 1928) experienced progressively worse SES as they moved through the life course, with low educational attainment and unstable work histories. Women who were ill tempered as children did not differ from other women in occupational achievements, but were more likely to experience downward social mobility through their marriages. Moffitt et al. (2002) found that youths who displayed antisocial behaviors throughout childhood and adolescence experienced more substance use, criminality, and work, financial, and family problems during young

adulthood than youths who displayed antisocial behaviors only during adolescence, but that the latter experienced more problems than youths who were antisocial only during childhood.

In sum, although it would be misleading to characterize theories of developmental continuity and discontinuity as competing (Schulenberg et al. 2003), our analysis nevertheless allows us to evaluate their contrary predictions as they apply to the case of children's mental health problems. We ask specifically: Can later improvements mitigate the effects of early mental health problems on educational attainment? And do mental health problems that emerge in adolescence influence educational attainment as strongly as problems that begin in childhood?

WHAT HAPPENS IN SCHOOLS

After attending to the timing of the association between youth mental health problems and educational attainment, we consider a second issue: What explains the effects of mental health trajectories on educational attainment? We focus here on three possible explanations: academic deficits, disruptive behaviors, and the manner in which parents and teachers respond. Our interest in academic deficits and disruptive behaviors derives from a more general debate regarding the relative importance of cognitive and noncognitive behaviors and traits in stratification processes (Farkas 2003). Farkas (2003) marshals convincing evidence that noncognitive behaviors and traits—work habits, social skills—influence educational and occupational attainment independent of aptitude. School readiness researchers provide further support in a related line of research which finds that two different types of “readiness” have distinct effects on educational success. The first of these, cognitive readiness, refers to early language development, preliteracy skills, and number concepts—the building blocks for literacy and numeracy development. The second, behavioral readiness, refers to regulatory strategies and social skills that facilitate children's transition into structured school learning environments (Campbell and von Stauffenberg 2007). Studies consistently find that children who are “unready” at the time of school entry, but particularly those who are “unready” behaviorally, are at much greater risk of academic failure than other children (La Paro and Pianta 2000).

Both cognitive and behavioral readiness covary with mental health problems. In the case of behavioral readiness, the covariation is definitional inasmuch as many of the feelings and behaviors that are used to index “mental health” problems—hyperactivity, impulsivity, aggression, anxiety—are used as indicators of behavioral readiness. In the case of academic readiness, the covariation is not definitional but is no less marked. Children who have mental health problems also have relatively poor academic skills, on average (Cole 1990; Hinshaw 1992; Roeser, Eccles, and Strobel 1998; Trzeniewski et al. 2006).

The associations between mental health problems, on the one hand, and behavioral readiness and cognitive readiness, on the other, suggest that the effects of mental health problems on academic outcomes may be attributable to one of two main processes. In the first, children with mental health problems begin school with poorer academic skills than other children, and their academic deficits interfere with later school success. In support of this possibility, some research finds that children's mental health problems affect cognitive processes associated with memory and attention, which, in turn, diminish achievement (Roeser et al. 1998). While it is surely the case that emotional problems and school performance are reciprocally related (Cole et al. 1996), early academic abilities may nevertheless account for some of the association between mental health problems and school success.

In the second, children with mental health problems fare poorly in school because they cause trouble in the classroom and, as a result, have difficulty completing their work in a timely and effective manner. Children who are engaged in disruptive and inappropriate behavior are less likely to be focused on the tasks that matter in classroom contexts, such as attending to written

and oral materials, listening to teacher instructions, and working on assignments alone and with other children. Teachers affirm that basic behavioral competencies are necessary prerequisites for successful learning (Lin, Lawrence, and Gorrell 2003). Not surprisingly, then, behavior ratings have significant effects on grades throughout elementary school, both at the time and in the future, independent of academic ability (Alexander et al. 1993; Entwisle, Alexander, and Steffel Olson 2003, 2005).

Each of these explanations assumes that youths with mental health problems are unable to engage with educational institutions in an appropriate way and, therefore, are unable to succeed in those institutions. We propose a third explanation that derives from the contrary premise that youths' mental health problems influence educational attainment through the social responses they elicit. According to this explanation, teachers and school administrators come to expect less from youths with mental health problems and, through their diminished expectations, discourage these youths from achieving their potentials. Parents, too, may come to expect less from their children with mental health problems as they observe the problems their children have in school (Karp 2002) and as a result of the challenges they face when trying to meet their children's needs (Bussing et al. 2003; Johnston and Mash 2001). The stigma associated with mental health problems (e.g., Link et al. 1987) may account for some of these negative expectations, but they may also result from more subtle processes of evaluation and accommodation in schools.

Prior research supports the relevance of social responses for the school experiences of youths with mental health problems. Several studies document the role of teachers' judgments of students in educational success. Teachers report more negative views of children with mental health problems (Mullins et al. 1995; Pace et al. 1999) and rate their relationships with these children as more conflictual, dependent, and less close than their relationships with other children (DiLalla et al. 2004; Henricsson and Rydell 2004; Murray and Murray 2004). Teacher ratings of their relationships with children, in turn, affect their expectations and, ultimately, children's school performance (Ainsworth-Darnell and Downey 1998; Birch and Ladd 1998; DiLalla et al. 2004; Hamre and Pianta 2001; Pianta et al. 1995; although see Jussim and Harber 2005). In short, the association of child problems with school failures may reflect a selective process whereby schools systematically expect less from children with mental health problems, independent of their academic and behavioral competencies and, thereby, discourage them from succeeding.

Our third explanation directs attention away from cognitive and behavioral deficits inherent to the child toward the centrality of person-environment interactions in life course development. Rather than treating the effects of mental health problems on socioeconomic attainment as predestined, it sees them as the product of interactional negotiations in which teachers, parents, and the children themselves come to devalue their potential. As such, it offers a fundamentally sociological explanation for an avowedly psychological process.

A CONCEPTUAL FRAMEWORK

We translate our interests in timing and process into three concrete research questions: (1) What distinct trajectories of mental health problems can be identified in a national sample of U.S. children? (2) What are the associations of these trajectories with educational attainment? (3) To what extent can the associations be explained by academic aptitude, disruptive behaviors, and the educational expectations of self and others? Our approach to answering these questions is guided by a conceptual framework that draws on the insights of developmental psychopathology, life course sociology, and scholarship on educational processes.

Are There Distinct Trajectories of Mental Health Problems among Youths?

Prior research takes two primary approaches to answering this question (see Nagin and Tremblay [2005] for a review). The first approach uses growth curve modeling to estimate parameters that describe underlying patterns in repeated measures (Willett and Sayer 1994; Raudenbush 2001). The main parameters of interest in these models are the mean intercepts and slopes of the growth curves and their variances. Significant variation in the intercept and slope encourages analyses designed to explain the variation using one or more predictor variables. For example, analysts might investigate whether the growth curve parameters for depression are significantly different for boys and girls (Ge et al. 1994) or based on the child's history of poverty (McLeod and Shanahan 1996). Growth curve estimation procedures (hierarchical linear modeling or latent curve analysis) assume that intercepts and slopes vary continuously across individuals, for example, that girls and boys may differ in the initial levels of the outcome or in their rates of increase or decrease but that the general form of the growth curve is the same in both groups.

The second approach to analyzing temporal patterns applies finite mixture models to identify clusters of distinct developmental trajectories that characterize groups of individuals (Nagin 1999). These "growth mixture" models relax the assumption of continuous variation in growth curves across individuals and, instead, assume that developmental trajectories have several distinct forms that are called trajectory classes. For example, levels of the dependent variable may be stable for some individuals but increase or decrease for others. Analysts who favor growth mixture modeling are often motivated by the belief that the trajectory classes have distinctive etiologies or consequences.

Studies that use growth curve and growth mixture models both provide information about how internalizing and externalizing problems change through childhood and adolescence. Growth curve models of physical aggression, for example, find steady declines in aggression through the childhood years and into adolescence (e.g., Cairns and Cairns 1994; Tremblay et al. 1999). Growth mixture models complement these findings by identifying four distinct groups of children: those with low levels of aggression from ages 6 through 15, those with moderate levels at young ages who desist from aggression at later ages, those with very high levels at young ages who desist, and a small group of children who have high levels of physical aggression throughout childhood and adolescence (Broidy et al. 2003; Nagin and Tremblay 1999). Similar results have been observed in studies of other externalizing problems such as conduct disorder and hyperactivity (Shaw et al. 2005). In contrast, growth curve models for antisocial behavior consistently identify a group of youths who engage in antisocial behaviors only during the adolescent years (i.e., whose problems increase with age [Aguilar et al. 2000; Moffitt 1993; Moffitt et al. 1996; Moffitt and Caspi 2001; Nagin, Farrington, and Moffitt 1995; Roeder, Lynch, and Nagin 1999]). As our measures of externalizing behavior incorporate indicators of hyperactivity/impulsivity and antisocial behavior, we expect to observe distinct trajectory classes for externalizing problems that distinguish children whose problems persist, decline, and emerge during the adolescent years.

Fewer studies of developmental trajectories for internalizing problems have been published, and those that have focus on different age groups. In a study that followed 11-year-olds through age 14, Brendgen et al. (2005) identified groups of youth who had persistently high levels of depression, as well as whose symptoms increased sharply over time and decreased over time. Using data on an older sample of young men from the Oregon Youth Study (ages 15–24), Stoolmiller, Kim, and Capaldi (2005) observed four trajectory classes for depression: high-persistent, high-decreasing, moderate-decreasing, and very low. Because our data extend back to the early childhood years, we expect to observe increasing levels of internalizing problems among some of the children in our sample along with classes whose problem levels remain level and decline.

What Are the Associations between Mental Health Trajectories and Educational Attainment?

Prior research on the educational implications of youths' mental health problems has given only limited attention to questions of timing. In contradistinction, life course sociologists present compelling evidence that the timing of life experiences matters (Elder 1997). Although theories in child development often assume that life experiences are more consequential if they occur at early ages (e.g., Bowlby 1969; Belsky, Steinberg, and Draper 1991), theories of developmental continuity and discontinuity support conflicting hypotheses regarding the relative importance of childhood and adolescent mental health problems in determining educational trajectories. Theories of developmental continuity predict that youths who experience high levels of mental health problems in childhood will be significantly less likely to graduate from high school and enter college than youths who do not experience problems in childhood *and* than youths whose problems emerge in adolescence. In contrast, theories of developmental discontinuity emphasize the primacy of current over past experience. They imply that youths whose problems emerge during adolescence—at a time closest to the educational outcomes of interest—will experience the poorest outcomes. Our analysis will allow us to evaluate the strength of the evidence in favor of each prediction.

To What Extent Can These Associations Be Explained by Academic Aptitude, Disruptive Behaviors, and the Expectations of Self and Others?

This question cuts to the heart of our interest in social responses. As noted, much prior research assumes that the educational failures of youths with mental health problems are a natural consequence of the learning difficulties and disruptive behaviors that accompany mental health problems. In our analysis, we evaluate the independent contributions of the educational expectations of youths, their mothers, and their teachers to explain the poor educational outcomes of troubled youth.

We anticipate that different mediators will be relevant to explaining the effects of different patterns of mental health on educational outcomes. Specifically, because academic skills and disruptive behaviors have the potential to become self-reinforcing and sustaining over time (Caspi et al. 1989; Rosenbaum 1978), we expect them to be especially important in the educational trajectories of children with mental health problems. In contrast, because the educational expectations of children, their parents, and their teachers may change over the course of children's educational careers in response to current circumstances (e.g., Trusty and Harris 1999), we expect them to be more potent mediators of the effects of adolescent mental health problems.

DATA AND METHODS

Data

We used data from the Children of the National Longitudinal Surveys of Youth (NLSY) for the analysis. The NLSY was designed to trace the labor market experiences of several nationally representative cohorts of men and women longitudinally. One cohort of women entered the study in 1979 when they were between the ages of 14 and 21. In 1986, when they were between the ages of 21 and 28, the first of a series of child assessments was conducted to begin following the developmental progress of their children. Subsequent assessments of the children have been conducted biennially.

We focused on children who were ages 6–8 in 1988. Age six is a common age of entry into school and, thus, serves as a natural starting point for our analysis. Children in this age group are also old enough in 2002 (ages 20–22), the ending point for our analysis, to permit reasonable estimates of their likelihoods of completing high school and entering college. Because of the study design, this sample of children was born to disproportionately young and socially

disadvantaged mothers. Given the additional disadvantages that this group of children faces (Bradley and Corwyn 2002), it is likely that our analyses underestimate the effects of children's mental health problems on educational attainment.

Measures

Mental health problems—We measured mental health problems every two years between 1988 and 1998.² In keeping with evidence for the existence of two broad classes of child problems (Achenbach 1991), we distinguished internalizing problems from externalizing problems in our analysis. Internalizing problems refer to manifestations of distress that are expressed in inward feelings, such as depression and anxiety. Externalizing problems refer to manifestations of distress that are expressed in outward behavior, such as persistent disobedience and physical aggression. The first four measures of both types of problems (1988, 1990, 1992, 1994) are based on the Behavior Problems Index, a modified version of Achenbach's Child Behavior Checklist (Achenbach et al. 1991). The items were reported by the mothers who indicated whether each item was “often true” (3), “sometimes true” (2), or “not true” (1) of the child. The 15-item externalizing index has a reliability of .737 in this sample; the 7-item internalizing index has a reliability of .875.³ We used standardized versions of simple summated scales in our analysis.

In 1996, the reporting source shifted from mothers to the youths themselves. Youths completed a short version of the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff 1977) as well as a 15-item measure of delinquency; we used these to measure internalizing and externalizing problems, respectively.⁴ Responses to each of the seven items in the short CES-D ranged from 0 (rarely, none of the time, one day) to 3 (most, all of the time, 5–7 days); we computed a standardized version of the simple summated scale ($\alpha = .644$). For delinquency, each item indicated whether the respondent had ever engaged in the activity during the past year. We summed and then standardized the total.

Educational attainment—We assessed two educational outcomes in 2002: high school completion and college entry. Youths were coded as having completed high school if they graduated or passed the GED tests by the time of the 2002 interview. Of those youths who completed high school, the vast majority (91%) were high school graduates. Six youths who were still in high school in 2002 were dropped from the analysis.

Our measure of college entry was based on youths' self-reports of ever having attended college as of 2002. Because some students will enroll in college at later ages, this measure is an imperfect indicator of college entry. Nevertheless, it is a reasonable measure of educational attainment. Most students first enter college in the fall after completing high school (Snyder, Tan, and Hoffman 2006). Students who enter at later ages are less likely to enroll in four-year colleges, to pursue education full-time, and to receive a baccalaureate degree (Horn, Cataldi,

²We could not follow the trajectories further because mental health was assessed in 2000 only among those youths who failed to participate in the 1998 interview.

³The items in the externalizing index were “cheats or tells lies,” “bullies or is cruel/mean to others,” “is not sorry for misbehaving,” “breaks things deliberately,” “is disobedient at school,” “has trouble getting along with teachers,” “argues too much,” “is disobedient at home,” “is stubborn, sullen or irritable,” “has strong temper, loses it easily,” “has difficulty concentrating/paying attention,” “is impulsive—acts without thinking,” “has trouble with obsessions, etc.,” “is restless, overly active, etc.,” and “can't get along with others.” The items in the internalizing index were “feels/complains no one loves him/her,” “feels worthless or inferior,” “is unhappy, sad or depressed,” “cries too much,” “demands a lot of attention,” “is too dependent on others,” and “has sudden changes in mood/feeling.”

⁴The short form of the CES-D included the following items: “I did not feel like eating, my appetite was poor,” “I had trouble keeping my mind on what I was doing,” “I felt depressed,” “I felt that everything I did was an effort,” “My sleep was restless,” “I felt sad,” “I could not get going.” The delinquency measure was based on answers to a question of the form: “In the last year, have you ... damaged school property; gotten into a physical fight at school/work; taken something from a store without paying for it; stolen something worth less than \$50; stolen something worth more than \$50; used force to get money or things; hit or seriously threatened to hit someone; attacked someone with the intention to seriously hurt them; conned someone; stolen a vehicle; broken into a building; sold or held stolen goods; helped with a gambling operation; hurt someone badly enough to need a doctor.”

and Sikora 2005). Their college experiences are, therefore, very different from those of students who enter college “on time” and yield less pronounced socioeconomic benefits.

Mediators—The three sets of mediators we considered were academic aptitude, school-related disruptive behaviors, and educational expectations. They represent the three proposed pathways through which youths' mental health problems affect educational attainment. We measured academic aptitude with three indicators: the Peabody Individual Achievement Test (PIAT) math score from 1988, the PIAT reading recognition test score from 1988, and whether the child ever received remedial help in school (based on mothers' reports in 1988, 1990, 1992, and 1994). Although the math and reading test scores come only from 1988, they are highly correlated with later test scores in this sample, as they are in other samples (Alexander et al. 2002).⁵

We used three measures of disruptive behaviors in school: whether the child's parents had been called into school because of the child's behavior, whether the child had been referred to a psychiatrist because of her or his behavior, and whether the child was ever suspended or expelled. All three indicators were based on mothers' reports as given at the 1988–94 interviews.

Our measures of educational expectations included a dummy variable indicating whether the youth was in college preparatory courses in high school (based on youths' self-reports in 1998), the mother's 1992 report of her expectations regarding how far the youth would go in school (a five-category scale that ranges from not graduating high school to taking further training after college), and the youth's own reported expectations from 1998 (in years).

Sociodemographic controls—We included common sociodemographic controls in all of the models: the child's age (as of 1988, in years), sex (1 = male, 0 = female), race/ethnicity (dummy variables for black and Hispanic with whites as the omitted group), the mother's age at the child's birth, the mother's marital status in 1988 (dummy variables for separated or divorced and never married), the years of school the mother had completed in 1988, and the proportion of years from 1988 to 1998 in which the child had lived in poverty. We also controlled whether the child was of low birth weight, the mother's 1980 Armed Forces Qualification Test (AFQT; an indicator of academic potential), and mother's 1980 report of delinquent activities based on evidence that they are associated with youths' mental health problems (McLeod and Nonnemaker 2000).⁶ With the exception of gender, all control variables were based on mothers' reports. (Means and SDs for the analysis variables are given in app. table A1.)

Analysis

The final sample for the analysis includes youths ages 6–8 in 1988 ($N = 1,568$) who participated in the 2002 interview ($N = 1,090$) and who had valid values on all of the analysis variables ($N = 883$). Most of the missing data were for youths' reports of educational expectations with scattered missing cases for the other variables.

We identified distinct trajectories of internalizing and externalizing problems using growth mixture models (see below). We then used logistic regression models to estimate the associations between the trajectories and educational attainment and to evaluate the ability of

⁵The correlations of math scores in 1988, 1990, and 1992 ranged from .60 to .70. The correlations for the reading scores ranged from .70 to .87.

⁶The AFQT covers arithmetic reasoning, word knowledge, paragraph comprehension, and numerical operations. It is scored as a percentile. Mother's delinquency was measured as a count, based on the mothers' reports of ever having engaged in each of a list of 13 delinquent activities (e.g., intention to damage property, breaking and entering) during the past year.

academic aptitude, disruptive behaviors, and educational expectations to explain those associations. Because the expected directions of the associations were known in advance, we used one-tailed significance tests.

RESULTS

Identifying Trajectories of Mental Health Problems

The first question we asked is whether there are distinct and meaningful trajectories of internalizing and externalizing problems that characterize children's paths through adolescence. To answer this question, we estimated growth mixture models. As noted above, growth mixture models expand upon conventional growth models by relaxing the assumption that all individuals are drawn from a single population with common population parameters. These models identify unobserved subpopulations that have different mean growth curves. Thus, instead of considering individual variation around a single population mean intercept and slope, growth mixture models yield latent trajectory classes that represent unique groups of youths and which can then be used as independent or dependent variables in further analysis.

We used six waves of data to estimate the trajectory classes. The first four waves of data were based on mothers' reports of their children's internalizing and externalizing problems (biennially from 1988–94). The last two waves of data (1996, 1998) were based on youths' self-reports of depression and delinquency. For purposes of our analysis, we assume that measures based on mothers' and youths' reports represent the same underlying concept; by standardizing the scales, we standardize the measurement of the concepts over time.⁷ We estimated the models in MPLUS for the sample of youths who participated in both the 1988 and 2002 surveys ($N = 1,090$). Details of the estimation procedure and model selection strategy are given in appendix B.

We estimated models for up to six trajectory classes for each problem type. Based on statistical and substantive considerations, we chose the four-class solution as the best fit for internalizing disorders. The four groups distinguish youths with stably low levels of problems over time (“stably low”) from those with high levels of problems in childhood that decreased with age (“childhood high”), moderate levels of problems in childhood that decreased with age (“childhood moderate”), and low levels of problems that increased as they moved into adolescence (“adolescence high”; see fig. 1).

We followed a similar model selection strategy for externalizing problems with which we identified the five-class solution as the best fit. The five classes, graphed in figure 2, distinguish youths with stably low levels of externalizing problems (“stably low”) from those with high levels that decreased with age (“childhood high”), moderate levels that decreased with age (“childhood moderate”), low levels that increased with age (“adolescence high”), and moderate levels that increased with age (“stably high”). These five classes encompass the range of trajectories that have been observed in prior research on externalizing problems and antisocial behavior (Broidy et al. 2003; Moffit et al. 1996).

⁷Readers might reasonably contest the assumption that the two types of measures represent the same underlying concept. We considered a joint trajectory analysis (see Brame, Nagin, and Tremblay 2001), which estimates the trajectories for two response variables separately and then identifies classes for their joint distributions, but there were too few years of self-reports to permit it. We repeated the analysis using only the four years of mothers' reports to define the trajectory classes. The specific form of the trajectory classes was somewhat different; for both internalizing and externalizing problems, we observed four classes: youths with stably high levels of problems, high levels of problems in early childhood that decreased in later childhood, low levels of problems in early childhood that increased in later childhood, and stably low levels of problems. Despite the slightly different trajectory classes, our substantive conclusions about the relative importance of early versus later mental health problems and about the processes that mediate their associations with educational attainment were the same as those reported here.

The mental health trajectories were associated with sociodemographic variables in predictable ways, although less strongly than we might have expected. Table 1 presents the mean values of the demographic controls within each trajectory class.⁸ For internalizing problems, sex, poverty, and mother's delinquency were the strongest correlates. Boys were underrepresented among youths who had very high levels of internalizing problems during childhood or adolescence, and they were overrepresented among youths with stably low or only moderate levels of problems in childhood. The mean proportion of life spent in poverty was much higher among youths who had internalizing problems at some time during childhood and adolescence than among youths with stably low levels of problems. The mean for mother's delinquency was particularly high for youths with high levels of internalizing problems in childhood.

For externalizing problems, mother's education joined sex, poverty, and mother's delinquency as strong correlates of trajectory class membership. Boys were overrepresented among youths who experienced externalizing problems at any time during childhood and adolescence. The proportion of life spent in poverty was also much higher in those groups, especially among youths who had high levels of externalizing problems in childhood or adolescence. The mean for mother's delinquency was highest among youths with stably high levels of problems, but was also high among youths who had high levels of problems during childhood that decreased over time. Given these patterns, it is not surprising that the mean of mother's education was significantly lower among youths who had high levels of problems in either childhood or adolescence.

In sum, consistent with prior research, youths from economically disadvantaged backgrounds, whose mothers had low levels of education, and whose mothers reported delinquent activities, were more likely than other youths to experience both internalizing and externalizing problems (see Gotlib and Avison [1993] for a review).

The Associations of the Trajectories with Attainment

With the trajectories identified, we turned our attention to the first of our substantive questions: What is the association of these trajectories with indicators of early adult educational attainment? We indexed attainment with high school completion and college entry. Theories of developmental continuity suggest that there will be a residual effect of childhood mental health problems on educational attainment but that children who experienced mental health problems throughout childhood and adolescence will be especially disadvantaged. Theories of developmental discontinuity suggest that adolescent mental health problems will be more consequential for educational attainment.

Table 2 lists the coefficients and odds ratios from logistic regression models that predicted each of the attainment outcomes from the trajectory classes for internalizing and externalizing problems, net of sociodemographic controls. According to the coefficients, youths who experienced high levels of internalizing problems in childhood *or* in adolescence were significantly less likely to complete high school than youths with stably low levels of internalizing problems. For example, youths who had high levels of internalizing problems in adolescence ("adolescence high") were only 37.4% as likely to complete high school as youths with stably low levels of problems. Youths who had high levels of internalizing problems in childhood ("childhood high") were only 48.6% as likely to complete high school as youths with stably low levels of internalizing problems even though mental health in the former group improved over time. In contrast, youths who experienced only moderate levels of internalizing

⁸Because the trajectory classes are the dependent variables, it would be more strictly correct for us to present the results of multinomial logistic regression models that predict class membership from the demographic variables. We did estimate those models. Their results are more complex to present and are consistent with the results of the mean comparisons.

problems in childhood (“childhood moderate”) did not differ from youths with stably low levels in their likelihood of high school completion.

Among youths who completed high school, the strength of the effect of internalizing problems on college entry depended on when the problems occurred. Among the trajectory classes, only those youths who had high levels of internalizing problems in childhood were less likely than youths with stably low levels of problems to enter college. Youths who had only moderate levels of problems during childhood or who had high levels of problems in adolescence did not differ from other youths in their likelihood of college entry, once they graduated from high school. In other words, youths whose internalizing problems were confined to adolescence failed to complete high school at relatively high rates but, if they were successful in high school, were as likely to enter college as their less troubled counterparts.

Effects were generally stronger and more consistent for externalizing problems. In this part of our analysis, we compared four groups of youths who had externalizing problems to youths with stably low levels of problems: those who had high levels of problems only in adolescence (“adolescence high”), those who had stably high levels of problems (“stably high”), those with high levels of problems in childhood (“childhood high”), and those who had only moderate levels of problems in childhood (“childhood moderate”).

Without exception, youths who experienced high levels of externalizing problems at any time during childhood and adolescence were significantly less likely than youths with low levels of problems to complete high school and to enter college. Youths who had only moderate levels of problems in childhood were generally less disadvantaged than youths who had high levels of problems although they, too, were less likely to enter college. The effect sizes were consistently large. For example, youths who had low levels of externalizing problems in childhood but high levels in adolescence (the “adolescence high” group) were only 34.0% as likely to complete high school as youths with stably low levels of problems. These same youths were only 50.9% as likely to enter college. Effect sizes were even larger for youths who had stably high levels of problems and for youths who had high levels of problems in childhood; odds ratios for high school completion and college entry in those groups ranged from .207 to .301.

In sum, for both internalizing and externalizing problems, the timing of the problems was inconsequential when predicting high school completion: high levels of problems in either childhood or adolescence were associated with poorer attainment. In contrast, for college enrollment, the timing of internalizing problems mattered, while the timing for externalizing problems did not. Youths who had high levels of either internalizing or externalizing problems during childhood were significantly less likely to enter college than youths with stably low levels of problems. In contrast, youths who had high levels of internalizing problems in adolescence alone were not any less likely to enter college, whereas youths with externalizing problems in adolescence were significantly less likely to enroll in higher education.⁹ Taken together, these results do not offer unqualified support for pure accounts of developmental continuity *or* discontinuity.

Before proceeding to the analysis of the mediators, we consider the implications of comorbidity for the results. Internalizing and externalizing problems covary during childhood (see Lilienfeld [2003] for a review). This raises the possibility that the observed effect of one set of trajectories is dependent upon the other. In particular, given prior evidence that externalizing problems may be more consequential for youths' development than internalizing problems (Miech et al. 1999), it is reasonable to ask whether the effects of internalizing problems are independent of their comorbidity with externalizing problems.

To evaluate this possibility, we reestimated the models in table 2 with the indicators for both sets of trajectories simultaneously (results available from the first author). With one exception, the magnitude and significance of effects did not differ from those reported here. The one exception was for the “childhood high” trajectory for internalizing problems. The significant association of that trajectory with high school completion (see table 2) was no longer significant once we included indicators for the externalizing trajectories. Whatever implications childhood internalizing problems have for high school completion appear to result from their associations with childhood externalizing problems. It is worth noting, however, that youths who had high levels of internalizing problems in childhood were still less likely to enter college than other youths, even when comorbid externalizing problems were taken into account. For the most part, then, the effects of internalizing and externalizing problems on educational attainment are independent.

Explaining the Effects of the Trajectories

We turn now to an analysis of which school-related variables most strongly explain the effects of the trajectories on early adult attainment: academic aptitude, disruptive behaviors, or educational expectations. These sets of variables represent three major pathways through which mental health influences academic success.

As prelude to that analysis, we first considered the associations between the trajectory classes and each of the school-related variables. We expected different trajectories to be associated with the school-related mediators differently because the school-related mediators were measured in different years. Our primary measures of academic ability, math and reading scores, were taken in 1988. Our measures of disruptive behaviors were based on reports from the 1988–94 survey waves, that is, when the youths were 6–8 through 12–14 years old. Our measures of educational expectations came from 1992 for the mothers and 1998 for the youths; the measure for college track placement also came from the 1998 survey. Thus, some of the “mediators” were measured at points in time near the beginning or middle of the trajectories that we identified rather than at the end. As a result, we expect different school-related experiences to vary across the mental health trajectories in ways that map onto the temporal ordering of the variables. For example, based on prior evidence for the association between mental health and cognitive skills (Blechman et al. 1986; Hinshaw 1992), we would expect early math and reading scores to be lower among youths who experienced mental health problems during childhood than among those whose problems began later. Using similar logic, because the measures of disruptive behaviors come from several waves, we would expect them to be associated with mental health problems whether they occurred in childhood or adolescence.

⁹There is good reason to expect gender differences in the effects of mental health problems on attainment outcomes, although the nature of the expected difference is unclear. Research showing that teachers respond more negatively to boys' misbehavior than to girls' (Gregory 1977) supports the expectation that childhood behavior problems would have a stronger effect on subsequent educational attainment for boys. However, Rosenfield's (1982) research on the gendered nature of social reactions to mental health problems suggests that interpersonal and institutional reactions are more punitive when the problems defy gender stereotypes, that is, when women behave in aggressive ways and men are passive, dependent, or depressed (see also Artis 1997; Loring and Powell 1988). Direct evidence from prior research on mental health and attainment is mixed. Kessler et al. (1995) found that the onset of psychiatric disorders significantly diminished the probability of completing high school, entering college, and completing college. For men, the effects were strongest for conduct disorder and weaker (but still significant) for anxiety and depressive disorders; for women, anxiety disorders were as strongly associated with achievement outcomes as were conduct disorders. In contrast, Miech and his colleagues (1999) did not find any gender differences in the effects of depression, anxiety, attention deficit disorder, or conduct disorder at age 15 on educational attainment at age 21. We tested for gender differences in our analysis using multiplicative interaction terms. Two interactions were significant for internalizing problems: being in the “adolescence high” group was associated with high school completion more strongly for girls than for boys; being in the “childhood high” group was also associated with college entry more strongly for girls than for boys. One interaction was significant for externalizing problems: being in the “childhood high” group was more strongly associated with college entry for girls than for boys. Although the significant interactions are consistent in suggesting that internalizing problems disadvantage girls more than boys, the nonsignificant differences for the other trajectories, combined with inconsistencies in their signs, lead us to downplay the differences.

Table 3 presents the coefficients from the relevant ordinary least squares (OLS) and logistic regression models. Beginning with indicators of academic aptitude, we see that childhood problems were more strongly associated than problems that emerged in adolescence. Youths who had high levels of internalizing problems in childhood had lower math and reading scores and were more likely to receive remedial help than were youths with stably low levels of internalizing problems. Youths with moderate levels of problems in childhood also had lower reading scores and were more likely to receive remedial help. However, youths who had low levels of problems during childhood but high levels in adolescence did not have significantly lower academic ability. A similar pattern exists for externalizing problems: youths with moderate or high levels of problems during childhood had lower math and reading scores and were more likely to receive remedial help than youths who had low levels of externalizing problems during childhood.

School-related disruptive behaviors were more common in almost all groups of youths with mental health problems, regardless of the type of problem they experienced or when their problems occurred. Youths with internalizing and externalizing problems were more likely than other youths to have been suspended or expelled at some time during their elementary and middle school years, their parents were more likely to have been called into school because of their behavior, and they were much more likely to have been referred to a psychiatrist. Regardless of how these behaviors affect eventual academic success, it is clear that schools respond strongly and negatively to youths with mental health problems.

The final set of mediators indexes the expectations of self and others for the youths' educational careers. The first two indicators are direct measures of educational expectations, from the mother's and the youth's perspective, respectively.¹⁰ The final indicator, being placed in the college preparatory track, is an indirect measure of the expectations school personnel hold for the child.¹¹

Trajectories of internalizing and externalizing problems were significantly associated with educational expectations in the predicted manner. The mothers of youths with internalizing problems reported expectations between 20% (.199/.997) and 48% (.480/.997) of one SD below those of mothers whose children had stably low levels of problems; the difference was particularly large for youths who had high levels of problems in childhood. The magnitude of the association between externalizing problems and mothers' expectations was of approximately the same magnitude—the mothers of youths with externalizing problems reported expectations between 18% (.178/.997) and 54% (.538/.997) of one SD below those of mothers whose children have stably low levels of problems—as were differences in the youths' self-reported educational expectations (ranging from 19% [.434/2.270] to 58% [1.324/2.270] for internalizing problems and from 17% [.392/2.270] to 83% [1.877/2.270] for externalizing problems).¹²

¹⁰Mother's educational expectations were missing for 92 youths. We substituted the mean value of the variable for those cases in order to avoid losing them from the analysis. Supplemental analyses that used the original version of the variable, without mean substitution, did not differ from those reported here. This implies that our results are not biased by the use of the mean substitution technique.

¹¹Eighty-nine cases lacked data on track placement. In order to avoid losing those cases, we recoded the missing values based on two different assumptions: that all of the cases lacking values were in college-track classes, and that all of the cases lacking values were not in college-track classes. We then compared the results from models that used the two recoded variables with the results from models that used the original variable with missing cases dropped. The results from the models that assumed all of the cases lacking values were not in college-track classes were virtually identical to those using the original variable. We report those results here.

¹²Youths' educational expectations may change as a result of their observations of their own school performance. As a result, observed associations between youths' mental health problems and their educational expectations may represent a rational evaluation rather than a diminished expectation. To evaluate this possibility, we reestimated the models using the earliest available measure of youth expectations (1996). In each case, the main findings held. This suggests that the lower educational expectations observed among youths with mental health problems are not simply a response to poor prior school performance.

In contrast, school track placement was much more strongly associated with externalizing problems than with internalizing problems. Youths who had high levels of internalizing problems in adolescence were 42% ($e^{-.862}$) as likely as youths with stably low problems to be placed in a college track, but track placements did not differ for youths with high levels of internalizing problems during childhood. Youths with externalizing problems were less likely to be placed in a college track regardless of when their problems occurred, even when they only experienced moderate levels of problems in childhood that declined in adolescence.

Additional analyses confirmed that the effects of internalizing and externalizing problems on school-related experiences were independent of academic aptitude (results available from the authors). This suggests that children's comportment importantly affects the opportunities that schools make available to them and the expectations that they and others hold for their futures.¹³

Our final step was to evaluate the ability of school-related experiences to explain the effects of mental health trajectories on early adult attainment. Tables 4 and 5 present the coefficients from logistic regression models that predicted high school completion and college entry from the trajectory classes first without and then with controls for school-related experiences. Only the coefficients for the trajectory classes are given in the tables; the full set of coefficients is available in appendix C. We entered each set of mediators in sequential order, beginning with indicators of academic aptitude and then adding indicators of disruptive behavior and educational expectations. This strategy offers a conservative test of the independent relevance of educational expectations in the association between mental health problems and educational attainment.

According to the models in table 4, all of the sets of mediators independently contributed to explaining the effects of internalizing problems on educational attainment. With the addition of each set of mediators to the models, the coefficients decreased in absolute size and became less statistically significant. As important from our perspective, educational expectations added substantially to the explanation in every case. In particular, the difference in high school completion between youths with high levels of internalizing problems in adolescence and those with stably low problems became nonsignificant only upon the addition of educational expectations to the model. The same was true for the difference in college enrollment between youths with high levels of childhood problems and those with stably low levels of problems. The same pattern was evident, and perhaps even a bit stronger, for externalizing problems. With few exceptions, the addition of educational expectations to the model explained a previously unexplained effect. Together, the results for the two types of problems demonstrate the powerful role that social responses play in the lives of children with mental health problems.¹⁴

Given the different years in which the mediating variables were measured, we expected different mediators to matter for different trajectory classes. Specifically, because the math and reading scores were obtained in 1988, we expected them to mediate the effects of high levels of childhood problems more strongly than the effects of problems that emerged at later ages. For the most part, our expectations were met. For example, the addition of math and reading

¹³We reestimated all of the models that predicted the mediators with internalizing and externalizing trajectories included simultaneously. Several of the coefficients that we reported as significant in table 3 were no longer significant in those models, presumably because of comorbidity between the two types of problems. The coefficients that became nonsignificant were evenly distributed among internalizing and externalizing trajectories except in the models that predicted school-related disruptive behaviors. In the case of those models, the coefficients for internalizing problems more often became nonsignificant when externalizing problems were controlled. This is not surprising inasmuch as externalizing problems are defined, in part, by behavior problems in school.

¹⁴In additional analyses, we considered the explanatory power of each mediator individually. Of all of the mediators, youths' own educational expectations most powerfully explained the effects of mental health trajectories on educational attainment.

scores rendered the effect of high childhood internalizing problems (i.e., the “childhood high” group) on high school completion nonsignificant but did not do the same to the effect of problems that emerged in adolescence. Because the indicators of disruptive behaviors cover later school years, it is also not surprising that they mediated the effects of problems on attainment outcomes regardless of when those problems occurred. Perhaps most surprising, educational expectations operated in a similar manner. Although reports of youths' educational expectations came from the 1998 interview, they mediated the effects of problems regardless of when the problems occurred. This suggests that youths with mental health problems maintained their low educational expectations, even when their problems decreased over time.¹⁵

DISCUSSION

The association between early childhood mental health problems and socioeconomic attainment is of interest to scholars from many different disciplines, including sociology, developmental psychopathology, educational psychology, and psychiatry. Our analysis adds to a growing literature that establishes the effects of children's mental health problems on subsequent attainments. The large effect sizes we observed attest to the importance of mental health in determining life chances (Wheaton 2001) and argue for greater sociological attention to the life course of troubled children.

Our analysis contributes to research on the educational experiences of children with mental health problems in two main ways. First, it presents evidence regarding the effects of trajectories of mental health problems on educational attainment. Prior research has investigated questions of timing by including indicators of mental health from multiple points in time in the models and comparing the size and significance of their coefficients. The trajectory class strategy we used improves on those efforts by acknowledging associations between the different measures and by avoiding multicollinearity. It allowed us to identify meaningful trajectories of mental health problems and to estimate their associations with eventual educational attainment. Overall, we observed that youths who had high levels of problems in *either* childhood *or* adolescence had poorer educational attainment than other youths. Youths whose internalizing problems emerged in adolescence were not significantly less likely to enroll in college than other youths, but they were much less likely to graduate from high school.

Theories of developmental continuity and of developmental discontinuity supported different predictions regarding the developmental trajectories that would be most strongly associated with educational attainment. Their predictions hinge on the relative importance of childhood (distal) versus adolescent (proximal) problems in educational processes. Our analysis lends support to both traditions. Mental health problems influenced educational attainment almost regardless of when they occurred. Children who displayed internalizing and externalizing problems at young ages failed to achieve expected educational outcomes even when their problems diminished over time. Youths whose problems emerged in adolescence were similarly disadvantaged, with the single exception noted above.

The question that remains is whether mental health problems that occur at different ages influence educational attainment for similar or different reasons. Our second extension of prior

¹⁵Readers might wonder whether the greater explanatory relevance of academic ability for childhood as compared to adolescent problems is purely a function of the timing of the measurement of academic ability. We reestimated the models using math and reading scores from 1990 and 1992. The differences in math and reading scores between youths with stably low levels of problems and those with high levels of problems in adolescence were, indeed, greater when we used later measures. However, math and reading scores still did not significantly mediate the effects of adolescent problems on educational attainment. Thus, it appears that academic ability is not implicated in the low academic achievement of youths whose mental health problems emerge in adolescence.

research, the analysis of explanatory models, sheds light on this issue. We tested the proposition that children's mental health problems matter for educational attainment because of the social responses they elicit. We found substantial support for the proposition. Whereas academic aptitude explained some of the association between mental health trajectories and educational attainment, and disruptive behaviors explained a bit more, educational expectations held by parents and children were equally powerful and independent mediators. Educational expectations, even when reported by youths themselves, are social products, determined partly by internal self-assessments and youths' observations of their own performances, but also by the encouragement and preferences of others. Youths with mental health problems hold lower expectations for themselves, which jeopardizes their educational attainment.

Although educational expectations were powerful mediators of the effects of youths' mental health problems on educational attainment regardless of when the problems occurred, there were meaningful differences in the explanatory power of the other mediators across the trajectory classes. Academic problems were more common among youths whose mental health problems began in childhood, and they explained a moderate amount of the effects of those problems on educational attainment. Yet, those same children engaged in disruptive behaviors in school that diminished their probabilities of academic success. In contrast, youths whose mental health problems emerged in adolescence did not experience academic problems in their early school years but were perceived as more disruptive throughout their youth and encountered lower educational expectations. Taken together, these results suggest that teachers and school administrators may respond to emotionally troubled children in ways that become self-reinforcing even as they come to expect less from youths whose problems emerge in adolescence.

Before closing, we note an important limitation of our analysis: the indirect nature of our measures of social responses. Direct teacher evaluations or classroom observations would enhance our ability to evaluate how teachers' classroom management strategies and interactions with students influence the educational trajectories of troubled students. Unfortunately, neither type of measure was available in the Children of the NLSY data set. The indirect nature of our measures renders our test of the role of social responses conservative inasmuch as the measures index only a limited set of responses. Moreover, the measures of some of the other mediators, particularly disruptive behaviors, could be considered indicators of social responses themselves, even though we assigned them a different conceptual status. By that logic, social responses may play an even stronger role than we estimated. The fact that educational expectations contributed additional explanatory power, beyond academic aptitude and disruptive behaviors, attests to their importance.

Our analysis has important implications for the many areas of research that have been concerned with the effects of children's mental health on educational attainment. For education researchers, our analysis encourages continued attention to the long-term educational trajectories of children who are emotionally and behaviorally "unready" at school entry but also greater attention to the unique challenges of youths whose mental health problems begin at later ages. Even at young ages, these youths have begun to run into trouble at school in the form of calls home, referrals, and suspensions/expulsions. Our analysis cannot determine whether the school troubles these youths experienced are the result of emotional and behavioral problems that are not captured in mothers' reports (or that are more evident at school than at home) or the cause of future mental health problems. In either case, we need to know more about how schools' responses to youths with mental health problems are implicated in the youths' educational failures.

Our results also suggest that mental health researchers who use the effects of mental health problems on educational outcomes to argue for insurance parity and improved access to

treatment should direct their efforts to even earlier ages. The president's New Freedom Commission Report (New Freedom Commission on Mental Health 2003) highlighted the lack of early detection and intervention programs as key limitations in the current mental health treatment system. Our analysis is not inconsistent with that emphasis inasmuch as the children we are looking at here would clearly benefit from programs designed to enhance their academic progress. At the same time, we want to emphasize that those programs are unlikely to be successful if they fail to address the responses of others as they are shaped by the child's participation. Research on the effects of mental health treatment establishes clearly that participation in treatment has benefits but that it also invokes public and private understandings of the person's experiences that are detrimental (Rosenfield 1997).

Finally, for researchers concerned with the relative importance of selection and causation processes in mental illness, our analysis encourages more attention to how selection processes occur. Selection processes are often equated with an assumption of genetic causation by sociologists; people who are predisposed to develop disorders experience a variety of social disadvantages because of the impairments associated with their disorder (see Eaton and Muntaner [1999] for a discussion). Research on labeling theory, however, shows clearly that the anticipation and experience of social rejection by persons with mental illness are associated with declines in socioeconomic attainment and with social isolation (Link et al. 1989). We contend that people with mental health problems experience social rejection not only when they have entered treatment and are labeled publicly, but also based on their manifest symptoms and how those symptoms are interpreted by others (Gove 1982). Mental health problems initiate stratification processes that have not been fully studied in their own right. Our analysis takes a first step toward bringing research on mental illness into conversation with research on the role of noncognitive traits and behaviors in stratification processes (Farkas 2003).

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APPENDIX A

TABLE A1

Descriptive Statistics for Analysis Variables

	Mean	SD
High school completion	.805	.396
College entry	.571	.495
Math score	23.933	9.962
Reading score	27.131	10.626
Child received remedial help	.221	.415
Child's behavior required parent visit to school	.469	.499
Child's school behavior required visit to psychiatrist	.051	.220
Child suspended or expelled	.207	.406
Mother's educational expectations	3.346	.997
Youth's educational expectations	14.518	2.270
Youth in college preparatory track	.354	.479
Child's age	6.940	.818
Child is male	.471	.499
Child is black	.418	.493
Child is Hispanic	.207	.406
Mother's age at child's birth	20.173	2.253
Mother separated or divorced	.214	.410
Mother never married	.222	.416
Mother's education	11.529	1.955
Proportion of life poor	39.336	38.733

	Mean	SD
Low birth weight	.091	.287
Mother's AFQT score	29.105	23.935
Mother's delinquency	1.308	1.635

NOTE.— $N=883$ except for “college entry,” for which $N=711$.

APPENDIX B

Description of Growth Mixture Modeling Strategy

Growth mixture models are an extension of conventional growth models (Muthén and Shedden 1999; Nagin 1999). Where conventional models assume that all individuals are drawn from a single population with common population parameters, growth mixture models (GMMs) allow for multiple different trajectories by modeling a mixture of distinct multivariate normal distributions, each referred to as a latent trajectory class (i.e., categorical latent variable).

In growth models, the joint distribution of the observed outcome variables is characterized as a function of age. Substantively, a developmental trajectory describes the progression of internalizing or externalizing problems as children age. In conventional growth models, a normality assumption is implied, and all children in a given sample are expected to have the same developmental trajectory. Growth mixture models, in contrast, suggest that a finite number of groups, each with its own trajectory, approximate the total variation in a sample.

In a simple model with no covariates (see app. fig. B1), the growth mixture model estimates a latent categorical variable c_i that represents the unobserved subpopulation membership for youth i , where $c_i = 1, 2, \dots, K$. Here, c_i is referred to as a trajectory class variable. The intercept and slope for each class c_i are represented by π_0 and π_1 , respectively. Each y_{it} represents repeated observations on the outcome (here, internalizing or externalizing problems). The latent trajectory classes derived from this model can then be examined for their antecedents (e.g., background variables as a predictor of class membership) and their consequences (e.g., class membership as a predictor of academic achievement).

The model is estimated in a maximum likelihood framework using the EM (expectation maximization) algorithm. The EM algorithm maximizes the expected complete-data log likelihood that is conditioned on the observed continuous variables for all youth. As noted by Muthén (2001, 2003), local optima are often encountered in the likelihood, particularly with increasing numbers of latent classes or with data that have limited information about class membership. We used 100 different sets of starting values for our analyses to avoid local optima.

Fig. B1.

Latent growth mixture model parameters

The latent growth mixture model incorporates parameter restrictions to be identified. Time scores are fixed at 0, 1, 2, 3, 4, and 5 for our linear growth model with equidistant time points. The zero slope growth factor at the first time point identifies the intercept. By default, the residual variances of continuous variables are freely estimated, but are constrained to be equal across classes. For our analyses, we set all slope variances equal to zero to avoid a linear dependency among the latent variables (Muthén 2003).

We estimated models for the sample of youths who were ages 6–8 in 1988 and who participated in both the 1988 and 2002 surveys; we assumed a linear functional form. It would have been possible for us to estimate the models using *all* youths who were ages 6–8 in 1988, regardless of their subsequent survey participation, as the models can accommodate many forms of missing data. We elected to restrict our sample to youths who had full information on the outcome variables in 2002 (although not necessarily on mental health at all waves) in order to ensure reasonable sample sizes in all of the classes.

This decision did not unduly influence our conclusions. In supplemental analyses, we reestimated the trajectory classes in the full sample of youths who were ages 6–8 in 1988. The form of the trajectory classes was virtually identical to that for the restricted sample, although, of course, some individual youths were classified differently in the two solutions. However, the sizes of some of the classes became prohibitively small after we deleted youths who did not have valid values on the attainment outcomes ($N = 4$ in one case). Thus, we used the trajectory classes from the latter estimation in the rest of the analysis.

We estimated models for up to six classes for each problem type in order to determine which solutions best fit the data. There is considerable controversy regarding how to choose the “best” trajectory class solution (Bauer and Curran 2003; Muthén 2003; Muthén and Muthén 2000).

Model selection is ultimately based on both conceptual considerations (e.g., interpretability and substantive meaning) and statistical fit indices. Appendix table B1 shows the Bayesian information criteria (BIC)—the consensus empirical criterion for model selection (Broidy et al. 2003; Muthén and Muthén 2000; Nagin 1999; Nagin and Tremblay 2001; van Lier et al. 2004)—for each of the class models we estimated. The BIC statistic is calculated as:

$$\text{BIC} = -2 \log(L) + \log(n) * (k),$$

where L is the model's maximized likelihood, n is the sample size, and k is the number of parameters in the model. Kass and Raftery (1995) argue that BIC can be used for comparison of non-nested models under general circumstances. Decreasing BIC values indicate better-fitting models. For a given solution, each individual's probability of membership in each class is also estimated, and an individual is classified into a particular trajectory class based on best fit measures.

Beginning with internalizing problems, according to the BIC alone, the five-class solution is the preferred solution. However, the five-class solution included a class with only 12 youths—too small to permit meaningful analysis.¹⁶ Thus, we chose the four-class solution as the best-fitting one for our purposes.¹⁷

In the case of externalizing problems, there was little decline in the BIC between the five-class and six-class solutions, and the six-class solution included a very small class (with one class having only 11 members).¹⁸ Here, too, we chose the solution with fewer classes as the best representation of the trajectory classes.

TABLE B1

BIC Statistics for Growth Mixture Models

	Internalizing	Externalizing
Two class	14,952.40	14,250.81
Three class	14,885.78	14,174.67
Four class	14,856.76	14,130.00
Five class	14,837.98	14,079.23
Six class		14,074.73

The Choice of Functional Form

As noted, all of our models assumed that the growth curves for each class had a linear functional form. With six waves of data, it is possible to estimate models with a quadratic or cubic form instead. Our preference for linear functional forms derives from preliminary analyses of the growth curves for internalizing and externalizing problems in the total sample. In those analyses, the quadratic terms were not significant, which indicated that a linear model was justified.

¹⁶The small class was for youths who had very high levels of internalizing problems in childhood that declined with age. We reestimated the models that predicted educational attainment with this class included. The substantive results did not change.

¹⁷For a given solution, each youth is assigned a probability of membership in each class. These probabilities can also be used to evaluate the fit of the solution. For the four-class model, mean class probabilities ranged from .77 to .91; for the five-class solution, they ranged from .80 to .99.

¹⁸The sixth class was for youths who had very high levels of externalizing problems in childhood and whose problems declined only slightly with age. Mean class probabilities ranged from .81 to .90 for the five-class solution and from .80 to .90 for the six-class solution.

In response to a reviewer's query regarding the possibility of curvilinearity in some of the trajectory classes, we reestimated the growth mixture models with quadratic terms included. For internalizing problems, the preferred solution had four classes, as for the linear models. The classes had roughly the same interpretations as those from the linear model; groups were identified for youths with high levels of problems in childhood that decreased with age ($N = 57$), moderate levels of problems in childhood that decreased with age ($N = 121$), moderate levels of problems in childhood that increased with age ($N = 44$), and stably low levels of problems ($N = 868$). The quadratic terms were significant for two of the four classes but not for two others. Specifically, the group of youths with stably low levels of internalizing problems showed slightly declining levels over time that flattened out at later ages, and the group of youths with moderate and declining levels showed a slight increase in symptoms for a few years before their decline at older ages. Individual respondents were often, although not always, classified into the same trajectory classes in the two sets of models.

The main difference between the two sets of trajectory classes was that many more respondents were classified as having "stably low" levels of problems in the quadratic as compared to linear model. We examined the mean levels of internalizing problems across the six waves for youths who were categorized as "stably low" by the quadratic models, but in another category (most often, the group with moderate symptoms in childhood that declined with age) by the linear models. The means were more consistent with the linear than the quadratic models. We concluded, then, that the linear models more effectively described the trajectories of internalizing problems than the quadratic models and used classes identified by the linear models in our analyses.

The quadratic models for externalizing problems were more problematic. Although the five-class solution was the preferred solution according to the BIC statistic, the solution yielded a class with no members and a warning message about nonidentification in the model. The four-class solution identified reasonably sized classes, but the classes did not correspond to those observed in prior research: they included two groups of youths with moderate levels of problems during childhood that increased over time (although with different curvilinear patterns; $N = 146$ and $N = 44$), one group of youths with low levels of problems in childhood that declined steadily with age ($N = 767$), and one group of youths with moderate levels that increased throughout the elementary school years and then declined at later ages ($N = 133$). Because of the problems we encountered when estimating the quadratic trajectory classes for externalizing problems, and because the models yielded results that were not substantively meaningful, we did not pursue further analyses with them. We suspect that the estimation problems resulted from missing data in the middle waves; the estimation procedures may simply have been stretched beyond their capacity when we tried to incorporate missing data and allow the growth curves to be curvilinear.

APPENDIX C

Complete Set of Coefficients for Final Mediation Models

TABLE C1

Models for Internalizing Behavior

	High School Completion	College Entry
Adolescence high	-.583 (.403)	.221 (.418)
Childhood moderate	-.173 (.250)	.071 (.227)
Childhood high	-.155 (.429)	-.672 (.470)

	High School Completion	College Entry
Math score	.001 (.019)	.030 [*] (.015)
Reading score	.087 ^{***} (.020)	-.003 (.015)
Remedial help	.207 (.257)	-.212 (.248) ^{**}
Parent visit	-.114 (.251)	-.501 (.214)
Visit to psychiatrist	-.427 (.422)	-.992 (.522)
Suspended/expelled	-.503 (.273)	.112 (.275)
Mother's expectations	-.098 (.116)	.287 (.108)
Youth's expectations	.370 (.055)	.393 (.050)
College track	1.176 (.299)	.276 (.194)
Child's age	-.565 (.185)	-.020 (.166)
Child is male	-.017 (.227)	-.071 (.195)
Child is black	.134 (.325)	.369 (.278)
Child is Hispanic	-.536 (.317)	.767 (.293)
Mother's age at child's birth	.034 (.051)	-.031 (.045)
Mother separated or divorced	-.165 (.283)	-.543 (.248)
Mother never married	-.603 (.298)	-.484 (.287)
Mother's education	.133 (.065)	.048 (.058)
Proportion of life poor	-.013 (.004)	-.007 (.003)
Low birth weight	.128 (.364)	.115 (.324)
Mother's AFQT	-.005 (.007)	.006 (.006)
Mother's delinquency	-.042 (.066)	.090 (.062)

* $P < .05$.** $P < .01$.*** $P < .001$.

TABLE C2

Models for Externalizing Behavior

	High School Completion	College Entry
Adolescence high	-.615 [*] (.359)	-.401 (.370)
Stably high	-.323 (.475)	-.560 (.604)
Childhood moderate	-.051 (.267)	-.079 (.216)
Childhood high	-.294 (.417)	-.708 (.570)
Math score	.000 (.019)	.031 (.015)
Reading score	.086 ^{***} (.020)	-.004 (.015)
Remedial help	.208 (.256)	-.224 (.246)
Parent visit	-.102 (.257)	-.435 (.220)

	High School Completion	College Entry
Visit to psychiatrist	-.426 (.429)	-.989 (.537)
Suspended/expelled	-.489 (.275)	.121 (.276)**
Mother's expectations	-.086 (.117)	.278 (.108)
Youth's expectations	.369 (.056)	.387 (.050)
College track	1.127 (.299)	.252 (.193)
Child's age	-.563 (.185)	-.024 (.166)
Child is male	.084 (.227)	-.004 (.192)
Child is black	.134 (.325)	.364 (.278)
Child is Hispanic	-.556 (.316)	.766 (.295)
Mother's age at child's birth	.038 (.051)	-.034 (.046)
Mother separated or divorced	-.137 (.283)	-.563 (.250)
Mother never married	-.558 (.298)	-.489 (.286)
Mother's education	.129 (.066)	.042 (.058)
Proportion of life poor	-.013 (.004)	-.007 (.003)
Low birth weight	.213 (.370)	.126 (.325)
Mother's AFQT	-.005 (.007)	.006 (.006)
Mother's delinquency	-.029 (.067)	.102 (.063)

* $P < .05$.** $P < .01$.*** $P < .001$.

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Fig. 1.
Trajectory classes: internalizing problems

Fig. 2.
Trajectory classes: externalizing problems

TABLE 1

Means of Control Variables within Trajectory Classes

Trajectories	Male	Child Is Black	Child Is Hispanic	Mother's Age at Child's Birth	Mother Separated/Divorced	Mother Never Married	Mother's Education	Proportion of Life Poor	Low Birth Weight	Mother's AFQT	Mother's Delinquency
Internalizing:											
Adolescence high	.289 (.457)	.385 (.491)	.250 (.437)	19.942 (2.330)	.250 (.437)	.154 (.364)	11.365 (1.900)	45.192 (40.870)	.077 (.269)	31.135 (27.284)	1.216 (1.495)
Childhood moderate	.566 (.497)	.414 (.494)	.202 (.402)	20.133 (2.193)	.187 (.391)	.232 (.423)	11.291 (1.853)	44.663 (39.318)	.069 (.254)	26.570 (22.694)	1.482 (1.736)
Childhood high	.347 (.481)	.326 (.474)	.224 (.422)	20.224 (1.992)	.347 (.481)	.163 (.373)	11.347 (1.640)	43.197 (35.991)	.122 (.331)	30.757 (25.902)	1.980 (1.854)
Stably low	.465 (.499)	.430 (.496)	.204 (.403)	20.204 (2.292)	.209 (.407)	.230 (.421)	11.642 (2.013)	39.614 (38.371)*	.097 (.296)	29.672 (23.867)	1.199 (1.576)**
F-statistic	5.927***	.760	.247	.247	2.174 ⁺	.893	1.926	2.808*	.711	1.070	4.476
Externalizing:											
Adolescence high	.653 (.479)	.453 (.501)	.227 (.421)	20.107 (2.134)	.227 (.421)	.293 (.458)	11.427 (1.868)	44.889 (38.650)	.147 (.356)	26.241 (23.310)	1.398 (1.554)
Stably high	.750 (.439)	.556 (.504)	.194 (.401)	19.361 (1.973)	.250 (.439)	.306 (.467)	10.944 (1.772)	54.630 (35.992)	.083 (.280)	21.750 (17.511)	2.536 (2.473)
Childhood moderate	.520 (.501)	.427 (.496)	.194 (.396)	20.210 (2.286)	.186 (.389)	.254 (.436)	11.464 (1.981)	44.691 (40.296)	.085 (.279)	29.514 (24.881)	1.355 (1.524)
Childhood high	.660 (.479)	.420 (.499)	.180 (.388)	19.780 (1.799)	.280 (.454)	.240 (.431)	10.940 (1.517)	52.000 (39.504)	.140 (.351)	23.184 (23.689)	2.192 (1.819)
Stably low	.376 (.485)	.397 (.490)	.215 (.411)	20.268 (2.307)	.217 (.413)	.186 (.389)	11.686 (1.992)	33.158 (36.951)	.080 (.272)	30.527 (23.831)	1.084 (1.533)
F-statistic	12.664***	1.041	.224	1.799	.717	2.224 ⁺	2.845*	7.543***	1.274	2.334 ⁺	11.598***

⁺ $P < .10$.* $P < .05$.** $P < .01$.*** $P < .001$.

TABLE 2

Coefficients (and Odds Ratios) from Logistic Regression Models Predicting Educational Attainment from Mental Health Trajectories

	HIGH SCHOOL COMPLETION		COLLEGE ENTRY	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
Internalizing trajectories:				
Adolescence high	-.985** (.365)	.374	-.387 (.380)	.679
Childhood moderate . . .	-.306 (.222)	.736	-.267 (.200)	.766
Childhood high	-.723* (.374)	.486	-1.360*** (.402)	.257
Externalizing trajectories:				
Adolescence high	-1.079*** (.315)	.340	-.676* (.323)	.509
Stably high	-1.359*** (.419)	.257	-1.418** (.537)	.242
Childhood moderate . . .	-.351 (.234)	.704	-.410* (.189)	.664
Childhood high	-1.201*** (.358)	.301	-1.576*** (.465)	.207

NOTE.—All models included controls for the child's age, sex, race, mother's age at the child's birth, mother's marital status, mother's education, the proportion of life poor, low birth weight, mother's AFQT, and mother's delinquency. Youths with stably low problems served as the reference groups.

* $P < .05$.

** $P < .01$.

*** $P < .001$.

TABLE 3

Coefficients from OLS and Logistic Regression Models Predicting School-Related Mediators from Mental Health Trajectories

TRAJECTORIES	ACADEMIC APTITUDE			DISRUPTIVE BEHAVIORS			EDUCATIONAL EXPECTATIONS		
	Math Score	Reading Score	Remedial Help	Parents Called	Sent to Psychiatrist	Suspended/ Expelled	College Track	Mother's Expectations	Own Expectations
Internalizing:									
Adolescence high	-.1355 (1.073)	-.1399 (1.124)	.030 (.397)	1.092*** (.315)	1.434** (.607)	.662** (.366)	-.862* (.363)	-.417*** (.135)	-1.324*** (.302)
Childhood moderate . . .	-.134 (.609)	-.1290* (.638)	.716*** (.194)	.544*** (.177)	1.232*** (.376)	.232 (.214)	-.205 (.182)	-.199** (.077)	-.434** (.172)
Childhood high	-.2253* (1.106)	-3.459** (1.159)	1.368*** (.330)	1.365*** (.338)	2.296*** (.496)	.613* (.380)	-.254 (.335)	-.480*** (.139)	-1.214*** (.312)
Externalizing:									
Adolescence high	-.515 (.929)	-.560 (.968)	.326 (.318)	1.044*** (.271)	1.489** (.784)	.483 (.320)	-.1007*** (.309)	-.178 (.117)	-1.005*** (.261)
Stably high	-1.704 (1.313)	-2.682* (1.368)	1.042** (.387)	2.150*** (.479)	3.172*** (.688)	1.479*** (.402)	-1.174** (.474)	-538*** (.166)	-1.877*** (.369)
Moderate-decreasing . . .	-1.658** (.588)	-2.501*** (.613)	.789*** (.199)	1.114*** (.173)	2.193*** (.564)	.362* (.218)	-.397* (.173)	-.273*** (.074)	-.392** (.165)
High-decreasing	-1.941* (1.126)	-4.307*** (1.173)	1.202*** (.333)	2.403*** (.414)	3.486*** (.630)	1.258*** (.354)	-1.063** (.395)	-.385** (.142)	-1.383*** (.316)

NOTE.—Separate models were estimated for internalizing and externalizing problems. All models included controls for the child's age, sex, race, mother's age at the child's birth, mother's marital status, mother's education, the proportion of life poor, low birth weight, mother's AFQT, and mother's delinquency. Youths with stably low problems served as the reference groups.

* $P < .05$.
 ** $P < .01$.
 *** $P < .001$.

TABLE 4

Coefficients from Logistic Regression Models Predicting Educational Attainment from Internalizing Trajectories and School-Related Mediators

INTERNALIZING TRAJECTORIES	HIGH SCHOOL COMPLETION				COLLEGE ENTRY			
	Without Mediators	Add Academic Ability	Add Disruptive Behavior	Add Educational Expectations	Without Mediators	Add Academic Ability	Add Disruptive Behavior	Add Educational Expectations
Adolescence high	-.985** (.365)	-1.014** (.374)	-.894** (.376)	-.583 (.403)	-.387 (.380)	-.341 (.387)	-.234 (.397)	.221 (.418)
Childhood moderate . . .	-.306 (.221)	-.214 (.232)	-.187 (.235)	-.173 (.250)	-.267 (.200)	-.174 (.206)	-.087 (.208)	.071 (.227)
Childhood high	-.723* (.374)	-.453 (.391)	-.331 (.392)	-.155 (.429)	-1.360*** (.402)	-1.174** (.414)	-.884* (.424)	-.672 (.470)

NOTE.—All models included controls for the child's age, sex, race, mother's age at the child's birth, mother's marital status, mother's education, the proportion of life poor, low birth weight, mother's AFQT, and mother's delinquency. Youths with stably low problems served as the reference groups.

* $P < .05$.

** $P < .01$.

*** $P < .001$.

TABLE 5

Coefficients from Logistic Regression Models Predicting Educational Attainment from Externalizing Trajectories and School-Related Mediators

EXTERNALIZING TRAJECTORIES	HIGH SCHOOL COMPLETION				COLLEGE ENTRY			
	Without Mediators	Add Academic Ability	Add Disruptive Behavior	Add Educational Expectations	Without Mediators	Add Academic Ability	Add Disruptive Behavior	Add Educational Expectations
Adolescence high	*** -1.079 (.315)	*** -1.058 (.329)	** -.970 (.336)	* -.615 (.359)	* -.676 (.323)	* -.734 (.329)	* -.587 (.338)	-401 (.370)
Stably high	*** -1.359 (.419)	** -1.170 (.438)	* -.888 (.454)	* -.323 (.475)	** -1.418 (.537)	* -1.401 (.552)	* -1.152 (.560)	-560 (.604)
Childhood moderate . . .	*** -.351 (.234)	*** -.144 (.244)	*** -.046 (.253)	*** -.051 (.267)	*** -.410 (.189)	*** -.286 (.194)	*** -.136 (.201)	-079 (.216)
Childhood high	*** -1.201 (.358)	*** -.888 (.372)	*** -.622 (.389)	*** -.294 (.417)	*** -1.576 (.465)	*** -1.415 (.482)	*** -.992 (.499)	-708 (.570)

NOTE.—All models included controls for the child's age, sex, race, mother's age at the child's birth, mother's marital status, mother's education, the proportion of life poor, low birth weight, mother's AFQT, and mother's delinquency. Youths with stably low problems serve as the reference groups.

* $P < .05$.

** $P < .01$.

*** $P < .001$.